

INITIAL ENVIRONMENTAL EXAMINATION-IEE

(REVISED-01)

FOR

“MANUFACTURING, ASSEMBLING AND SALES OF BUSES, COACHES,
REPAIR AND MAINTENANCE SERVICES”

No 188/189, 10th Street, Yangon Industrial Zone, Mingalardon Township, Yangon Region



PROPONENT



SC Auto (Myanmar) Co., Ltd.

No 188/189, 10th Street, Yangon Industrial Zone, Mingalardon Township,
Yangon Region

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Report Review Form

Report Title: Initial Environmental Examination Report (Final) for “MANUFACTURING, ASSEMBLING AND SALES OF BUSES, COACHES, REPAIR AND MAINTENANCE SERVICES”	
Report Version: 01 Version	
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Approved by: U Kyaw Soe Win	Position: Managing Director (TCR No. 0019)
Approved Date: 27/2/2024	Signature: 

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကုန်တိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ ရန်ကုန်စက်မှုဇုန်၊ အမှတ်-၁၁၈/၁၁၉၊ (၁၀) လမ်းတွင် ခရီးသည်တင်
 မော်တော်ယာဉ်နှင့် အဝေးပြေးဘတ်စ်ကားများ တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် ပြုပြင်ထိန်းသိမ်းရေးဝန်ဆောင်မှုလုပ်ငန်းအတွက် ရေးဆွဲတင်ပြလာသည့်
 ကနဦးပတ်ဝန်းကျင် ဆန်းစစ်ခြင်း (Initial Environmental Examination-IEE) အစီရင်ခံစာအပေါ် စိစစ်တွေ့ရှိချက်နှင့် သုံးသပ်အကြံပြုချက်များအား
 ပြန်လည်ပြင်ဆင်ဖြည့်စွက်ထားမှုများ

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
(က)	ကတိကဝတ်	
	<p>ကတိကဝတ်အားဖော်ပြရာတွင် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံး လုပ်နည်း အပိုဒ် ၃၅ အရ အောက်ပါကတိကဝတ်များကို အခြား ဖော်ပြချက်များနှင့် ပူးပေါင်းဖော်ပြဘဲ စီမံကိန်းအဆိုပြုသူနှင့် အကြံပေး ပုဂ္ဂိုလ်တို့မှ လက်မှတ်ရေးထိုး၍ သီးခြားထည့်သွင်းဖော်ပြရန်-</p> <p>(က) ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းသည် တိကျခိုင်မာကြောင်းနှင့် ပြည့်စုံကြောင်း၊</p> <p>(ခ) ဤလုပ်ထုံးလုပ်နည်းအပါအဝင် သက်ဆိုင်ရာဥပဒေများကို တိကျစွာ လိုက်နာ၍ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းကို ဆောင်ရွက်ထားကြောင်း၊</p> <p>(ဂ) စီမံကိန်းသည် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာပါ ကတိကဝတ်၊ ပတ်ဝန်းကျင်ထိခိုက်မှု လျော့ချရေးလုပ်ငန်းများနှင့် အစီအစဉ် များကို အပြည့်အဝ အစဉ်အမြဲ လိုက်နာဆောင်ရွက်မည်ဖြစ်ကြောင်း၊</p> <p>(ဃ) စက်ရုံလုပ်ငန်းပြီးစီး၍ စီမံကိန်းပိတ်သိမ်းချိန်တွင် လူမှုဝန်းကျင်အား ထိခိုက်မှုအနည်းဆုံးဖြစ်စေရန် အစီအမံများ ချမှတ်ဆောင်ရွက်ပေးမည် ဖြစ်ကြောင်း။</p>	DOCUMENT CERTIFICATION AND DECLARATION - စာမျက်နှာ XIV တွင်ပြန်လည်ထည့်သွင်းဖော်ပြထားပါသည်။
(ခ)	အကျဉ်းချုပ်အစီရင်ခံစာ	
	မှတ်ချက်ပေးရန်မရှိပါ။	
(ဂ)	စီမံကိန်းအကြောင်းအရာဖော်ပြချက်	
	<ul style="list-style-type: none"> • စီမံကိန်းအဆိုပြုသူ၏ အမည်၊ ဆက်သွယ်ရန်လိပ်စာ၊ ဖုန်းနံပါတ်၊ 	<ul style="list-style-type: none"> • အခန်း (၃) အပိုဒ် ၃.၁ Project Particulars စာမျက်နှာ (၄၃)

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
	<p>အီးမေးလ်၊ ဝက်ဆိုက်တို့ကို ဖော်ပြပေးရန်၊</p> <ul style="list-style-type: none"> • စီမံကိန်းလုပ်ငန်း စတင်မည့်အချိန်ကာလ၊ ထုတ်လုပ်မှုစတင်မည့် အချိန်ကာလ၊ စီမံကိန်းပိတ်သိမ်းမည့် အချိန်ကာလတို့ကို ဖော်ပြထားသော Project Schedule ကို ဖော်ပြပေးရန်၊ • စက်ရုံမှထုတ်လုပ်မည့် မော်တော်ယာဉ်အမျိုးအစားများကို ဓါတ်ပုံများဖြင့် ဖော်ပြရန်နှင့် အမျိုးအစားအလိုက် ထုတ်လုပ်မည့် အရေအတွက်ကို နှစ်အလိုက်/ လအလိုက်ဖော်ပြရန်၊ • စီမံကိန်းလုပ်ငန်းတွင်ပါဝင်သည့် အခြေခံအဆောက်အအုံများနှင့် အရေအတွက်ကို စာရင်းပြုစုဖော်ပြရန်၊ • အသုံးပြုမည့်စက်ယန္တရားများနှင့် အရေအတွက်ကို စာရင်းပြုစုဖော်ပြရန်၊ • အစီရင်ခံစာ၏ စာမျက်နှာ ၄၈ တွင် ဖော်ပြထားသော Figure 3.20 Grease Interceptor for Industrial Wastewater Drain ကို ရှင်းလင်းပြတ်သားစွာ ဖြင့် ပြန်လည်ဖော်ပြပေးရန်၊ • အစီရင်ခံစာ၏ စာမျက်နှာ ၅၀ တွင် ဖော်ပြထားသော Figure 3.22 Sanitation System Outlet ကို ရှင်းလင်းပြတ်သားစွာဖြင့် ပြန်လည်ဖော်ပြပေးရန်၊ • စက်ရုံတွင် ထုတ်လုပ်မှုကဏ္ဍအလိုက် စက်ပစ္စည်းများ၏ နေရာချထားမှု အခင်းအကျင်း Layout Plan၊ Schematic Diagram တို့ကို ဖော်ပြရန်၊ • Spray Painting Process အတွက် သုံးစွဲမည့် သုတ်ဆေးများ၊ ဖြန်းဆေး အမျိုးအစား၊ Material Safety Data Sheet၊ သုံးစွဲမည့်ပမာဏ၊ ရယူမည့် အရင်းအမြစ်၊ သိုလှောင်ထားရှိမည့်အစီအစဉ်တို့ကိုဖော်ပြရန်၊ • လောင်စာဆီများ သုံးစွဲသည့်ပမာဏ၊ ရယူသည့်အရင်းအမြစ်၊ သယ်ယူ 	<p>တွင် ပြန်လည်ထည့်သွင်းဖော်ပြထား ပါသည်။</p> <ul style="list-style-type: none"> • အခန်း(၃) အပိုင်း ၃.၁၀ Project Schedule ဇယား ၃.၈ (စာမျက်နှာ ၆၆ မှ ၆၇ ထိ) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။ • အခန်း(၃) အပိုင်း ၃.၇ Product Profile and Production Capacity စာမျက်နှာ (၆၀) တွင်ထည့်သွင်းဖော်ပြထား ပါသည်။ • အခန်း(၃) အပိုင်း ၃.၁၃ Factory Buildings Description ရှိ Table ၃.၁၀ စာမျက်နှာ (၇၁ မှ ၈၁ ထိ) တွင်ထည့်သွင်း ဖော်ပြထားပါသည်။ • အခန်း (၃) အပိုင်း ၃.၆ Equipment (to be imported) ဇယား ၃.၄ စာမျက်နှာ (၅၃ မှ ၆၀ ထိ) တွင် ထည့်သွင်း ဖော်ပြထား ပါသည်။ • အခန်း (၃) အပိုင်း ၃.၁၄ Waste Disposing System၊ စာမျက်နှာ (၈၁-၈၆) နှင့် Appendix (17) တွင်ပြန်လည် ဖော်ပြထားပါသည်။ • အခန်း (၃) အပိုင်း ၃.၁၄.၂ Sanitary Water Disposal- စာမျက်နှာ (၈၂-၈၅) နှင့် Appendix (13) စာမျက်နှာ (CIX) တွင်ပြန်လည် ဖော်ပြထားပါသည်။ • အခန်း (၃) အပိုင်း ၃.၁၃ Factory Buildings Description ၊ စာမျက်နှာ (၇၁ မှ ၈၁ ထိ) တွင် ဖော်ပြထားပါသည်။ • အခန်း(၃) ဇယား ၃.၄-စာမျက်နှာ (၅၂) တွင် ထည့်သွင်း ဖော်ပြထားပါသည်။ Material Safety Data Sheet အား Appendix (XXXIII) တွင်ဖော်ပြထားပါသည်။ • အခန်း (၃) အပိုင်း ၃.၁၂ Utilities ၊ Fuel Requirements ခေါင်း

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
	<p>ပို့ဆောင်မှုနှင့် သိုလှောင်ထားရှိမှု အခြေအနေကို ဖော်ပြပေးရန်၊</p> <ul style="list-style-type: none"> • အစီရင်ခံစာ၏ စာမျက်နှာ (၁၇-၂၅) တွင် တင်သွင်းမည့် ကုန်ကြမ်းပစ္စည်းများကို အရေအတွက်နှင့်တကွ ဖော်ပြထားရာ အဆိုပါ တင်သွင်းမည့် ကုန်ကြမ်းပစ္စည်းများ အရေအတွက်ကို နှစ်အလိုက်/ လအလိုက် အချိန် ကာလနှင့်တကွ ဖြည့်စွက်ဖော်ပြရန်၊ • စီမံကိန်းတွင် လိုအပ်မည့်ကုန်ကြမ်းများနှင့် ထုတ်လုပ်ပြီးဖြစ်သော မော်တော်ယာဉ်များအား သယ်ယူပို့ဆောင်ရေးနည်းလမ်းများ၊ အစီအစဉ်များ၊ သိုလှောင်ထားရှိမှု၊ သယ်ယူပို့ဆောင်မည့်နေရာ၊ ယာဉ်များ စသည်တို့ကို ဖော်ပြရန်၊ • လျှပ်စစ်ဓါတ်အားသုံးစွဲမှုနှင့် ရယူသည့်အရင်းအမြစ်၊ ရေသုံးစွဲမှုနှင့် ရယူသည့် အရင်းအမြစ်တို့ကို စီမံကိန်းအကြောင်းအရာ ဖော်ပြချက်တွင် ဖြည့်စွက်ဖော်ပြရန်၊ • စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိမှုမာဏကို အမျိုးအစားအလိုက် ခွဲခြားဖော်ပြပေးရန်နှင့် သိုလှောင်ထားရှိမည့်နေရာ၊ မည်သို့ တာဝန်ယူ စွန့်ပစ်မည် ဖြစ်ကြောင်းကို ဖော်ပြပေးရန်၊ • စက်ရုံလုပ်ငန်းများနှင့် အလုပ်သမားများ သုံးစွဲရာမှ တစ်နေ့တာ ထွက်ရှိမည့် စွန့်ပစ်ရေပမာဏ၊ စီးဆင်းရာလမ်းကြောင်းများနှင့် နောက်ဆုံးစွန့်ပစ်မည့် နေရာကို မြေပုံဖြင့်ဖော်ပြပေးရန်။ 	<p>စဉ်ဖြင့် စာမျက်နှာ (၇၄ မှ ၇၅ ထိ) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p> <ul style="list-style-type: none"> • အခန်း (၃) အပိုင်း ၃.၅ Raw Materials၊ ဇယား ၃.၁ ၊ စာမျက်နှာ (၄၄-၆၃) တွင် ထည့်သွင်းဖော်ပြထားပါသည် • အခန်း (၃) အပိုင်း ၃.၅ Raw Material၊ စာမျက်နှာ(၄၄-၅၂) နှင့် အပိုင်း ၃.၆ Product Profile and Production Capacity စာမျက်နှာ (၆၀) တွင် ထည့်သွင်းဖော်ပြထားပါသည် • အခန်း (၃) အပိုင်း ၃.၁၂ Utilities စာမျက်နှာ (၆၈ မှ ၇၁ ထိ) တွင် ထည့်သွင်းဖော်ပြထား ပါသည်။ • အခန်း (၃) အပိုင်း ၃.၁၄ Waste Disposing System အပိုင်းငယ် ၃.၁၄.၃ Solid Waste Disposing System စာမျက်နှာ (၈၆) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။ • အခန်း (၃) အပိုင်း ၃.၁၄ Waste Disposing System အပိုင်းငယ် ၃.၁၄.၁ Storm Water စာမျက်နှာ (၈၁) တွင် ထည့်သွင်း ဖော်ပြထားပါသည်။
(ဃ)	မူဝါဒ၊ ဥပဒေနှင့် အဖွဲ့အစည်းဆိုင်ရာမူဘောင်	
	<p>အစီရင်ခံစာတွင် လုပ်ငန်းနှင့်သက်ဆိုင်သည့် အောက်ဖော်ပြပါ တည်ဆဲ ဥပဒေများကို ထည့်သွင်းဖော်ပြရန်နှင့် အဆိုပါဥပဒေများကို ရေးသား ဖော်ပြရာ တွင် ဥပဒေများ၏ ပုဒ်မ၊ အပိုဒ်အား ကူးယူခြင်းမဟုတ်ဘဲ အဆိုပါ ဥပဒေ၏</p>	<p>အခန်း(၂) စာမျက်နှာ ၆ မှ ၄၂ အထိ ပြန်လည်ထည့်သွင်းဖော်ပြ ထားပါသည်။</p>

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
	<p>ပုဒ်မ၊ အပိုဒ်ပါအချက်များကို စီမံကိန်းအဆိုပြုသူမှ လိုက်နာ ဆောင်ရွက်မည့် ကတိကဝတ်ကို ထည့်သွင်းဖော်ပြရန်-</p> <ul style="list-style-type: none"> • ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဥပဒေ (၂၀၁၂) ပုဒ်မ ၇ (က)၊ ၁၄၊ ၁၅၊ ၁၆၊ ၂၉) • ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနည်းဥပဒေများ (၂၀၀၄) (နည်း ၆၉) • ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ ၂၀၁၅ (အပိုဒ် ၁၀၂ မှ ၁၁၀၊ ၁၁၃၊ ၁၁၅၊ ၁၁၇) • အမျိုးသားပတ်ဝန်းကျင်ဆိုင်ရာ အရည်အသွေး (ထုတ်လွှတ်မှု) လမ်းညွှန် ချက်များ၊ (အပိုဒ် ၁.၂၊ ၁.၃၊ ၁.၄) • မြန်မာနိုင်ငံရင်းနှီးမြှုပ်နှံမှုဥပဒေ၊ ၂၀၁၆ (ပုဒ်မ ၅၀ (ဃ)၊ ၅၁၊ ၆၅ (စ) မှ (ထ)၊ ၇၃) • မြန်မာနိုင်ငံ ရင်းနှီးမြှုပ်နှံမှုနည်းဥပဒေများ၊ ၂၀၁၇ (နည်း ၂၀၂၊ ၂၀၃၊ ၂၀၆၊ ၂၁၂) • မြန်မာ့အာမခံလုပ်ငန်းဥပဒေ၊ ၁၉၉၃ (ပုဒ်မ ၁၅၊ ၁၆) • ပုဂ္ဂလိကစက်မှုလုပ်ငန်းဥပဒေ၊ ၁၉၉၀ (ပုဒ်မ ၄၊ ၁၃ (ခ) (စ) (ဆ)၊ ၁၅ (က) (ခ)) • ဓါတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများ အန္တရာယ်မှ တားဆီးကာကွယ်ခြင်း ဥပဒေ၊ ၂၀၁၃ (ပုဒ်မ ၁၅၊ ၁၆၊ ၁၇၊ ၂၂၊ ၂၇) • မြန်မာ့မီးသတ်တပ်ဖွဲ့ဥပဒေ၊ ၂၀၁၅ (ပုဒ်မ ၂၅) • ရေနံနှင့်ရေနံထွက်ပစ္စည်းဆိုင်ရာဥပဒေ၊ ၂၀၁၇ (ပုဒ်မ ၉ (က) (င)၊ ၁၀ (ခ)၊ (လောင်စာဆီ/ သယ်) ပုဒ်မ ၁၁၊ (ကန်ဖြင့်လှောင်လျှင်) ပုဒ်မ ၁၀ (က) (ဂ) (ဃ)) • မော်တော်ယာဉ်ဥပဒေ၊ ၂၀၁၅ • စံချိန်စံညွှန်းသတ်မှတ်ခြင်းဆိုင်ရာဥပဒေ၊ ၂၀၁၄ (ပုဒ်မ ၁၇၊ ၁၉၊ ၂၆) • မြန်မာအင်ဂျင်နီယာကောင်စီဥပဒေ၊ ၂၀၁၃ (ပုဒ်မ ၃၇၊ ၃၄) 	

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
	<ul style="list-style-type: none"> • ပို့ကုန်သွင်းကုန်ဥပဒေ၊ ၂၀၁၂ (ပုဒ်မ ၅၊ ၆၊ ၇) • အလုပ်သမားအဖွဲ့အစည်းဥပဒေ၊ ၂၀၁၁ • အလုပ်သမားအငြင်းပွားမှုဖြေရှင်းရေး ဥပဒေ၊ ၂၀၁၂ • အလုပ်အကိုင်နှင့် ကျွမ်းကျင်မှုဖွံ့ဖြိုး တိုးတက်ရေးဥပဒေ၊ ၂၀၁၃ • အနည်းဆုံးအခကြေးငွေ ဥပဒေ၊ ၂၀၁၃ • အခကြေးငွေပေးချေရေးဥပဒေ၊ ၂၀၁၆ • လူမှုဖူလုံရေးဥပဒေ၊ ၂၀၁၂ • Workmen Compensation Act, 1923 • ခွင့်နှင့်အလုပ်ပိတ်ရက်များ ဥပဒေ၊ ၁၉၅၁ • မြန်မာနိုင်ငံပြည်သူ့ကျန်းမာရေးဥပဒေ၊ ၁၉၇၂ (ပုဒ်မ ၃၊ ၅) • ရန်ကုန်တိုင်းဒေသကြီး စည်ပင်သာယာရေးအဖွဲ့များဥပဒေ၊ ၂၀၁၈ • ရေအရင်းအမြစ်နှင့် မြစ်ချောင်းများထိန်းသိမ်းရေးဥပဒေ၊ ၂၀၀၆ (ပုဒ်မ ၈ (က)၊ ၁၁၊ ၁၉၊ ၂၁ (ခ)၊ ၂၂၊ ၂၄ (ခ)) 	
(c)	စီမံကိန်းအနီးပတ်ဝန်းကျင်အကြောင်းအရာဖော်ပြချက်	
၁။	<ul style="list-style-type: none"> • စီမံကိန်းကြောင့် ဖြစ်နိုင်သည့် သက်ရောက်မှုများကို ဖော်ထုတ်ရန်အတွက် အဆိုပါသက်ရောက်မှုများကို ခြုံငုံမိစေမည့် နယ်ပယ်ကို သတ်မှတ်၍ ဆန်းစစ်လေ့လာရမည် ဖြစ်သောကြောင့် ထိုသတ်မှတ်ထားသည့် ဧရိယာ နေရာအား ဖော်ပြရန်၊ • အဆိုပါသတ်မှတ်ထားသည့် ဧရိယာအတွင်း လူနေရပ်ကွက်များ၊ မြစ်ချောင်း များ၊ အခြားစီမံကိန်းများ၊ ဘာသာရေးနှင့် ယဉ်ကျေးမှုဆိုင်ရာ အခြေခံ အဆောက်အဦများရှိပါက မြေပုံဖြင့်ဖော်ပြရန်။ 	<ul style="list-style-type: none"> • အခန်း (၄) အပိုင်း ၄.၁ location and scale of the project စာမျက်နှာ (၈၈-၈၉) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။ • အခန်း (၄) အပိုင်း ၄.၁ Location and scale of the project စာမျက်နှာ (၈၈-၈၉) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။
၂။	<ul style="list-style-type: none"> • သက်ရောက်မှုများအား ခြုံငုံစွာ ဆန်းစစ်လေ့လာမည့် ဧရိယာကို ဖော်ပြပြီး အဆိုပါဧရိယာအတွင်း မြစ်ချောင်းများ ရှိမရှိ ဖော်ပြရန်နှင့် ရှိပါက Surface 	<ul style="list-style-type: none"> • အခန်း (၄) အပိုင်း ၄.၁ Location and scale of the project စာမျက်နှာ (၈၈-၈၉) နှင့် အပိုင်း ၄.၇ surface water စာမျက်နှာ

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
	<p>Water အရည်အသွေးကို တိုင်းတာဖော်ပြရန်၊</p> <ul style="list-style-type: none"> • ပတ်ဝန်းကျင်လေအရည်အသွေးတိုင်းတာမှုရလဒ်တွင် Ozone အတွက် တိုင်းတာမှုရလဒ်ကို ဖြည့်စွက်ဖော်ပြရန်၊ • ဆူညံသံတိုင်းတာမှုအား အနည်းဆုံးသုံးကြိမ်နှင့်အထက် ပြုလုပ်ရန်နှင့် တိုင်းတာသည့်နေရာများ၏ ကိုဩဒိနိတ်အမှတ်များနှင့် ဓါတ်ပုံအထောက်အထားများကို ဖော်ပြရန်။ 	<p>(၉၈) အတွင် ထည့်သွင်းဖော်ပြထားပါသည်။</p> <ul style="list-style-type: none"> • အခန်း (၄) အပိုင်း ၄.၄ air quality - ဇယား ၄.၄ - စာမျက်နှာ (၉၂-၉၃) အတွက် ထည့်သွင်းဖော်ပြထားပါသည်။ • အခန်း (၄) အပိုင်း ၄.၈ Noise environment စာမျက်နှာ (၉၈-၉၉) အတွက် ထည့်သွင်းဖော်ပြထားပါသည်။ ထို့ပြင် ၃ ကြိမ်နှင့် အထက် တိုင်းတာခြင်းအား အတည်ပြုချက်ရရှိပြီးနောက် monitoring ကာလ တွင် လုပ်ဆောင်သွားပါမည်။
(စ)	ထိခိုက်မှုများအား သတ်မှတ်ဖော်ထုတ်ခြင်း၊ ဆန်းစစ်ခြင်းနှင့် လျော့နည်းစေရေး ဆောင်ရွက်မည့်နည်းလမ်းများ	
	<ul style="list-style-type: none"> • စီမံကိန်းလုပ်ငန်းဆောင်ရွက်ရာမှ ထွက်ရှိမည့် အစိုင်အခဲ စွန့်ပစ်ပစ္စည်းများ ၏ ပမာဏကို အမျိုးအစားအလိုက် ခွဲခြားဖော်ပြရန်နှင့် သိုလှောင်ထားရှိမှု၊ နောက်ဆုံးစွန့်ပစ်သည့်နည်းလမ်း၊ တာဝန်ယူစွန့်ပစ်မည့် အဖွဲ့အစည်းနှင့် အစီအစဉ်တို့ကို ဖော်ပြပေးရန်၊ • စီမံကိန်းလုပ်ငန်းဆောင်ရွက်ရာမှ ထွက်ရှိမည့် Wastewater သန့်စင်မည့် နည်းစနစ်၊ ဒီဇိုင်း၊ အဆိုပါ သန့်စင်ပြီးနောက် ထွက်ရှိလာမည့် Wastewater အရည်အသွေးကို NEQEG နှင့်အညီ နှိုင်းယှဉ်ဖော်ပြရန်၊ နောက်ဆုံး စွန့်ပစ်မည့်နေရာအား ကိုဩဒိနိတ်အမှတ်များဖြင့် ထည့်သွင်းဖော်ပြရန် • ဆူညံသံထွက်ပေါ်နိုင်သည့် အရင်းအမြစ်များ (ဥပမာ- Generator, Air Compressor, Boiler, Raw Material Cutting, Bending, Rolling စသည်ဖြင့်) ကို ဖော်ပြရန်နှင့် လျော့ချမည့် အစီအစဉ် (ဥပမာ-အသံလုံ ခန်းဖြင့် တည်ဆောက်မည်ဖြစ်ကြောင်း) ကို ဖြည့်စွက်ဖော်ပြရန်။ 	<ul style="list-style-type: none"> • အခန်း (၃) အပိုင်း ၃.၁၄ Waste Disposing System အပိုင်းငယ် ၃.၁၄.၃ Solid Waste Disposing System စာမျက်နှာ (၈၆) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။ • အခန်း (၃) အပိုင်း ၃.၁၄ Waste Disposing System အပိုင်းငယ် ၃.၁၄.၁ Storm Water စာမျက်နှာ (၈၁-၈၂) တွင် ထည့်သွင်း ဖော်ပြ ထားပါသည်။
(ဆ)	ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်	
၁။	<ul style="list-style-type: none"> • ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်တွင် ထိခိုက်မှုလျော့ချမည့် လုပ်ငန်းများ၊ စောင့်ကြပ်ကြည့်ရှုခြင်းများအတွက် ဖော်ပြထားသော ရန်ပုံငွေနှင့် မလုံ 	<ul style="list-style-type: none"> • အခန်း (၆) အပိုင်း ၆.၄ Environmental Monitoring Cost Estimate၊ စာမျက်နှာ (၁၅၄) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
	<p>လောက်ပါက ထပ်မံကျခံသုံးစွဲမည်ဖြစ်ကြောင်း ဖြည့်စွက်ဖော်ပြရန်၊</p> <ul style="list-style-type: none"> • ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အတွက် တာဝန်ယူဆောင်ရွက်မည့် အဖွဲ့အစည်းဖွဲ့စည်းထားရှိမှု၊ မူဝါဒ၊ အဖွဲ့ဝင်တစ်ဦးချင်း၏ တာဝန်ဝတ္တရားများကို ဖော်ပြရန်၊ • စောင့်ကြပ်ကြည့်ရှုမည့် အစီအစဉ်တွင် လေအရည်အသွေးအတွက် NEQEG နှင့်အညီ စောင့်ကြပ်ကြည့်ရှုနိုင်ရန် ထပ်မံလိုအပ်သော PM10, PM2.5, Ozone တို့ကို ဖြည့်စွက်ဖော်ပြရန်၊ • စက်ရုံလုပ်သားများ၏ လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် စီမံဆောင်ရွက်ထားရှိမှုများ၊ အချိန်ပြည့် ကျန်းမာရေးစောင့်ရှောက်မှု ပေးနိုင်ရေး အစီအစဉ်များကို ဖော်ပြရန်၊ • စက်ရုံလုပ်သားများ၏ Safety အတွက် လုပ်ငန်းခွင်နှင့် သက်ဆိုင်သည့် Safety Dress အသုံးပြုမှု အခြေအနေများကို ဖြည့်စွက်ဖော်ပြပေးရန်။ 	<ul style="list-style-type: none"> • အခန်း (၆) အပိုင်း ၆.၁ Environmental Management Team၊ ဇယား ၆.၁ စာမျက်နှာ (၁၃၆ မှ ၁၃၇ ထိ) တွင် ဖော်ပြထားပါသည်။ • အခန်း (၆) အပိုင်း ၆.၃ Environmental Monitoring Plan ဇယား ၆.၄ စာမျက်နှာ (၁၅၄ မှ ၁၅၅ ထိ) တွင် ဖော်ပြထားပါသည်။ • အခန်း (၆) အပိုင်း ၆.၂ Environmental Management Plan၊ အပိုင်းငယ် ၆.၂.၁ စာမျက်နှာ (၁၄၆ မှ ၁၅၀) ထိ တွင် ဖော်ပြထားပါသည်။ • အခန်း (၆) အပိုင်း ၆.၂ Environmental Management Plan၊ အပိုင်းငယ် ၆.၂.၁ စာမျက်နှာ (၁၄၆ မှ ၁၅၀) ထိတွင် ဖော်ပြထားပါသည်။
(၈)	စီမံကိန်းကြောင့် ထိခိုက်ခံစားရသည့် ဒေသခံပြည်သူများအတွက် ဆောင်ရွက်ပေးမည့် ဖွံ့ဖြိုးရေးအစီအစဉ်	
	<ul style="list-style-type: none"> • ထိခိုက်ခံစားရနိုင်သည့် ဒေသခံပြည်သူတို့၏ ရေရှည်လူမှုစီးပွားရေး ဖွံ့ဖြိုးတိုးတက်စေမှုအတွက် ဦးစားပေးဆောင်ရွက်သင့်သည့် လုပ်ငန်းများအတွက် လုံလောက်သည့် ရန်ပုံငွေထူထောင်ခြင်းနှင့် လုပ်ငန်းများ ဖော်ဆောင်ပေးခြင်း တို့ကို ထည့်သွင်းဖော်ပြရန်။ 	<ul style="list-style-type: none"> • အခန်း(၆) အပိုင်း ၆.၇ Corporate Social Responsibilities (CSR) စာမျက်နှာ (၁၅၆) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။
(၉)	အများပြည်သူနှင့်တိုင်ပင်ဆွေးနွေးခြင်းနှင့် သတင်းအချက်အလက်ထုတ်ပြန်ခြင်း	
	<ul style="list-style-type: none"> • စီမံကိန်းဆိုင်ရာသတင်းအချက်အလက်များကို အများပြည်သူနှင့် လူမှုအဖွဲ့အစည်းများက သိရှိနိုင်ရန် ကြော်ငြာထားရှိသည့် အစီအစဉ်များကို ဖြည့်စွက်ဖော်ပြပေးရန်၊ • အများပြည်သူမှ စီမံကိန်းနှင့်ပတ်သက်၍ မကျေနပ်မှုများ၊ နှစ်နာမှုများကို 	<ul style="list-style-type: none"> • အခန်း (၈) အပိုင်း ၈.၂ Response for Comments and Suggestions စာမျက်နှာ (၁၆၁) တွင် ထည့်သွင်းဖော်ပြထားပါသည်။ • အခန်း (၈) အခန်း (၈) အပိုင်း ၈.၂ Response for Comments and

စဉ်	သုံးသပ်အကြံပြုချက်များ	သုံးသပ်အကြံပြုချက်များ
	<p>တိုင်ကြားနိုင်စေရန်အတွက် လုပ်ငန်းစဉ်တစ်ခု အကောင်အထည်ဖော် ဆောင်ရွက်ရန်၊</p> <ul style="list-style-type: none"> • ထိုလုပ်ငန်းစဉ်တွင် ပါဝင်မည့် နစ်နာမှုတိုင်ကြားရေး အစီအစဉ်များ၊ တာဝန်ယူ ဖြေရှင်းမည့် အဖွဲ့အစည်းများ၊ ဖြေရှင်းဆောင်ရွက်ရန် ကြာမြင့်မည့် အချိန်ကာလနှင့် တိုင်ကြားသူထံသို့ တုန့်ပြန်မည့် အစီအစဉ်များ စသည်တို့ကို အသေးစိတ် ထည့်သွင်းဖော်ပြရန်၊ • မကျေနပ်မှုများ၊ နစ်နာမှုများကို တိုင်ကြားရာတွင် တိုင်ကြားနိုင်မည့်နေရာများကို အများပြည်သူ မြင်နိုင်မည့်၊ ထင်ရှားမည့် နေရာများတွင် ကြေညာထားရှိမည့် အစီအစဉ်များအား အစီရင်ခံစာတွင် ထည့်သွင်းဖော်ပြရန်။ 	<p>Suggestions၊ ဇယား ၈.၂ စာမျက်နှာ (၁၆၁) တွင် ထည့်သွင်းဖော်ပြထားပါ သည်။</p>
(ည)	အထွေထွေအကြံပြုချက်	
	<ul style="list-style-type: none"> • ပတ်ဝန်းကျင်ထိခိုက်မှုဆိုင်ရာလုပ်ထုံးလုပ်နည်း အပိုဒ် ၃၇ အရ ကနဦး ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာ (IEE) Soft Copy ကို ပူးတွဲ တင်ပြရန်၊ • ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာလုပ်ထုံးလုပ်နည်းအပိုဒ် ၃၄၊ ၃၅၊ ၃၆ ပါ IEE အစီရင်ခံစာတွင် ပါဝင်ရမည့် Format အတိုင်း ခေါင်းစဉ်ကြီး၊ ခေါင်းစဉ်ခွဲများ၊ ဓာတ်ပုံများ၊ မြေပုံများ၊ နောက်ဆက်တွဲများ စနစ်တကျ ဖော်ပြရန် • စီမံကိန်းအဆိုပြုသူမှ ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဦးစီးဌာန၏ သုံးသပ်ချက်နှင့် အကြံပြုချက်များအား ပြန်လည်ရေးဆွဲတင်ပြရာတွင် ပြန်လည်ပြင်ဆင်ထားသည့် ဖြေကြားချက်များအား ပူးတွဲတင်ပြရန်နှင့် အစီရင်ခံစာ၏ မည့်သည့်အပိုင်း၊ မည့်သည့်စာမျက်နှာတွင် ရေးသားထား သည်ကို Comment Response Table ဖြင့် ဖော်ပြရန် 	<ul style="list-style-type: none"> • ညွှန်ကြားချက်အတိုင်း ဆောင်ရွက်ထားပါသည်။

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DOCUMENT CERTIFICATION AND DECLARATION

Green Myanmar Environmental Services Co., Ltd. has prepared this Initial Environmental Examination (IEE) report for “Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services” project. The undersigned certify that the particulars in this report are correct and true to the best of my knowledge.

I, (*Managing Director of SC Auto (Myanmar) Co., Ltd.*) as proponent of this project, do hereby solemnly affirm and declare that:

- Comply with all Myanmar laws, rules and regulations, including Special Economic Zone Law and Clauses 14 and 15 of the Environmental Conservation Law (2012),
- Ensure that legal and other obligations are incorporated in the designs, procedures and project controls,
- Communicate legal and other requirements to personnel and contractors accountable for compliance,
- Ensure all relevant legal and other requirements and associated documentation (e.g., licenses, permits, approval applications) are readily available on site to company personnel, contractors, subcontractors and consultants,
- Conduct a compliance audit at least annually and ensure there is a process in place to monitor on-going compliance with all legal and other requirements.
- Follow according to the Environmental Management Plan & Monitoring Plan.
- Prepare plans to prevent environmental and social damage when the factory is disclosure.
- Submit monitoring report regularly
- Follows company OHS policies

Signature :  -----
Name : YIAN LEE -----
Designation : PROJECT DIRECTOR -----

SC Auto (Myanmar) Company Limited

No 188/189, 10th Street, Yangon Industrial Zone,
Mingalardon Township, Yangon Region, Myanmar
Tel: 01- 9670928

Date:

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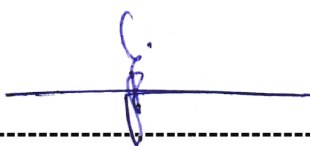
COMMITMENT AND ACKNOWLEDGEMENT

An Initial Environmental Examination (IEE) Report which includes Environmental Management Plan (EMP) is a procedure that identifies, describes, evaluates and develops means of mitigating potential impacts of a proposed activity on the environment.

This IEE report was prepared by using information from the following sources: review of selected literature, reports, and advisories; meetings with several interested parties; personal visitation with several persons; the experience of the IEE team; and other information solicited from baseline data and stakeholders. And we strongly commit that this report was prepared in compliance with Myanmar Environmental Laws and Regulations.

The IEE team is grateful to the project proponent – **SC Auto (Myanmar) Company Limited** - for commissioning us to conduct this IEE and EMP report in respect of the proposed project. We would like to further acknowledge with great appreciation all those neighbors who participated in the public consultation process for their cooperation throughout the exercise.

We further acknowledge the support, either direct or indirect, from the various parties who assisted the IEE team towards the successful completion of this report.

Signature : 
Name : **U Kyaw Soe Win**
Designation : **Managing Director**



Green Myanmar Environmental Services Co., Ltd.

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Website: www.gmes-mm.com

Date: **.27/2/2024.....**

ABBREVIATIONS

Al	Aluminum
NH ₃	Ammonia
BOD	Biological Oxygen Demand
CO ₂	Carbon Dioxide
Co., Ltd.	Company Limited
CN	Cyanide
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
cmol/kg	centi-mole per liter
m ³	cubic meter
CSR	Corporate Social Responsibility
dB	Decibel
°C	Degree Celsius
DPM	Diesel Particulate Matter
ECD	Environmental Conservation Department
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EM	Environmental Monitoring
EMP	Environmental Management Plan
EPA	Environmental Protective Agency
FRP	Fiber Reinforced Plastic
g/kg	gram per kilogram
GMES	Green Myanmar Environmental Services
HQ	Head Quarter
HSE	Health, Safety and Environment
IEE	Initial Environmental Examination
IFC	International Finance Corporation
ISO	International Standardization Organization
in	inches
IT	Information Technology
km	kilometer
Kph	kilometer per hour
kVA	kilovolt ampere
LTA	Lost time accident
M & E	Mechanical & Electrical

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MEPE	Myanmar Electric Power Enterprise
mg/kg	milligram per kilogram
µg/m ³	microgram per cubic-meter
mm	millimeter
Mn	Manganese
mmol/l	milli-mole per liter
m/s	meter per second
NEQG	National Environmental Quality (Emission) Guidelines
ppb	part per billion
PM	Particulate Meter
PM _{2.5}	Particulate Meter 2.5 microns diameter
PM ₁₀	Particulate Meter 10 microns diameter
ppm	part per million
PVC	Poly Vinyl Chloride
RTM	Resin transfer molding
SO ₂	Sulfur Dioxide
TDS	Total Dissolved Solid
UNDP	United Nation Development Programme
USA	United States of America
VEC	Valued Ecosystem Components
VOC	Volatile Organic Compound
WHO	World Health Organization
YCDC	Yangon City Development Committee
YTU	Yangon Technology University

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SC Auto (Myanmar) Co., Ltd.

EXECUTIVE SUMMARY

The GMES, Green Myanmar Environmental Services that is authorized third party of Ministry of Natural Resources and Environmental Conservation (MONREC) and registration number is 0006, has carried out this Initial Environmental Examination (IEE) in November 2017 for the proposed project of assembly and manufacture of buses and coaches, repair and maintenance services at the No 188/189, 10th Street, Yangon Industrial Zone, Mingalardon Township, Yangon Region, the Republic of the Union of Myanmar. SC Auto (Myanmar) Company Limited which will invest US \$ 10.901 million on the proposed auto mobile project is 100% foreign investment, aiming to carrying out construction and operation of assembly and manufacture of automobile factory at the above-mentioned address.

Salient Features of Project

The Salient features of the project are as below:

1	Project Type:	Manufacturing and sales
2	Name of the Project:	Manufacturing, Assembling and Sales of buses/coaches, repair and maintenance services
3	Location:	
	(a) Township	Mingalardon
	(b) Region	Yangon
	Latitudes	N 16° 56' 49.72”
	Longitudes	E 096° 11' 41.72”
4	Address for correspondence:	No 188/189, 10 th Street, Yangon Industrial Zone, Mingalardon Township, Yangon Region
5	Financial details:	
	Authorized Capital	US \$ 12,000,000
	(b) Allocations made for environmental management plans	50 % of CSR Fund
6	Land area	4 acres (16,187.44 square meter)
7	Land acquisition	Lease land
8	Lessor	SCAI Yangon Limited
9	Lease period	50 years (from 2019 to 2069)
10	No. of buildings	7
11	Period of project	50 years (Initial) + extendable (10) years two times
12	Period of construction	1 year and 6 months
13	Estimated production per year No. of car/ year	Local sales
		Year 4 unit 100 Year 5 unit 130 Year 6-10 unit 155 Export sales
		Year 4 unit 100 Year 5 unit 130 Year 6-10 unit 155
14	Water requirement & source	1,883 m ³ /year, underground water
15	Source of electrical power	11/0.4 KV National Grid
16	Auxiliary power	400 kVA Diesel Generator

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17	Number of workers used	Year 1-2 Total 193 Year 3-4 Total 355 Year 5-10 Total 416
18	Number of working days	Maximum 290 days/year

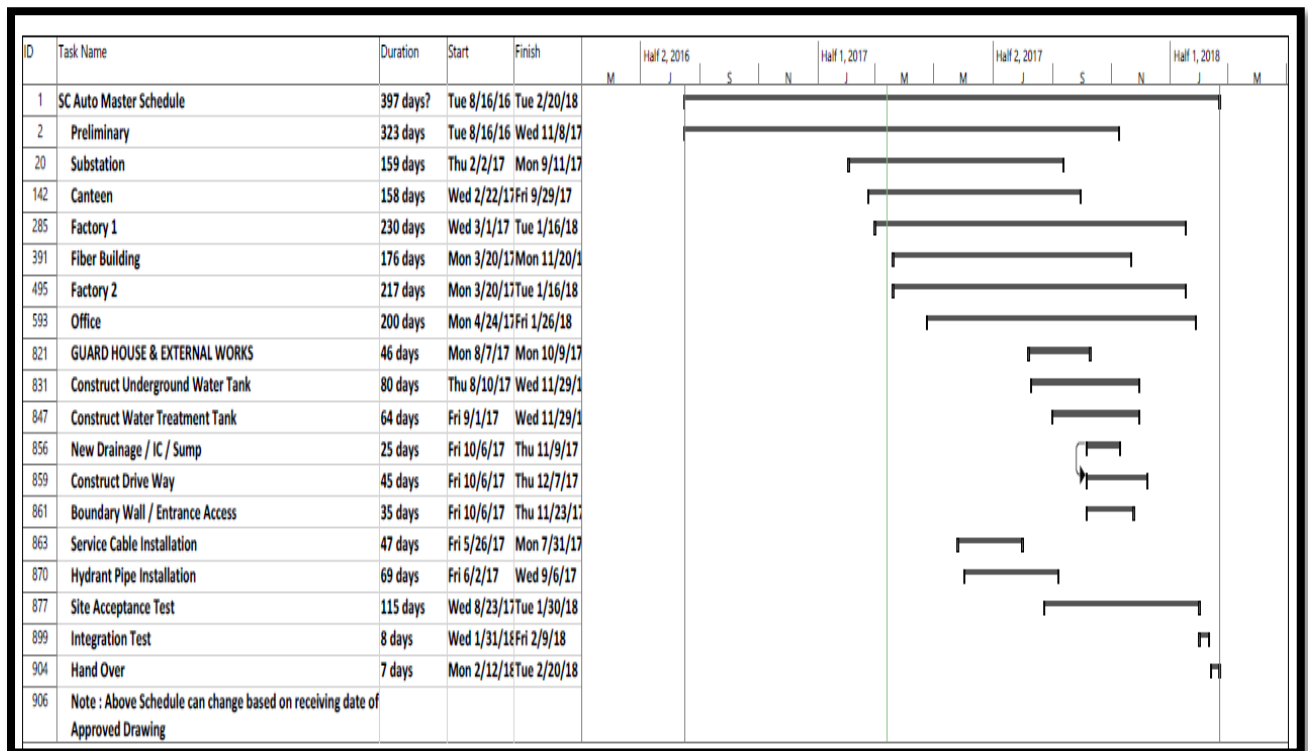


Figure (1): Construction Schedule



Figure (2): Factory Location

Initial Environmental Examination Report

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Figure (3): Google Map of Site Boundaries and Surrounding Environment

Factory Buildings Layouts Plan

Factory building layout is shown in following figure

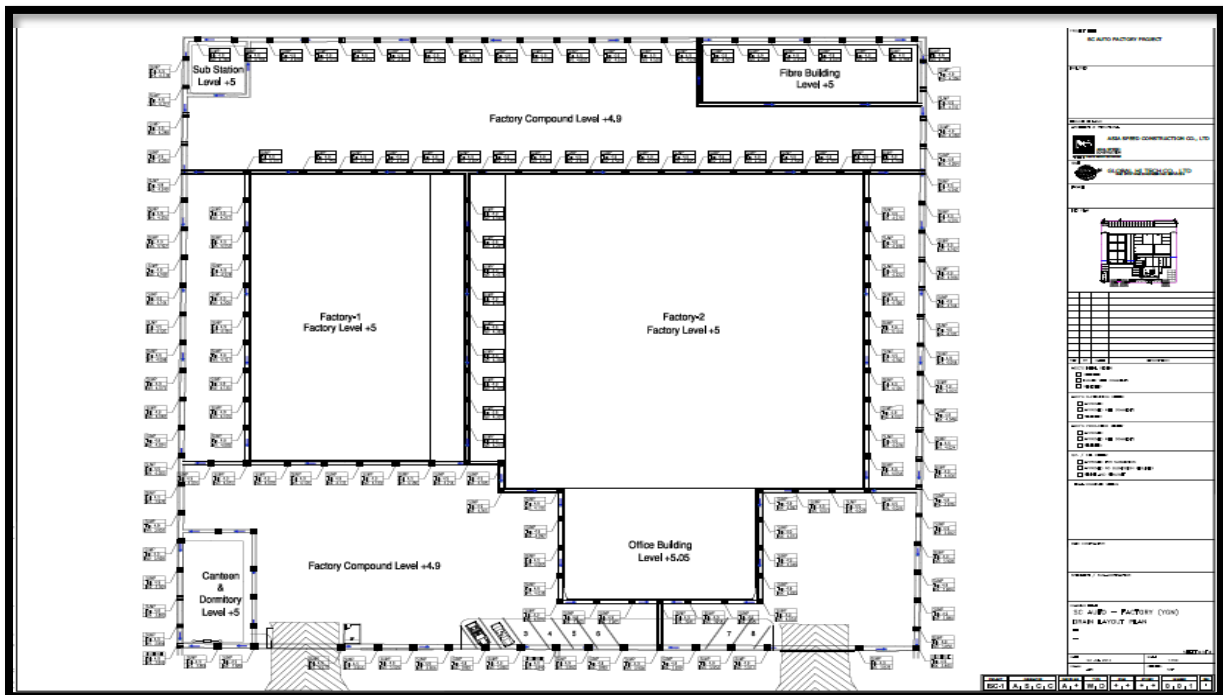


Figure (4): Factory Building Layout Plan

Man Power

Man power of factory is shown in following table.

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SC Auto (Myanmar) Co., Ltd.

Table (7): List of Employees

No.	Description	Year 1-2	Year 3-4	Year 5-10
	Local			
PRODUCTION				
1	Factory Manager	1	1	1
2	Assistant Factory Manager	3	3	3
3	Supervisor	5	24	25
4	Team Leader	9	80	90
5	Operator	83	155	200
	Total	101	263	319
OFFICE & MANAGEMENT				
1	HR Staffs	3	3	3
2	Purchasing staff	3	3	3
3	Sales and marketing staff	7	7	8
4	Translator staff	1	3	3
5	Documentation	3	3	3
6	Accountant	6	6	7
7	Cleaning Clerk	2	2	2
8	Kitchen staff	2	2	2
9	Security guard	6	6	6
10	Driver	3	3	4
11	IT officer	2	2	2
12	M&E officer	2	2	2
13	General Manger	1	1	1
	Total	41	41	44
1	Ware House	8	8	8
2	Engineer	20	20	22
	Total	28	28	30
1	Workshop			
2	Workshop Manager	1	1	1
3	Workshop supervisor	4	4	4
4	Technician	15	15	15
5	Sales & Marketing	3	3	3
	Total	23	23	23
	Grand Total	193	355	416
Foreigner				
1	Supervisor	12	8	
2	Specialist	6	4	2
	Total	18	12	2

Operating Schedule

The operating schedule for this project is based on single shift basis and maximum 290 working days in a year.

Working hours 8:00 am ~12:00 am; 1:00 noon ~ 4:30pm;

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Lunch break; 12:00 noon ~ 1:00pm;
Working days / week 5 days; Monday to Friday

Baseline Study

The current environmental and social conditions in and around the project area are shown in the following table. Field survey of air quality, water quality, soil quality, and noise, were conducted in and around the Project site. The other information on natural such as flora and fauna, cultural assets, and hydrology (topography) and social environment was collected through the literature survey and/or reconnaissance survey.

Type	Description
I. Environment	
Topography, Geography, Geology, and Soil	Mingaladon is 144 ft above the sea level .In this town ship there are almost no streams or creeks, only one stream called Balar Chaung exist, flowing from north to south in only 12 miles and west from east in 8 miles. Draft, water depth of stream in rainy season is around 12 ft and 8 ft in summer, and therefore it cannot be used as waterway for transportation. There are no adverse geological conditions providing feasibility for the construction of factory building and no wetlands and no plantation of any kind of trees in and around the project area. Also there is no major conservation of wildlife in the area-
Climate	Temperature Temperature profile is highest at 39 degrees Celsius and lowest at 15.5 °C. Reference from secondary data of Mingaladon Township from General Administration Department, here below is the temperature summary table for summer and winter Rainfall Yangon is supplied with an average of 2681 mm (105.6 in) of rainfall per year, or 223.4 mm (8.8 in) per month.
Flora, Fauna, and Biodiversity	No species near the project area.
Emergency Risk	Flood, cyclone, and earthquake are identified as notable natural hazards around the project area.
II. Social environment	
Population	Area of Mingaladon Township is 128 km ² and density 2582/km ² .Population of Mingaladon Township is 255,807 in 2014-2015.
Ethnicity	It was learnt that 93.00 % of the population is Bamar nationality, 1.21 % is Rakhine, 1.48% is Karan, 0.63% is Mon and the rest are Chin, Kachin ,Kayar and Shan.
Religion	The majority of the religion is Buddhist (95.49%), and Christian (1.63%), Hindu (1.26%), Islam (1.62%) respectively.
Local Economy and Livelihood	Mingaladon Township is gradually developing. Residents enjoy their livelihood in agricultural, industrial, private and government service sectors. The Number (3) National High way Road is next to the Township. Residents could merchandise the goods produced from Industries nearby.
Hospitals and Health	For health-care facilities, 2 numbers of township level hospitals

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Services	with 50 and 100 beds, 25 Private clinics, and 5 Village tract health care centers are available. There are three military hospitals for military services ;Defense Services General Hospital (1000-bed), Defense Services Orthopaedic Hospital (500-Bed), Defense Services Obstetric, Gynaecological and Paediatric Hospital (500 beds).
Cultural Heritage/ Assets	There is no cultural heritage site designated.
III. Environmental Baseline conditions	
Air Quality	The monitoring survey of CO, NO ₂ , NO, SO ₂ , O ₃ , PM _{2.5} , and PM ₁₀ for the ambient air quality was conducted in the Project site at December 2017 continuous 24 hours. The results of having guideline parameters were acceptable limits.
Water Quality	<p>Wastewater quality</p> <p>In order to monitor the wastewater quality, wastewater sample from municipal sewage drain located in front of the factory was taken. According to the test results, COD, BOD and total suspended solids (TSS) values of municipal drain water sample exceeded NEQG (Effluent) – General Application. All other parameters were within the desirable limits of NEQ.</p> <p>Ground water quality</p> <p>The ground water quality analyzed from the tube well located in the proposed project area can provide some indication of the water quality of the project area. According to the above table, total iron (Fe) value of tube well water sample exceeded the Drinking Water Standards. And then, turbidity value also exceeded the WHO (2011) and Indian Specification (IS: 10500, 2012), and manganese (Mn) value also exceeded the EPA (Spring 2012) and Indian Specification (IS:10500, 2012). All other parameters were within the desirable Drinking Water Standards.</p>
Soil Quality	The surface soil sample was collected in front of the factory premise and ten parameters such as pH, Cl, Fe, As, CN, Al, Mn, P-Alkalinity, Total Alkalinity, Extractable Acidity were tested.
Noise Level	At that time, noise level was accepted limit.

Production Steps

SC Auto Bus Production Line

- Stage 1, Engineering Design
- Stage 2, Raw Material cutting, bending, rolling
- Stage 3, Parts Fabrication
- Stage 4, Structure Frames, Engine, Axles, Gearbox, etc... Assembly
- Stage 5, Body panel assembly & Interior Fittings
- Stage 6, Air Conditioner System & electrical wiring Installation
- Stage 7, Spray Painting
- Stage 8, Quality Control & Checking

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Summary of Significant Environmental Impacts and Mitigation Measures

Activity	VEC	Impact	Duration	Magnitude	Extent	Type	Probability	Significance
Construction Phase								
Soil and land leveling	Air Quality	Increased air emissions (dust and exhaust emission)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MODERATE
	Geomorphology and Landscape	Geomorphologic changes and visual impact	PERMANENT	SMALL	LOCAL	DIRECT	25-75%	MODERATE
	Terrestrial Ecology and Biodiversity	Effect on flora and fauna	PERMANENT	MODERATE	LOCAL	DIRECT	25-75%	MODERATE
	Socio-Economic Activities	Increased economic activity	MEDIUM	SMALL	LOCAL	DIRECT	25-75%	POSITIVE
	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
Construction of access roads	Air Quality	Increased air emissions (dust and exhaust emission)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Geomorphology and Landscape	Geomorphologic changes and visual impact	PERMANENT	SMALL	LOCAL	DIRECT	25-75%	MODERATE
	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-Economic Activities	Local employment prospects	MEDIUM	SMALL	LOCAL	DIRECT	25-75%	POSITIVE
Purchase of supplies and services	Air Quality	Increased air emissions (dust and exhaust emission)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
Human resource	Socio-economic activities	Local employment prospects	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE
Workers' Temporary Accommodation	Water resources and sewage	Potable water use and sewage disposal	MEDIUM	MODERATE	LOCAL	DIRECT	25-75%	MINOR
	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE

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SC Auto (Myanmar) Co., Ltd.

Excavation, foundation, building works and mechanical erection	Air quality	Increased air emissions (exhaust, dust etc)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Geomorphology and landscape	Visual impact due to construction activities	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	REGIONAL	DIRECT	>75%	POSITIVE
	Noise Pollution	Increased noise levels	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
Use of vehicles and construction equipment	Air quality	Increased air emissions (exhaust, dust etc)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE
Construction of infrastructure	Biodiversity	Degradation of ecosystem	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Noise Pollution	Increased noise levels	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE
Waste disposal	Groundwater quality	Leaching of waste into aquifer	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
	Community health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
Operation Phase								
1) Stage 1, Engineering Design	-	-	-	-	-	-	-	-
2) Stage 2, Raw Material cutting, bending,	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE

Initial Environmental Examination Report

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SC Auto (Myanmar) Co., Ltd.

rolling								
3) Stage 3, Parts Fabrication	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
4) Stage 4, Structure Frames Assembly	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
5) Stage 5, Body panel assembly & Interior Fittings	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
6) Stage 6, Air Conditioner System & electrical wiring Installation	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
7) Stage 7, Spray Painting	Air quality	VOC	LONG	MODERATE	LOCAL	DIRECT	<25%	MODERATE
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
8) Stage 8, Quality Control & Checking	-	-	-	-	-	-	-	-
Solid Waste disposal	Ground water quality	Leaching of waste into aquifer	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
	Community health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE

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SC Auto (Myanmar) Co., Ltd.

Decommission Phase								
Waste Disposal	Groundwater quality	Leaching of waste into aquifer	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
	Community health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
Dismantling infrastructure	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-Economic Activities	Local employment prospects	MEDIUM	SMALL	LOCAL	DIRECT	25-75%	POSITIVE

The generic environmental measures that need to be undertaken during project construction, operation and decommission phases are important. Environmental Management Plan (EMP) for this three stages are as follow.

Environmental Management Plan

Project / Activity Phase (Potential Environmental Impact)	Objectives	Mitigating & Enhancement Measures	Estimated Cost of Proposed Measures (USD)	Responsible Person / Unit
Construction Phase				
Soil disturbance/erosion	To lessen soil disturbance and prevent soil erosion due to construction activities	<ul style="list-style-type: none"> Control earthworks and compact loose soils Install drainage structure properly Landscaping on project completion Control and manage excavation activities Control activities during rainy conditions Provide soil erosion control and conservation structures/means where necessary To the greatest extent possible, phase site clearance so as to minimize the area of exposed soil at any given time Re-cover exposed soils with grass and other appropriate species as soon as possible. Temporarily bund exposed soil and redirect flows from heavy runoff areas that threaten to erode or result in substantial surface runoff to adjacent drain 	No extra cost	SC Auto and construction contractor

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		<p>waters</p> <ul style="list-style-type: none"> • Monitor areas of exposed soil during periods of heavy rainfall throughout the construction phase 		
Noise	To ensure cumulative noise impacts are acceptable	<ul style="list-style-type: none"> • Construction activities that will generate disturbing sounds should be restricted to normal working hours. • Workers operating equipment that generates noise should be equipped with noise protection gear. Workers operating equipment generating noise levels greater than 80 dBA continuously for 8 hours or more should use earmuffs. Workers experiencing prolonged noise levels of 70 – 80 dBA should wear earplugs. 	No extra cost	Contractor
Air Pollution (nuisance dust)	To minimize dust effectively and avoid complaint due to the air borne particulate matter release to the atmosphere	<ul style="list-style-type: none"> • Spray water during the construction phase of excavated areas during dry conditions • Control speed and operation of construction vehicles • Prohibit idling of vehicles • Ensure sound condition of construction machinery and equipment • Workers on the site should be issued with dust masks during dry and windy conditions. 	No extra cost	Contractor
Material transportation	To reduce dust/noise/waste generation and avoid spillage during transportation	<ul style="list-style-type: none"> • All fine earth materials must be enclosed during transportation to the site to prevent spillage and dusting. Trucks used for that purpose should be fitted with tailgates that close properly and with tarpaulins to cover the materials. The cleanup of spilled earth and construction material on the main roads should be the responsibility of the Contractor and should be done in a timely manner (say within 2 hours) so as not to inconvenience or endanger other 	No extra cost	Contractor

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		<p>road users. These requirements should be included as clauses within the contracts made with relevant sub-contractors.</p> <ul style="list-style-type: none"> • The transportation of lubricants and fuel to the construction site should only be done in the appropriate vehicles and containers, i.e. fuel tankers and sealed drums. • As far as possible, transport of construction materials should be exit the project site 		
Material storage	To ensure proper storage of material and avoid accidental spillage	<ul style="list-style-type: none"> • The stockpiling of construction materials should be properly controlled and managed. Fine grained materials (sand, marl, etc.) should be stockpiled away from surface drainage channels and features. • Low berms should be placed around the piles and/or tarpaulin used to cover open piles of stored materials to prevent them from being washed away during rainfall • Safe storage areas should be identified and retaining structures put in place prior to the arrival and placement of material. • Hazardous chemicals (e.g. fuels) should be properly stored in appropriate containers and these should be safely locked away. handling facilities 	No extra cost	Contractor
Sewage and litter management	To prevent soil/water contamination due to grey water discharge and overload or spillage of temporary septic tanks	<ul style="list-style-type: none"> • Install proper sewage treatment plant • Proper solid waste receptacles and storage containers should be provided in sufficient numbers, particularly for the disposal of lunch boxes and drinking bottles, so as to prevent littering on the site • Arrangements should be made for the regular collection of litter and for its disposal only at the dump site. 	No extra cost	Contractor

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Construction waste disposal	To ensure adequate disposal options for all kinds of construction waste including glass, metal, wood, cement residues, plastic, paper based wastes, oil spills etc.	<ul style="list-style-type: none"> • Waste collection, segregation and disposal should be properly managed and contact to Mingaladon Township Municipality for final disposal. • Special attention should be given to minimizing and reducing the quantities of solid waste produced during site preparation and construction. To reduce organic waste, softer vegetation may be composted onsite and used for soil amendment during landscaping. • Reusable inorganic waste (e.g. excavated soil) should be stockpiled away from drainage features and used for in filling where necessary. • Unusable construction waste, such as damaged pipes, formwork and other construction material, must be disposed of at Mingaladon Township Municipality dumpsite. 	No extra cost	Contractor
Accident/ Injury/ Health Hazard	To minimize potential accidents/injuries and disease	<ul style="list-style-type: none"> • Proper personal protective equipment i.e. safety shoes, helmet, goggles, and gloves shall be used at all times on site • Use barriers and guards as necessary to protect employees from physical hazards, • Signage danger warning or CAUTION will be put at strategic places • Development of occupational safety and health guidance plans • Provide first aid kits and contact points in case of injury and accidents • Form a safety and health committee to coordinate safety and health issues at workplace • Provide regular safety awareness talks and trainings 	No extra cost	Contractor

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Operation Phase				
Noise and vibration pollution	To ensure noise and vibration pollution effect on surrounding should be under the threshold limit by emission guide line.	<ul style="list-style-type: none"> • Conduct a noise survey and mark out dedicated areas with signage where there are elevated noise levels and PPE is required. • Enclose noisy machines to isolate people from the noise where practicable. • Reduce vibration exposure times and provide PPE where people may be exposed to vibration. • Limit scrap handling and transport during unsocial hours to reduce noise. 	Under EMP budget	HSE officer of SC Auto factory
Waste water	To minimize affect local ecology as well as posing a hazard to drinking water supplies and contaminating land.	<ul style="list-style-type: none"> • Minimize the consumption of water used in production processes and equipment cleaning. • Consider upgrades to wastewater treatment facilities. • Recycle wastewater where possible, e.g. certain solvent wastes such as gun wash can be sent for recovery and reuse in another application where these facilities are available • Ensure untreated wastewater does not discharge to watercourses through use of wastewater treatment facilities and monitoring of wastewater discharges 	Under EMP budget	HSE officer of SC Auto factory
Solid wastes	To prevent ground contamination due to improper solid waste management.	<ul style="list-style-type: none"> • Define waste management plan. • Contact certified waste collector, DOWA for waste disposal • Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty drums, to supplier for reuse. • Recycle packaging wherever possible. • Develop and implement a waste management plan covering all aspects of waste treatment on site. Wherever possible, priority should be given to 	Under approved EMP budget for waste management	HSE officer of SC Auto factory

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		reduction of wastes generated, and recovery and re-use of raw materials		
Occupational Health and Safety				
Chemical exposure	To ensure safe working condition for workers	<ul style="list-style-type: none"> • Provide personal protective equipment (PPE) that is fit for the task to prevent injury and maintain hygiene standards. Train staff in the correct selection, use and maintenance of PPE, and put in place measures to encourage/ mandate its use. • Implement a program of assessment of routine monitoring of worker health. 	Under approved budget for HSE management plan for PPE	HSE officer of SC Auto factory
Noise and vibration	To ensure noise level should under the threshold limit with exposure limit	<ul style="list-style-type: none"> • Enclose noisy machines to isolate people from the noise where practicable. • Reduce vibration exposure times and provide PPE where people may be exposed to vibration. • Limit scrap handling and transport during unsocial hours to reduce noise. 	Under approved budget for HSE management plan for PPE	HSE officer of SC Auto factory
Machinery	To meet HSE objective of no LTA(Lost time accident)	<ul style="list-style-type: none"> • Train staff in correct selection, use and maintenance of PPE. • Train workers in correct use of machinery and safety devices. • Avoid direct handling of sharp edged items and/or remove sharp edges by machining. • Engineer out sharp edges and access to dangerous parts of machinery through a hierarchy of controls (permanently fixed physical barrier, interlocked physical barrier, physical barrier, presence sensing system). 	<p>SC Auto Management should define HSE objective</p> <p>SC Auto Management should define Incentive for HSE bonus.</p>	HSE officer of SC Auto factory
Manual handling and repetitive work	To meet HSE objective of no LTA(Lost time accident)	Ensure that walkways are constructed of non-slip materials and route cables and pipe-work under walkways.	SC Auto Management should define HSE objective	HSE officer of SC Auto factory

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			SC Auto Management should define Incentive for HSE bonus	
Working Condition	To meet HSE objective of no LTA(Lost time accident) due to fatigue condition of overload	<ul style="list-style-type: none"> • Implement a program of routine monitoring of worker health. • Implement a grievance/dispute resolution mechanism for workers. 	<p>SC Auto Management should define HSE objective</p> <p>SC Auto Management should define Incentive for HSE bonus.</p>	HSE officer of SC Auto factory
Decommissioning Phase				
Waste disposal due to dismantling activities	To minimize generation of scraps and other debris on sites	<ul style="list-style-type: none"> • Use of an integrated solid waste management system i.e. through a hierarchy of options: • Wastes generated as a result of facility decommissioning activities will be characterized in compliance with standard waste management procedures. • All buildings, machinery, equipment, structures and tools that will not be used for other purposes should be removed and recycled/ reused say in other projects • Where recycling/reuse of the machinery, equipment, implements, structures, tools and other waste is not possible, the materials should be disposed to approved dumpsites • To contact Mingaladon Township Municipality for final waste disposal. 	1,000	Contractor

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Ground water pollution due to dismantling activities	To prevent potential pollution	<ul style="list-style-type: none"> • procedures for finding contaminated material during excavations will be established • covering and damping of excavated materials • appropriate storage of contaminated material if found. • Ground contamination and storm water contamination will be limited on site by proper handling and storage of materials and equipment. 	2,000	SC Auto
Rehabilitation of project site	To ensure less vegetation disturbance, land deformation and restoration of site	<ul style="list-style-type: none"> • Implement an appropriate re-vegetation program to restore the site to its original status • During the re-vegetation period, appropriate surface water run off controls will be taken to prevent surface erosion; • Monitoring and inspection of the area for indications of erosion will be conducted and appropriate measures taken to correct any occurrences; • Fencing and signs restricting access will be posted to minimize disturbance to newly-vegetated areas; • Scoop out any contaminated soils and replace with uncontaminated soil from another source Comprehensive Landscaping. 	2,000	SC Auto
Health and safety impacts	To avoid potential occupational hazards	<ul style="list-style-type: none"> • The safety of the workers should surpass as a priority of all other objectives in the decommissioning project • Provide appropriate Personal Protective Equipment (PPE) as necessary. • Staircases and other hazardous areas shall be suitably protected say using strong rails to avoid occurrence of incidences • Provide emergency health care and sanitation to 	1,000	Contractor

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		<p>employees.</p> <ul style="list-style-type: none"> • Ensure sufficient emergency firefighting tools (fire extinguishers, hooks, buckets and water tanks) are standby at demolishing site 		
Socio-economic impacts	To prevent loss of income, quality of life and benefits such as medical, insurance cover etc...	<ul style="list-style-type: none"> • Assist with re-employment and job seeking of the involved workforce. • Compensate and suitably recommend the workers to help in seeking opportunities elsewhere. • Offer advice and counseling on issues such as financial matters. • Ensure assistance with re-employment and job seeking of the involved workforce. • Make sure to compensate and suitably recommend the workers to help in seeking opportunities elsewhere. • Offer advice and counseling on issues such as financial matters. 	2,000	SC Auto

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Environmental Monitoring Plan

A centralized environmental monitoring cell will be established for monitoring of important and crucial environmental parameters which are of immense importance to assess the status of environment during plant operation. With the knowledge of baseline conditions, the monitoring program can serve as an indicator for any deterioration in environmental conditions due to operation of the industry, and helps in planning suitable steps that could be taken in time to safeguard the environment. Monitoring is as important as that of control of pollution since the efficiency of control measures can only be deterred by monitoring. The following routine monitoring program will be implemented by following the IEE report.

Environmental monitoring schedules are prepared covering various phases of project advancement, such as constructional phase, regular operational phase and closing phase.

Environmental Parameters	Monitoring Item	Location	Frequency	Responsibilities
Construction Phase/ Decommissioning Phase				
Air quality	<ul style="list-style-type: none"> PM₁₀, PM_{2.5}, Ozone,, VOC, CO, CO₂, NO₂, SO₂ 	Construction / Closing site	Once during construction period	Construction Contractor
	<ul style="list-style-type: none"> Recorded the machineries maintenance Recorded dust emission activities Recorded traffic 	Construction / Closing site	Monthly	Construction supervisor
Soil quality	<ul style="list-style-type: none"> Chemical and toxic material emission/ leakage status from storage area Other possible leakage of chemicals due to the vehicular movement and bitumen mixing 	Construction/ Closing site	Monthly	Construction Contractor
Water quality	<ul style="list-style-type: none"> Checking temporary septic tank and disposed system, temporary drain 	Construction/ Closing site	Monthly	Construction Contractor
Water Use	<ul style="list-style-type: none"> Daily amount of water use 	Construction/ Closing site	Daily Observation	Construction Contractor
Noise	<ul style="list-style-type: none"> Intensity measurement 	Construction/ Closing site	Monthly	Construction Contractor

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Waste Disposal	<ul style="list-style-type: none"> Recorded disposal amount of solid wastes and sewage of the workers Checking the waste storage area 	Areas around workers quarters	Daily Observation	Construction Contractor
	<ul style="list-style-type: none"> Recorded disposal amount of construction wastes, compliance with the disposal requirements Separate hazardous and No-hazardous Checking the waste storage area 	Construction/ Closing site	Weekly	Construction Contractor
Employment	Number of people employed	Construction/ Closing site	Monthly	Construction Contractor
Other Social Considerations	CSR activities record	Monitoring team	Monthly	Construction Contractor
Occupational Health and Safety	Safety activities, Record of accident and OHS training and activities, Record of worker argument and conflict	Workers	Monthly	Safety Supervisor
Community Health and Safety	Record of accident and OHS training and activities, Recorded of training for driver and worker	Local residents	Upon conditions	Safety Supervisor
Emergency risk	Accident record, safety, training	Construction/ Closing site	Monthly	Safety Supervisor
Operation Phase				
Air Quality	PM ₁₀ , PM _{2.5} , Ozone, VOC, CO, CO ₂ , NO ₂ , SO ₂	Ambient air	Annual	Factory Manager and HSE officer
	Particulate matters, VOC	Workplaces such as painting area,	Annual	Factory Manager and HSE officer

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		w are house, car parts assembling area		
	Generator exhaust gas (CO, CO2, NO2, SO2)	Stack	Annual	Factory Manager and HSE officer
Water Quality	<ul style="list-style-type: none"> Wastewater (pH, oil & grease, suspended solid, BOD, COD, color and Temperature, etc 	Municipal drain and factory drain outlet	Bi-annual	Factory Manager and HSE officer
	<ul style="list-style-type: none"> Ground water (pH, Arsenic, Cl) 	Water reservoir	Bi-annual	Factory Manager and HSE officer
Waste Disposal	<ul style="list-style-type: none"> Recorded disposal amount of plastic, drum, paper box, used wedding rock Check collection system Check storage Separation of waste type (Hazardous & No-hazardous) 	Plant premises	Monthly	Factory Manager and HSE officer
Soil Contamination	<ul style="list-style-type: none"> Oil leakage, Spill of solvent, Paint Measuring heavy metal 	Plant premises, paint storage area, fuel storage area, generator room,	Annual	Factory Manager and HSE officer
Noise and Vibration	Noise & Vibration level	<ul style="list-style-type: none"> Plant premises workplace s area such as painting area, w are house, car parts assembling area 	Annually and upon complaint	Factory Manager and HSE officer
Odor	Inspection of ventilation	Factory and storage	Monthly	Factory Manager and HSE officer

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	condition	buildings		
Hazardous and Chemical Substance	<ul style="list-style-type: none"> • Check handling and using of paint, reinforced fiber • Check storage area • Check disposal system 	Factory and storage buildings	Monthly	Factory Manager and HSE officer
Occupational Health and Safety	<ul style="list-style-type: none"> • Record of accident and record of occupation/ safety training, • Each employee medical checkup record. • Checking PPE and • Provide adequate PPE • Provide OHS training 	Plant premises	Bi-annual	HSE officer
Other Social Considerations	Check and Record CSR plan and job opportunities	Monitoring team	Annual	HR Manger
Emergency Risks	<ul style="list-style-type: none"> • Record of emergency case of accident and its response plan • Checking Firefighting equipment • Provide fire drill and training 	Plant premise	Annual	HSE officer
Transboundary or Global issues	N/A	-	-	-

Public Consultation

Public Consultation Meeting (PCM) and Public Disclosure (PD) for IEE will be planned in order to collect opinions and feedback of the public and to disseminate information on the IEE study of the project.

Public Consultation Meeting

There are two ways of discussion, one way is participants can involve themselves in public consultation meeting and another way is by writing suggestions on distributed suggestion form.

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Meeting attendees were encouraged to ask questions and give comments during and after the presentation. Comment forms were available at each meeting for attendees to write comments at the time of the meeting.

On June 18th 2018 at Supervise and Administrative office of ZayKabar Company Limited, Thingangyun Gyi village group, Mingalardone Industrial Park, Mingalardone Township, Yangon Region the public meeting for disseminating project information to general public including stakeholder and requesting (22) suggestions letter on the project was carried out (23) participants from local community attended the public meeting and participated in open discussion.

The main points of discussion, questions and answers were mentioned in the following table.

	Suggestions and Discussions	Commitment
1	To take noise control due to outcome from the assembling, repair and maintenance services	We are performing to mitigate Noise level, usage of quiet, properly maintained equipment or machinery in good condition
2	Need to take dispose wastewater systematically at the workplace	To follow National Standard Guideline according to Environmental Management Plan
3	Ensure to take drainage system, dispose wastewater systematically from the factory	We will submit to Industrial Zone Management Committee for keeping of drainage system and dispose wastewater system
4	To provide PPE, Educational, Health and safety to employees	We provided PPE to workers
5	To conserve and prevent to the environment, not to polluting Ambient Air quality and noise	To follow National Standard Guideline according to Environmental Management Plan
6	To provide allowances, benefits, Health and cheerfulness of the workers	We will provide to employees according to the Ministry of Labor Department
7	The person who should be inspect to the factory from GMES Co., Ltd., bi-monthly or quarterly	We will take for Environmental Monitoring according to the Environmental Management Plan
8	It is need to take Air ventilation system due to Automotive paint can be disperse if it was sprayed to the car	We will perform special close type room for not dispersing automotive paint to the environment. We will perform dust controller We will provide PPE to workers
9	Ensure to keep drainage system for the surrounding of the factory	We will take good drainage system submit to Industrial Zone Management Committee

Corporate Social Responsibility (CSR)

Corporate Social Responsibility (CSR) is now an important factor in company's project operation. SC Auto (Myanmar) Co., Ltd has 1 % of an annual profit as a Corporate

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Social Responsibility budget and is formulated annually as part of the Company’s annual strategic planning processes.

Conclusions

It is predicted that socio-economic impact due to this project will positively increase the chance of more employment opportunities for local inhabitants. There are no Resettlement and Rehabilitation issues involved in this project. The project infrastructures shall be of use to people of the area. The revenue of the State Govt. shall be definitely increasing due to the proposed project category. The entire project area is devoid of any endangered flora and fauna. Thus the proposed project is not likely to affect the environment or adjacent ecosystem adversely. And then, SC Auto bus assembly factory has installed effective pollution system for air and soil pollution

The assessment has concluded that, with the full adoption of the mitigation measures stated in this report and implementation of the IEE and EMP during the construction ,operational and decommission periods, the manufacturing facility should have no significant negative impacts. The facility will also bring a number of socio-economic benefits to the area and the region in general.

The implementation of the project will provide significant contribution to uplift the socio-economic condition of local people. Though the impact zone, affected people and most of the adverse impacts identified and evaluated by the IEE study are of substantial, they can be minimized through the implementation of mitigation measures.

Based on the analysis of benefits and assessments of implementing mitigation measures, the proposal is very relevant for implementation.

အနှစ်ချုပ်အစီရင်ခံစာ

စီမံကိန်းမြန်မာပတ်ဝန်းကျင်ဆိုင်ရာဝန်ဆောင်လုပ်ငန်းကုမ္ပဏီလီမိတက်အနေဖြင့် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာကို ခရီးသည်တင်ဖော်ယာဉ်နှင့်အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် ပြုပြင်ထိန်းသိမ်းရေးလုပ်ငန်း၏ SC Auto Company အတွက် ရေးဆွဲခဲ့ပါသည်။ SC Auto Company သည် အမှတ် (၁၈၈/၁၈၉)၊ ၁၀ လမ်း၊ ရန်ကုန်စက်မှုဇုန်၊ မင်္ဂလာဒုံမြို့နယ်တွင် တည်ရှိပါသည်။ ကုမ္ပဏီသည် နိုင်ငံခြားရင်းနှီးမြှုပ်နှံမှု အမေရိကန် ဒေါ်လာ ၇,၀၉၀,၁၆၅ သန်း စိုက်ထုတ်ခြင်း စက်ရုံတည်ဆောက်ရေးနှင့် လည်ပတ်ရေးအတွက် ဆောင်ရွက်ပါသည်။

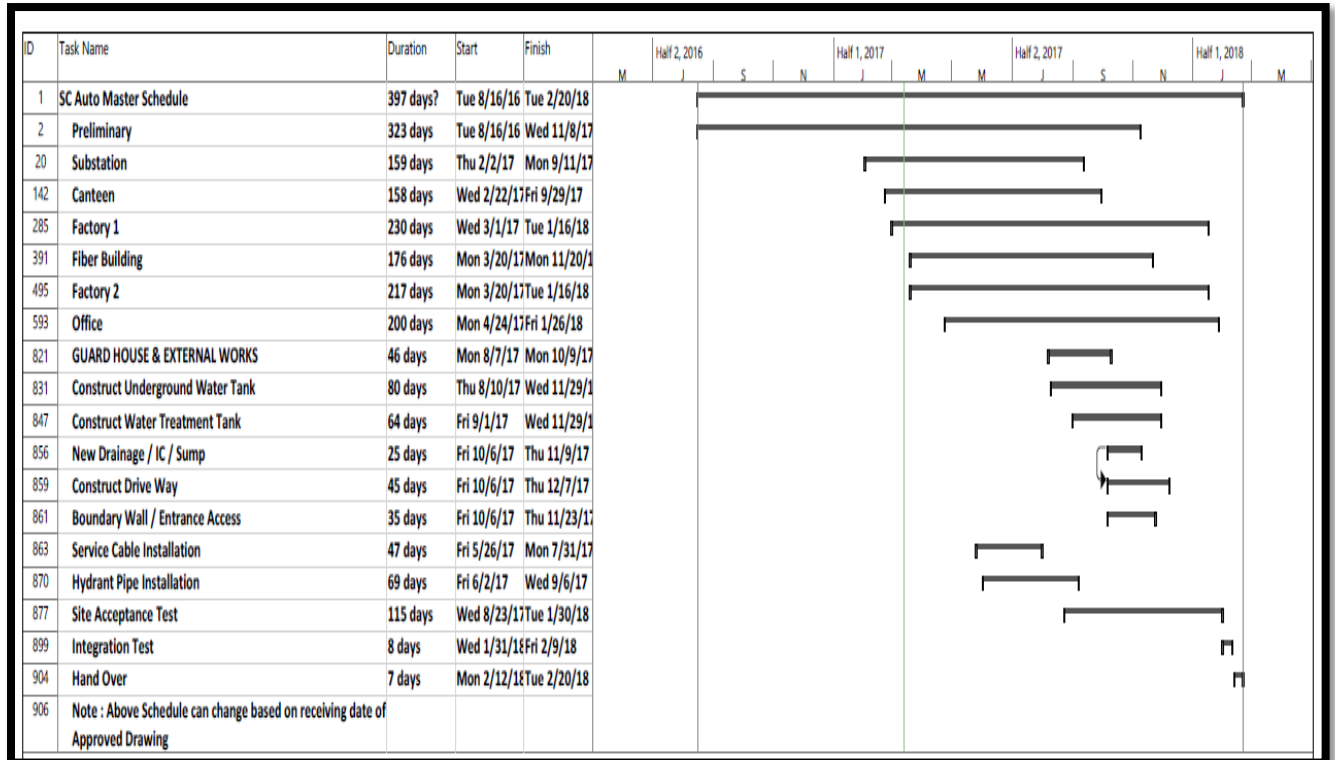
စီမံကိန်းဆိုင်ရာသတင်းအချက်အလက်များ

စီမံကိန်းအမျိုးအစား	ကုန်ထုတ်လုပ်ခြင်းနှင့်ဖြန့်ဖြူးရောင်းချခြင်း
စီမံကိန်းအမည်	ထုတ်လုပ်တပ်ဆင်ခြင်း၊ရောင်းချခြင်းနှင့်ပြုပြင်ထိန်းသိမ်းရေးဝန်ဆောင်မှုလုပ်ငန်း
တည်နေရာ	အကွက် ၁၈၈/၁၈၉၊(၁၀)လမ်း၊ ရန်ကုန်စက်မှုဇုန်၊ မင်္ဂလာဒုံ မြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။
ဘဏ္ဍာရေးအနေအထား မတည်ရင်းနှီးငွေ	အမေရိကန်ဒေါ်လာ ၁၂၀,၀၀၀
ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးရုံပုံငွေ	ကုမ္ပဏီအမြတ်၏ ၁ %
မြေအကျယ်အဝန်း	၄ ဧက (၁၆၁၈၇.၁၄၄ စတုရန်းမီတာ)
မြေပိုင်ဆိုင်မှု	အငှားမြေ
ငှားရမ်းသူ	ဦးယုရှင်
အဆောက်အဦးအရေအတွက်	၇
စီမံကိန်းကာလ	နှစ် (၅၀) မှုလနှင့် ၁၀ နှစ် တိုးချဲ့ခွင့် ၂ ကြိမ်
ရေသုံးစွဲမှုအခြေအနေ	၁၈၈၃ ကုဗမီတာ တစ်နှစ် မြေအောက်ရေ
လျှပ်စစ်သုံးစွဲမှု	၁၁/၀.၄ kw နိုင်ငံတော် လျှပ်စစ်ဓါတ်အားလိုင်း
အရံလျှပ်စစ်ထုတ်စက်	၄၀၀ kVA ဒီဇယ် အင်ဂျင်မီးစက်
ဝန်ထမ်းဦးရေ	ပထမနှစ် ၂၃ ဒုတိယနှစ် ၂၉ တတိယနှစ် ၂၉ စတုတ္ထနှစ် ၂၉
တစ်နှစ်တာ အလုပ်ဆင်းရက်	၂၉၀ ရက်ပေါင်း
စီမံကိန်းကွင်းဆင်းလေ့လာနေ့စွဲ	၁၉.၁၁.၂၀၁၇

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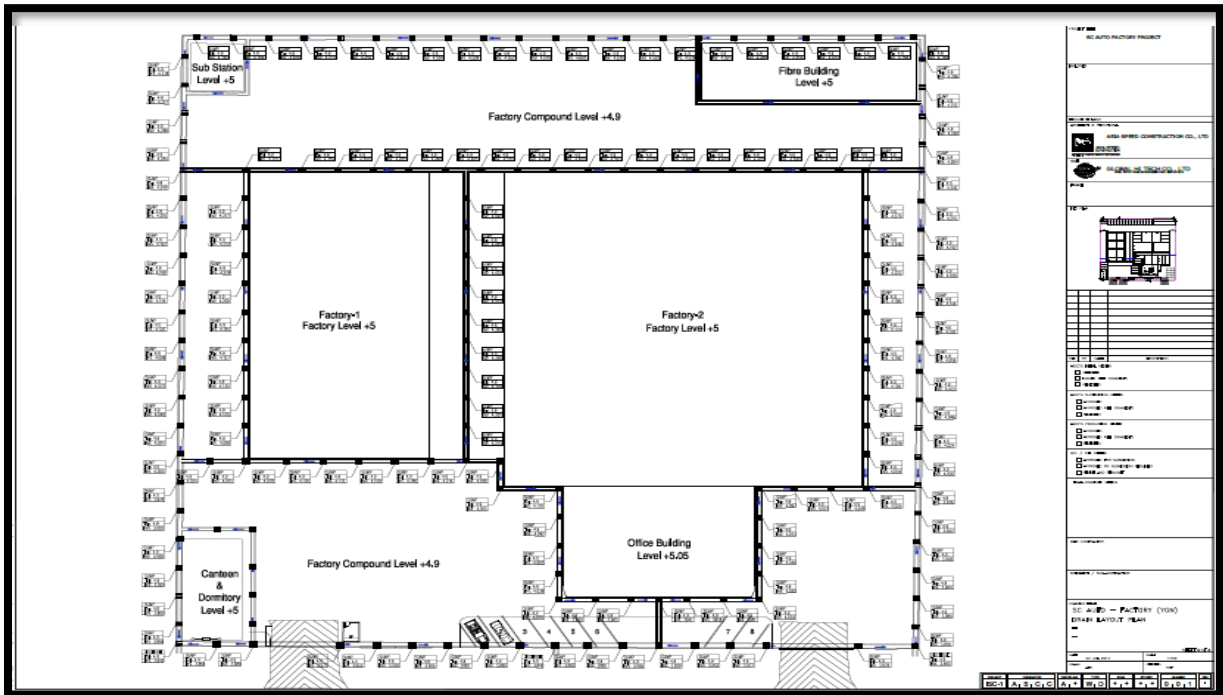
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စီမံကိန်းပုံစံ

စီမံကိန်းတွင်ပါဝင်သောအဆောက်အဦးများမှာအောက်ပါပုံတွင်ဖြစ်ပါသည်။



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ဇယား (၂)။ ဝန်ထမ်းအင်အားစာရင်း

စဉ်	ဖော်ပြချက်	နှစ် ၁ မှ ၂	နှစ် ၃ မှ ၄	နှစ် ၅ မှ ၁၀
	ပြည်တွင်းလုပ်သား			
	ထုတ်လုပ်ရေး			
၁	စက်ရုံမန်နေဂျာ	1	1	1
၂	လက်ထောက်စက်ရုံမန်နေဂျာ	3	3	3
၃	ကြီးကြပ်ရေးမှူး	5	24	25
၄	အဖွဲ့ခေါင်းဆောင်	9	80	90
၅	လုပ်သား	83	155	200
	စုစုပေါင်း	101	263	319
	ရုံးပိုင်း နှင့် စီမံခန့်ခွဲမှု			
၁	HR ဝန်ထမ်း	3	3	3
၂	အဝယ်တော်ဝန်ထမ်း	3	3	3
၃	အရောင်းမြှင့်တင်ရေးဝန်ထမ်း	7	7	8
၄	စကားပြန်ဝန်ထမ်း	1	3	3
၅	စားရင်းဇယားထိန်းဝန်ထမ်း	3	3	3
၆	ငွေစာရင်းကိုင်	6	6	7
၇	သန့်ရှင်းရေးဝန်ထမ်း	2	2	2
၈	စားဖိုဆောင်ဝန်ထမ်း	2	2	2
၉	လုံခြုံရေး	6	6	6
၁၀	ယာဉ်မောင်း	3	3	4
၁၁	IT အရာရှိ	2	2	2
၁၂	M&E အရာရှိ	2	2	2
၁၃	အထွေထွေမန်နေဂျာ	1	1	1
	စုစုပေါင်း	41	41	44
၁	ပစ္စည်းထိန်း	8	8	8
၂	အင်ဂျင်နီယာ	20	20	22
	စုစုပေါင်း	28	28	30
၁	ပြင်ထိန်းဝန်ထမ်း			
၂	ပြင်ထိန်းမန်နေဂျာ	1	1	1
၃	ပြင်ထိန်းကြီးကြပ်ရေးမှူး	4	4	4
၄	ပညာရှင်	15	15	15
၅	အရောင်းမြှင့်တင်ရေး	3	3	3
	စုစုပေါင်း	23	23	23
	ဌာနအားလုံးပေါင်းဦးရေ	193	355	416

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၁	ကြီးကြပ်ရေးမှူး	12	8	
၂	ပညာရှင်	6	4	2
	စုစုပေါင်း	18	12	2

စက်ရုံလည်ပတ်ရေးအချိန်ဇယား

စက်ရုံလည်ပတ်ရေးအချိန်ဇယားသည် အလုပ်ချိန် ၈ နာရီ တစ်ဆိုင်းဖြစ်ပြီး တစ်နှစ်တွင် အလုပ်လုပ်ရက် ပေါင်း ၂၉၀ ရှိပါသည်။

အလုပ်လုပ်ချိန်	မနက် ၈:၀၀ မှ နေ့လည် ၁၂:၀၀၊ နေ့လည် ၁:၀၀ မှ ညနေ ၄:၃၀
ထမ်းစားနားချိန်	နေ့လည် ၁၂:၀၀ မှ နေ့လည် ၁:၀၀
တစ်ပတ်အလုပ်လုပ်ရက်	၅ ရက်၊ တနင်္လာ မှ သောကြာ

အခြေခံအချက်အလက်ကောက်ယူခြင်း

လက်ရစီမံကိန်းအနီးပတ်လည်ရှိ သဘာဝပတ်ဝန်းကျင် နှင့် လူမှုပတ်ဝန်းကျင်အခြေအနေ ကို အောက်ပါဇယားတွင်ဖော်ပြထားပါသည်။ လေထု၊ ရေထု၊ မြေထု နှင့် ဆူညံသံတို့အားတိုင်းတာ ကောက်ယူခဲ့ပြီး အပင် နှင့် တိရစ္ဆာန်၊ ယဉ်ကျေးမှုအမွေအနှစ် နှင့် ရေအသုံးချမှုများ နှင့် လူမှုပတ်ဝန်းကျင်အချက်အလက်များကို သက်ဆိုင်ရာဒေသအချက်အလက်မှ ရယူအသုံးပြုခဲ့ပါသည်။

အမျိုးအစား	ဖော်ပြချက်
သဘာဝပတ်ဝန်းကျင်	
မြေမျက်နှာသွင်ပြင်၊ ပထစီအနေအထား၊ ဘူမိဗေဒ နှင့် မြေအမျိုးအစား	ပင်လယ်ရေမျက်နှာပြင်အထက် ၁၄၄ ပေတွင်ရှိပါသည်။ ချောင်းတစ်ချောင်းသာလျှင်ရှိပါသည်။ ၎င်းမှာ ဘားလားချောင်းဖြစ်ပါသည်။ မြောက်မှ တောင်သို့ ၁၂ မိုင်ရှည်သွယ်တန်းနေပြီး အနောက်သို့ ၈ မိုင်သွယ်တန်းနေပါသည်။ မိုးရာသီတွင် ချောင်အနက်မှာ ၂ ပေ ရှိပြီး နွေတွင် ၈ ပေခန့်သာရှိပါသည်။ ထို့ကြောင့်ရေကြောင်းပို့ဆောင်ရေးအတွက် အသုံးပြုမရပါ။ စီမံကိန်းအနီးတွင် မြေမျက်နှာသွင်ပြင်သည်ထိခိုက်နိုင်မှုမရှိပါ။ ရေပင်ဧရိယာလည်းမရှိပါ။
ရာသီဥတု	အပူချိန် မင်္ဂလာဒုံမြို့နယ်၏အပူချိန်သည် အမြင့်ဆုံး ၃၉ ဒီဂရီဆဲစီးရပ် နှင့် အနိမ့်ဆုံးမှာ ၁၅.၅ ဒီဂရီဆဲစီးရပ်ရှိပါသည်။ ၎င်းကို မြို့နယ်အချက်အလက်စာအုပ်မှကောက်နုတ်ဖော်ပြထားပါသည်။ မိုးရေချိန် ရန်ကုန်မြို့၏တစ်နှစ်ပျမ်းမျှမိုးရေချိန်မှာ ၂၆၈၁ mm (၁၀၅.၆ လက်မ) ရှိပြီး တစ်လလျှင် ၂၂၃.၄ mm (၈.၈ လက်မ) ရှိပါသည်။
သက်ရှိဇီဝဗေဒ	ရှားပါးမျိုးစိပ်များစီမံကိန်းအနီးတွင်မရှိပါ။
အရေးပေါ်အခြေအနေ	ရေကြီး၊ ငလျင် နှင့် မုတ်တိုင်းတိုင်းကျရောက်သော နေရာတွင်မကျရောက်ပါ။
လူမှုပတ်ဝန်းကျင်	
လူဦးရေ	မင်္ဂလာဒုံမြို့နယ်သည် ၁၂၈ စတုရန်းကီလိုမီတာ ကျယ်ဝန်းပါပြီးလူဦးရေ

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	သိပ်သည်းမှုမှာ ၂၅၈၂/ စတုရန်းကီလိုမီတာရှိပါသည်။ လူဦးရေမှာ ၂၀၁၄-၂၀၁၅ စစ်တန်းအရ ၂၅၅၈၀၇ ရှိပါသည်။
လူမျိုး	လူဦးရေ၏ ၉၃ % သည် ဗမာလူမျိုး၊ ရခိုင် ၁.၂၁ %၊ ကရမ်း ၁.၄၈ %၊ မွန် ၀.၆၃ % ဖြစ်ပါသည်။ ချင်း၊ ကချင်၊ ကယား နှင့် ရှမ်းလူမျိုး များ လည်းနည်းပါးစွာရှိပါသည်။
ကိုးကွယ်ယုံကြည်မှု	အဓိက အားဖြင့် ၉၅.၄၉ % သည် ဗုဒ္ဓဘာသာဝင်များဖြစ်ပြီး ခရစ်ယန် ၁.၆၃ %၊ ဟိန္ဒူ ၁.၂၆ % နှင့် မူဆလင် ၁.၆၂ % အသီးသီးကိုးကွယ်ကြပါသည်။
စီးပွားရေးနှင့် အသက်မွေးဝမ်းကြောင်း	မင်္ဂလာဒုံမြို့နယ်သည်တဖြည်းဖြည်းဖွံ့ဖြိုးတိုးတက်နေသည်။ ဒေသခံများ၏ အဓိကလုပ်ငန်း များမှာ စိုက်ပျိုးရေး၊ စက်ရုံဝန်ထမ်း၊ ကုမ္ပဏီ ဝန်ထမ်း နှင့် အစိုးရအလုပ်များလုပ်ကိုင်ပါသည်။ အမှတ် (၃) လမ်းနှင့် ကပ်လျက်ရှိသဖြင့် စက်ရုံများမှထုတ်ကုန်များအား ကုန်စီကူးသန်းရောင်းဝယ် ရေးများလုပ်ငန်း များလည်းလုပ်ကိုင်ပါသည်။
ဆေးရုံ နှင့် ကျန်းမာရေး ဝန်ဆောင်မှုလုပ်ငန်းများ	ကုတင် (၅၀) နှင့် (၁၀၀) ရှိမြို့နယ်ဆေးရုံ (၂) ရုံ၊ ပုဂ္ဂလိကဆေးခန်း (၂၅) ခု၊ ကျေးလက်ကျန်းမာရေးဌာန (၅) ခု ရှိသည်။ ထို့ပြင် အထွေထွေ ကုတင် ၁၀၀၀ နှင့် ၅၀၀၊ အရိုးဆေးရုံ ကုတင် (၅၀၀) စစ်ဆေးရုံ (၃) ရုံလည်းရှိပါသည်။
ရှေးဟောင်းယဉ်ကျေးမှု	ရှေးဟောင်းယဉ်ကျေးမှုအမွေအနှစ်များမရှိပါ။
ပတ်ဝန်းကျင်အရေအသွေးအခြေအနေ	
လေထုအရည်အသွေး	ပတ်ဝန်းကျင်လေထုအရေအသွေးကို ၂၀၁၇ ဒီဇင်ဘာတွင်တိုင်းတာခဲ့ရာ နိုင်ငံတော်မှသတ်မှတ်ထားသော စံချိန်အားကျော်လွန်မှုမရှိပါ။
ရေအရည်အသွေး	စွန့်ပစ်ရေအရည်အသွေး စွန့်ပစ်ရေမူနာကို စက်ရုံရှေ့စည်ပင်မြောင်းမှကောက်ယူခဲ့ပါသည်။ တိုင်းတာမှုအရ COD, BOD, TSS တန်းဖိုးများသည်နိုင်ငံ တော်မှ သတ်မှတ်ထားသော စံချိန်အားအနည်းငယ်ကျော်လွန်နေပါသည်။ တခြားသော parameters များသည်စံချိန်အတွင်းရှိပါသည်။ မြေအောက်ရေအရည်အသွေး မြေအောက်ရေမူနာကို စီမံကိန်းတွင်းအင်္ဂါစီတွင်းမှ ကောက်ယူခဲ့ပါသည်။ တိုင်းတာမှုအရ သံဓာတ်သည်သောက်သုံးရေစံညွှန်း ထက် ကျော်လွန်နေပါသည်။ စေးပျစ်အားသည်လည်း WHO နှင့် India စံညွှန်းများကိုကျော် လွန်နေပါသည်။ ထို့ပြင်မန်းဂနီသည်လည်း EPA နှင့် India စံညွှန်းများကိုကျော်လွန်နေပါသည်။ တခြားသော parameters များသည်စံချိန်အတွင်းရှိပါသည်။
မြေကြီးအရည်အသွေး	မြေကြီးမူနာကို စက်ရုံခြေရှေ့မှ ရယူကာ အမျိုးအစား (၁၀) မျိုး ကိုတိုင်း တာခဲ့ပါသည်။၎င်းတို့မှာ pH, Cl, Fe, As, CN, Al, Mn, P-Alkalinity, Total Alkalinity, Extractable Acidity တို့ဖြစ်ပါသည်။
ဆူညံသံ	ဆူညံသံတိုင်းတာရာတွင် သတ်မှတ်စံညွှန်းအောက်တွင်ရှိပါသည်။

ထုတ်လုပ်မှုလုပ်ငန်းစဉ်

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SC Auto (Myanmar) Co., Ltd.

SC Auto ခရီးသည်တင်ယာဉ် ထုတ်လုပ်မှုလုပ်ငန်းစဉ်အဆင့်ဆင့်

- အဆင့် (၁)။ အင်ဂျင်နီယာရေးဒီဇိုင်း
- အဆင့် (၂)။ ကုန်ကြမ်းသတ္တုပြားများအား ဖြတ်ခြင်း၊ ကွေးခြင်း
- အဆင့် (၃)။ အစိတ်အပိုင်းများ တပ်ဆင်ခြင်း
- အဆင့် (၄)။ ကားကိုယ်ထည်၊ အင်ဂျင်၊ ဝင်ရိုးတန်း၊ ဂီယာအုံ စသည်တို့ တပ်ဆင်ခြင်း
- အဆင့် (၅)။ မှန်များ တံခါးများ နှင့် အတွင်းပိုင်း ပစ္စည်းများတပ်ဆင်ခြင်း နှင့် အထိုင်ချခြင်း
- အဆင့် (၆)။ ကားလေအေးပေးစနစ် နှင့် လျှပ်စစ်လိုင်းများတပ်ဆင်ခြင်း
- အဆင့် (၇)။ ကားဆေးမှုန်ခြင်း
- အဆင့် (၈)။ အရည်သွေးစစ်ဆေးခြင်း

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SC Auto (Myanmar) Co., Ltd.

ပိတ်ဝန်းကျင်ထိခိုက်နိုင်မှုများ၏ သိသာထင်ရှားမှု အဆင့်သတ်မှတ်ခြင်း

လုပ်ဆောင်မှုများ	အတိုင်းအတာများ	ထိခိုက်မှုများ	ကာလ	ပမာဏ	နေရာ	အမျိုးအစား	ဖြစ်နိုင်ချေ	သိသာ ထင်ရှားမှု
တည်ဆောက်ရေးကာလထိခိုက်နိုင်မှုများ၏ သိသာထင်ရှားမှုများ								
မြေညှိခြင်း	လေအရည် အသွေး	လေထုအတွင်းထုတ်လွှတ်မှု မြင့်မားခြင်း(ဖုန်နှင့် အိတ်ဇောမှ ထုတ်လွှတ်မှုများ)	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	အတန် အသင့်
	မြေမျက်နှာ သွင်ပြင်နှင့် ရှုခင်း	မြေမျက်နှာ သွင်ပြင်နှင့် မျက်စိ ပသာဒ ထိခိုက်ခြင်း	အမြဲတမ်း	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	အတန် အသင့်
	ကုန်းမြေဖိဝ ပတ်ဝန်းကျင် နှင့် ဇီဝမျိုးစုံမျိုး ကွဲများ	အပင်နှင့် သတ္တဝါများ အပေါ်သက် ရောက်ခြင်း	အမြဲတမ်း	အတန်အသင့်	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	အတန် အသင့်
	လူမှုစီးပွား ဆိုင်ရာ လုပ်ဆောင်မှု များ	စီးပွားရေး အလုပ်အကိုင် များ တိုးတက် လာ ခြင်း	အလယ်အလတ်	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	ကောင်းကျိုးရရှိ
	အသံဆူညံခြင်း	ဆူညံသံ ထုတ်လွှတ် ခြင်း	ကာလတို	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
အဝင်လမ်းဖောက် လုပ်ခြင်း	လေထုအရည် အသွေး	လေထုအတွင်းထုတ်လွှတ်မှု မြင့်မားခြင်း (ဖုန်နှင့် အိတ် ဇောမှ ထုတ်လွှတ် မှုများ)	ကာလတို	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	မြေမျက်နှာ သွင်ပြင်နှင့် ရှုခင်း	မြေမျက်နှာ သွင်ပြင်နှင့် မျက်စိပသာဒထိခိုက် ခြင်း	အမြဲတမ်း	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	အတန် အသင့်
	ဆူညံသံ ညစ်ညမ်းခြင်း	ဆူညံသံ ထုတ်လွှတ်ခြင်း	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လူမှုစီးပွားဆိုင်ရာလုပ် ဆောင်မှုများ	ဒေသတွင်း အလုပ် သမားများ အခွင့် အလမ်း	အလယ်အလတ်	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	ကောင်း ကျိုးရရှိ

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		ရရှိခြင်း						
လုပ်ငန်းအတွက် ပစ္စည်းများ ဝယ်ယူခြင်း	လေထုအရည် အသွေး	လေထုအတွင်းထုတ်လွှတ်မှု မြင့်မားခြင်း (ဖုန်နှင့် အိတ် ဇောမှ ထုတ်လွှတ်မှုများ)	ကာလတို	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
လူအရင်းအမြစ်	လူမှုစီးပွား ဆိုင်ရာ ဆောင်ရွက်မှု များ	ဒေသတွင်း အလုပ် သမား များ အခွင့်အလမ်း ရရှိခြင်း	အလယ်အလတ်	အတန်အသင့်	စီမံကိန်း နေရာ	တိုက်ရိုက်	>၇၅%	ကောင်းကျိုးရရှိ
အလုပ်သမားများ အတွက် ယာယီနေထိုင်စရာ အဆောက်အဦး များ ဆောက်လုပ်ခြင်း		ရေအသုံးချမှု နှင့် စွန့်ပစ်ရေ စွန့် ထုတ်ခြင်း	အလယ်အလတ်	အတန်အသင့်	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လူမှုစီးပွား ဆိုင်ရာ ဆောင်ရွက်မှု များ	စီးပွားရေးလုပ်ငန်းများ လုပ်ဆောင်မှုမြင့်မားလာခြင်း	အလယ်အလတ်	အတန်အသင့်	စီမံကိန်း နေရာ	တိုက်ရိုက်	>၇၅%	ကောင်းကျိုးရရှိ
မြေတူးခြင်း ၊ အုတ်မြစ်ချခြင်း ၊ အဆောက်အဦး များ တည်ဆောက်ခြင်း	လေထု အရည်အသွေး	လေထုအတွင်းထုတ်လွှတ်မှု မြင့်မားခြင်း (ဖုန်နှင့် အိတ် ဇောမှ ထုတ်လွှတ်မှုများ)	ကာလတို	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	မြေမျက်နှာ သွင်ပြင်နှင့် ရှုခင်း	တည်ဆောက်ရေးလုပ်ငန်း လုပ် ဆောင်မှု များကြောင့် မျက်စိ ပသာဒ ထိခိုက်ခြင်း	ကာလတို	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လူမှုစီးပွားဆိုင်ရာ ဆောင်ရွက်မှုများ	စီးပွားရေးလုပ်ငန်းများ လုပ် ဆောင်မှုမြင့် မားလာခြင်း	အလယ်အလတ်	အတန်အသင့်	စီမံကိန်း ရှိရာဒေသ	တိုက်ရိုက်	>၇၅%	ကောင်းကျိုးရရှိ
	ဆူညံသံထုတ်လွှတ်ခြင်း	ဆူညံသံများ မြင့်မားခြင်း	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
ယာဉ်များနှင့် တည်ဆောက်ရေးလုပ်ငန်း သုံး စက်များ အသုံးပြုခြင်း	လေထု အရည်အသွေး	လေထုအတွင်းထုတ်လွှတ်မှု မြင့်မားခြင်း (ဖုန်နှင့် အိတ်ဇောမှ ထုတ်လွှတ်မှုများ)	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လူမှုစီးပွားဆိုင်ရာ ဆောင်ရွက်မှုများ	စီးပွားရေးလုပ်ငန်းများလုပ် ဆောင်မှု မြင့်မား လာခြင်း	အလယ်အလတ်	အတန်အသင့်	စီမံကိန်းနေရာ	တိုက်ရိုက်	>၇၅%	ကောင်းကျိုးရရှိ

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အခြေခံအဆောက်အဦများ ဆောက်လုပ်ခြင်း	ဖိတ်ခေါ်မှု/စီမံခန့်ခွဲမှုများ	ဂေဟစနစ် ယိုယွင်း စေခြင်း	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	ဆူညံသံ ထုတ်လွှတ်ခြင်း	ဆူညံသံများ မြင့်မားခြင်း	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လူမှုစီးပွားဆိုင်ရာ ဆောင်ရွက်မှုများ	စီးပွားရေးလုပ်ငန်းများ လုပ်ဆောင် မှုမြင့်မား လာခြင်း	အလယ်အလတ်	အတန်အသင့်	စီမံကိန်းနေရာ	တိုက်ရိုက်	>၇၅%	ကောင်းကျိုးရရှိ
စွန့်ပစ်ပစ္စည်းများ စွန့်ထုတ်ခြင်း	မြေအောက်ရေ အရည်အသွေး	စွန့်ပစ်ပစ္စည်း များ မြေ အောက်ရေကို ထိခိုက်စေခြင်း	အလယ်အလတ်	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	<၂၅%	အတန် အသင့်
	လူမှုပတ်ဝန်းကျင်ဆိုင်ရာ ဘေးအန္တရာယ် ကင်းရှင်းရေးနှင့် ကျန်းမာရေး	ကျန်းမာရေးအပေါ် ဆိုးကျိုး သက်ရောက်မှု	အလယ်အလတ်	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	<၂၅%	အတန် အသင့်
လုပ်ငန်းလည်ပတ်ရေးကာလ								
အဆင့် ၁ ၊ အင်ဂျင်နီယာ ဒီဇိုင်းများ								
အဆင့် ၂ ၊ ကုန်ကြမ်းများ ဖြတ်တောက်ခြင်း ၊ ကွေးခြင်း ၊ လှိမ့်ခြင်း	ဆူညံသံညစ်ညမ်း ခြင်း	ဆူညံသံ ထုတ်လွှတ် ခြင်း	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့်ဘေး အန္တရာယ်ကင်းရှင်း ရေး	ကျန်းမာရေးအတွက် ဆိုးကျိုးသက်ရောက်မှုများ	အလယ်အလတ်	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
အဆင့် ၃ ၊ အစိတ်အပိုင်းများ တပ်ဆင်ခြင်း	ဆူညံသံ ညစ်ညမ်းခြင်း	ဆူညံသံ ထုတ်လွှတ် ခြင်း	ကာလတို	SMALL နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့်ဘေး အန္တရာယ်ကင်းရှင်း ရေး	ကျန်းမာရေးအတွက် ဆိုးကျိုးသက်ရောက်မှုများ	အလယ်အလတ်	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်

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အဆင့် ၄ ၊ ပုံကြမ်း တပ်ဆင်ခြင်း	ဆူညံသံ ညစ်ညမ်းခြင်း	ဆူညံသံ ထုတ်လွှတ် ခြင်း	ကာလတို	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
အဆင့် ၅ ၊ အစိတ်အပိုင်းများ တပ်ဆင်ခြင်းနှင့် ကိုယ်ထည်အတွင်း ပိုင်းတပ်ဆင်ခြင်း	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	ကျန်းမာရေးအတွက် ဆိုးကျိုးသက်ရောက်မှုများ	အလယ်အလတ်	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
အဆင့် ၆ ၊ လေအေးပေး စနစ် တပ်ဆင်ခြင်း နှင့် လျှပ်စစ်စနစ် များ တပ်ဆင်ခြင်း	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	ကျန်းမာရေးအတွက် ဆိုးကျိုး သက် ရောက်မှု များ	အလယ် အလတ်	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
အဆင့် ၇ ၊ ဆေးမှုတ်ခြင်း	လေထုအရည် အသွေး	အငွေ့ပျံနိုင်သော အော်ဂဲနစ် ခြပ်ပေါင်း များ	ကာလရှည်	အတန် အသင့်	စီမံကိန်း နေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
အဆင့် ၈ ၊ အရည်အသွေး ထိန်းသိမ်းခြင်းနှင့် စစ်ဆေးခြင်း	လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေး	ကျန်းမာရေးအတွက် ဆိုးကျိုးသက်ရောက်မှုများ	အလယ် အလတ်	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
အပိုင်အခဲစွန့်ပစ်ပစ္စည်းများ စွန့်ထုတ်ခြင်း	မြေအောက်ရေ အရည်အသွေး	စွန့်ပစ်ပစ္စည်းများ မြေအောက်သို့ စိမ့်ဝင်ခြင်း	အလယ်အလတ်	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
အပိုင်အခဲစွန့်ပစ်ပစ္စည်းများ စွန့်ထုတ်ခြင်း	Community health and safety ပတ်ဝန်းကျင် လူမှုကျန်းမာရေး	Adverse health impacts ကျန်းမာရေးအတွက် ဆိုးကျိုးသက်ရောက်မှုများ	MEDIUM အလယ်အလတ်	SMALL နည်းပါး	LOCAL စီမံကိန်းနေရာ	DIRECT တိုက်ရိုက်	<25% <၂၅%	MODERATE အတန်အသင့်

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ထိခိုက်မှုများ								
ပိတ်သိမ်းခြင်းကာလ								
စွန့်ပစ်ပစ္စည်းစွန့်ထုတ်ခြင်း	မြေအောက်ရေ အရည်အသွေး	စွန့်	အလယ်အလတ်	နည်းပါး	စီမံကိန်းနေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
	ပတ်ဝန်းကျင် လူမှုကျန်းမာရေး ထိခိုက်မှုများ	ကျန်းမာရေး အတွက် ဆိုးကျိုးသက် ရောက်မှုများ	အလယ်အလတ်	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	<၂၅%	အတန်အသင့်
အဆောက်အဦများ ပြန်လည် ဖြိုဖျက်ခြင်း	ဆူညံသံ ထွက်ရှိမှု	ဆူညံသံ ထုတ်လွှတ်ခြင်း	ကာလတို	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	မသိသာ
	လူမှုစီးပွားဆိုင်ရာ ဆောင်ရွက်မှုများ	ဒေသတွင်း အလုပ်အကိုင်အခွင့်အလမ်း တိုးတက်ခြင်း	အလယ်အလတ်	နည်းပါး	စီမံကိန်း နေရာ	တိုက်ရိုက်	၂၅-၇၅%	ကောင်းကျိုးရရှိ

ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်

စီမံကိန်း/ လုပ်ဆောင်မှု အခြေအနေ (သက်ရောက်နိုင်သော ပတ်ဝန်းကျင်ဆိုင်ရာ ထိခိုက်မှုများ)	ရည်ရွယ်ချက်	လျော့ပါးစေသောနည်းလမ်းများ	လျော့ပါးစေသော နည်းလမ်းများအတွက် ခန့်မှန်း ကုန်ကျစရိတ်	တာဝန်ရှိပုဂ္ဂိုလ် /အဖွဲ့အစည်း
တည်ဆောက်ရေးကာလ				
မြေဆီလွှာပျက်စီးခြင်း	တည်ဆောက်ရေး လုပ်ဆောင်မှုများ ကြောင့် မြေဆီလွှာ ပျက်စီးမှု	<ul style="list-style-type: none"> မြေဆီလွှာပျက်စီးမှု မဖြစ်စေရန် မြေတူးဖော်ခြင်းအလုပ်များကို စနစ်တကျ လုပ်ဆောင်ခြင်း ရေမြောင်းစနစ်ကို ကောင်းစွာ ပြုလုပ်ခြင်း စီမံကိန်းပြီးမြောက်သောနေရာများတွင် မျက်စိပသားဒ 	သီးသန့်ကုန်ကျစရိတ် မရှိ	စီမံကိန်းဖော် ဆောင်သူနှင့် တည်ဆောက် ရေး လုပ်ငန်းတာဝန်ယူ

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	နည်းပါးစေရန်	<p>ဖြစ်စေသော ရှုခင်းများ ဖော်ဆောင်ခြင်း</p> <ul style="list-style-type: none"> • မိုးသည်းထန်သော ကာလတွင် လုပ်ဆောင်မှုများကို စနစ်တကျ ထိန်းချုပ်ခြင်း • မြေဆီလွှာပျက်စီးခြင်း ၊ ထိန်းသိမ်းခြင်းတို့အတွက် လိုအပ်သော အထောက်အပံ့များ တည်ဆောက်ခြင်း • မြေဆီလွှာထိန်းသိမ်းခြင်းအနေဖြင့် မြက် နှင့် အခြားသော အပင်မျိုးများကို ပြန်လည်စိုက်ပျိုးပေးခြင်း • ယာယီအကာများ ဖုံးအုပ်ထားခြင်းဖြင့် မြေပျက်နာပြင်ပေါ် ရေစီးဆင်းမှုကို ကာကွယ်ခြင်း • မိုးသည်းထန်ချိန်တွင် ထိတွေ့နိုင်သော မြေပျက်နာပြင်ဧရိယာကို တိုင်းတာခြင်း 		သူ
ဆူညံသံ	ဆူညံသံထွက်ရှိမှုသည် လက်ခံနိုင်သော အတိုင်းအတာ ရှိစေခြင်း	<ul style="list-style-type: none"> • တည်ဆောက်ရေးလုပ်ငန်းများကို ပုံမှန် အလုပ်ချိန်အတိုင်းသာ ဆောင်ရွက်ရန် • ဆူညံသံထွက်ရှိမှုမြင့်မားသော စက်ပစ္စည်းများကို အသံလျော့ချသောစနစ်တပ်ဆင်ရန် • ဆူညံသံ ၈၀ dBA ခံစားရသော အလုပ်သမားများကို အလုပ်ချိန် ၈ နာရီသာ လုပ်ခွင့်ပြုရန် နှင့် နားကြပ်များ တပ်ဆင်စေခြင်း 	သီးသန့်ကုန်ကျစရိတ် မရှိ	တည်ဆောက် ရေးလုပ်ငန်း တာဝန်ယူသူ
လေထုညစ်ညမ်းခြင်း (အမှုန်အမွှား)	ပတ်ဝန်းကျင်လေထုအတွင်းသို့ ဖုန်နှင့် အမှုန်အမွှား ပြန့်နှံ့မှုကို ထိန်းချုပ်ခြင်း	<ul style="list-style-type: none"> • ခြောက်သွေ့သောကာလ မြေတူးဖော်ခြင်း လုပ်ငန်းလုပ်ဆောင်ချိန်တွင် အမှုန်အမွှားထွက်ရှိမှု လျော့ချရန် ရေဖြန်းစနစ်ထားရှိခြင်း • တည်ဆောက်ရေး ယာဉ်များ၏ လည်ပတ်ခြင်းနှင့် သွားလာမောင်းနှင်မှု အမြန်နှုန်းများကို ထိန်းချုပ်ခြင်း • မလိုအပ်ပဲ စက်မောင်းနှင်ထားခြင်းအား တားမြစ်ခြင်း 	သီးသန့်ကုန်ကျစရိတ် မရှိ	တည်ဆောက် ရေးလုပ်ငန်း တာဝန်ယူသူ

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		<ul style="list-style-type: none"> • တည်ဆောက်ရေး စက်များနှင့် ယာဉ်များ၏ အသံထွက်ရှိမှုကို ထိန်းသိမ်းခြင်း • ခြောက်သွေ့ပြီး လေတိုက်ခတ်သော ကာလတွင် တည်ဆောက်ရေးလုပ်ငန်းခွင်အတွင်းရှိ လုပ်သားများကို မျက်နှာဖုံးအုပ်၍ အလုပ်လုပ်စေခြင်း 		
<p>ပစ္စည်းများ သယ်ယူပို့ဆောင်ခြင်း</p>	<p>သယ်ယူပို့ဆောင်ချိန်အတွင်း ဖုန် ၊ အသံနှင့် စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိမှုကို လျော့နည်းစေခြင်း</p>	<ul style="list-style-type: none"> • မြေကြီးများ သယ်ယူပို့ဆောင်ရာတွင် အဖုံးအကာဖြင့် သယ်ယူပို့ဆောင်ရန် • မြေသယ်ကားများသည်လည်း အဖုံးအကာများ လုံခြုံစွာ ဖုံးအုပ်နိုင်သော စနစ် တပ်ဆင်ထားရမည် • မြေနှင့် တည်ဆောက်ရေးလုပ်ငန်းသုံး ပစ္စည်းများ သယ်ယူပို့ဆောင်ရာတွင် လမ်းမများပေါ်သို့ ဖိတ်ကျခြင်းအတွက် ရှင်းလင်းရန် တည်ဆောက်ရေးကန်ထရိုက်တာမှ တာဝန်ရှိသည်။ ယင်းအချက်များသည် စီမံကိန်းအကောင်အထည်ဖော်ဆောင်သူနှင့် တည်ဆောက်ရေးကန်ထရိုက်တာတို့ စာချုပ်ချုပ်စဉ်တွင် ပါဝင် ဖော်ပြထားရမည်။ • လောင်စာဆီနှင့် ချောဆီများ တည်ဆောက်ရေးလုပ်ငန်းခွင်သို့ သယ်ပို့ရာတွင် သတ်မှတ်ထားသော ယာဉ်အမျိုးအစားဖြင့်သာ သယ်ပို့ရမည်။ • ဖြစ်နိုင်လျှင် တည်ဆောက်ရေးပစ္စည်းများ သယ်ယူပို့ဆောင်ခြင်းသည် စီမံကိန်းဧရိယာအတွင်းသာ ရှိသင့်သည်။ 	<p>သီးသန့်ကုန်ကျစရိတ် မရှိ</p>	<p>တည်ဆောက် ရေးလုပ်ငန်း တာဝန်ယူသူ</p>

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<p>ပစ္စည်းများ သိုလှောင်ခြင်း</p>	<p>ပစ္စည်းများ ကောင်းစွာသိုလှောင်ခြင်းနှင့် မတော်တဆ ယိုဖိတ်မှုကို ရှောင်ကြည်ရန်</p>	<ul style="list-style-type: none"> • တိုင်စိုက်ခြင်းအတွက် ပစ္စည်းများကို စနစ်တကျ သိုလှောင်ထားရမည်။ • သဲ ၊ ထုံးအစရှိသော ပစ္စည်းများကို ရေမြောင်းများနှင့် အဝေးတွင် လုံခြုံစွာ ထိန်းသိမ်းထားရမည်။ • ပစ္စည်းများ သိုလှောင်ထားရှိရန်အတွက် အန္တရာယ်ကင်းသော ဧရိယာများ သတ်မှတ်ထားပေးရမည်။ • အန္တရာယ်ရှိသော ဓာတုပစ္စည်းများ (ဥပမာ ၊ လောင်စာ) တို့ကို သင့်တော်သော ကွန်တိန်နာများ တွင် ထားရှိပြီး စနစ်တကျ သေချာစိတ်ထားရမည်။ စနစ်တကျကိုင်တွယ်အသုံးပြုရမည်။ 	<p>သီးသန့်ကုန်ကျစရိတ် မရှိ</p>	<p>တည်ဆောက် ရေးလုပ်ငန်း တာဝန်ယူသူ</p>
<p>မိလ္လာ စွန့်ပစ်ခြင်း စီမံခန့်ခွဲမှု</p>	<p>ဆေးကြောရေးများမှ မြေဆီလွှာနှင့် ရေထုညစ်ညမ်းမှုကို ကာကွယ်ခြင်း ၊ ယာယီမိလ္လာကန်များမှ ယိုဖိတ်မှု မဖြစ်စေရန် ကာကွယ်ခြင်း</p>	<ul style="list-style-type: none"> • မိလ္လာသန့်စင်စနစ်ထားရှိရမည် • အစိုင်အခဲစွန့်ပစ်ပစ္စည်း စွန့်ပစ်စနစ်ကို လုံလောက်စွာထားရှိပေးရမည် • သတ်မှတ်ထားသော စွန့်ပစ်ရမည့် နေရာသို့ စွန့်ပစ်နိုင်ရန် စီစဉ်ပေးရမည်။ 	<p>သီးသန့်ကုန်ကျစရိတ် မရှိ</p>	<p>တည်ဆောက် ရေးလုပ်ငန်း တာဝန်ယူသူ</p>
<p>တည်ဆောက်ရေး စွန့်ပစ်ပစ္စည်းများ စွန့်ထုတ်ခြင်း</p>	<p>တည်ဆောက်ရေးလုပ်ငန်းမှ စွန့်ပစ်ပစ္စည်းများ ဖြစ်ကြသော မှန် ၊ သတ္တု ၊ သစ်သား ၊</p>	<ul style="list-style-type: none"> • စွန့်ပစ်ပစ္စည်း သိမ်းဆည်းခြင်းနှင့် စွန့်ပစ်ခြင်းတို့ကို မင်္ဂလာဒုံမြို့နယ်စည်ပင်သာယာနှင့် ချိတ်ဆက်၍ စွန့်ပစ်ရမည် • စီမံကိန်းလုပ်ငန်းခွင် ပြင်ဆင်ခြင်းနှင့် တည်ဆောက်နေစဉ် အစိုင်အခဲစွန့်ပစ်ပစ္စည်းများ အနည်းဆုံး ထွက်စေရန် 		<p>တည်ဆောက် ရေးလုပ်ငန်း တာဝန်ယူသူ</p>

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	<p>ဘိလပ်မြေ အကြွင်း အကျန်များ ၊ ပလတ်စတစ် ၊ စက္ကူများ ၊ ဆီများ ယိုဖိတ်ခြင်း တို့ မဖြစ်စေရန် လုံလောက်သော စွန့်ပစ်စနစ်ထား ရှိခြင်း</p>	<p>ပြုလုပ်ရမည်။</p> <ul style="list-style-type: none"> • . • အော်ဂဲနစ် စွန့်ပစ်ပစ္စည်းများ ထွက်ရှိမှု လျော့ချခြင်းနှင့် မြေဆီလွှာထိန်းသိမ်းရန် အပင်ငယ်များ ပြန်လည်စိုက်ပျိုးခြင်း • တူးဖော်ထားသော မြေများကို လိုအပ်သောနေရာတွင် ပြန်လည်ဖို့ခြင်း • အသုံးမဝင်တော့သော ဆောက်လုပ်ရေးလုပ်ငန်းသို့ ပစ္စည်းအပျက်များကို မင်္ဂလာဒုံမြို့နယ် စည်ပင်သာယာဌာနနှင့် ဆက်သွယ်စွန့်ပစ်ရန် 		
<p>မတော်တဆ ၊ ထိခိုက်မှု ၊ ကျန်းမာရေးအန္တရာယ်</p>	<p>မတော်တဆနှင့် ထိခိုက်မှုများ ၊ ရောဂါများ ဖြစ်ပွားမှု အနည်းဆုံး ဖြစ်စေရန်</p>	<ul style="list-style-type: none"> • တကိုယ်ရည်သုံးအကာအကွယ်ပစ္စည်း များ ၊ ဖိနပ်၊ ဦးထုပ် ၊ မျက်မှန် ၊ လက်အိတ် စသည်တို့ကို လုပ်ငန်းခွင်တွင် အချိန်ပြည့် သုံးရန် • အကာအရံများ လိုအပ်သလို ကာရံထားခြင်းအတွက် အလုပ်သမားများ ထိခိုက်မှုကို ကာကွယ်ပေးခြင်း • အန္တရယ်ရှိသောနေရာများတွင် သတိပေးဆိုင်းဘုတ်များ ချိတ်ဆွဲထားခြင်း • လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး အစီအစဉ်များ အကောင်အထည်ဖော်ခြင်း • ထိခိုက်မှုများအတွက် ရှေးဦးသူနာပြုဆေးသေတ္တာများကို အလွယ်တကူ ထားရှိပေးခြင်း • ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် ပုံမှန်ဟောပြောပွဲများ သင်တန်းများပေးခြင်း 	<p>သီးသန့်ကုန်ကျစရိတ် မရှိ</p>	<p>တည်ဆောက် ရေး လုပ်ငန်း တာဝန်ယူသူ</p>
<p>ဆူညံသံညစ်ညမ်းခြင်း</p>	<p>ဆူညံသံထွက်ရှိမှု</p>			

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	သည် သတ်မှတ်သော လမ်းညွှန်ချက် များအတွင်းရှိစေ ရန်			
စွန့်ပစ်ရေ	ပတ်ဝန်းကျင် မြေထုနှင့် ရေထု ညစ်ညမ်းမှုကို လျော့ချရန်	<ul style="list-style-type: none"> ထုတ်လုပ်မှုလုပ်ငန်းစဉ်နှင့် စက်ပစ္စည်းများ ဆေးကြောခြင်းအတွက် ရေအသုံးချမှုကို အနည်းဆုံးဖြစ်စေရန် အသုံးပြုခြင်း စွန့်ပစ်ရေ သန့်စင်မှုစနစ်ကို အဆင့်မြင့်တင်ရန် စီစဉ်ခြင်း ရေကို တတ်နိုင်သမျှ ပြန်လည် အသုံးပြုနိုင်ရန် စီစဉ်ခြင်း မသန့်စင်ရသေးသော စွန့်ပစ်ရေများ စွန့်ထုတ်ခြင်းကို သေချာစွာ စောင့်ကြပ်ကြည့်ရှုခြင်း 	ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်၏ ကုန်ကျစရိတ်အတွင်း မှ	SC AUTO စီမံခန့်ခွဲမှု အဖွဲ့
အစိုင်အခဲစွန့်ပစ်ပစ္စည်း	အစိုင်အခဲစွန့်ပစ် ပစ္စည်းများ ကြောင့် မြေထု ညစ်ညမ်း ခြင်းကို ကာကွယ်ရန်	<ul style="list-style-type: none"> စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှု အစီအစဉ် သတ်မှတ်ခြင်း DOWA ကဲ့သို့သော စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲမှု စနစ်ရှိနေရာသို့ ဆက်သွယ်စွန့်ပစ်ခြင်း အန္တရာယ်ရှိသော ပစ္စည်းနှင့် အန္တရာယ်မရှိသော ပစ္စည်းများ၏ ဗူးခွံများကို ရောင်းချသူထံသို့ ပြန်လည်အသုံးပြုနိုင်ရန် ပေးပို့ခြင်း 	ပတ်ဝန်းကျင် စီမံခန့်ခွဲမှု အစီအစဉ်မှ စွန့်ပစ်ပစ္စည်း စီမံခန့်ခွဲမှု ကုန်ကျစရိတ် အတွင်းမှ	SC AUTO ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်း ရှင်းရေး ဌာန
လုပ်ငန်းခွင် ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး				
ဓာတုပစ္စည်း ထိတွေ့ခြင်း	အလုပ်သမားများအတွက် ဘေးကင်း သော လုပ်ငန်း ခွင်ဖြစ် စေရန်	<ul style="list-style-type: none"> တကိုယ်ရည်သုံးအကာအကွယ် ပစ္စည်းများ ထောက်ပံ့ပေးခြင်း နှင့် စနစ်တကျ အသုံးပြုတတ်စေရန် သင်တန်းပေးခြင်း အလုပ်သမားများ၏ ကျန်းမာရေးကို ပုံမှန် စစ်ဆေးပေးခြင်း 	ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် သတ်မှတ်ထား သော	SC AUTO ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်း ရှင်းရေးဌာန

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			ကုန်ကျစရိတ်အတွင်း မှ	
ဆူညံသံနှင့် တုန်ခါမှု	ဆူညံသံထွက်ရှိမှု သည် သတ်မှတ် သော လမ်းညွှန်ချက် များအတွင်းရှိစေရန်	<ul style="list-style-type: none"> ဆူညံသံမြင့်မားသော စက်များကို လူများနှင့် သီးသန့်ခွဲထားခြင်း တုန်ခါမှု ထိတွေ့ချိန်ကို လျော့ချခြင်း တကိုယ်ရည်သုံးအကာအကွယ်ပစ္စည်းများ ထောက်ပံ့ပေးခြင်း 	ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် သတ်မှတ်ထားသော ကုန်ကျစရိတ်အတွင်း မှ	SC AUTO ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေးဌာန
စက်ပစ္စည်းများ	ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး ဦးတည် ချက် များနှင့် ကိုက်ညီစေရန်	<ul style="list-style-type: none"> တကိုယ်ရည်သုံးအကာအကွယ် ပစ္စည်းများကို မှန်ကန်စွာရွေးချယ်တတ်စေရန် ဝန်ထမ်းများအား သင်တန်းပေးခြင်း စက်များနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး ပစ္စည်းများကို မှန်ကန်စွာအသုံးပြုတတ်စေရန် ဝန်ထမ်းများ အား သင်ကြားပေးခြင်း ထိခိုက်နိုင်သော ပစ္စည်းများကို တိုက်ရိုက်ကိုင်တွယ်ခြင်းမှ ရှောင်ကြဉ်ခြင်း 	SC Auto စီမံခန့်ခွဲမှု ကျန်းမာရေးနှင့် ဘေးအန္တရာယ် ကင်းရှင်းရေးဦး တည်ချက်ကို သတ် မှတ်ခြင်း SC Auto စီမံခန့်ခွဲမှု ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး အတွက် အပိုဆုကြေးငွေ သတ်မှတ်ခြင်း	SC Auto ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး ဌာန

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လုပ်ငန်းဖျက်သိမ်းခြင်းအဆင့်				
<p>ဖျက်သိမ်းရေးလုပ်ငန်းများ မှ စွန့်ပစ်ပစ္စည်း စွန့်ပစ်မှု</p>	<p>လုပ်ငန်းခွင်အတွင်း အပျက်အစီးများ နှင့် အခြားအပိုင်းအစ များ ထွက်ပေါ် လာ ခြင်းကို လျော့ချ ရန်</p>	<ul style="list-style-type: none"> • ဘက်ပေါင်းစုံမှ နည်းလမ်းအဆင့်ဆင့်ဖြင့် အစိုင်အခဲ စွန့်ပစ်မှု စီမံခန့်ခွဲမှု အစီအစဉ်ကို အသုံးပြုခြင်း။ • စက်ရုံ ဖျက်သိမ်းရေးလုပ်ငန်းများကြောင့် ထွက်ပေါ်လာသည့် စွန့်ပစ်ပစ္စည်းများကို စွန့်ပစ်ပစ္စည်းစီမံခန့်ခွဲမှုဆိုင်ရာလုပ်ထုံးလုပ်နည်းများ နှင့်အညီ အမျိုးအစားအလိုက် လိုက်နာ ဆောင်ရွက်ခြင်း။ • အဆောက်အအုံများ၊ အဆောက်အဦများ၊ စက်ပစ္စည်းများ နှင့် ကိရိယာများအားလုံးကို အခြားရည်ရွယ်ချက်များ တွင် ပြန်သုံးခြင်းမပြုပဲ ဖယ်ရှားရမည်။ (အခြားစီမံကိန်းများတွင် ပြုပြင်ပြီး၊ ပြန်သုံးခြင်းကို ဆိုလိုသည်) • စက်ပစ္စည်းများ၊ စက်ကိရိယာများ၊ အသုံးပြုကိရိယာများ နှင့် အခြား စွန့်ပစ်ပစ္စည်းများ ကို ပြန်လည်ပြုပြင်ခြင်း၊ ပြန်သုံးခြင်းလုပ်ရန် မဖြစ်နိုင်ပါက ၎င်းပစ္စည်းများကို ခွင့်ပြုထားသော နေရာများတွင်သာ စွန့်ပစ်ရမည်။ • လုပ်ငန်းအဆုံးသတ် စွန့်ပစ်ပစ္စည်း စွန့်ပစ်ခြင်း အတွက် မင်္ဂလာဒုံမြို့နယ်ရှိ စည်ပင်သာယာ နှင့် ဆက်သွယ်ရမည်။ 	<p>1,000</p>	<p>တည်ဆောက် ရေး လုပ်ငန်း တာဝန်ယူသူ</p>
<p>ဖျက်သိမ်းရေးလုပ်ငန်းများ ကြောင့် မြေအောက်ရေညစ်ညမ်း မှု</p>	<p>ဖြစ်လာနိုင်သော ညစ်ညမ်းမှုများကို တားဆီးရန်</p>	<ul style="list-style-type: none"> • မြေတူးစဉ် အဆိပ်အတောက်ဖြစ်နေသော ပစ္စည်းများကိုရှာဖွေရန် လုပ်ထုံးလုပ်နည်းထားရှိရမည်။ • တူးဖော်ရရှိထားသောပစ္စည်းများကိုစုပုံထားပြီး ကာထားခြင်း။ • အဆိပ်အတောက်ဖြစ်နေသော ပစ္စည်းများကိုရှာဖွေရ ရှိပါက သင့်တော်စွာ သိုလှောင်ခြင်း။ 	<p>2,000</p>	<p>SC Auto</p>

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		<ul style="list-style-type: none"> လုပ်ငန်းခွင်အတွင်း ပစ္စည်းများ နှင့် စက်ကိရိယာများကို သင့်တော်စွာကိုင်တွယ်ပြီး သိုလှောင်ခြင်းဖြင့် မြေအောက်ရေ နှင့် စီးဆင်းရေ ညစ်ညမ်းမှုကို တားဆီးနိုင်သည်။ 		
စီမံကိန်းလုပ်ငန်းခွင်၏ ပြန်လည်ထူထောင်ရေး	သဘာဝပေါက်ပင်များ ဖျက်ပစ်မှု၊ မြေသားပုံပျက်မှု တို့ နည်းစေရန်၊ လုပ်ငန်းခွင်ကို ပြန်လည်ထူထောင်မှု ရှိစေရန် သေချာအောင်လုပ်ဆောင်ခြင်း	<ul style="list-style-type: none"> လုပ်ငန်းခွင်၏မူလအခြေအနေအတိုင်းပြန်လည်ရရှိအောင် သဘာဝပေါက်ပင်များကိုပြန်လည်စိုက်ပျိုးသည့် သင့်တော်သော အစီအစဉ် များကို အကောင်အထည်ဖော်လုပ်ဆောင်ခြင်း။ သဘာဝပေါက်ပင်များကိုပြန်လည်စိုက်ပျိုးသည့်အချိန် အတွင်း မျက်နှာပြင်တိုက်စားမှုမှကာကွယ်ရန် မျက်နှာပြင်စီးဆင်းရေကို သင့်တော်သော ထိန်းသိမ်းမှုများလုပ်ဆောင်ရမည်။ ထိုဧရိယာ၏လေ့လာစောင့်ကြည့်ခြင်းနှင့် ကြည့်ရှုထိန်းသိမ်းခြင်း အတွက် တိုက်စားခြင်း၏လက္ခဏာရပ်များကို ကောက်ယူပြီး မည်သည့် အခြေအနေကိုမဆို မှန်ကန်စေရန် သင့်တော်သည့်ဆောင်ရွက်မှုများ ကိုလုပ်ဆောင်သွားရမည်။ အသစ်စိုက်ပျိုးထားသောဧရိယာကို နောက်ယုက်မှု မရှိစေရန် တားမြစ်ဆိုင်းဘုတ်များ၊ ခြံဝန်းများ ကာထားခြင်းလုပ်ရမည်။ ညစ်ညမ်းနေသောမြေဆီလွှာများကိုပစ်ပြီး အခြားဘက်ရှိ မညစ်ညမ်းသောမြေဆီလွှာများနှင့် အစားထိုးရမည်။ 	2,000	SC Auto
ကျန်းမာရေး နှင့် ဘေးကင်း	အလားအလာရှိသော	<ul style="list-style-type: none"> လုပ်ငန်းဖျက်သိမ်းခြင်းတွင် အလုပ်သမားများ၏ 	2,000	တည်ဆောက် ရေး

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လုံခြုံရေး	လုပ်ငန်းခွင်အန္တရာယ်များကိုရှောင်ရှားရန်	<p>ဘေးကင်းလုံခြုံခြင်းသည် အခြားသောကိစ္စများထက် ဦးစားပေးရမည်။</p> <ul style="list-style-type: none"> • လိုအပ်ပါက တစ်ဦးချင်းအကာအကွယ်ပစ္စည်းများ ထောက်ပံ့ရမည်။ • ထိခိုက်မှုများဖြစ်ပွားခြင်းမှရှောင်ရှားရန် လေ့ကျင့်မှုများ နှင့် အခြားအန္တရာယ်ရှိသောနေရာများတွင်လက်ရန်းများ တပ်ထားရမည်။ • အလုပ်သမားများအတွက် အရေးပေါ် ကျန်းမာရေး နှင့် သန့်ရှင်းရေးစောင့်ရှောက်မှုများပေးရမည်။ • ဖျက်သိမ်းသည့်လုပ်ငန်းခွင်အတွင်း မီးသတ်ဘူးများ၊ ချိတ်၊ ပုံး၊ ရေလှောင်ကန်များ ကဲ့သို့သော အရေးပေါ် မီးသတ်ကိရိယာများ အဆင်သင့်ထားရှိရမည်။ 		လုပ်ငန်း တာဝန်ယူသူ
လူမှုစီးပွားရေးဆိုင်ရာ သက်ရောက်မှုများ	ဝင်ငွေ၊ ဘဝအဆင့်အတန်း နှင့် ဆေးဘက် ဆိုင်ရာ အာမခံများ စသည်တို့၊ လျော့နည်းလာခြင်းမှ ကာကွယ်ရန်။	<ul style="list-style-type: none"> • အလုပ်သမားအင်အားစုတွင်ပါဝင်သော အလုပ်အကိုင် ရှာဖွေခြင်း နှင့် အလုပ်ပြန်လည် ခန့်အပ်ရန် အထောက်အကူပေးခြင်း။ • အလုပ်သမားများကို လျော်ကြေးပေးခြင်း နှင့် အခြားနေရာမှအခွင့်အလမ်းများရှာဖွေရာတွင် • သင့်တော်သောအကြံပြုချက်များပေးခြင်း။ • ငွေကြေးပိုင်းဆိုင်ရာကိစ္စရပ်များအပေါ် ကမ်းလှမ်းချက် နှင့် အကြံဉာဏ် များပေးခြင်း။ 	1,000	တည်ဆောက်ရေး လုပ်ငန်း တာဝန်ယူသူ

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တည်ဆောက်ရေးနှင့် ပိတ်သိမ်းခြင်းကာလတွင် ပတ်ဝန်းကျင်အချက်အလက်များကို အကဲ ဖြတ်ခြင်း လုပ်ငန်းသည် အထူးအရေးပါပြီး ယင်းအချက်များကို အခြေခံ၍ ပတ်ဝန်းကျင်စောင့် ကြပ်ကြည့်ရှုရေးလုပ်ငန်းစဉ်များကို လုပ်ဆောင်ရပါမည်။ ပတ်ဝန်းကျင် စောင့်ကြပ်ကြည့်ရှုရေး အစီအစဉ်တွင် ပါဝင်မည့်လူများ သည် တိုင်းတာရရှိထားသည့် အချက်အလက်များကို ညွှန်းကိန်းအဖြစ် အသုံးပြုလည်ပတ်ရေး ကာလမှ ရရှိသည့် အခြေအနေများကို သုံးသပ် ချိန်ထိုးရပါမည်။

စောင့်ကြပ်ကြည့်ရှုခြင်းအစီအစဉ်သည် ပတ်ဝန်းကျင်ထိခိုက်မှုမရှိရန် ကောင်းစွာကြပ်မတ် နိုင်ပါသည်။ အောက်ဖော်ပြပါ ပုံမှန်စောင့်ကြပ်ကြည့်ရှုခြင်း အစီအစဉ်သည် စက်ရုံတည်ဆောက် ပြီးစီးချိန်တွင် ဆောင်ရွက်ရမည့် ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းအစီရင်ခံစာပါညွှန်ကြားချက်များ အတိုင်းလိုက်နာ ဆောင်ရွက်ရပါမည်။

ပတ်ဝန်းကျင်စောင့်ကြပ်ကြည့်ရှုရေးအစီအစဉ်တွင် တည်ဆောက်ရေးကာလ၊ လည်ပတ်ရေး နှင့် ပိတ်သိမ်းရေးကာလ အခြေအနေနှစ်ရပ်ကို ထည့်သွင်းဖော်ပြရပါမည်။

စောင့်ကြပ်ကြည့်ရှုတိုင်းတာရမည့် အစီအစဉ်များ	တိုင်းတာသည့် အချက်အလက်	နေရာ	အကြိမ် အရေအတွက်	တာဝန်ယူမှု
ဆောက်လုပ်ရေး/ ပိတ်သိမ်းခြင်းကာလ				
လေအရည်အသွေး	<ul style="list-style-type: none"> TSP, Particulate, VOC, CO, CO2, NO2, SO2 စက်ပစ္စည်းများပြင်ဆင် ထိန်းသိမ်းမှုမား မှတ်တမ်းတင်ခြင်း ဖုန်မှုန်ထွက်ရှိမှုများ သောလုပ်ငန်းများအား မှတ်တမ်းတင်ခြင်း 	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	ဆောက်လုပ်ရေးကာလအတွင်းတစ်ကြိမ် တိုင်းရန်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
မြေထုအရည်အသွေး	<ul style="list-style-type: none"> စတိုးများသိုလှောင်ကန်များမှတစ်ဆင့်ပစ္စည်းများ အဆိပ်ရှိ ပစ္စည်းများ ထုတ်လွှတ်/ ယိုစိမ့်မှု အခြေအနေ ယာဉ်များမှတစ်ဆင့်ပစ္စည်းများ၊စက်ဆီချောဆီများ ယိုစိမ့်မှု 	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
ရေအရည်အသွေး	ယာယီ မိလ္လာကျင်းများ နှင့် မိလ္လာစွန့်ပစ်မှုစနစ်၊ ယာယီ ရေမြောင်းစနစ်များအားစစ်ဆေးရန်	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
ရေအသုံးပြုမှု	နေ့စဉ်ရေသုံးစွဲမှုပမာဏ	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ

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ဆူညံသံ	ပြင်းထန်မှုတိုင်းတာခြင်း	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
စွန့်ပစ်ပစ္စည်းစွန့်ပစ်မှု	<ul style="list-style-type: none"> အလုပ်သမားများ၏ အစိုင်အခဲ နှင့်မိလ္လာထွက် စွန့်ပစ်ပစ္စည်းများပမာဏ မှတ်တမ်း သိုလှောင် ဧရိယာ အားစစ် ဆေးခြင်း 	အလုပ်သမားများနှင့် ရပ်ကွက်ပတ်ဝန်းကျင် ဧရိယာ	နေ့စဉ် တွေ့ရှိချက်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
	<ul style="list-style-type: none"> စွန့်ပစ်မှုဆိုင်ရာလိုအပ်ချက် အတိုင်းစွန့်ပစ်သောဆောက်လုပ်ရေးစွန့်ပစ်ပစ္စည်းပမာဏ မှတ်တမ်း အန္တရာယ်ရှိသော စွန့်ပစ်ပစ္စည်းနှင့် အန္တရာယ်မရှိသောစွန့်ပစ်ပစ္စည်းအားခွဲခြားခြင်း သိုလှောင်ဧရိယာ အားစစ် ဆေးခြင်း 	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	အပတ်စဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
အလုပ်အကိုင်ရရှိမှု	အလုပ်အကိုင်ရရှိသူ ဦးရေ	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
အခြားလူမှုစီးပွားအတွက် ထည့်သွင်းစဉ်းစားချက်များ	<ul style="list-style-type: none"> လူမှုစီးပွားတာဝန်ယူမှု အစီအစဉ် ဒေသခံများအလုပ်အကိုင်ဖန်တီးပေးမှု 	စောင့်ကြည့်လေ့လာရေးအဖွဲ့	လစဉ်	ဆောက်လုပ်ရေးကန်ထရိုက်တာ
လုပ်ငန်းခွင်ကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	ဘေးအန္တရာယ်ကင်းရှင်းရေး အစီအစဉ်၊ မတော်တဆမှုမှတ်တမ်း၊ အလုပ်အကိုင် မှတ်တမ်း	အလုပ်သမားများ	လစဉ်	ဘေးအန္တရာယ်ကင်းရှင်းရေး အရာရှိ
အများပြည်သူကျန်းမာရေးနှင့် ဘေးအန္တရာယ်ကင်းရှင်းရေး	မတော်တဆမှုမှတ်တမ်းနှင့် အလုပ်အကိုင်မှတ်တမ်း	ဒေသခံတွင်း နေထိုင်သူ များ	အခြေအနေများပေါ် မူတည်၍	ဘေးအန္တရာယ်ကင်းရှင်းရေး အရာရှိ
အရေးပေါ်အခြေအနေ	မတော်တဆမှု မှတ်တမ်း၊ ဘေးအန္တရာယ်ကင်းရှင်းရေးသင်တန်းပေးခြင်း	ဆောက်လုပ်ရေးလုပ်ငန်းခွင်၊ ပိတ်သိမ်းရေးလုပ်ငန်းခွင်	လစဉ်	ဘေးအန္တရာယ်ကင်းရှင်းရေး အရာရှိ
လုပ်ငန်းလည်ပတ်သည့်ကာလ				
လေအရည်အသွေး	Particulate matter, VOC, CO, CO2, NO2, SO2	ပတ်ဝန်းကျင်လေထု	နှစ်စဉ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်

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	Particulate matters, VOC	လုပ်ငန်းစဉ်ဧရိယာ -ဥပမာ ကားဆေး မှုတ်ခန်း၊စတိုး၊ ကားတပ်ဆင် သောနေရာ	နှစ်စဉ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
	မီးစက်မီးခိုးခေါင်းတိုင်မှ ထွက် သော အငွေ့များ (CO, CO2, NO2, SO2)	မီးစက်ခေါင်းတိုင်	နှစ်စဉ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
စွန့်ပစ်ရေအရည် အရည်အသွေး	စွန့်ပစ်ရေ (Temp., pH, oil & grease, suspended solid, BOD, COD ,etc)	စက်ရုံရှေ့မြောင်း ရေ နှင့် စက်ရုံ တွင်း မြောင်း အထွက်	တစ်နှစ် ၂ ကြိမ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
	မြေအောက်ရေ (pH, Arsenic, Cl)	ရေစုကန်	တစ်နှစ် ၂ ကြိမ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
စွန့်ပစ်ပစ္စည်းစွန့်ပစ်မှု	<ul style="list-style-type: none"> ပလပ်စတစ်၊ စည်ပုံး၊ စက္ကူပုံးနှင့် စွန့်ပစ်ရေ သန့်စင်ရုံမှ ထွက် သောရွံ့နှံ့များစွန့်ပစ်မှု ပမာဏ အား မှတ်တမ်း တင် ခြင်း အမှိုက်သိမ်း စနစ်အား စစ်ဆေးခြင်း သိုလှောင်မှုအား စစ် ဆေးခြင်း စွန့်ပစ်ပစ္စည်းများအားခွဲ ခြား ခြင်း (အန္တရာယ်ရှိ သော စွန့်ပစ် ပစ္စည်း နှင့် အန္တရာယ်မရှိ သောစွန့်ပစ် ပစ္စည်း) 	စက်ရုံပတ်ဝန်း ကျင်	လစဉ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
မြေဆီလွှာညစ်ညမ်းမှု	ဆီများယိုစိမ့်ခြင်း၊ ဖျော်ရည်၊ သုတ်ဆေး၊ စွန့်ပစ်ရေ ဧရိယာမှ ဖိတ်စင်ခြင်း	စက်ရုံပတ်ဝန်း ကျင်၊ဓာတု ပစ္စည်း သိုလှောင်ဧရိယာ၊ လောင်စာ ဆီ သိုလှောင် ဧရိယာ၊ ဘွိုင် လာခန်း၊ ဂျင်နရေတာခန်း	နှစ်စဉ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
ဆူညံသံနှင့်တုန်ခါမှု	ဆူညံသံနှင့်တုန်ခါမှု အဆင့်	စက်ရုံဝန်းကျင်၊ လုပ်ငန်းခွင်	နှစ်စဉ် နှင့် ညွှန်ကြား ချက်အ တိုင်း	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
အနံ့အသက်	လေဝင်လေထွက် ကောင်းမွန်မှုအား စစ်ဆေးခြင်း	အလုပ်ရုံ နှင့် သို လှောင်ရုံ များ	လစဉ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်
အန္တရာယ်ရှိပစ္စည်းများ နှင့် ဓာတုပစ္စည်းများ	<ul style="list-style-type: none"> ကားမှုန်ဆေး နှင့် fiber ကော် ပစ္စည်းများ စသည်တို့ကို ကိုင် တွယ်ခြင်း၊ အသုံးပြု ခြင်းများကို စစ်ဆေး 	အလုပ်ရုံ နှင့် သိုလှောင်ရုံများ	လစဉ်	စက်ရုံမန်နေဂျာနှင့် တာဝန်ခံပုဂ္ဂိုလ်

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	<ul style="list-style-type: none"> ခြင်း သိုလှောင်ဧရိယာများ အား စစ်ဆေးခြင်း စွန့်ပစ်ခြင်း နည်းစနစ်များအား စစ်ဆေးခြင်း 			
လုပ်ငန်းခွင်ကျန်းမာရေးနှင့်ဘေးအန္တရာယ် ကင်းရှင်းရေး	<ul style="list-style-type: none"> လုပ်ငန်းခွင်ဘေးအန္တရာယ်ကင်းရှင်းရေးနှင့်မတော်တဆမှုများမှတ်တမ်း ဝန်ထမ်းတစ်ဦးချင်းစီ၏ ဆေးမှတ်တမ်း ဘေးအန္တရာယ်ကင်းရှင်းရေးသင်တန်းများပေးခြင်း သင့်တော်သော် PPE များထောက်ပံ့ပေးခြင်း PPE များအားပုံမှန်စစ်ဆေးခြင်း 	စက်ရုံပတ်ဝန်းကျင်	တစ်နှစ် ၂ ကြိမ်	ဘေးအန္တရာယ်ကင်းရှင်းရေး အရာရှိ
အခြားလူမှုစီးပွားအတွက် ထည့်သွင်းစဉ်းစားချက်များ	<ul style="list-style-type: none"> လူမှုစီးပွားတာဝန်ယူမှုအစီအစဉ် ဒေသခံများအလုပ်အကိုင်ဖန်တီးပေးမှု 	စောင့်ကြည့်လေ့လာရေး အဖွဲ့	နှစ်စဉ်	လူမှုဆက်ဆံရေး မန်နေဂျာ
အရေးပေါ်အခြေအနေ	<ul style="list-style-type: none"> အရေးပေါ်မတော်တဆဖြစ်ပွားမှုများနှင့် ၎င်းတို့အား ဖြေရှင်းမှုအစီအစဉ် မှတ်တမ်း မီးသတ်ပစ္စည်းများစစ်ဆေးခြင်း မီးသတ်သင်တန်းများပေးခြင်း 	စက်ရုံပတ်ဝန်းကျင်	နှစ်စဉ်	ဘေးအန္တရာယ်ကင်းရှင်းရေး အရာရှိ
နယ်စပ်ဖြတ်ကျော်ပတ်ဝန်းကျင်ဆိုင်ရာကိစ္စများ	N/A	-	-	-

အများပြည်သူနှင့်တွေ့ဆုံဆွေးနွေးမှု

ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း အစီရင်ခံစာအတွက် အများပြည်သူနှင့်တွေ့ဆုံဆွေးနွေးခြင်း (PCM) နှင့် ထုတ်ဖော်ကြေညာခြင်း (PD) လုပ်ငန်းစဉ်များကို စီမံကိန်းနှင့်ပတ်သက်၍ အများပြည်သူထံမှ သဘောထား အမြင်များ၊ အကြံပြုချက်များကို ရရှိစေရန်နှင့်လုပ်ငန်း၏ ကနဦးပတ်ဝန်းကျင်ဆန်းစစ်ခြင်း လေ့လာမှုအတွက် သတင်းအချက်အလက်များ ဖြန့်ဝေပေးရန်အတွက် ပြုလုပ်ခြင်းဖြစ်သည်။

အများပြည်သူနှင့်တွေ့ဆုံဆွေးနွေးပွဲကျင်းပခြင်း

တွေ့ဆုံဆွေးနွေးပွဲတွင် နည်းလမ်း (၂) ရပ်ဖြင့်အကြံပြုနိုင်ရန်စီစဉ်ပေးခဲ့ပါသည်။ ပထမ တစ်မျိုးမှာ တက်ရောက်သူများမှ ပွဲတွင်ပါဝင်ဆွေးနွေးခြင်း နှင့် နောက်တစ်နည်းမှာ အကြံပြုစာများ ဖြန့်ဝေပေးခြင်းဖြစ်ပါသည်။

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ဆွေးနွေးပွဲတက်ရောက်သူများမှ ရှင်းလင်းတင်ပြမှုပီးသောအခါ အကြံများပေးခြင်းသိလိုသည်များ မေးမြန်းခြင်းများပြုလုပ်ခဲ့ပါသည်။ ဆွေးနွေးပွဲတွင်အကြံပြုစာများမှအကြံများလည်းရရှိပါသည်။

ဆွေးနွေးပွဲကို ဇေယျာကုမ္ပဏီလီမိတက်၏ စီမံခန့်ခွဲမှုရုံးတွင် ၂၀၁၈ ဇွန်လ ၁၈ ရက်နေ့ တွင် ပြုလုပ်ခဲ့ပါသည်။ ဆွေးနွေးပွဲသို့ ဒေသခံ (၂၂) ဦးတက်ရောက်ခဲ့ပြီး အကြံပြုစာ (၂၂) စောင်ရရှိခဲ့ပါသည်။

ဆွေးနွေးပွဲမှအဓိကဆွေးနွေးချက်များ နှင့် ပြန်လည်ဖြေရှင်းချက်များမှာအောက်ပါအတိုင်းဖြစ် ပါသည်။

အကြံပြုချက်ဆန္ဒသဘောထားများ	ဆောင်ရွက်ပေးမည့်အစီအစဉ်
<ul style="list-style-type: none"> ယာဉ်များတပ်ဆင်ထုတ်လုပ်ခြင်းနှင့် ထိန်းသိမ်းရေးလုပ်ငန်းဖြစ်သဖြင့် တပ်ဆင်မှုများအတွက် ဖြစ်ပေါ်လာသည့် ဆူညံသံများအား အတတ်နိုင်ဆုံးထိန်းချုပ်ပေးရန်လိုအပ်ပါသည်။ 	<ul style="list-style-type: none"> ဆူညံသံလျော့နည်းရန်အတွက် စက်ပစ္စည်းများအား ပြင်ဆင်ခြင်း၊ ဆူညံသံထွက်သည့် စက်ပစ္စည်းများကို ကာရံခြင်းများ ပြုလုပ်ပါမည်။ ၎င်းနေရာတွင် လုပ်ကိုင်နေသော ဝန်ထမ်းများအတွက် အကာအကွယ်ပစ္စည်းများ စီစဉ်ထားရှိပေးပါမည်။
<ul style="list-style-type: none"> လုပ်ငန်းခွင်တွင် ရေဆိုးစွန့်ပစ်မှုကိစ္စများ အတွက် စနစ်တကျပြုလုပ်ရန် လိုအပ်ပါသည်။ 	<ul style="list-style-type: none"> ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အရ နိုင်ငံတော်မှ သတ်မှတ်ချက်များနှင့်အညီ ဆောင်ရွက်ပါမည်။
<ul style="list-style-type: none"> ရေမြောင်းစနစ်၊ ရေစီးရေလာစနစ်၊ စက်ရုံမှ ထွက်သော စွန့်ပစ်ရေများကို စနစ်တကျ ကောင်းမွန်အောင် လုပ်ဆောင်သင့်ပါသည်။ 	<ul style="list-style-type: none"> သက်ဆိုင်ရာစက်မှုဇုန်စီမံခန့်ခွဲရေးကော်မတီသို့ တင်ပြ၍ လုပ်ဆောင်ပါမည်။
<ul style="list-style-type: none"> အလုပ်သမားများ၏ လုပ်ငန်းခွင်အန္တရာယ် ကင်းရှင်းရေးအတွက် (PPE)ထောက်ပံ့ပေးရန်၊ ပညာရေး၊ ကျန်းမာရေး၊ လုံခြုံမှု စောင့်ရှောက်ပေးရန် 	<ul style="list-style-type: none"> လုပ်သားများ လုပ်ငန်းခွင် ဘေးအန္တရာယ် ကင်းရှင်းရေးအတွက် ဆောင်ရွက်ပေးပါမည်။
<ul style="list-style-type: none"> သဘာဝပတ်ဝန်းကျင် မပျက်စီးစေရန်၊ လေထုညစ်ညမ်းမှုမဖြစ်စေရန်၊ ဆူညံသံထွက်စေရန် ဆောင်ရွက်ပေးပါ 	<ul style="list-style-type: none"> ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အရ နိုင်ငံတော်မှ ချမှတ်ထားသော လမ်းညွှန်ချက်နှင့်အညီဆောင်ရွက်ပါမည်။
<ul style="list-style-type: none"> အလုပ်သမားရရှိနိုင်မည့် အကျိုးခံစားခွင့်၊ ကျန်းမာရေးနှင့်ညီညွတ်သောနေရာထိုင်ခင်းများ စီစဉ်ပေးခြင်း၊ အလုပ်သမားများ စိတ်ရော ကိုယ်ပါ ကျန်းမာခြင်း အတွက် အစီအစဉ်များ ဆောင်ရွက်ပေးရန် 	<ul style="list-style-type: none"> အလုပ်သမားဝန်ကြီးဌာနမှ ညွှန်ကြားထားသည့် အလုပ်ရုံများနှင့်ပတ်သက်သည့် ဝန်ထမ်းခံစားခွင့် နှင့်အညီ ဆောင်ရွက်ပေးပါမည်။
<ul style="list-style-type: none"> Green Myanmar မှ တာဝန်ရှိသူများစက်ရုံသို့ ၂ လ၊ ၃ လ တစ်ကြိမ် လာရောက်စစ်ဆေး သင့်ပါကြောင်း 	<ul style="list-style-type: none"> ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပါ စောင့်ကြည့်အဖွဲ့များမှ စောင့်ကြည့်တိုင်းတာ စစ်ဆေးခြင်းနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အတိုင်း ဆောင်ရွက်ပါမည်။
<ul style="list-style-type: none"> ကာများဆေးမှုတ်လျှင် အမှုန်များ လွင့်နိုင်သောကြောင့် လေသန့်ရှင်းစေရန် ပြုလုပ်ပေးပါ 	<ul style="list-style-type: none"> ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပါ စောင့်ကြည့်အဖွဲ့များမှ စောင့်ကြည့်တိုင်းတာ

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<ul style="list-style-type: none"> • ကာများဆေးမှုတ်လျှင် အမှုန်များ လွင့်နိုင်သောကြောင့် လေသန့်ရှင်းစေရန် ပြုလုပ်ပေးပါ 	<ul style="list-style-type: none"> • ကားဆေးမှုတ်ရာတွင် အထူးသီးသန့် အလုံခန်းများတွင် စနစ်တကျ စီစဉ်ထားရှိပြီး အမှုန်များ မလွင့်စေရန် အကာအရံများနှင့်အမှုန်စုပ်စနစ်များ စီစဉ်ဆောင်ရွက်ပါမည်။ ဝန်ထမ်းများ အတွက် အကာအကွယ်ပစ္စည်းများ ဖြည့်ဆည်းပေးပါမည်။
<ul style="list-style-type: none"> • စက်ရုံအနီးပတ်ဝန်းကျင်ရှိ ရေမြောင်းများ ရေစီးရေလာကောင်းအောင် ပြုလုပ်ပေးပါ 	<ul style="list-style-type: none"> • သက်ဆိုင်ရာစက်မှုဖုန်းစီမံခန့်ခွဲရေးကော်မတီသို့ သတင်းပို့၍ ရေစီးရေလာကောင်းစေရန် ပြုလုပ်ပေးပါမည်။

လူမှုစီးပွားတာဝန်ယူမှုအစီအစဉ်

SC Auto (Myanmar) ကုမ္ပဏီလီမိတက်၏ လူမှုစီးပွားတာဝန်သိမှုရုံပုံငွေကို နှစ်စဉ် ကုမ္ပဏီအမြတ် ၁ % ကို အသုံးပြုသွားမည်ဖြစ်ပါသည်။

နိဂုံး

ယခုတည်ဆောက်မည့် စက်ရုံကြောင့် ဒေသခံပြည်သူများ အလုပ်အကိုင်အခွင့်အရေးများ ပေါ်ထွန်းလာပြီး လူမှုစီးပွားဘဝတိုးမြှင့်လာမည်ဟု ခန့်မှန်းသုံးသပ်ရပါသည်။ စက်ရုံကြောင့် လူများ အကျိုးခံစားခွင့်ရမည်ဖြစ်ပါသည်။အစိုးရ၏ အခွန်ဝင်ငွေများတိုးပွားလာပါမည်။ယခုအကောင်အထည် ဖော်မည့်နေရာသည် သစ်ပင်ပန်းမာန် နှင့် ရှားပါးတိရစ္ဆာန်မျိုးများကျက်စားသည့်နေရာမဟုတ်ပါ။ ထို့ကြောင့် စီမံကိန်းနေရာသည် သဘာဝပတ်ဝန်းကျင်ကို ထိခိုက်မှုမရှိသည့် နေရာဖြစ်ပါသည်။ ထို့ပြင် ၎င်းစက်ရုံတွင်ထပ်မံကာလေထု၊ မြေထုအားထိန်းသိမ်းကာကွယ်ခြင်းများအတွက် ထိန်းချုပ်ကာကွယ် သောစနစ်များ တပ်ဆင်ထားသည်မှာ ပြည့်စုံလုံ လောက်မှုရှိ ပါသည်။

ယခုအစီရင်ခံစာဖြစ်သည့် ကနဦးပတ်ဝန်းကျင်လေ့လာဆန်းစစ်ခြင်း တွင်ပါဝင်သည့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်များအတိုင်း ကုစားမှုများကို တည်ဆောက်ရေး၊ လည်ပတ်ရေး နှင့် ပတ်သိမ်း ခြင်းကာလများတွင် စံနစ်တကျ ဆောင်ရွက်ခြင်းဖြင့် ကြီးမားသော ပတ်ဝန်းကျင် ပျက်ဆီးမှုများ မဖြစ်နိုင်ပါ။ စီမံကိန်း ကြောင့် လူမှုစီးပွား ဖွံ့ဖြိုးမှုများကို ရရှိမည်ဖြစ်ပါသည်။ ယခုကနဦး ပတ်ဝန်း ကျင်လေ့လာဆန်းစစ်ခြင်းအစီရင်ခံစာတွင် ပါရှိသည့်အတိုင်း ဆိုးကျိုးများ ကို ဖော်ထုတ်ပြီး ကုစား မည့်နည်းလမ်း များ ကိုပါ ဆောင်ရွက်ခြင်းဖြင့် စီမံကိန်းကြောင့် ထိခိုက်မှု အနည်းဆုံး ဖြစ်မည်ကို လေ့လာတွေ့ ရှိရပါ သည်။

လေ့လာတွေ့ရှိချက် နှင့် အကဲဖြတ်ချက်များအရ ဆိုးကျိုးဖြစ်ပေါ်စေမည့် အချက်များကို ကုစားဆောင်ရွက်ပါက ယခုစီမံကိန်းသည် အကောင်အထည်ဖော်ရန် သင့်တော်ကြောင်းတွေ့ ရှိရပါ သည်။

1.0 INTRODUCTION

1.1 Overview

Operation of industrial, service and certain commercial activities have impacts on environment. To consider the protection of environment and the health & safety of the community, the proper design and construction of industrial premise is a vital element of an effective environmental protection program for new / proposed industrial premises as well as on any planned expansion or modification of existing premises.

The preparation of an IEE Report is one of the requirements in the submission of application for an Environmental Clearance to Environment Conservation Department.

This document is the Initial Environmental Examination for the Manufacturing, Assembling and Sales of Vehicles and Related Business Activities project of SC Auto (Myanmar) Co., Ltd.

The proposed project mainly focuses on design and manufacturing of Buses/Coaches and parts for import substitution and export. SC Auto (Myanmar) design also includes assembly, repairs, services alter of vehicles inclusive of buses, coaches and support spare parts services and accessories and then it has purpose to produce vehicles as lorries, vans, cars and trucks.

Manufacturing facilities include vehicle assembly plants, which employ 355 people and produce 100 unit for local sales and 100 unit for export sales at first year.

1.2 Rationale of the IEE

The Project requires an initial environmental examination (IEE) to determine the nature and extent of impact from implementation of the Project. An IEE is also required as per the provision of the Environment Protection Act and Regulations of Government of Myanmar. In this regard, an IEE for the Manufacturing, Assembling and Sales of Vehicles and Related Business Activities project was prepared.

1.3 Objectives of the IEE

The main objective of the IEE is to identify impacts from the project implementation on physical, biological, socio-economic, and cultural environment of the project area, and to propose measures to avoid, minimize, mitigate, and compensate such impacts. The specific objectives of the proposed IEE are to:

- Establish baseline data of the proposed work area,
- Identify major issues that may arise as a result of the proposed works on bio- physical, socio-economic and cultural environment of the project area,
- Recommend practical and site specific environmental mitigation and enhancement measures, and prepare and implement environmental management and monitoring plan, and
- Confirm that IEE is sufficient for the proposed work.

1.4 Structure of Report

This report reviews information on existing environmental attributes of the areas around the Study Area. Geological, hydrological and ecological features, air quality, noise, water quality, soils, social and economic aspects and cultural resources are included. The report predicts the probable impacts on the environment due to the proposed project. This IEE also proposes various environmental management measures. Details of all background environmental quality, environmental impact/pollutant generating activities, pollution sources, pollution control equipment, predicted environmental quality and related aspects have been provided in this report.

- Introduction
- Description of the Project
- Description of Environmental and Social Conditions
- Assessment of Environmental Impacts and Mitigation Measures
- Institutional Requirements Environmental Management Plan
- Public Consultation
- Findings, Recommendations and Conclusions

1.5 IEE Working Group

The planning and conduct of the IEE report for Manufacturing, Assembling and Sales of Vehicles and Related Business Activities Project was carried out by a team of Green Myanmar Environmental Services (GMES) Co., Ltd. - **Transitional Consultant Registration Number of Organization No.0006**. And then, Consultant personal qualification, Certificate of Organization and Personal are as shown in Appendix (1) and (2) respectively.

Table 1.1 GMES IEE Team

No.	Title of Post	Term of Reference	Nominee and Organization & Transitional Consultant Registration Number
1	Team Leader	<ul style="list-style-type: none"> • Overall management of IEE/EMP operation • Work plan • Technical meeting & Workshop • Document Reviewing and Process Flow Studying • Lead and Facilitation of Public consultation • Data compilation & analysis • Coordination with stakeholders 	Engr-U Kyaw Soe Win Professional Engineer Managing Director Green Myanmar Environmental Services Co., Ltd. No.0019

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2	Consultant (Air Quality Management)	<ul style="list-style-type: none"> • Give Advice on collecting field data for air quality • Assist on air quality control system • Give Advice on air pollution evaluate and mitigation • Give advice for data processing, computing, projection, modeling and analysis • Give advice in report preparation 	Engr-U Sein Thaug Oo Professional Engineer Chairman Green Myanmar Environmental Services Co., Ltd. No.0023
3	Environmental Consultant	<ul style="list-style-type: none"> • Advise on the design of EMP • Develop term of reference for duty and responsibility among EMP team • Advise on the environmental baseline • Advise on the field survey • Facilitate technical analysis • Streamline the Environmental Management Plan 	Engr. Daw Khin Swe Aye Former Lecturer. Department of Chemical Engineering, YTU No.0021
4	Consultant on Environmental Quality Management	<ul style="list-style-type: none"> • Assist in preparation of guideline for environmental sampling of air and water quality • Monitor the sample collection • Register and inspect the sample collected • Assist in report preparation for environmental baseline 	Engr. Daw Khin Shwe Htay Former Lecturer, YTU Environmental Engineer No.0022
5	Consultant for Laboratory Analysis	<ul style="list-style-type: none"> • Advise on data processing and laboratory testing • Prepare instruction for laboratory testing • Check the result of environmental laboratory testing • Compare the laboratory result and verification 	U Myo Myint Former Factory Manager of Alcohol Distillery Beelin, Ministry of Industry (1) No.0026
6	Specialist on waste management	<ul style="list-style-type: none"> • Collecting field data for industrial and municipal waste 	Engr. Daw Tin May Soe, Former Professor, YTU Experience in environmental

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		<ul style="list-style-type: none"> • Assist in Laboratory Testing • Data processing, computing, projection, modeling and analysis • Assist in report preparation 	toxicology and pollution control No.0028
7	Specialist on Water quality	<ul style="list-style-type: none"> • Collecting surface and ground water quality samples • Assist in Laboratory Testing • Data processing, computing, projection, modeling and analysis • Assist in report preparation 	Engr. Daw Aye Aye Kyaw Former Professor, YTU Experience in Water Management Professional Engineer
8	Social Operation and Field Coordinator	<ul style="list-style-type: none"> • Develop operational checklist for Social Survey • Facilitate technical meeting and record keeping • Assist in data mining and secondary data collection • Coordinate with local authority and communities for village level meeting 	U Khin Aung GMES Co., Ltd.
9	Environmental Consultant	<ul style="list-style-type: none"> • Advise on the design of EMP • Develop terms of reference for duty and responsibility among EMP team • Advise on the environmental baseline • Advise on the field survey • Advise on data processing and laboratory testing • Facilitate technical analysis • Streamline the EMP report and Environmental Management Plan 	Engr. U Maung Maung Aye Construction Coordinator Badamayar Topside Construction, Total E&P Myanmar)
10	Quality Engineer	<ul style="list-style-type: none"> • Develop operational checklist for Environmental Study • In charge for preliminary field visit • Establish field operational office for EMP field survey • Supervise field survey • Check the report quality and formatting 	U Kyi Han Bo BE – Aerospace Fuel and Propellant Engineer (Myanmar Aerospace Engineering University.)
11	Technician	<ul style="list-style-type: none"> • Environmental and Social Survey • Data analysis 	U Myo Thet Naung BE – Aerospace Fuel and Propellant Engineer.

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		<ul style="list-style-type: none">• Report preparing and formatting	(Myanmar Aerospace Engineering University.) U Aung Kyaw Than BE. Chemical Engineer U Myo Min Htun B.Sc (physic)
12	Water Sampling and Laboratory Testing	<ul style="list-style-type: none">• Preparation for water & wastewater sampling• Preparation for laboratory testing• Laboratory testing• Reporting for laboratory result	Daw Cheey Twin, B.E Chemical Laboratory Manger Daw Wint Phyu Htway, B.E Chemical Laboratory Supervisor Daw Aye Thuzar Hein, B.E Chemical Laboratory Technician Green Myanmar Environmental Services Co., Ltd.

2.0 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

2.1 Background

The emerging environmental scenario calls for attention on conservation and judicious use of natural resources. There is a need to integrate the environmental consequences of the development activities and for planning suitable measures in order to ensure sustainable development. The environmental considerations in any developmental process have become necessary for achieving sustainable development. To achieve such goals, the basic principles to be adopted are:

- To enhance the quality of environment in and around the project area by adopting proper measures for conservation of natural resources;
- Prevention of adverse environmental and social impact to the maximum possible extent;
- To mitigate the possible adverse environmental and socio-economic impact on the project-affected areas.

Policy, legal and institutional framework of the proposed project relating to the environmental, social, health and economic conditions are discussed in this section.

2.2 Policy and Legal Framework

This section highlights the relevant environmental policies and legal established by The Government of The Republic of The Union of Myanmar for purposes of environmental protection towards the process of sustainable development. Myanmar Government issued an Environmental Policy in 1994, Myanmar Agenda 21 in 1997, National Sustainable Development Strategy in 2009, The Environmental Conservation Law in 2012, Environmental Conservation Rules in 2014, Environmental Impact Assessment Procedure and National Environmental Quality (Emission) Guidelines in 2015.

To establish sound environment policies, utilization of water, land, forests, mineral, marine resources and other natural resources in order to conserve the environment and prevent its degradation, Ministry of Natural Resources and Environmental Conservation (MONREC) of the Government of The Republic of The Union of Myanmar has established National Environmental Policy of Myanmar (2019) which broadly aim at:

- To establish national environmental policy principles for guiding environmental protection and sustainable development and for mainstreaming environmental considerations into all policies, laws, regulations, plans, strategies, programmes and projects in Myanmar.

2.3 Legal Compliance and Environmental Commitments

2.3.1 Legal Compliance

SC Auto (Myanmar) Co., Ltd. endorse for this IEE Report as follow:

- The IEE is the accurate and complete,
- The IEE has been prepared in strict compliance with applicable laws including EIA Procedure (2015), and

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- The Project will at all times comply fully with the commitments, mitigation measures, and plans in the IEE Report.

Legal and approval requirements applicable to the Project related to the environmental and social concerns will be identified by SC Auto (Myanmar) Co., Ltd.

The lifespan of the factory will be 50 years. So, SC Auto (Myanmar) Co., Ltd. will prepare the environmental management plan for decommissioning phase before the decommissioning and comply and implement according to that environmental management plan.

SC Auto (Myanmar) Co., Ltd. will comply the following Myanmar Acts, Laws, Rules, Regulations, Procedures and Guidelines relevant to the project described in Table 2.1 and Table 2.2.

Table 2.1 Myanmar Acts and Rules relevant to the Project

Laws and Regulations	Year	Purpose/ Description
Administrative Sector		
The Penal Code of Offences Affecting the Public Health, Safety, Convenience, Decency and Morals	1861	Provisions related to prohibitions against contaminating public springs or reservoirs and “making atmosphere noxious to health”
The Towns Act	1907	Provisions on offences which affect the human environment
The Police Act	1945	Provisions on offences which affect the human environment
The Emergency Provisions Act	1950	Prohibitions on the destruction of embankments; causing extreme suffering to the public or loss of life; endangering the security or well-being of public reservoirs, water supply works, water pipe connections, and public dams; and poisoning drinking water
The Ward or Village Tracts Administration Law (Amendment)	2012 (2016)	Provisions on offences which affect the human environment
Culture and Heritage Sector		
Archive Properties (Amendment) Act	1962	To implement the protection and preservation policy with respect to perpetuation of cultural heritage that has existed for many years Provisions to protect ancient sites and regions and cultural heritage areas from any adverse impacts due to industrialization, tourism and urbanization
The Protection and Preservation of Cultural Heritage Regions Law (Amendment)	1998 (2009)	To protect and preserve the cultural heritage and New project in such sensitive areas is required to get prior approval from the Culture
The Protection and Preservation of Ancient	2015	

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Laws and Regulations	Year	Purpose/ Description
Monuments Law		
<i>City Development Sector</i>		
The Water Power Act	1927	Prohibitions on the pollution of public water
The Underground Water Act	1930	This Act provides the requirement for systematic use of ground water towards sustainable purpose
The City of Yangon Development Law (Amendment)	1990 (1995, 1996)	Provisions relating to environmental sanitation, pollution of air and water, and public health
<i>Environmental Conservation Sector</i>		
Environment Conservation Law	2012	To implement National Environmental Policy; to set up basic principles and guidelines for sustainable development and systematic integration of environmental conservation; to conserve the clean environment, natural and cultural heritage for present and future generation, to prevent degradation of natural resources and for sustainable use, to build up public understanding on environmental awareness
Environmental Conservation Rules	2014	The Rules reinforce the obligation for project developers to submit an EIA or an IEE. It aims to establish and adopt the necessary programs for the conservation and enhancement of environment, protection, control and reduction of pollution in environment, and conservation
Environmental Impact Assessment Procedures	2015	To establish types of project that needed to submit an EIA or an IEE or an EMP. And also to establish the environmental assessment process and to issue the environmental compliance certificate
National Environmental Quality (Emission) Guidelines	2015	To provide the basis for regulation and control of noise and vibration, air emissions, and liquid discharges from various sources in order to prevent pollution for purposes of protection of human and ecosystem health
<i>Finance and Revenue Sector</i>		
The Myanmar Insurance Law	1993	Requires any business which may pollute the environment to effect compulsory general liability insurance

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Laws and Regulations	Year	Purpose/ Description
<i>Forestry Sector</i>		
The Forest Law The Forest Rules	1992 1995	Provisions to conserve water, soil, biological diversity and the environment; sustain forest produce yields; protect forest cover; establish forest and village firewood plantations; sustainably extract and transport forest products
Protection of Wild Life and Wild Plants and Conservation of Natural Areas Law	1994	To protect wildlife, wild plants and conserve natural areas, to contribute towards works of natural scientific research, and to establish zoological gardens and botanical gardens. The Law highlights habits maintenance and restoration, protection of endangered and rare species of both fauna and flora, establishment of new parks and protected areas, and buffer zone management
<i>Health Sector</i>		
The Public Health Law	1972	For promoting and safeguarding public health and to take necessary measures in respect of environmental health
Prevention and Control of Communicable Diseases Law (Amendment)	1995 (2011)	The Law highlights the functions and responsibilities of health personnel and citizens in relation to prevention and control of communicable diseases. It also describes measures to be taken in relation to environmental sanitation, reporting and control of outbreaks of epidemics and penalties for those failing to comply. The law also authorizes the Ministry of Health to issue rules and procedures when necessary with approval of the government
The Control of Smoking and Consumption of Tobacco Product Law	2006	To protect from the danger which affects public health adversely by creating tobacco smoke-free environment; To uplift the health, economy and social standard of the public through control of smoking and consumption of tobacco product
<i>Industrial Sector</i>		
The Electricity Law The Electricity Rules	1984 2014 1985	The law elaborates the responsibilities of the Inspectorate under the Ministry of Industry for ensuring safety in electricity in generation, transmission and distribution. It includes the testing of all electrical goods produced domestically or imported. If safety

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Laws and Regulations	Year	Purpose/ Description
		is at risk the Inspector has the authority to disconnect supply to any customer. The Inspector also is responsible for determining cause of any injury or death caused by electricity, issuing electrician registration certificates, and establishing standards
The Petroleum Act The Petroleum Rules	1934 1937	Provisions to regulate production, storage, and transport of oil so as not to cause pollution or the outbreak of fires
The Factories Act (Amendment)	1951 (2016)	Provisions for the proper disposal of waste and effluents in factories; treatment of waste water; regulations for health and cleanliness in factories, and the prevention of hazards
The Private Industrial Enterprise Law	1990	Provisions to avoid environmental pollution.
The Prevention of Hazard from Chemical and Related Substances Law	2013	To protect from being damaged the natural environment resources and being hazardous any living beings by chemical and related substances To perform the sustainable development for the occupational safety, health and environmental conservation
<i>National Planning and Economic Development</i>		
Foreign Investment Law (Amendment) Foreign Investment Rules	2012 (2015) 2013	Provisions to restrict or prohibit investment activities which affect public health, the environment and ecosystems, which produce toxic waste or which engage with toxic chemicals; duties of investors to conduct business in such a way as to avoid environmental damage, air and water pollution, in accordance with existing laws
Myanmar Citizen Investment Law (Amendment)	2013 (2015)	Broad provisions supporting environmental conservation and protection and adherence to existing laws related to environmental matters; restrictions on businesses which cause damage to the natural environment and ecosystems.
Myanmar Investment Law (MIL)	October 2016	The new investment law has been effective since April 1, 2017; the MIL combines the Foreign Investment Law (FIL) 2012 and the Citizens Investment Law 2013. The new investment law was created to attract both foreign and local investors by simplifying the application process and offering tax breaks, incentives, rights and protections for businesses.
<i>Transportation Sector</i>		

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Laws and Regulations	Year	Purpose/ Description
The Canal Act	1905	Prohibitions against the destruction of, damage to, or pollution of the flow of water in any canal or drainage work
The Motor Vehicle Law	1964 2015	Provisions to control vehicle engine emissions and the leakage of fuel or oil
The Conservation of Water Resources and Rivers Law The Conservation of Water Resources and Improvement of River Systems Rule	2006 2013	The Conservation of Water Resources and Rivers Law (2006) prohibits carrying out any actions with the aim to ruin water resources, including rivers, and causing intentional water wastage, and pollution of water resources
Workforce Sector		
The Workmen’s Compensation Act (Amendment)	1923 (2005)	To make payments out-of-pocket to employees who become injured or who die in any accidents arising during and in consequence of their employment. Such compensation also must be made for diseases which arise as a direct consequence of employment, such as carpal tunnel syndrome
The Leave and Public Holidays Act (Amendment)	1951 (2014)	To allow worker for leave and holiday allowances, religious or social activities with earn allowance, and benefits for Health allowances Concerned workers: Daily wage workers/ temporary workers/permanent workers
Constitution of the Union of Myanmar	2008	Section 24 – The Union shall enact necessary laws to protect the rights of workers Section 349 (b) – Citizens shall enjoy equal opportunity in carrying out occupation Section 359 -The Union prohibits forced labor except hard labor as a punishment for crime duly convicted and duties assigned by the Union in accord with the law in the interest of the public.
The Labor Organization Law	2011	The objectives of this law are: To protect the rights of the workers in accordance with section 24 of the Constitution To promote good relations between the employer and the worker To enable to workers to form and carry out the labor organizations systematically and independently
The Development of Employment and Skill Law	2013	The main objectives of this law are: To facilitate employment which is appropriate to the age and ability of the job seeker

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Laws and Regulations	Year	Purpose/ Description
		To help workers obtain employment and to provide stability of employment and skills development for employees To help employers obtain appropriate employees
The Minimum Wage Law The Minimum Wage Rules	2013 2013	To fulfill the basic needs of the workers and their families who are working in commercial establishments, production and servicing establishments, agriculture and livestock. And, to develop the work performance and competitiveness of workers.
The Payment of Wage Law	2016	Receipt of wages is made regularly. Unlawful deductions are not to be made.
The Settlement of Labor Dispute Law (Amendment)	2012 (2014)	The objectives of this law are: For safeguarding the rights of workers. Promoting a good relationship between employer and workers and creating a peaceful workplace Obtaining the rights fairly, rightfully and quickly by settling disputes between employer and worker justly
The Social Security Law The Social Security Rules	2014 2014	The objective of this law is to get benefit for sickness, maternity, death, employment injury, invalidity benefit, superannuation benefit by: giving medical treatment, providing cash benefit or granting a right to residency

Table 2.2 Myanmar Legislation and Relevance to the Project

The Constitution of the Republic of the Union of Myanmar, 2008	
Description	<ul style="list-style-type: none"> • The Union shall enact necessary laws to protect the rights of workers. (section 24) • The economic system of the Union is market economy system. (section 35) • The Citizens shall enjoy equal opportunity in carrying out occupation. [section 349(b)] • The Citizens shall enjoy equal opportunity in carrying our business. [section 349 (d)] • Every Citizen has in accord with the law, the right to conduct business freely in the Union for national economic development. (section 370)
Relevance to the Project	❖ The project will manage to align with the concept of the constitution.
The Competition Law, 2015	
Description	<ul style="list-style-type: none"> • No entrepreneur shall obstruct or disturb directly or indirectly other economic business. (section 22)
Relevance to	❖ The project shall carry out to align with the guideline.

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<i>the Project</i>	
The Penal Code	
<i>Description</i>	<ul style="list-style-type: none"> • Voluntarily corrupts or fouls the water of any public spring or reservoir, so as to render is less fit for the purpose for which it is ordinarily used shall be punished. (section 277) • Voluntarily vitiates the atmosphere in any place, so as to make it noxious to the health of persons in general dwelling or carrying on business in the neighborhood or passing along a public way shall be punished. (section 278) • Doing any act so rashly or negligently with fine or any combustible matter or explosive substance or machinery shall be punished. (section 285,286+287)
<i>Relevance to the Project</i>	<ul style="list-style-type: none"> ❖ This is relevant to the discharging and emission of waste water and combustion gases from the project. The Project shall not cause water and air pollutions.
The Police Act, 1945	
<i>Description</i>	<ul style="list-style-type: none"> • No person shall commit the following acts: (section 34 (6), (9)) <ul style="list-style-type: none"> ▪ Throwing or placing any dirt, filth, or any stones or building materials, or causing any offensive matter to run from any house, factory or any road or in any open place or street may be taken into custody by any police. ▪ Neglecting to fence in on duly protect any well, tank or other dangerous place or structure.
<i>Relevance to the Project</i>	<ul style="list-style-type: none"> ❖ The project will manage to align with the law.
The Ward or Village Tract Administration Law, 2012 and the Ward or Village Tract Administration Rules, 2012	
<i>Description</i>	<ul style="list-style-type: none"> • The Ward or Village Tract Administrator shall cause the residents to work and reside peacefully and tranquility. [section 12 (c)] • The Head of Ward or Village Tract shall report the entering of foreigners, residing of foreigners and occurring special events of foreigners to whom it concerns. (Rule 17)
<i>Relevance to the Project</i>	<ul style="list-style-type: none"> ❖ The project will manage to align with the law.
The Myanmar Fire Brigade Law, 2015	
<i>Description</i>	<ul style="list-style-type: none"> • Factory, industry, the business owner or manager of endangered from fire safety shall form the reserved fire brigade and shall keep the equipment related to fire safety. (section 25)
<i>Relevance to the Project</i>	<ul style="list-style-type: none"> ❖ The project will manage to align with the law.
The Myanmar Investment Law, 2016	
<i>Description</i>	<ul style="list-style-type: none"> • The objectives are to protect the inventors and their businesses in accord with Law, to give opportunities of work for the people, to promote the production, service, trade of high capacity. [sections 3

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	<p>(b), (c) + (e)]</p> <ul style="list-style-type: none">• The investor shall have the right to lease the land or building for long term from the owner if it is private or from the relevant government department organization if it is state-owned or entitled to administer by the government. [section 50 (a)]• The investor shall register the land lease contract at the office of registry of deeds in accordance with the registration act. [section 50 (d)]• The investor shall appoint skilled citizen and foreign workers, technicians, and staff by signing an employment contract between employer and employee in accordance with the labor laws and rules; [section 51 (d)]• The investments are ensured not to centralize. (section 52)• The investor shall not make any significant alteration of topography or elevation of the land on which he is entitled to lease or to use, without the approval of the commission; [section 65 (f)]• The investor shall not affect, pollute, damage the natural and social environment and not to obscure cultural heritage in accord with the existing laws, rules, procedures and the best standards exercising internationally. [section 65 (g)]• The investor shall list and keep proper records of books of account and annual financial statement, and necessary financial matters relating to the investments performed by permit or endorsement in accordance with internationally and locally recognized accounting standards; [section 65 (h)]• The investor shall close and discontinue the investment only after payment of compensation to employees in accordance with applicable laws for any breach of employment contracts, closure of investment, sale and transfer of investment, discontinuation of investment, or reduction of workforce; [section 65 (i)]• The investor shall pay wages and salaries to employees in accordance with applicable laws, rules, procedures, directives and so forth during the period of suspension of investment for a credible reason; [section 65 (j)]• The investor shall pay compensation and indemnification in accordance with applicable laws to the relevant employee or his successor for injury, disability, disease and death due to the work; [section 65 (k)]• The investor shall supervise foreign experts, supervisors and their families, who employ in their investment, to abide by the applicable laws, rules, orders and directives, and the culture and traditions of Myanmar; [section 65 (l)]• The investor shall respect and comply with the labor laws; [section 65 (m)]• The investor shall have the right to sue and to be sued in accordance with the laws; [section 65 (n)]• The investor shall pay effective compensation for loss incurred to the victim, if there are damage to the natural environment and socioeconomic losses caused by logging or extraction of natural
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<p><i>Relevance to the Project</i></p>	<p>resources which are not related to the scope of the permissible investment, except from carrying out the activities required to conduct investment in a permit or an endorsement. [section 65 (o)]</p> <ul style="list-style-type: none"> • The investor shall allow the Commission to inspect in any places, when the Commission informs the prior notice to inspect the investment; [section 65 (p)] • The investor shall take in advance permit or endorsement of the Commission for the investments which need to obtain prior approval under the Environmental Conservation Law and the procedures of environmental impact assessment, before undertaking the assessment, and shall submit the situation of environmental and social impact assessment to the Commission along the period of activities of the investments which obtained permit or endorsement of the Commission. [section 65 (q)] <p>For insurance</p> <ul style="list-style-type: none"> • The investor shall insure the types of insurance stipulated in the provision of the rules at any insurance enterprise which is entitled to carry out insurance businesses within the Union. [section 73] <p>❖ The project will manage to align with the law</p>
<p>Myanmar Investment Rules, 2017</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • The Investor must comply with the conditions of the Permit and other applicable laws when making an Investment. [section 202] • The Investor shall fully assist while negotiating with the Authority for settling the grievances of the local community that have been effected due to Investments. [section 203] • If the Investor is desirous to appoint a foreigner as senior management, technician expert or consultant according to section 51 (a) of the Law, it shall submit such foreigner’s passport, expertise evidence or degree and profile to the Commission Office for approval. [section 206] <p>For Insurance</p> <ul style="list-style-type: none"> • Every Investor that holds the Permit or Tax Incentives must have taken out the relevant insurance out of the following types of insurance at any insurance business that holds the license in the Union based on the nature of the business: [section 212] <p>(a) Property and Business Interruption Insurance ; (b) Engineering Insurance ; (c) Professional Liability Insurance; (d) Professional Accident Insurance; (e) Marine Insurance; and (f) Workmen Compensation Insurance.</p> <p><i>Relevance to the Project</i></p> <p>❖ The project will manage to align with the rules.</p>
<p>The Myanmar Insurance Law, 1993</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • Owners of motor vehicles shall effect compulsory Third Party Liability Insurance with the Myanma Insurance. (section 15) • An entrepreneur or an organization operating an enterprise which

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<p><i>Relevance to the Project</i></p>	<p>may cause damage to the life and property of the public or which may cause pollution to the environmental shall affect compulsory general liability insurances with the Myanmar Insurance. (section 16)</p> <ul style="list-style-type: none"> • The Ministry may determine from time to time the entrepreneurs or organizations which are to effect compulsory general liability insurances. (section 17) <p>❖ The project shall carry out to align with the guideline.</p>
<p>The Income Tax Law, 1974</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • Income gained from the economic business shall be levied under the heading of economic business. [section 11 (a)] • An entrepreneur shall send income annual list annually within three months after the end of the income year. (section 18)
<p><i>Relevance to the Project</i></p>	<p>❖ According to the schedule, this project relates to this law.</p>
<p>The Commercial Tax Law, 1990 and the Law Amending the Commercial Tax Law, 2014</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • Carrying out the service business shall be levied tax stated in the schedule of this Law. [section 4 (d)] • Carrying out the production business or service shall register to the township income tax officer as prescribed in the regulations. (section 11)
<p><i>Relevance to the Project</i></p>	<p>❖ According to the schedule, this project relates to the law.</p>
<p>The Money Laundering Law, 2014</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • Whoever commits the money laundering offence shall, or conviction, be punished with imprisonment for a term which may extend to 10 years or with a fine or with both. If it is a company or organization, it shall be punished with a fine which may extend to Kyat 500 million and the benefit holder shall be punished with imprisonment which may extend to 7 years. [Section 43]
<p><i>Relevance to the Project</i></p>	<p>❖ The project will manage to align with the law.</p>
<p>The Import Export Law, 2012</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • No one shall import or export the prohibited goods. [section 5] • No one shall import or export the goods without permit which are prescribed to obtain permit. [section 6] • A person who obtained any license shall not violate the conditions contained in the license. [section 7]
<p><i>Relevance to the Project</i></p>	<p>❖ The project will manage to align with the law</p>
<p>Yangon City Development Committee Law, 2018</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • Repair and removal of the dangerous buildings, components and parts and sanction to reside; [section 24, a (10)]

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<p><i>Relevance to the Project</i></p>	<ul style="list-style-type: none"> • Cooperation in disaster prevention process, arranging firefighting equipment, demolition or cancellation of the fire-hazardous buildings and tents; [section 24, a (13)] <p>❖ The project will manage to align with the law.</p>
<p>The Environmental Conservation Law, 2012</p>	
<p><i>Description</i></p>	<p>The following provisions are particularly relevant to Environmental Impact Assessment requirements and this project:</p> <p>For waste disposal,</p> <ul style="list-style-type: none"> • A person causing a point source of pollution shall treat, emit, discharge and deposit the substances which cause pollution in the environment in accord with stipulated environmental quality standards. [section 14] • The owner or occupier of any business, material or place which causes a point source of pollution shall install or use an on-site facility or controlling equipment in order to monitor, control, manage, reduce or eliminate environmental pollution. If it is impracticable, it shall be arranged to dispose the wastes in accord with environmentally sound methods. [section 15] • A person or organization operating business in the industrial estate or business in the special economic zone or category of business stipulated by the Ministry: [section 16] <ul style="list-style-type: none"> (a) is responsible to carry out by contributing the stipulated cash or king in the relevant combined scheme for the environmental conservation including the management and treatment of waste; (b) shall contribute the stipulated users charges or management fees for the environmental conservation according to the relevant industrial estate; special economic zone and business organization; (c) shall comply with the directives issued for environmental conservation according to the relevant industrial estate; special economic zone or business <p>For prior permission,</p> <ul style="list-style-type: none"> • No one shall, without the prior permission operate business, work-site or factory, workshop which is required to obtain the prior permission under this law. [section 28] <p>For prohibition,</p> <ul style="list-style-type: none"> • No one shall violate any prohibition contained in the rules, notifications, orders, directives and procedures issued under this Law. [section 29] <p>The duties and powers relating to the environmental conservation of the Ministry are as follows:</p> <ul style="list-style-type: none"> • Managing to cause the polluter to compensate for environmental impact, cause to contribute fund by the organizations which obtain benefit from the natural environmental service system cause to contribute a part of the benefit from the business which explore, trade and use the natural resources in environmental conservation works; [section 7]
<p><i>Relevance to the Project</i></p>	<p>❖ The project shall carry out according to the directives of environmental</p>

	conservation department.
The Environmental Conservation Rules, 2014	
Description	<p>MOECAAF launched Environmental Conservation Rules on 5 June 2014. The Rules reinforce the obligation for project developers to submit an EIA or an IEE. It aims to establish and adopt the necessary programs for the conservation and enhancement of environment, protection, control and reduction of pollution in environment, and conservation.</p> <p>The Environmental Conservation Rules stipulate the following relevant articles under Chapter (XI) Environmental Impact Assessment.</p> <ul style="list-style-type: none"> • The business department organization or person who would carry out categories of plan business or activity stipulated under rule 52: Shall carry out environmental impact assessment for his plan, business or activity; <ul style="list-style-type: none"> b. Submit to the Ministry in advance by which organization or person, the environmental impact assessment is intended to be carried out; c. Submit the environmental impact assessment report to the Ministry. [section 54] • The plan, business or activity which is established before the issue of these rules and responsible to carry out the environmental impact assessment or initial environmental examination shall prepare the environmental management plan in accord with the environmental impact assessment procedure to be issued under the law and submit to the Ministry. The Ministry shall scrutinize the environmental management plan for approving it. The person who carries out the project, business or activity shall implement the environmental management plan approved by the Ministry and matters stipulated by the Ministry within the time stipulated by the Ministry. [section 55] • The person who carries out any project, business or activity shall arrange and carry out for conducting the environmental impact assessment for any project, business or activity by a qualified third person or organization accepted by the Ministry. [section 56] • The Ministry shall, on submission to the Ministry in advance by which organization or person, the environmental impact assessment is intended to be carried out under sub-rule (b) of rule 54, determine and decide, after making scrutiny, whether or not it is suitable level of international organization or person to carry out the environmental impact assessment. The decision of the Ministry relating to such matter is final and conclusive. [section 57] • The Ministry shall form the environmental impact assessment report Review Body with experts from relevant Government departments and organizations. [section 58] • If private experts are included in the environment impact assessment report Review Body, honorariums, expenses and allowances for them shall be borne from the environmental management fund. [section 59] • The Ministry may assign the Department to scrutinize the report of environmental impact assessment prepared and submitted by a third party or an organization and report to the Ministry through the environmental impact assessment Review Body. [section 60]

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<p><i>Relevance to the Project</i></p>	<ul style="list-style-type: none"> • The Ministry may approve and reply the environmental impact assessment report or environmental management plan with the guidance of the Committee. [section 61] <p>For Prohibitions</p> <ul style="list-style-type: none"> • Any person shall not carry out the actions which can be damaged to natural environment which is changing due to ecosystem and such system; except the permission of the relevant Ministry in order to the interest of the public. [section 69] <p>❖ This states to carry out environmental impact assessment.</p>
<p>The National Environmental Quality (Emission) Guidelines, 2015</p>	
<p><i>Description</i></p>	<p>These National Environmental Quality (Emission) Guidelines (hereafter referred to as Guidelines) provide the basis for regulation and control of noise and vibration, air emissions, and liquid discharges from various sources in order to prevent pollution for purposes of protection of human and ecosystem health.</p> <ul style="list-style-type: none"> • Para 4 states that these Guidelines refer to emission sources, and are intended to prevent or minimize adverse impacts to environmental quality or human health by ensuring that pollutant concentrations do not reach or exceed ambient guidelines and standards. The Guidelines apply to projects that generate noise or air emissions, and / or that have either direct or indirect discharge of process water, wastewater from utility operations or storm water to the environment. • Para 6 mentions the provisions of the general and applicable industry-specific Guidelines shall be reflected in project environmental management plan (EMP) and environmental compliance certificate (ECC) and together constitute a project’s commitment to take necessary measures to avoid, minimize and control adverse impacts to human health and safety, and the environment through reducing the total amount of emissions generation; to adopting process modifications, including waste minimization to lower the load of pollutants requiring treatment; and as necessary, to apply treatment techniques to further reduce the load of contaminants prior to release or discharge. • Para 7 states recognizing that these Guidelines are intended to prevent pollution through reducing the mass of pollutants emitted to the environment, dilution of air emissions and effluents to achieve maximum permitted values is not acceptable. Specified guideline values should be achieved, without dilution, at least 95 percent of the time that a project is operating, to be calculated as a proportion of annual operating hours.
<p><i>Relevance to the Project</i></p>	<p>❖ The project shall carry out to align with the guideline.</p>
<p>Environmental Impact Assessment Procedure (2015)</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • The monitoring reports shall include: a) documentation of compliance with all Conditions; b) progress made to date on implementation of the EMP against the submitted implementation schedule; c)

	<p>difficulties encountered in implementing the EMP and recommendations for remedying those difficulties and steps proposed to prevent or avoid similar future difficulties; d) number and type of non-compliance with the EMP and proposed remedial measures and timelines for completion of remediation; e) accidents or incidents relating to the occupational and community health and safety, and the environment; and f) monitoring data of environmental parameters and conditions as committed in the EMP or otherwise required. [section 102]</p> <ul style="list-style-type: none">• Within ten (10) days of completing a monitoring report as contemplated in Article 97 and Article 98 in accordance with the EMP schedule, the Project Proponent shall make such report (except as may relate to National Security concerns) publicly available on the Project’s website, at public meeting places (e.g. libraries, community halls) and at the Project offices. Any organization or person may request a digital copy of a monitoring report and the Project shall, within ten (10) days of receiving such request, submit a digital copy via email or as may otherwise be agreed upon with the requestor. [section 103]• The Ministry has the right, using its own officers at national, regional, state, Nay Pyi Taw Union Territory and/or local offices, the services of any consultant, or both, to conduct monitoring and inspections of a Project and activities related thereto in order to control and determine compliance by the Project with all applicable environmental and socio-economical requirements and, where possible, to prevent violations of the Project’s obligations. The Ministry may also, for the implementation of monitoring and inspections, enlist the assistance of other relevant government departments and organizations. [section 104]• If, upon inspection, the Ministry identifies any non-compliance with the EMP or Conditions in the ECC, the Ministry may require the Project Proponent to undertake remedial measures and/or may impose penalties as provided for in this Procedure. [section 105]• For purposes of monitoring and inspection, the Project Proponent shall grant to the Ministry and/or its representatives, at any time during normal working hours and from time to time as and when the Ministry may reasonably require, access to the Project’s offices and to the Project site and any other location at which the Project activities or activities related to the Project are performed. [section 106]• In carrying out any inspection, the Ministry may take photographs and make other audio and video recordings of any type, take soil, sediment, water, and air samples, and examine computers, copy documents including digital files, interview persons, and carry out any other investigation which the Ministry believes to be necessary or appropriate. The Ministry, as it deems necessary, may carry out such inspection in coordination with any other ministries. [section 107]• In the event of an emergency, or where, in the opinion of the Ministry, there is or may exist a violation or risk of violation of the compliance by the Project with all applicable environmental and social requirements, the Project shall grant full and immediate access
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<p><i>Relevance to the Project</i></p>	<p>to the Ministry at any time as may be required by the Ministry, including outside normal working hours. [section 108]</p> <ul style="list-style-type: none"> • The Ministry’s inspections may include without limitation sites, facilities, vehicles, computers, archives, documents and all other forms and types of media and information storage, and persons. [section 109] • The Project Proponent shall further ensure that the Ministry’s rights of access hereunder shall extend to access by the Ministry to the Project’s contractors and subcontractors. [section 110] • The Ministry shall indicate the manner in which environmental obligations are not being complied with by the Project Proponent, and shall give the Project a specified time period (determined by the Ministry to be reasonable under the circumstances) within which to bring the Project into compliance. [section 113] • All costs of the Ministry to conduct inspection and monitoring of the Project shall be borne by the Project Proponent. Such costs shall not exceed that which is necessary to ensure the Project’s compliance with the Project commitments as set out in the EMP and in the ECC. [section 115] • The Ministry may require that Projects and other economic activities that derive from such policy, strategy, development plan, framework or program and which have been required to undertake a study to identify and assess the potential environmental and social impacts (as stipulated above) shall be developed and implemented (sited, designed, constructed and operated) in accordance with the environmental and social management and monitoring framework of such policy, strategy, development plan, framework or program. [section 117] <p>❖ The project will manage to align with the procedure.</p>
<p>The Standardization Law, 2014</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • A person desirous of obtaining quality recommendation shall apply to the department and organization which have obtained the accreditation certificate from the Department. [section 17] • The Committee may, if it is found out that the person who has obtained the quality recommendation violates any term or condition contained in the relevant recommendation, take any of the following actions: [section 19] <ul style="list-style-type: none"> (a) warning; (b) suspending the quality recommendation for a limited period; (c) cancelling the quality recommendation • If any person who has obtained the quality recommendation uses the standardization mark on the product or relating to service which does not meet the relevant standard shall be punished with imprisonment for a term not exceeding one year or with fine not exceeding Kyat one million or with both. [section 26] <p>❖ The project will manage to align with the law.</p>
<p><i>Relevance to the Project</i></p>	<p>❖ The project will manage to align with the law.</p>

Myanmar Engineering Council Law,2013	
Description	<ul style="list-style-type: none"> • If, whoever has received a registration certificate, is found to have breached any rules contained in the registration certificate or violated any prohibition contained in a rule, order or directive enacted under this law or in any stipulation of this law, the executive committee may take the following administrative actions- [section 34] <ul style="list-style-type: none"> (a) giving a warning; (b) assessing a suitable fine; (c) suspending the registration certificate; (d) cancelling the registration certificate. • No one shall perform any engineering work and technological work which are specified as being dangerous to the public by a rule enacted under this law without having received a registration certificate issued by the council, except for engineers appointed in a government department or an organization in the performance of their duties. [section 37]
Relevance to the Project	<ul style="list-style-type: none"> ❖ The project will manage to align with the law.
The Electricity Law, 2014	
Description	<ul style="list-style-type: none"> • No electrical business shall be operated other than the business contained in the permit by any permit holder. [section 45] • No one shall produce, transmit, connect, contact and use the electric power without electric safety certificate. [section 47] • No one shall connect, waste, and utilize the electric power without the permission of the permit holder. [section 52] • No one shall cut off the electric power line, transfer electricity, destroy electrical equipment and used in any electrical business. [section 53]
Relevance to the Project	<ul style="list-style-type: none"> ❖ The provisions are to be cautious in operating this project.
The Petroleum Act, 1934	
Description	<ul style="list-style-type: none"> • Import, transport or storage of petroleum shall be abided by the rules made under section and terms and conditions of the license that requires to obtain under the rules. [section 3] • Dangerous petroleum (petroleum lower than 76°F which is flammable) shall be warned as a duty. [section 6]
Relevance to the Project	<ul style="list-style-type: none"> ❖ This is relevant to the transport, storage, and usage of oil by the project. The project will manage to align with the law.
Petroleum and Petroleum Products Law,2017	
Description	<ul style="list-style-type: none"> • Issuing licenses for motor vehicles, watercraft and barges for the carriage of petroleum and any types of petroleum products; [section 9 (a)] • specifying the procedures and terms for transportation, except for transportation by pipelines. [section 9 (e)] • Issuing storage licenses for warehouses and storage tanks; [section 10 (a)]

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<p><i>Relevance to the Project</i></p>	<ul style="list-style-type: none"> • issuing a transportation permit for motor vehicles, watercraft and barges for the transportation of petroleum and any types of petroleum products; [section 10 (b)] • with regard to license applications under sub-section (a) and a permit under subsection (b), specifying the application period, forms and terms, application procedures, issuing body and fees to be collected; [section 10 (c)] • on-the-spot investigation and taking action in accordance with the laws in force in case of environmental damages caused during the operation of petroleum and petroleum products businesses; [section 10 (d)] • Every container which contains dangerous petroleum or any types of dangerous petroleum products shall display a warning through the placement of a mark, embossing, painting, printing or in other appropriate ways. If it is not possible to do so, a warning which is similar to a mark that warns of the dangerous nature of petroleum, spirit and petrol shall be displayed in easily visible words or signs. [section 11] <p>❖ The project will manage to align with the law.</p>
<p>The Private Industrial Enterprise Law, 1990</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • The salient basic principles to operate the industrial business are: (section 3) • Any person conducting any private industrial enterprise on the day this Law is enacted; by using any type of power which is three horsepower and above or manpower of ten wage-earning workers and above shall register under this Law. (section 4) <p>The duties of the entrepreneur are as follows:</p> <ul style="list-style-type: none"> • shall abide by the terms and conditions of the registration certificate; (section 13 b) • shall shift the place of enterprise, change the nature of enterprise, amalgamate enterprises and split up enterprises only with the approval of the Directorate; (section 13 f) • shall abide by the orders and directives issued from time to time by the Ministry and the Directorate; (section 13 g) <p>The entrepreneur has the right to carry out the followings:</p> <ul style="list-style-type: none"> • appointing foreign experts and technicians with the approval of the Ministry; (section 15 a) • carrying out change of the name of enterprise, transfer of ownership, temporary suspension or permanent closing down of the enterprise in the manner prescribed and with the approval of the Directorate. (section 15 b)
<p><i>Relevance to the Project</i></p>	<p>❖ The provisions are to be cautious in operating this project.</p>
<p>The Prevention of Hazard from Chemical and Related Substances Law, 2013</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • A person who has obtained a license, before starting the respective chemical and related substances business:- • shall be inspected for the safety and the power of resistance of the

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	<p>machinery and equipment by the respective Supervisory Board and Board of Inspection; (section 15 a)</p> <ul style="list-style-type: none">• shall be attended the person who serve in the work to the respective foreign trainings or the trainings and the expert trainings on prevention of hazard from the chemical and related substances opened by the government department and the government organizations. (section 15 b)• A person who has obtained a license:• shall perform to abide strictly the instructions for being safety in using the chemical and related substances by himself and also the persons who serve the work; (section 16 b)• shall keep the required safety equipment enough in the chemical and related substances businesses, furthermore shall grant the personal protection equipment and dresses free of charge to the working persons; (section 16 c)• shall make the course of training and study and instruction if necessary to the working persons for using the occupational safety equipment, the personal protection equipment and the dresses systematically in the chemical and related substances business; (section 16 d)• shall make medical checkup the working persons who will work in the chemical and related substances business and shall permit to serve in that work after obtaining the recommendation that his health is suitable for that work. This medical checkup records shall be kept systematically; (section 16 f)• A person who has obtained a license, shall put the insurance in accordance with the prescriptive stipulations to be able to pay the compensation, if the impact and damage is occurred on the Human Being and Animals or the environment in respect of the chemical and related substances businesses. (section 17)• A person who has obtained the registration certificate shall abide the regulations consisted in the registration certificate furthermore shall also abide the order and instructions issued occasionally by the Central Supervisory Board. (section 22) <p>A person who has obtained the license to be complied the following matters to control and decrease the hazard of the chemical and related substances:</p> <ul style="list-style-type: none">• classifying the hazard level to protect in advance the hazard according to the properties of the chemical and related substances; (section 27 a)• expressing the Material Safety Data Sheet and Pictogram; (section 27 b)• providing the safety equipment, the personal protection equipment to protect and decrease the accident and attending to the training to be used systematically; (section 27 c)• performing in accordance with the stipulations in respect of transporting, possessing, storing, using, discharging the chemical and related substances; (section 27 d)• not being imported or exported the chemical and related substances banned by the Central Supervisory Board and the machinery and equipment which are used them. (section 27 e)
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<p><i>Relevance to the Project</i></p>	<ul style="list-style-type: none"> • Producing, using, possessing, storing, distributing, selling, transporting, importing, exporting the chemical or related substances prohibited by the Control Body, and Operating without licenses is prohibited. [section 33+34] • Chemicals and related substances which are not registered, cancelled from the registration list has not reached the standard and quality shall be used in the business. [section 35] <p>❖ The project will manage to align with the law</p>
<p>The Water Power Act, 1927</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • The law provides the use of public water. • Use of public waters, attempt to use of public waters occurrence of environmental pollution by the water flow, obstruction of water flow for producing water power energy or for prospecting minerals are prohibited to generate without license or not in conformity with the terms and conditions of the license. [section 3] • The Deputy Commissioners may issue order to erect the materials constructed to affect the water power by violating the Act, order issued under the Act. [section 5]
<p><i>Relevance to the Project</i></p>	<p>❖ The Law is not relevant the proposed project and EIA study because the project site will not use public water for industrial purpose.</p>
<p>The Underground Water Act, 1930</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • Digging tube wells shall be done only with the license issued by prescribing terms and conditions. [section 3] • Digging underground water or attempt to do so shall be informed to the authorized official determined by the President. [section 5]
<p><i>Relevance to the Project</i></p>	<p>❖ The project will manage to align with the law.</p>
<p>The Conservation of Water Resources and Rivers Law, 2006 and The Conservation of Water Resources and Rives Rules, 2013</p>	
<p><i>Description</i></p>	<p>For Prohibitions</p> <ul style="list-style-type: none"> • No person shall carry out any act or channel shifting with the aim to ruin the water resources and rivers and creeks. [section 8 (a)] • Disposal of fuel, chemicals, poisonous substances and other substances which affect the natural environment from the shore, sailing, launched, anchored, stranded, sunk vessel or disposal of explosive substances are prohibit. [section 11] • No one shall dispose of any substance into the river-creek that may cause damage to waterway or change of watercourse from the bank or vessel which is plying, vessel which has berthed, anchored, stranded or sunk. [section 19] • No one shall drill well or pond or dig earth without the permission of the Directorate. [section 21(b)] • No one shall, without the permission of the directorate, pile sand, shingle and other heavy materials for business purposes in the bank area and waterfront area. [section 22] • No one shall violate the conditions prescribed by the Directorate so as

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<i>Relevance to the Project</i>	<p>not to cause water pollution and change of watercourse in rivers and creeks. [section 24 (b)]</p> <p>❖ The project will manage to align with the law.</p>
The Motor Vehicle Law, 2015 and The Motor Vehicle Rules, 1989	
<i>Description</i>	<ul style="list-style-type: none"> • Unregistered motor vehicle, motor vehicles of terminated, expired or cancelled motor vehicle registration are not allowed to drive in the public place. [section 45] • Motor vehicle without insurance for injury shall not be used in the public place. [section 46] • No one shall drive without license in the public place. [section 47] • No vehicles shall carry more than the number or weight of goods which is permitted according to registration. [Rule 138]
<i>Relevance to the Project</i>	<p>❖ The project will manage to align with the law.</p>
The Highway Law, 2000	
<i>Description</i>	<ul style="list-style-type: none"> • The aim of this law is to supervise systematically the use in highways. [section 3] • Not to drive the vehicle in highways with the prescribed wheel type, weight. [section 8] • Violating any prohibition to protect the damage of highway shall be punished with imprisonment or with a fine. [section 9 (a)] • It is liable to pay compensation or damage for damaging the highway. [section 9-A] • No buildings shall be constructed in the highway area. [Rule 26 (b)]
<i>Relevance to the Project</i>	<p>❖ The project will manage to align with the law.</p>
Myanmar Public Health Law, 1972	
<i>Description</i>	<p>Includes a general provision that empowers Union Government to carry out measures relating:</p> <ul style="list-style-type: none"> • To protect environment from gas, odor, dust, sound and radio activity which endanger in the public environment, [section 3 (1) (c)]. • To keep the factory, industry, work site produced and sell food clean. [section 3 (2) (d)] • Examine if necessary in the government laboratory. [section 3 (2) (h)] • To be cautions to be in conformity with the standard prescribed by the Union Government from time to time. [3 (2) (i)]
<i>Relevance to the Project</i>	<p>❖ The project will manage to align with the law.</p>
The Control of Smoking and Consumption of Tobacco Product Law, 2006	
<i>Description</i>	<ul style="list-style-type: none"> • This law aims to protect from the danger which affects public health adversely by creating tobacco-free environment and to up lift the health, economy, and social standard of the public through control of smoking and consumption of tobacco product. [section 3] • The responsible person shall arrange the written statements that state

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<p><i>Relevance to the Project</i></p>	<p>non-smoking area in the prescribed places. [section 9 (a)]</p> <ul style="list-style-type: none"> • Smoking area shall be arranged and statements that show specific places for smoking area in non-smoking area provided in section 7. [section 9 (b)] • No one shall smoke in non-smoking area. [section 9 (c)] • Non-smoking areas are prescribed and smoking, turning, carrying, holding are liable to a fine. [sections 7+17] <p>❖ The project shall carry out to align with the law.</p>
<p>The Factories Act, 1951</p>	
<p><i>Description</i></p>	<p>Working hours</p> <ul style="list-style-type: none"> • Shall not exceed 8 working hours per day or 44 hours per week [section 59+62] • Shall not exceed 48 hours per week for the work which has to be done continuously [section 59] • There must be a minimum 30 minutes interval after each 5 working hours [section 63] • The combined working hours and interval time shall not exceed 10 hours per day [section 64] • The working days shall not exceed 6 days per week • There must be one day holiday each week (Sunday). If Sunday service is required, there must be a substitution of another day. There must be substituted an alternative day-off. [section 61] <p>Overtime</p> <ul style="list-style-type: none"> • Shall not exceed more than 16 hours per week or, for continuous work, 12 hours per week • The overtime wage shall be calculated as double the basic wage • Permission of Factories and the General Labor Law Inspection Department must be obtained for an approval of a constant overtime policy <p>Calculation of overtime wages</p> <ul style="list-style-type: none"> • For salary earners: Overtime wage per hour = {(salary x 12 month) / 52-week x 44 (48) hrs.} x 2 • For daily wages worker: Overtime wage per hour = {(daily wage x 6 day) / 44 (48) hrs.} x 2 • Piece-work laborers: Overtime wage per hour = {(daily average wage x 6 day) / 44 (48) hrs.} x 2 <p>Worksite Safety and Health Measures</p> <ul style="list-style-type: none"> • The factory must be kept clean and the workspace must be situated away from drains, latrines or other things which create a bad or unhealthy smell. [section 13] • Wastes must be disposed systematically. [section 14] • There must be proper ventilation, light and heat. [section 15+19] • There must be no dust or smoke in the hall or factory. [section 16] • There must be clean drinking water in proper places for all workers. [section 20]

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<p><i>Relevance to the Project</i></p>	<ul style="list-style-type: none"> • Population of workers must not be dense and there must be sufficient light. [section 19] • The latrines must be in suitable places. [section 21] • The generators and other auxiliary units must be kept undercover. [section 23, 24] • There must be arrangements made for any emergency cut out of electricity service. [section 26] • In weaving or spinning machines, any female workers and any children must not be allowed to handle. [section 28] • Females and young workers are not allowed to lift heavy loads. • Floors, stairs and paths must be well-built and hand rails are to be built and necessary covers must be placed. [section 34] • Explosive and flammable substances should be covered and protected. [section 39] • In every factory, the arrangement of escape routes and fire alarms must be kept. [section 40] <p>Welfare</p> <ul style="list-style-type: none"> • There must be washing and cleaning facilities for workers. [section 44+45] • There must be sufficient seats for workers if a chance is given for sitting. [section 46] • There must be sufficient First Aid Boxes. [section 47] • If the workers in a factory exceed 250, doctors or nurses in clinic are to be appointed. [section 48] • If the workers of a factory exceed 100, recreation centers and canteens are to be kept for food. [section 49] • For factories with over 50 female workers, there must be a child nursery center available for the children under 6 year of age. [section 50] <p>❖ The project will manage to align with the law.</p>
<p>The Social Security Law 2012 and The Social Security Rules, 2014</p>	
<p><i>Description</i></p>	<ul style="list-style-type: none"> • The objective is benefit for sickness, maternity, death, employment injury, invalidity benefit, superannuation benefit by giving medical treatment, providing cast benefit or granting a right to residency. (Section 3) • All establishments shall contribute to the social security fund from the salary of insured workers as follows: <ul style="list-style-type: none"> (a) Health and social care fund:2% from employer, 2% from employee (b) Injury fund: 1% from employer (c) The accepted maximum salary per month to qualify for participation in the social security fund is currently set at 300,000/- kyats <p style="text-align: center;">Kinds of security funds are:</p> <ul style="list-style-type: none"> (a) Health and social care fund (b) Family assistance fund (c) Injury fund (d) Invalidity benefit, superannuation benefit, and survivors benefit

	<p>fund</p> <p>(e) Unemployment benefit fund</p> <p>(f) Other social security fund (e.g. housing fund)</p> <p style="text-align: center;"><i>For medical treatment and cash benefit for sickness;</i></p> <ul style="list-style-type: none"> • Beneficiaries have the right to take medical treatment at the permitted hospital or clinic for a period up to 26 weeks. (Section 22(a)) • When the insured person beneficiary is retired, 50% payment of medical treatments is entitled if social security contributions have been paid for more than 180 months. (Section 29) • Beneficiaries have the right to enjoy 60% of average wages, calculated against the most recent four-month working period, as a cash benefit, during a period of illness lasting up to maximum 26 weeks. (Section 23) <p style="text-align: center;">For maternity benefits (Section 25, 26 and 27)</p> <p>(a) Benefits are allowed to be taken if the prior working period of an employee has been a minimum of one year and if there have been paid social security contributions by the worker for a minimum six months.</p> <p>(b) Maternity leave may total six weeks before confinement and eight weeks after confinement, up to 14 weeks in total</p> <p>(c) An additional four weeks are allowed for maternity leave if twins have been delivered.</p> <p>(d) Up to a maximum of six weeks total leave is allowed to be taken in cases of miscarriage.</p> <p>(e) Full wages may be taken for prenatal examination at the rate one day per time and up to a maximum of seven times.</p> <p>(f) 70% of average wages of the previous year can be taken as maternity leave compensation before the birth.</p> <p>(g) An additional 50% of wages which can be taken once the child is born (additional 75% for twins, 100% for triplets). Hence, 120% of average wages will be administered for the eight weeks of maternity leave which may be taken after birth.</p> <p>(h) Has the right to take leave for medical treatment for a child up until one year after birth.</p> <p>(i) A father is entitled to take up to 15 days unpaid leave for infant care upon confinement of his wife.</p> <p style="text-align: center;"><i>For funeral expenses</i></p> <ul style="list-style-type: none"> • If a social security insured person passes away, his or her beneficiary is entitled to receive five times their average month's wage. This is determined as the average wage of the last four working months of the deceased person. • The obligations of employers are: <p>(a) To inform immediately to the Social Security Office when an injury has happened to an employee. (Section 54(a))</p> <p>(b) To register their business in the Social Security Office within 30 days from the day of first business operations (Rules)</p> <p>(c) To register every newly appointed employee with the Social Security Office. (Rules)</p>
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<i>Relevance to the Project</i>	<ul style="list-style-type: none"> • The employer who registered in accord with the Social Security Law has the right to be exempted from the Workmen’s Compensation Act. ❖ The project will manage to align with the Law.
The Workmen’s Compensation Act, 1923	
<i>Description</i>	<ul style="list-style-type: none"> • This Law is for factories which have failed to register with the Social Security Office and to subscribe to the 2012 Social Security Law and Rules. • Required to employees who become injured or who die in any accidents arising during and in consequence of their employment. Such compensation also must be made for disease which arise as a direct consequence of employment, such as carpal tunnel syndrome. (Section 3)
<i>Relevance to the Project</i>	<ul style="list-style-type: none"> ❖ The project will manage to align with the Law.
The Leave and Holiday Act, 1951	
<i>Description</i>	<p>The objectives are: To allow worker for leave and holiday allowances, religious or social activities with earn allowance, and benefits for Health allowances.</p> <ul style="list-style-type: none"> • Concerned workers: Daily wage workers/temporary workers/permanent workers. • Casual Leave (6) days (Section 5) <ul style="list-style-type: none"> (a) Casual leave of 6 days with wages is to be provided (b) Casual leave can be taken a maximum of 3 days at a time except in special cases. (c) Casual leave cannot be joined with any other leave (d) Leave will be cancelled if it has not been used with a year. • Earned Leave (10) days (Section 4) <ul style="list-style-type: none"> (a) For continuous service of 12 months and above 10 days of ‘earned leave’ shall be entitled. (b) If the service day is not 24 days, 1 day deduction from earned leave is made, (c) Can be accumulated for up to 3 years. • Medical Leave (30) days [section 6] <ul style="list-style-type: none"> (a) Workers are entitled to 30 days of medical leave with full pay if 6 months service has been completed (b) If 6 months service has not been completed, ‘leave without pay’ can be granted for medical needs (c) If not taken within a year, medical leave is void or cancelled. • Maternity Leave [section 7-A] <ul style="list-style-type: none"> (a) 6 weeks maternity leave before confinement and at least (8) weeks after confinement (b) Entitled jointly with medical leave. • Public Holidays (21) days [section 3] <ul style="list-style-type: none"> (a) Workers can enjoy time off with full pay (b) If work is given on a public holiday, twice the rate of regular

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	wages is required.
<i>Relevance to the Project</i>	❖ The project will manage to align with the law.
The Payment of Wages Law, 2016	
<i>Description</i>	<ul style="list-style-type: none"> • The employer shall pay the wage when the work is completed or the time of agreed period for any daily, hourly, weekly, or other part time job or for work charge. (section 4 (a)) • The agreed period shall not be more than one month. (section 4 (b)) • Permanent job shall be paid monthly. (section 4 (c)) • Resignation on own volition, dismiss or decrease of the employee shall be paid according to the provisions of section 4.
<i>Relevance to the Project</i>	❖ The project will manage to align with the law.
The Minimum Wages Law, 2013 and The Minimum Wages Rules, 2013	
<i>Description</i>	<p>As to the preamble of this law, the objectives are:</p> <ul style="list-style-type: none"> • To fulfill the basic needs of the workers and their families who are working in commercial establishments, production and servicing establishments, agriculture and livestock. • And to develop the work performance and competitiveness of workers. The minimum Wages Law is passed by parliament in late 2013 and amounts were specified/ finalized by a national tripartite committee in mid-2015. Implementation of the new wage rates was required to start on 1 September 2015. • Duties of the Employer • 3,600 Kyats per 8-hour working day (450 Kyat/hour) shall be the minimum wage paid to skilled employees of companies with more than 15 employees in all industries, throughout all of Myanmar. • 50% of the minimum – 1,800 Kyats per 8-hour working day (225 Kyats/hour) – may be paid to completely unskilled newly hired workers engaged in a training/induction program up to a maximum of 3 months. • 75% of the minimum – 2,700 Kyats per 8-hour working day (338 Kyats/hour) – may be paid to newly hired employees during their 2nd 3 months of employment, regarded as a ‘probationary period’.
<i>Relevance to the Project</i>	❖ The project will manage to align with the law.
The Labor Organization Law, 2011 and The Labor Organization Rules, 2012	
<i>Description</i>	<p>As to the preamble of this law, the objectives are:</p> <ul style="list-style-type: none"> • To protect the rights of the workers in accordance with section 24 of the Constitution • To promote good relations between the employer and the worker. • To enable to workers to form and carry out the labor organizations systematically and independently. <p>Rights and Responsibilities of the Labor Organization</p> <ul style="list-style-type: none"> • The labor organizations shall have the right to carry out freely in drawing up their constitution and rules, in electing their

<p><i>Relevance to the Project</i></p>	<p>representatives, in organizing their administration and activities or in formulating their programs.</p> <ul style="list-style-type: none"> • The labor organizations have the right to negotiate and settle with the employer if the workers are unable to obtain and enjoy the rights of the workers contained in the labor laws and to submit demands to the employer and claim in accord with the relevant law if the agreement cannot be reached. • The labor organization has the right to demand the relevant employer to re-appoint a worker if such worker is dismissed by the employer and if there is cause to believe that the reasons of such dismissal were based on labor organization membership or activities, or were not in conformity with the labor laws. • The labor organizations have the right to send representatives to the Conciliation Body in settling a dispute between the employer and the worker. • In discussions with the Government between the employer and the complaining workers, the representatives of the labor organization also have the right to participate and discuss. • Have the right to participate in solving the collective bargaining of the workers • Shall carry out peacefully the holding of meetings, strikes and the carrying out any other collective activities. • Shall assist in making agreements between the employer and the workers. [section 17 to 23] <p>Duties of the Employer The employer shall:</p> <ul style="list-style-type: none"> • recognize the labor organizations • allow the member of executive committee assigned by the labor organization to perform their duty not exceeding two days per month • shall assist as much as possible if the labor organizations requests help which is in the interest of the factory’s workers. [section 29 to 31] <p>Prohibitions No employer shall:</p> <ul style="list-style-type: none"> • lock-out any service without the permission of relevant conciliation body • lock-out any work during the settlement of dispute period • carry out an illegal lock-out, dismiss a worker for his membership in a labour organization or for the exercise of organizational activities or participating in a strike. [section 43+44] <p>No worker shall:</p> <ol style="list-style-type: none"> (a) Go on strike without informing in advance the relevant employer or the relevant conciliation body (b) Go on strike during the settlement of dispute period (c) Go on an illegal strike [section 45+46] <p>❖ The project will manage to align with the law</p>
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The Settlement of Labor Disputes Law, 2012	
<i>Description</i>	<p>As to the preamble of this law, the objectives are:</p> <ul style="list-style-type: none"> • To safeguard the rights of workers • To promote a good relationship between employer and workers and creating a peaceful workplace. • To obtain the rights fairly, rightfully and quickly by settling disputes between employer and worker justly. <p>Forming Workplace Coordinating Committee The employer shall, in an establishment which has 30 employees and above and if there is a labor organization.</p> <ul style="list-style-type: none"> • Allow 2 nominated workers for each labor organization. • Assign employer representatives who are the same number as the representatives of the workers. <p>If there is no labor organization,</p> <ul style="list-style-type: none"> • Organize election of 2 representatives of the workers. • Appoint 2 representatives of the employer • The term of such committees is one year. <p>Settlement of Dispute</p> <ul style="list-style-type: none"> • A party, employer or worker, may complain to the Conciliation Body. • If he is not satisfied with the conciliation of the Conciliation Body, may apply to the court. [section 23] • The Conciliation Body shall refer the collective dispute which does not reach settlement to the relevant Arbitration Body. [section 25] • No party shall be barred to proceed with the right to institute criminal or civil proceedings in respect of such dispute during conciliation or arbitration. [section 52] • As a strike suspends the employment agreement temporarily, the employer shall not be liable to pay salary or allowance during such period to the workers who go on strike. [section 54]
<i>Relevance to the Project</i>	<ul style="list-style-type: none"> ❖ The project will manage to align with the law.
The Development of Employment and Skill Law,2013	
<i>Description</i>	<ul style="list-style-type: none"> • The employer shall carry out the training program in accord with the work requirement in line with the policy of the skill development team to develop the skill relating to the employment for the workers who are proposed to appoint and working at present. [section 14] • The employer shall apply through the relevant committees to the skill development team to acquire the registration certificate in accord with the stipulations. [section 16 (a)]
<i>Relevance to the Project</i>	<ul style="list-style-type: none"> ❖ The project will manage to align with the law.

2.4 Environmental Management Commitments

The following Environmental Management Commitments are relevant to the operation of the “*Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services*”. To meet environmental, social and other requirements, SC Auto (Myanmar) Co., Ltd. shall

- Ensure that other obligations are incorporated in the designs, procedures and project controls.
- Communicate other requirements to personnel and contractors accountable for compliance.
- Ensure all relevant legal and other requirements and associated documentation (e.g., licenses, permits, approval applications) are readily available on site to SC Auto (Myanmar) Co., Ltd. personnel, contractors, subcontractors and consultants.
- Conduct a compliance audit at least annually and ensure there is a process in place to monitor on-going compliance with all legal and other requirements.
- Ensure that all mitigation measures for the project as soon as practical.
- Ensure that all management plans for the project as soon as appropriately.
- Ensure that budget allocation for all mitigation measures & management plans.

2.5 International Conventions, Treaties and Agreements

Myanmar has signed several international treaties related to the environment. The Error! Reference source not found. presents a list of the conventions signed by Myanmar.

Table 2.3 International Treaties and Conventions

No.	International Convention, Treaties and Agreements	Remarks
1.	Relevant ILO Conventions in force in Myanmar C1 Hours of Work (Industry) C14 Weekly Rest (Industry) C17 Workmen’s Compensation (Accidents) C19 Equality of Treatment (Accident Compensation) C26 Minimum Wage Fixing Machinery C29 Forced Labour Convention C42 Workmen’s Compensation (Occupational Diseases) Revised 1934 C52 Holidays with Pay C87 Freedom of Association and Protection of the Right to Organize	Ratified: 1921 1923 1956 1927 1954 1955 1957 1954 1955
2.	Plant Protection Agreement for the Southeast Asia and Pacific Region, Rome	1959 (Ratification)
3.	Treaty on the Prohibition of the Emplacement of Nuclear Weapons and other Weapons of Mass Destruction on the Sea Bed and Ocean Floor and in the Subsoil there of, London, Moscow, Washington, 1971	1971 (Signatory)
4.	MARPOL: International Convention for the prevention of pollution	1988

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No.	International Convention, Treaties and Agreements	Remarks
	from ships. November 2, 1973	(Accession)
5.	MARPOL: Protocol of 1978	1988 (Accession)
6.	Convention for the prevention of marine pollution from Land-Based Sources June 4, 1974	-
7.	ICAO: ANNEX 16 to the Convention on International Civil Aviation Environmental Protection Vol. I and II, Aircraft Noise and Aircraft Engine Emission	Accession
8.	Agreement on the Networks of Aquaculture Centers in Asia and the Pacific, Bangkok 1988	1990 (Accession)
9.	Convention on the Rights of the Child	1991 (Accession)
10.	Convention on the Prohibition of the Development, Production, Stockpiling and Use of Chemical Weapons and their Destruction, Paris, 1993	1993 (Signatory)
11.	Vienna Convention for the Protection of the Ozone Layer, Vienna 1985	24-11-1993 (Ratification)
12.	Montreal Protocol on Substances that Deplete the Ozone Layer, Montreal 1987	24-11-1993 (Ratification)
13.	London Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, London, 1990	24-11-1993 (Ratification)
14.	Agreement to Promote Compliance with International Conservation and Management Measures by Fishing Vessels on the High Seas, Rome, 1973	1994 (Acceptance)
15.	The Convention for the Protection of the World Culture and Natural Heritage, Paris, 1972	29-4-1994 (Acceptance)
16.	United Nations Framework Convention on Climate Change, New York, 1992 (UNFCCC)	25-11-1994 (Ratification)
17.	Convention on Biological Diversity, Rio de Janeiro, 1992	25-11-1994 (Ratification)
18.	International Tropical Timber Agreement (ITTA), Geneva 1994	1996 (Ratification)
19.	Agreement Relating to the Implementation of Part XI of the United Nations Convention on the Law of Sea of 10 December 1982, New York, 1994	21-5-1996 (Accession)
20.	Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), Washington DC 1973; and as amended in Bonn, Germany 1979	1997 (Accession)
21.	United Nations Convention to Combat Desertification in Those Countries Experiencing Serious Drought, Paris 1994	1997 (Accession)
22.	Convention on Elimination of All Forms of Discrimination against Women (CEDAW)	1997 (Accession)

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No.	International Convention, Treaties and Agreements	Remarks
23.	Cartagena Protocol on Biosafety, Cartagena, 2000	2001 (Signatory)
24.	ICAO: ANNEX 16 to the Convention on International Civil Aviation Environmental Protection Vol. I and II, Aircraft Noise and Aircraft Engine Emission	Accession
25.	Kyoto Protocol to the Convention on Climate Change, Kyoto 1997	2003 (Accession)
26.	Declaration on ASEAN Heritage Parks	2003 (Signatory)
27.	International Treaty on Plant Genetic Resources for Food and Agriculture, 2001	2004 (Ratification)
28.	Stockholm Convention on Persistent Organic Pollutants (POPs)	2004 (Accession)
29.	Ramsar Convention on Wetlands of International Importance	2005 (Accession)
30.	Establishment of ASEAN Regional Centre for Biodiversity	2005 (Signatory)
31.	Universal Declaration of Human Rights (UNDHR)	Signatory
32.	Convention for the protection of marine environment of the North-East Atlantic September 9, 1992	-
33.	Convention on the protection of the Marine Environment of the Baltic Sea Area April 9, 1992	-
34.	United Nations convention of the law of the sea December 10, 1982	-
35.	The Convention on the prevention of marine pollution by Dumping Waste and Other matter December 29, 1972	-
36.	Protocol to the convention on the prevention of marine pollution by Dumping of Waste and Other matter 1996	-

2.6 Standards and Guidelines for the Surrounding Environment of the Project

According to Article 10 of the Environmental Conservation Law (2012), (now MONREC set up some environmental quality standards, with the approval of the Union Government and the Committee.

As of 29 December 2015, emission guideline and target values of ambient air quality, air emission, wastewater, and noise levels were set in NEQEG, while other standards have not been set yet by MONREC.

In this Project, the Project Proponent, SC Auto (Myanmar) Company Limited basically apply the NEQEG and in case of no quantitative target values in NEQEG, the quantitative target values of other country and international organizations will be referred. Each quantitative target value to be applied is described below sections.

2.6.1 Air Quality

Since there is no ambient air quality standard in Myanmar and only air emission guideline values in National Environmental Quality Emission Guidelines (NEQEG) (2015) referred from WHO’s air quality guidelines, these guideline values shown in below table will be set as target values for both ambient and emission air quality for operation and closing phases.

Table 2.4 Air Emission Guidelines

No.	Parameter	Averaging Period	Guideline Value (µg/m ³)
1.	Nitrogen dioxide (NO ₂)	1-year	40
		1-hour	200
2.	Ozone (O ₃)	8-hour daily maximum	100
3.	PM ₁₀	1-year	20
		24-hour	50
4.	PM _{2.5}	1-year	10
		24-hour	25
5.	Sulfur dioxide (SO ₂)	24-hour	20
		10-minutes	500

Source: National Environmental Quality (Emission) Guidelines (NEQEG) (29 Dec 2015)

Since there are any combustion facilities designed to deliver electrical or mechanical power, steam, heat or any combination of these, it is necessary to set the target value for air emission level from combustion facilities in this project.

Table 2.5 Small Combustion Facilities Emission Guidelines

No.	Combustion Technology /Fuel	Particulate Matter PM ₁₀ ^a	Sulfur Dioxide	Nitrogen Oxides
1.	Gas	-	-	200 ^b mg/Nm ^{3c} 400 ^d mg/Nm ³ 1,600 ^e mg/Nm ³
2.	Liquid	100	3	1,600-1,850 ^f mg/Nm ³
3.	Natural gas (3-<15 MW ^g)	-	-	90 ^h mg/Nm ³ 210 ⁱ mg/Nm ³
4.	Natural gas (15-<50 MW)	-	-	50 mg/Nm ³
5.	Fuels other than natural gas (3-<15 MW)	-	0.5 % sulfur	200 ^h mg/Nm ³ 310 ^j mg/Nm ³
6.	Fuels other than natural gas (15-<50 MW)	-	0.5 % sulfur	150 mg/Nm ³
7.	Gas	-	-	320 mg/Nm ³
8.	Liquid	150 mg/Nm ³	2,000 mg/Nm ³	460 mg/Nm ³
9.	Solid ^j	150 mg/Nm ³	2,000 mg/Nm ³	650 mg/Nm ³

^aParticulate matter 10 micrometers or less in diameter, ^b Spark ignition, ^c Milligrams per normal cubic meter at specified temperature and pressure, ^d dual fuel, ^e compression ignition, ^f higher value applies if bore size > 400 m,

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^g Megawatt, ^h Electric generation, ⁱ mechanical drive, ^j Includes biomass

Source: National Environmental Quality (Emission) Guidelines (NEQEG) (29 Dec 2015)

2.6.3 Water Quality

According to International Water Quality Guidelines Study report published by United Nation Environment Program, there are various water quality standards and they are:

- a) Water Quality Standards
 - ❖ Water Quality Standards for Conservation of the living Environment (Rivers)
 - ❖ Water Quality Standards for Conservation of the living Environment (Lakes)
 - ❖ Water Quality Standards for Protecting Human Health (Rivers and Lakes)
- b) Ground Water Quality Standards
- c) Coastal Water Quality Standards
 - ❖ Coastal Water Quality Standards for Conservation of the Living Environment
 - ❖ Coastal Water Quality Standards for the Protection of Human Health
- d) Drinking Water Quality Standards

Although the water quality standards are widespread, for this IEE, Study GMES IEE Team selected WHO Drinking Water Standards - 2011 and also selected National Environmental Quality (Emission) Guidelines (2015) as effluent water standards for general effluent runoff.

Table 2.6 WHO Drinking Water Standards (2011)

No.	Parameter	Guideline Values	Unit
1.	Aluminum	0.2	mg/l
2.	Arsenic	10	µg/l
3.	Chloride	250	mg/l
4.	Copper	2	mg/l
5.	Cyanide	0.07	mg/l
6.	Manganese	0.4	mg/l
7.	pH	6.5~8.5	-
8.	Sulfate	250	mg/l
9.	Total Alkalinity	-	mg/l
10.	Total Dissolved Solids	600	mg/l
11.	Total Hardness	500	mg/l
12.	Total Iron	0.3	mg/l
13.	Turbidity	5	NTU

The guideline values for effluent water quality are referred to general application standards of NEQEG (2015) and tabulated in Error! Reference source not found..

Table 2.7 Effluent Water Standards for Operation Phase

No.	Parameter	Guideline Values	Unit
1.	5-day Biological oxygen demand (BOD)	50	mg/l

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No.	Parameter	Guideline Values	Unit
2.	Ammonia	10	mg/l
3.	Arsenic	0.1	mg/l
4.	Cadmium	0.1	mg/l
5.	Chemical oxygen demand (COD)	125	mg/l
6.	Chlorine (total residual)	0.2	mg/l
7.	Chromium (Hexavalent)	0.1	mg/l
8.	Chromium (total)	0.5	mg/l
9.	Copper (Cu)	0.5	mg/l
10.	Cyanide (free)	0.1	mg/l
11.	Cyanide (total)	1	mg/l
12.	Fluoride	20	mg/l
13.	Heavy metals (total)	10	mg/l
14.	Iron	3.5	mg/l
15.	Lead	0.1	mg/l
16.	Mercury	0.01	mg/l
17.	Nickel	0.5	mg/l
18.	Oil and grease	10	mg/l
19.	pH	6-9	S.U. ^a
20.	Phenols	0.5	mg/l
21.	Selenium	0.1	mg/l
22.	Silver	0.5	mg/l
23.	Sulfide	1	mg/l
24.	Temperature increase	<3	°C
25.	Total coliform bacteria	400	100 ml
26.	Total phosphorus	2	mg/l
27.	Total suspended solids	50	mg/l
28.	Zinc	2	mg/l

^a Standard unit

2.6.3 Noise Levels

According to the NEQEG, the noise levels are set as shown in the following table and noise prevention and mitigation measures should be taken by all projects where predicted or measured noise impacts from a project facility or operation exceed the applicable noise level guideline at the most sensitive point of reception. Noise impacts should not exceed the levels shown below, or result in a maximum increase in background levels of three decibels at the nearest receptor location off-site.

Since the project is located in Yangon Industrial Zone and surrounding receptors are industrial and commercial areas, the target noise level targeted to industrial and commercial receptors will be applied during the operation phase of the project.

Table 2.8 Ambient Noise Level Standards for Operation Phase

Receptor	One Hour L_{Aeq} , dB (A)	
	Day time 07:00-22:00 (10:00-22:00 for Public holidays)	Night time 22:00-07:00 (22:00-10:00 for Public holidays)
Resident, Institutional, Educational	55	45
Industrial Commercial	70	70

Source: National Environmental Quality (Emission) Guidelines (NEQG) (29 Dec 2015)

Table 2.9 OHS Noise Exposure Limits for the Work Environment (Noise Exposures in dBA)

Noise (dBA)	Permissible exposure Noise (hours and minutes)
85	16 hrs
87	12 hrs 6 min
90	8 hrs
93	5 hrs 18 min
96	3 hrs 30 min
99	2 hrs 18 min
102	1 hrs 30 min
105	1 hr
108	40 min
111	26 min
114	17 min
115	15 min
118	10 min
121	6.6 min
124	4 min
127	3 min
130	1min

Note: Exposures above or below the 90 dB limit have been "time weighted" to give what OSHA believes are equivalent risks to a 90 dB eight-hour exposure. [Source: Marsh (9)]

2.7 Institutional Framework of Myanmar Government Responsible for Project

2.7.1 Ministry of Natural Resources and Environmental Conservation (MONREC)

Ministry of Natural Resources and Environmental Conservation (MONREC) is the focal ministry for environmental management and empowered to undertake a range of regulatory activities under the Environment Conservation Law (ECL). The ECL gives MONREC mandate to implement the EIA-regime in Myanmar through the EIA Procedure.

2.7.2 The Environment Conservation Department (ECD)

The Environment Conservation Department (ECD) under MONREC has an executive role in environmental licensing, pollution control and monitoring of

environmental impacts and a coordination and collaboration role for the integration of environmental issues into sectorial planning. ECD is creating sub-national offices, at the regional level, with further offices planned at the district and township levels.

National Environmental Conservation and Climate Change Committee (NECCCC) has a coordinating role and a role in the approval of the EIAs.

2.7.3 Myanmar Investment Commission (MIC)

Myanmar Investment Commission (MIC) is the main administrative body for the granting of investment permits under the Myanmar Investment Law. Directorate of Investment and Company Administration (DICA) acts a secretariat to the MIC.

2.7.4 Department of Public Health

Department of Public Health within the Ministry of Health and Sports is responsible for occupational and health protection in Myanmar.

2.7.5 Ministry of Labor, Immigration and Population

Ministry of Labor, Immigration and population also is responsible for labor and welfare administration. The Department of Factories and general labor laws inspection monitors and enforces safety and health standards in factories and disseminates industrial safety information.

2.7.6 Directorate of Industrial Supervision and Inspection (DISI)

Directorate of Industrial Supervision and Inspection (DISI) is responsible to inspect and register for boiler according to the boiler law (2012) and electrical system in factory according to the electrical power law (2014).

2.7.8 Departmental Cooperation Team

The Departmental Cooperation Team is organized for the field inspection of the operation of business in accordance with section 14 of the Foreign Investment Law. The Departmental Cooperation Team is responsible for coordination between business and government department and to guide to the business for the government department's requirements

The Departmental Cooperation Team is organized by representatives from the governmental departments:

- (1) Directorate of Investment and Company Administration
- (2) Department of Customs
- (3) Department of Commerce
- (4) Directorate of Labor
- (5) Department of Immigration and National Registration
- (6) Ministry of Hotel and Tourism
- (7) Internal Revenue Department
- (8) Central Bank of Myanmar

- (9) Ministry of Electricity and Energy
- (10) Directorate of Industrial Supervision and Inspection
- (11) Ministry of Natural Resources and Environmental Conservation
- (12) Ministry of Agriculture, Livestock and Irrigation.

2.8 Key Commitment of Proponent for Environmental Management

The general commitments by SC Auto (Myanmar) Company Limited are as follows:

- ❖ To comply with all Myanmar laws, rules and regulations and Environmental Conservation Law (2012)
- ❖ To ensure that legal requirements are incorporated in designs for construction phase and in production procedures for operational phase
- ❖ To ensure that all contractors and sub-contractors follow strictly relevant legal and other requirements during construction phase
- ❖ To ensure all relevant legally required documents are readily available on site by the project proponent’s personnel, contractors and sub-contractors such as licenses, permits, approval applications
- ❖ To conduct environmental compliance audit at least bi-annually during operational phase
- ❖ To ensure implementation of company’s CSR program
- ❖ To ensure compliance with company’s OSH policy
- ❖ To submit the environmental monitoring report biannually.

3.0 DESCRIPTION OF THE PROJECT

3.1 Project Particulars

Project name	The Manufacturing, Assembling and Sales of Vehicles and Related Business Activities Project
Project location	No 188/189,10 th Road, Yangon Industrial Zone, Mingalardon Township, Yangon Region
Project proponent	SC AUTO (MYANMAR) COMPANY LIMITED
Office address	No 188/189,10 th Street, Yangon Industrial Zone, Mingalardone Township, Yangon Region
Contact person	Ms. Lee Swee Hoon
Designation	Promoter
Telephone	01-9670928
Email	Rachel.lee@scauto.com.sg
Proponent name	Wai Phyo Aung
Designation	Corporate Affairs Manager
Telephone	09- 254088442
Email	waiphyo.aung@scauto.com.sg

3.2 Project Location and Area

The proposed project is located in No 188/189,10th Road, Yangon Industrial Zone, Mingalardon Township, Yangon Region.



Figure 3.1 Google Earth Map of the Project Site

3.3 Site Boundaries and Surrounding Environment and Site Assess Road

At the vicinity of SC auto there are still plots which have no buildings. SC Auto factory is located in Mingalardon Industrial City. The detail access road is as shown in following figure.



Figure 3.2 Assess Road around the Project Area

3.4 Project Investment

Amount of foreign capital is to be brought in US \$ 10,901.65 Thousands.

3.5 Raw Materials

Raw materials are imported from Singapore via sea freight. It is transported from port to factory by car and stored in factory’s warehouse. Raw materials required for assembly are as follows. According to the ECD comment, the raw material imported amount is not have monthly because the factory will order for the raw material is annually imported.

Table 3.1 Annual Raw Materials Requirement (to be Imported)

No.	Particular	Unit	Quantity
1	CHASSIS	UT	30.00
2	CHASSIS - H	UT	70.00
3	STEEL MATERIAL	TON	560.00
4	E.G PERFORATED SHEET	PC	300.00

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No.	Particular	Unit	Quantity
5	ALUMINIUM SHEET	TON	98.00
6	ALUMINIUM CHEQUERED PLATE	TON	27.00
7	COPPER PIPE	PC	2,000.00
8	COPPER ELBOW	KG	5,000.00
9	COPPER BRAZING ROD	KG	1,000.00
10	PVC INSULATION TAPE/ MASKING TAPE	BOX	2,000.00
11	INSULATION SPONGE	LOT	200.00
12	BUS AIRCON	ST	100.00
13	BUS AIRCON PIPING KIT	ST	300.00
14	REFRIGERANTS 134 A	CY	100.00
15	AIRCON HOSE	ROLL	100.00
16	ALUMINIUM PROFILE	TON	50.00
17	RUBBER PROFILE, HOSE & STOPPER	ROLL	500.00
18	DOOR PUMP	ST	210.00
19	DRIVER SEAT	ST	100.00
20	DRIVER SEAT MOUNTING BRACKET	PC	100.00
21	BUZZER	BOX	400.00
22	WIPER SET	ST	220.00
23	BUS INTERIOR ACCESSORIES	BOX	200.00
24	PVC WIRE COVER	ROLL	800.00
25	TERMINAL SOCKET/WIRE CONNECTOR	BOX	800.00
26	SWITCH	BOX	100.00
27	SENSOR	BOX	100.00
28	EMERGENCY DOOR SENSOR SWITCH	BOX	100.00
29	CAR PARKING/REVERSING SENSOR SYSTEM	ST	120.00
30	CABLE TIE	BOX	300.00
31	RELAY	BOX	100.00
32	FUSE	BOX	100.00
33	DIODE	BOX	100.00
34	HEAD LAMP	ST	1,300.00
35	TAIL LAMP	ST	2,600.00
36	LAMP	PC	3,500.00
37	BULB	BOX	100.00
38	TIMER	BOX	100.00
39	MONITOR	ST	300.00
40	CONVERTOR	PC	110.00
41	INVERTOR	PC	110.00
42	DVD PLAYER	PC	120.00
43	CAMERA AND ACCESSORIES	ST	120.00
44	BUS AUDIO SYSTEM	ST	100.00
45	HEAD PHONE	ST	5,100.00
46	HEAD END RECEIVER	ST	100.00
47	MICRO WAVE OVEN	PC	100.00
48	THERMOPOT	PC	100.00
49	INSULATION FOAM	PC	800.00
50	HNDLE AND LOCK	BOX	300.00
51	RUBBER MAT	ROLL	50.00

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No.	Particular	Unit	Quantity
52	FRONT WINDSCREEN GLASS	PC	240.00
53	BUS SIDE BODY GLASS	PC	3,000.00
54	DRIVER WINDOW WITH GLASS	PC	240.00
55	BEARING AND PILLOW BLOCK	BOX	650.00
56	HOSE CLIP	BOX	120.00
57	GAS SPRING	PC	4,000.00
58	BONNET CABLE 011019	ST	120.00
59	HINGES	BOX	500.00
60	ROCK WOOL INSULATION	PA	1,000.00
61	VENTILATION FAN	ST	220.00
62	INTERIOR LED LIGHTING SYSTEM	ROLL	700.00
63	FIRE EXTINGUISHER	PC	200.00
64	AIR LOUVER	PC	1,000.00
65	FORMICA	PC	1,000.00
66	REAR VIEW MIRROR SYSTEM	ST	500.00
67	STAINLESS STEEL BASIN	PC	100.00
68	INTERIOR LUGGAGE RACK SYSTEM	ST	120.00
69	SANDPAPER	BOX	730.00
70	COTTON CLOTH	PA	112.00
71	SEALANT AND ACTIVATOR	BOX	5,500.00
72	PASSENGER SEAT	BOX	5,100.00
73	GUIDE SEAT	BOX	100.00
74	ADHESIVE GLUE	TIN	1,000.00
75	INTERIOR PVC MATERIAL	ROLL	700.00
76	FLOOR RUBBER	ROLL	400.00
77	PLYWOOD	PC	3,000.00
78	SCREW, BOLT, NUT AND WASHER	BOX	3,000.00
79	REVIT (1000pcs/Box)	BOX	2,000.00
80	STICKER	BOX	200.00
81	CURTAIN ACCSSORIES	ST	100.00
82	PLASTIC COVER	BOX	100.00
83	WHEEL DECORATION COVER	BOX	240.00
84	LASER CUT STEEL PLATE/BUSHES	TON	150.00
85	SUN CURTAIN	ST	200.00
86	PAPER ROLL	ROLL	500.00
87	REFRIGERATOR	SET	100.00
88	WELDING ROD FOR FLOOR	ROLL	220.00
89	ENGINES & ACCESSORIES	ST	100.00
90	TRANSMISSION SYSTEM & ACCESSORIES	ST	100.00
91	REAR AXLE SYSTEM & ACCESSORIES	ST	100.00
92	COOLING PAD & ACCESSORIES	ST	100.00
93	FRONT AXLE SYSTEM & ACCESSORIES	ST	100.00
94	MINI-KITCHEN	ST	100.00
95	BUS TOILET SYSTEM & ACCESSORIES	ST	100.00
96	ALUMINIUM MATERIAL (VARIOUS TYPE & SIZES)	TON	30.00
97	ENTERTAINMENT SYSTEM	ST	150.00
98	FERRITIC STEEL HOLLOW SECTION	TON	320.00

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No.	Particular	Unit	Quantity
99	ELECTRICAL DISTRIBUTION BOARD & ACCESSORIES	ST	100.00
100	SHEET MATERIALS (VARIOUS TYPE & SIZE)	TON	112.50
101	STEEL BLOCKS (VARIOUS TYPES & SIZES)	TON	50.00
102	DVR RECORDER	ST	150.00
103	INVERTERS	BOX	100.00
104	INSTRUMENTAL CLUSTER & SWITCH PACK & ACCESSORIES	ST	100.00
105	BRAKE SYSTEM & ACCESSORIES	ST	100.00
106	TRANSMISSION OIL	DRUMS	30.00
107	HYDRAULIC OIL	DRUMS	30.00
108	POWER STEERING OIL (ATF III FLUID)	PACK	500.00
109	FIBRE GLASS MATERIAL - GELCOAT	DRUMS	160.00
110	FUEL TANK & ACCESSORIES	ST	200.00
111	SERVOCOM	BOX	100.00
112	CARDAN SHAFT	PC	100.00
113	ENGINE OIL	DRUMS	50.00
114	HYDRAULIC PUMP	BOX	210.00
115	PANELS (VARIOUS TYPES & SIZES)	TON	100.00
116	SUSPENSION SYSTEM & ACCESSORIES	ST	100.00
117	COOLING WATER SYSTEM & ACCESSORIES	ST	100.00
118	COOLER BOX	ST	100.00
119	FIBRE GLASS MATERIAL - RESIN	DRUMS	600.00
120	WIRE MESH	RO	4.50
121	UNIONS (VARIOUS TYPES & SIZES)	BOX	100.00
122	FAN DRIVE SYSTEM & ACCESSORIES	ST	100.00
123	AIR COOLING SYSTEM & ACCESSORIES	ST	100.00
124	MULTIC 2	BOX	120.00
125	FRONT DISTRIBUTION BOARD ACCESSORIES & ASSEMBLY	ST	100.00
126	REAR DISTRIBUTION BOARD ACCESSORIES & ASSEMBLY	ST	100.00
127	STEEL PIPES (VARIOUS SHAPES & SIZES)	TON	100.00
128	FRONT STABILIZER BAR	PC	100.00
129	HYDRAULIC OIL	DRUMS	200.00
130	CRIMP PINS	BOX	100.00
131	DROP ARM	PC	120.00
132	AIR INTAKE SYSTEM & ACCESSORIES	ST	100.00
133	FRONT STEERING SYSTEM & ACCESSORIES	ST	100.00
134	PCB BOARD	PC	100.00
135	TYRES	PC	700.00
136	LCD TV	PC	300.00
137	LUGGAGE DOOR PUMP	ST	210.00
138	AIR CLEANER	BOX	100.00
139	COOLANT	DRUMS	50.00
140	STEEL FRAMES (VARIOUS TYPES & SIZES)	TON	200.00
141	HOLLOW SECTIONS (VARIOUS TYPE & SIZES)	TON	300.00

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No.	Particular	Unit	Quantity
142	FUEL SYSTEM & ACCESSORIES	ST	100.00
143	BRACKETS (VARIOUS TYPES & SIZES)	TON	100.00
144	INTERMEDIATE SHAFT	BOX	100.00
145	EMERGENCY SYSTEM & ACCESSORIES	ST	120.00
146	AIR DRYER	BOX	100.00
147	FIBRE GLASS MATERIAL - ACETONE	DRUMS	160.00
148	DIESEL EURO 6	DRUMS	100.00
149	FLOOR LIGHT STRIPS & ACCESSORIES	ST	100.00
150	RODS & PIPES (VARIOUS TYPE & SIZES)	TON	50.00
151	BATTERY	PC	220.00
152	AIRCON COMPRESSOR SYSTEM & ACCESSORIES	ST	100.00
153	PULLEY & ACCESSORIES (VARIOUS TYPES & SIZES)	SET	300.00
154	FIBRE PARTS (VARIOUS TYPES & SIZES)	SET	400.00
155	DE-IONISED WATER	DRUMS	50.00
156	HOSES (VARIOUS TYPES & SIZES)	ROLL	1,000.00
157	MOUNTING RUBBER (VARIOUS TYPES & SIZES)	BOX	300.00
158	FUEL HOSE	ROLL	5.00
159	AIR SUPPLY SYSTEM & ACCESSORIES	ST	100.00
160	ADBLUE	DRUMS	50.00
161	MULTIFUNCTION GATEWAY	PC	110.00
162	BEVEL BOX	BOX	100.00
163	HYDRAULIC RESERVOIR	BOX	100.00
164	VALVES (VARIOUS TYPES & SIZES)	BOX	100.00
165	FRONT TO REAR STEERING SYSTEM & ACCESSORIES	ST	100.00
166	FIBRE GLASS MATERIAL - PIGMENT	TIN	55.00
167	ELECTRICAL CONTROL UNIT	BOX	1,000.00
168	ACCELERATOR PEDAL & ACCESSORIES	ST	100.00
169	TERMINAL SEALS & PLUGS (VARIOUS TYPES & SIZES)	BOX	300.00
170	AIR BELLOW	PC	600.00
171	REAR STEERING SYSTEM & ACCESSORIES	ST	100.00
172	FIBRE GLASS MATERIAL - CHOPPED STRAND MAT ECM	ROLL	800.00
173	AMPLIFIER	BOX	100.00
174	STEERING WHEEL & ACCESSORIES	ST	100.00
175	INTERIOR LUGGAGE CASTING PARTS	BOX	400.00
176	CASTED PARTS (VARIOUS SHAPES & SIZES)	TON	100.00
177	FIBRE GLASS MATERIAL - MOLD RELEASE WAX CHEMLEASE PMR	TINS	200.00
178	FIBRE GLASS MATERIAL - REOLOSIL	BAG	100.00
179	T-JOINTS & BRACKETS (VARIOUS TYPES & SIZES)	BOX	100.00
180	WHEEL RIM & ACCESSORIES	ST	700.00
181	FIBRE GLASS MATERIAL - WOVEN ROVING	CARTON	100.00
182	SWITCH PACK	BOX	100.00
183	CONTACT PIN, TERMINAL & PINS	BOX	300.00
184	SEAT BELT (VARIOUS TYPES)	BOX	100.00

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No.	Particular	Unit	Quantity
185	WIPER WATER TANK	ST	120.00
186	RUBBER HOSES (VARIOUS TYPES & SIZES)	ROLL	500.00
187	CLAMPS (VARIOUS TYPES & SIZES)	BOX	200.00
188	SWIVEL CONNECTORS (VARIOUS TYPES & SIZES)	BOX	100.00
189	CONNECTORS (VARIOUS TYPES & SIZES)	BOX	1,000.00
190	QUICK CONNECTORS (VARIOUS TYPES & SIZES)	BOX	100.00
191	ADAPTORS (VARIOUS TYPES & SIZES)	BOX	100.00
192	ELECTRICAL ACCESSORIES ((VARIOUS TYPES)	BOX	300.00
193	BATTERY DISTRIBUTION BOARD	ST	100.00
194	FUEL LEVEL SENSOR	BOX	110.00
195	AIR RESERVOIR	ST	800.00
196	REAR STABILIZER BAR	PC	110.00
197	CONNECTOR HOUSINGS (VARIOUS TYPES & SIZES)	BOX	200.00
198	TIER RINGS (VARIOUS TYPES & SIZES)	BOX	100.00
199	HOSE ASSEMBLY (VARIOUS TYPES & SIZES)	ST	2,000.00
200	DAMPERS	PC	800.00
201	EMERGENCY DOOR LOCK	ST	220.00
202	WIRE HARNESS MATERIALS (WIRE)	DRUMS	1,000.00
203	REGULATORS	ST	400.00
204	OIL RESERVOIR	BOX	110.00
205	NYLON TUBING (VARIOUS TYPES & SIZES)	ROLL	1,000.00
206	WIRE HARNESS & ACCESSORIES	ST	5,000.00
207	REDUCERS (VARIOUS TYPES & SIZES)	BOX	100.00
208	OIL TANK	BOX	100.00
209	TEES (VARIOUS TYPES & SIZES)	BOX	100.00
210	WIRE CONNECTORS (VARIOUS TYPES & SIZES)	BOX	500.00
211	WIRE HARNESS MATERIALS (ACCESSORIES))	BOX	500.00
212	AIR FILTER	BOX	110.00
213	FIRST AID KIT	PC	120.00
214	AIR ELEMENT	BOX	120.00
215	REMOTE CONTROL	ST	120.00
216	CAVITY PLUGS (VARIOUS TYPES & SIZES)	BOX	500.00
217	DIGITAL CLOCK	PC	150.00
218	FIBRE GLASS MATERIAL - MEKP	CARTON	320.00
219	STANCHION POLES (VARIOUS TYPES & SIZES)	ST	100.00
220	PAINTING ACCESSORIES AND CONSUMABLES (PAINT BRUSHES, ROLLERS ETC)	BOX	200.00
221	FLEXIBLE TUBINGS (VARIOUS TYPES & SIZES)	ROLL	2,000.00
222	FLANGE (VARIOUS TYPES & SIZES)	BOX	100.00
223	HEAT INSULATION SPONGE	PC	1,000.00
224	PCB ACCESSORIES (MINI PCB)	BOX	100.00
225	HARNESS MACHINE PRINTING INK	BTL	5.00
226	MIXCHLACK (MIXING PAINT) VARIOUS COLOR	TIN	3,500.00
227	COOLING UNIT SYSTEM & ACCESSORIES	ST	100.00
228	STABILIZER LINK	PC	420.00
229	HORN	PC	220.00
230	HANDRAILS (VARIOUS TYPES & SIZES)	PC	1,500.00

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No.	Particular	Unit	Quantity
231	FOAM TAPES	ROLL	1,000.00
232	INTERIOR UPHOLSTERY SPONGE	ROLL	1,000.00
233	RUBBER COMPONENTS (VARIOUS TYPES & SIZES)	BOX	300.00
234	WIPER TANK & ACCESSORIES	BOX	300.00
235	RIBBED HOSES (VARIOUS TYPES & SIZES)	ROLL	500.00
236	ELECTRICAL CONTACTS (VARIOUS TYPES & SIZES)	BOX	200.00
237	HEIGHT CONTROL VALVE	PC	500.00
238	PAINT REDUCER	TIN	5,000.00
239	PAINT HARDENER	TIN	5,500.00
240	LUGGAGE RUBBER	ROLL	440.00
241	TIE ROD ENDS	BOX	600.00
242	DOOR BELTS	PC	300.00
243	VINYL STICKER	BOX	100.00
244	SERVICE SET	PC	3,000.00
245	PAINT CLEAR COAT	TIN	3,500.00
246	FAN BELTS (VARIOUS TYPES & SIZES)	PC	500.00
247	FIBRE GLASS MATERIAL - MIRROR GLAZE	TIN	320.00
248	PAINT PRIMER	TIN	4,000.00
249	DOOR ALARM	PC	200.00
250	PAINT PUTTY	BOX	1,100.00
251	BUSHES (VARIOUS TYPES & SIZES)	PC	3,000.00
252	INSULATION MATERIALS & ACCESSORIES (SPONGES, FOAM ETC)	PC	1,000.00
253	SOUND INSULATION SPONGE	PC	3,000.00
254	GASKET RUBBER	ROLL	500.00
255	DOOR CHIMES	PC	300.00
256	SWITCH COMBINATION	BOX	650.00
257	BALL JOINT	BOX	100.00
258	T & V VERTEILER	BOX	100.00
259	BUSHING (VARIOUS TYPES & SIZES)	BOX	100.00
260	EMERGENCY HAMMER	PC	1,000.00
261	BEARINGS (VARIOUS TYPES & SIZES)	BOX	200.00
262	PUSH BELLS	PC	1,000.00
263	PUSH BUTTONS	PC	1,000.00
264	COUPLINGS (VARIOUS TYPES & SIZES)	BOX	100.00
265	SOCKETS (VARIOUS TYPES & SIZES)	BOX	100.00
266	DOOR COCK HOUSING	ST	450.00
267	POLYFOAM	PC	2,000.00
268	HANDLES (GRAB HANDLE, DOOR HANDLE ETC)	ST	3,000.00
269	SENSORS	BOX	100.00
270	FITTINGS (VARIOUS TYPES & SIZES)	BOX	100.00
271	HEAT SHRINK TUBE (VARIOUS TYPES & SIZES)	ROLL	200.00
272	DOOR STOP RUBBER	BOX	100.00
273	CABLES (VARIOUS TYPES & SIZES)	DRUMS	300.00
274	WATER TRANSFER PRINTING FILM	CARTON	10.00
275	WATER TRANSFER PRINTING ACTIVATOR	BOX	10.00

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Table 3.2 Annual Raw Material Requirement (Local)

No.	Particular	Unit	Quantity
1	Compressed argon(10.4 m3/cyl)	CY	50
2	Oxygen gas O2 7.4 m3/cyl	CYL	90
3	Acetylene Gas 6.6 m3 /cyl	CYL	135
4	Nitrogen gas N2 6.8 M3/cyl	CY	90
5	Carbon dioxide CO2 gas 31 kg/cyl	CY	300
6	Argon mix blue shield	CY	200

Table 3.3 Estimated Annual Requirement of Chemical and Related Substances

No.	Name	Annual Requirement
1	Aircon Refrigerant Gas R134a	1,633 U
2	PU Foam B3	1,360 U
3	Rock Wood Insulation (Rockwood Stone Wool) (Mineral Wool)	1,680 U
4	Fire Extinguisher Dry Chemical Powder (fire class A, B, C)/ ABC Dry Chemical Powder	1,000 U
5	Sealant Activator Primer (Sika Primer-206 G+P)	6,000 U
6	Adhesives (Various Types) World Brand Adhesive No.800	1,800 U
7	Fibre Glass Material – Gelcoat GH/ GS 5200-8	31,000 kg
8	Fibre Glass Material- Resin Solution, flammable/ Flameguard 2597 PT-FR-26	16,800 kg
9	Fibre Glass Material- Pigment (J – Series pigment Paste)	5,200 kg
10	Fibre Glass Material-Fibreglass Roving, Chopped Stand, Mat, Milled fiber, Glass Flake, Yarn, Fibreglass Cloth, Surface Tissue, C Veil, Boat Tape, Glass Tape, Biaxial Mat, Triaxial, Vitrocore, Unidirectional Fabric, Quadriaxial Fabric	3,600 kg
11	Fibre Glass Material- Mold Release Wax Chemlease PMR (Megular’s M08-Mirror Glaze Maximum Mold Release Wax) (23-135A)	2,963 L
12	Fibre Glass Material-Reolosil	4,000 kg
13	Fibre Glass Material- Woven Roving	2,360 kg
14	Fibre Glass Material-MEKP (Methyl Ethyl Ketone Peroxide Esterox Series)	3,340 kg
15	Harness Machines Printing Ink (1071 Fault- Finder Cleaner Group 1)	3,000 U
16	Mixchlack (Mixing Paint) Various Color Permacron Mixing Colour Series 293 (N), (Xi)	3,300 L
17	Paint Reducer (Permahyd Steinschlag Elastic Schwrz/ Black)	1,230 L
18	Paint Hardener (Rederal Hardner 0909 Red)	1,090 L
19	Paint Clear Coat	2,350 L

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	(37480120 A4LT Permafast Trubo 2K Clearct)	
20	Fibre Glass Material-Mirror Glaze (Meguiar’s M08-Mirror Glaze Maximum Mold Release Wax (23-135 A))	400 U
21	Paint Primer (Permafleet 1:1 Wash Primer Lasierend 3688)	1,330 L
22	Paint Putty (Raderal IR Premium Spachtel 2035)	5,088 kg
23	Insulation Materials & Accessories (Sponges, Foam ETC)	855 U

Table 3.4 List of Spray Paint using Amount (Annual)

CHASSIS NO; (3001,3004,3006,3007,3008,3009,3010,3011) - 2Axle (8 Units)								
No.	ERP Part No;	COLO R CODE	Particular	Unit	Qty	Qty for one /bus	Qty for 8 buses	Imported Location
1	PAI0064	W8617	TONER WHITE	LT	96.00	12.00	96.00	Singapore
2	PAI0124	299	SILVER (DARK SILVER)	LT	16.00	2.00	16.00	Singapore
3	PAI0069	X 0092	SILVER BLACK	LT	16.00	2.00	16.00	Singapore
4	PAI0123	95691	Light Silver	LT	80.00	10.00	80.00	Singapore
CHASSIS NO; (3002,3003,3016,3020) - 2Axle (4 Units)								
No.	ERP Part No;	COLO R CODE	Particular	Unit	Qty	Qty for one /bus	Qty for 4 buses	Imported Location
1	PAI0264	Nil	BASED RED (SOLID) R71,BD,AC11071 (30190) PASSION RED-MAIN COLOUR	LT	64.00	16.00	64.00	Singapore
2	PAI0321	Nil	DARK RED	LT	48.00	12.00	48.00	Singapore
3	PAI0069	X 0092	SILVER BLACK	LT	8.00	2.00	8.00	Singapore
4	PAI0064	W8617	TONER WHITE	LT	32.00	8.00	32.00	Singapore
5	PAI0124	299	SILVER (DARK SILVER)	LT	400	1.00	4.00	Singapore



Figure 3.3 Photos of Spray Paints Storage System

3.6 Equipment (to be imported)

The using equipment for the production process are as shown in the following.

Table 3.5 Equipment to be Imported

No.	Particular	Unit	Quantity
1	Flaring Tools	PC	3
2	Manifold Gauge	ST	5
3	Refrigerant Recovery Machine	ST	2
4	Vaccum Pump	ST	3
5	Digital Weighing Machine	ST	3
6	Refrigerant Gas Analyzer	ST	2
7	Pipe Bulging Tools	ST	6
8	Pipe Bending & Cutting Tools Set	ST	6
9	Brazing Kit	ST	6
10	Refrigerant Gas Leak Detector	ST	12
11	Torque Wench	PC	20
12	Clutch Removal Tools	PC	6
13	Feeler Gauge	PC	6
14	Belt Tension Gauge	PC	6
15	Measuring Cylinder	PC	6
16	Angle Alignment Gauge	PC	6
17	Multi-Meter	ST	8
18	Ammeter Clamp	ST	6
19	Anemometer (Air Flow Meter)	ST	6
20	Evaporator Coil Fin Comb	ST	6
21	Digital Thermometer	ST	6
22	Air Impact Wrench Set	PC	8
23	Hand Drilling Tools	PC	100
24	Sticker Plotting Machine	PC	1
25	Manual Milling Machine	PC	2
26	Manual Lathe Machine	PC	2
27	Bench Saw Machine	PC	2
28	Angle Crimping Tools	PC	50
29	Engineering Large Printing Machine	PC	3
30	Hand Rivetor	PC	50
31	Drill Chuck	PC	50
32	Silicon/Sealant Applicator Tools	PC	50
33	Saw Machine (Air)	PC	2
34	Aluminim Cutting Tools	PC	10
35	Rivet Applicator Tools	PC	30
36	Overhead Crane 10 Tons	PC	2
37	Overhead Crane 5 Tons	PC	1
38	Welding Machine for Argon	PC	3
39	MIG Welding Machine with Feeder	PC	46
40	MIG Welding Machine without Feeder	PC	20
41	Welding Machine for Stainless Steel	PC	3
42	Metal Cutting Bandsaw Machine	PC	3
43	Aluminim Sheet Cutting Tools	PC	10

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44	Aluminum Profile Cutting Machine	PC	2
45	Saw Blade for Aluminum Cutting Machine	PC	10
46	Saw Blade for Aluminum & Wood	PC	20
47	Battery for Drill Machine	PC	2
48	Hand Impact Drilling Machine	PC	8
49	Insert for Milling Machine	PC	10
50	Holder for Insert	PC	1
51	Insert Tools	PC	2
52	Hand Sanding Tools	PC	20
53	G Clamp	PC	100
54	Grooving Insert	PC	10
55	Boring Insert	PC	20
56	Machine Tap	PC	20
57	Digital Clamp Multimeter	PC	2
58	Digimatic Holtest	PC	2
59	Micrometer	PC	8
60	Ring Gauge	PC	2
61	Computers/Laptops/Peripheral	ST	60
62	Air Compressor Set	ST	3
63	Receiver Tank for Air Compressor	PC	6
64	Dryer for Air Compressor	PC	3
65	Forklift 3 Ton	PC	2
66	Tools Box	PC	5
67	F-Clamp	PC	120
68	C-Clamp	PC	50
69	Webbing Sling	PC	50
70	Measuring Tape	PC	200
71	Steel Ruler	PC	30
72	Safety Helmet	PC	1,000
73	Impact Wrench (Air)	PC	5
74	Vernier Caliper	PC	20
75	Digital Multimeter	PC	2
76	Sound Level Tester	PC	2
77	Saw Blade for HSS	PC	50
78	Profile Bending Machine	PC	1
79	Press brake Machine	PC	3
80	Sheet Metal Folding Machine	PC	1
81	Guillotine Shearing Machine	PC	3
82	Plate Rolling Machine	PC	1
83	Polishing Tools	PC	20
84	Sanding Tools	PC	5
85	Scissor Lift (Man Lift)	PC	3
86	Bus Body Grinding Machine	PC	20
87	Metal Grinding Machine	PC	20
88	Spray Paint Booth	LOT	1
89	Spray Painting Guns/Equipment	PC	20
90	Sanding Equipment	PC	12
91	Welding Shield (Auto)	PC	10

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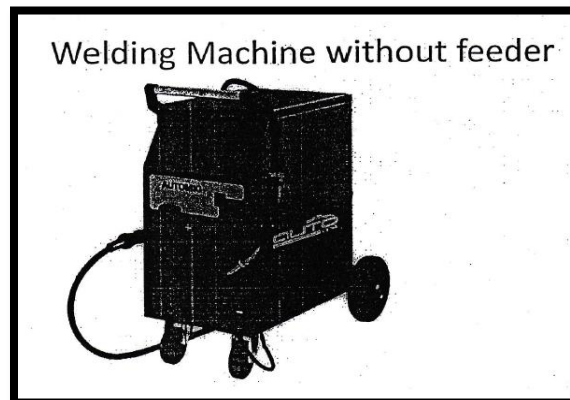
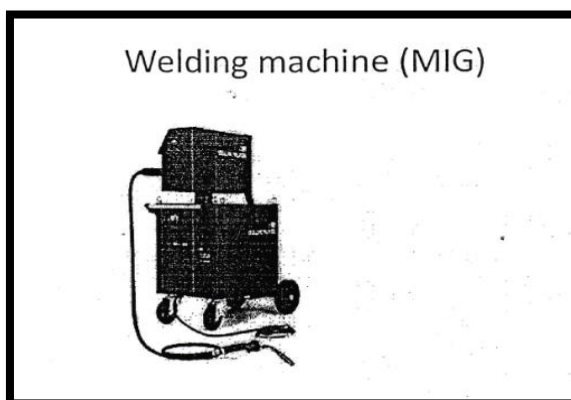
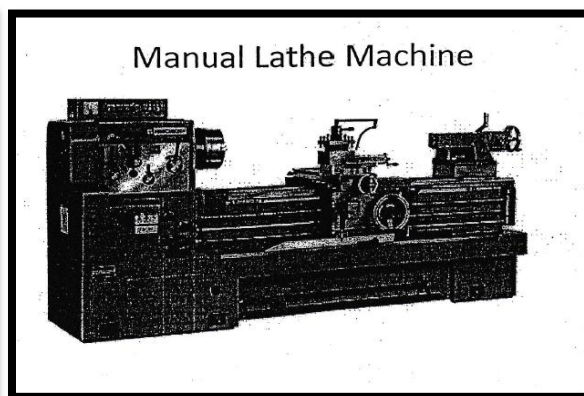
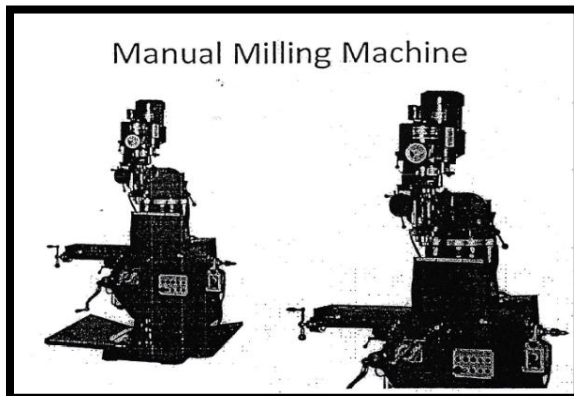
92	Air Hose	PC	15
93	Spare Parts for Welding Machine	PC	12
94	Gas Cutting Torch	PC	10
95	Gas Regulator for Welding Machine	PC	12
96	Chain for Industrial use	PC	15
97	Swan Neck	PC	20
98	Gas Welding Torch	PC	22
99	Flashback Arrestor for Welding Machine	PC	20
100	Spare Parts for Grinding Machine	PC	10
101	Structure Production Moulds	ST	3
102	Structure Production Jigs/Fixture	ST	3
103	Structure Production Templates	ST	3
104	Fibre Production Moulds	ST	3
105	Metal Bar Cutting Machine	PC	5
106	Gas Regulator for Welding Machine	PC	20
107	Welding Torch	PC	10
108	Magnetic Core Drilling Machine	PC	5
109	Silicon/Sealant Applicator	PC	40
110	Wireless Mobile Column Hoist	ST	8
111	Heat Applicator for Upholstery	PC	2
112	Computerised Software for Manufacturing (ERP-Enterprise Resource Planning)	LOT	1
113	Server for ERP	LOT	1
114	Production Floor Computers/Monitors/Handheld devices	LOT	10
115	Small Crane	ST	3
116	CNC Milling	ST	1
117	CNC Turning	ST	1
118	Projectors	PC	5
119	Video Conferencing System	ST	1
120	Main Servers/Back up Servers	ST	3
121	Floor Rubber Mounting Equipment	ST	2
122	Upholstery Sealing Application Equipment	ST	2
123	Warehouse Mobile Trolleys	PC	200
124	Warehouse Storage Racks	LOT	1
125	Electric Stacker	ST	2
126	Production Tools Cabinet & Work Bench	ST	20
127	Pipe Threading Machine	UT	1
128	Pre-filter & After Filter for Air Compressor	UT	2
129	Hydraulic Press Machine	UT	2
130	3D Welding Table & accessories	UT	3
131	Workstation System Furniture	Lot	1
132	Electric Scissor Lift	UT	1
133	Water Filtration System	UT	1
134	2D Laser Cutting Machine	UT	1
135	Tube Laser Cutting Machine	UT	1
136	Pneumatic Portable Marking Machine	UT	1
137	Wire Processing Machine	UT	1

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138	Applicators for Wire Processing Machine	UT	30
139	Wire Harness Testing Machine	UT	1
140	Bench Top Wire Twister Machine	UT	1
141	Pneumatic Crimping Press Machine	UT	1
142	Wire Stripper	UT	1
143	Ultrasonic Metal Welding System	UT	1
144	Networking Switch Hubs	PC	7
145	Firewall Appliance for Network Security	PC	1
146	Biometric Security Devices	PC	20
147	Spare parts for Spray Paint Booth	PC	20
148	Compactor System	Set	1
149	Floor Rubbers & accessories	Lot	1
150	Storage Bins for Warehouse	PC	3000
151	Furnitures (Sofa, mattress, dining tables, chairs, lamps, coffee tables, curtains etc)	Lot	1
152	Spare parts for Machines repair	PC	50
153	Media wall system & accessories	lot	1
154	LCD TV for meeting rooms	lot	1
155	Water Feature	PC	3
156	Ventilator Fan	PC	5
157	Tools for machines	PC	20
158	Server Rack	PC	3
159	Paint Mixing Machine	UT	1
160	Dust Collector	UT	1
161	Tube Bender	UT	1

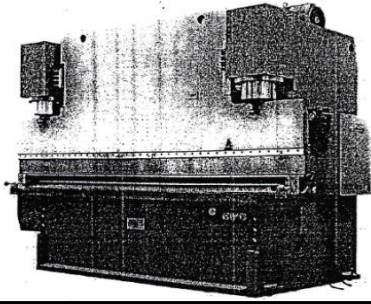


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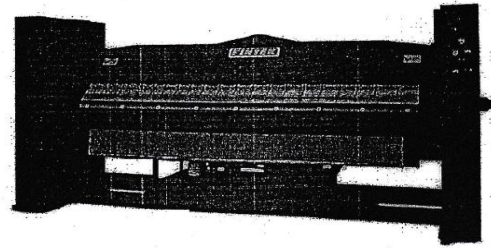
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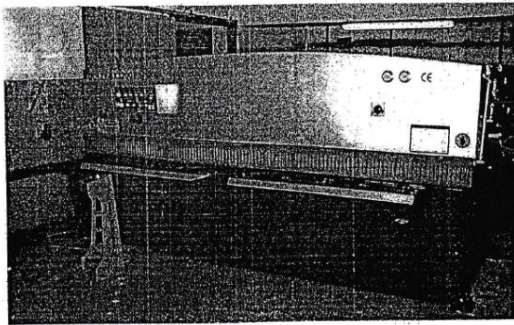
Sheet Metal bending Machine



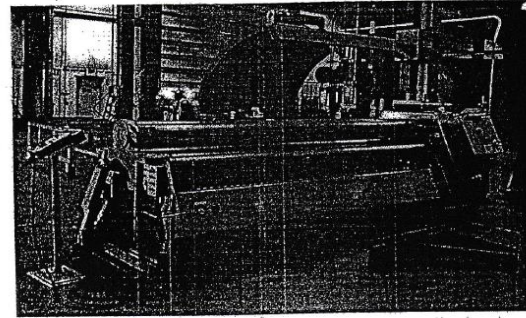
Sheet Metal folding Machine



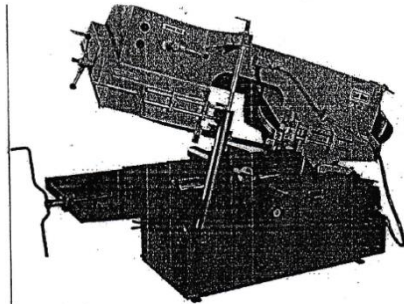
Sheet Metal cutting Machine



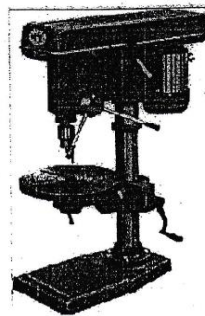
Sheet Metal Rolling Machine



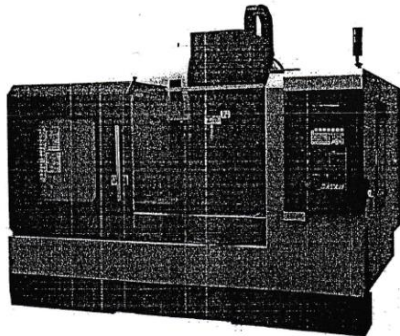
Metal bar Cutting Machine



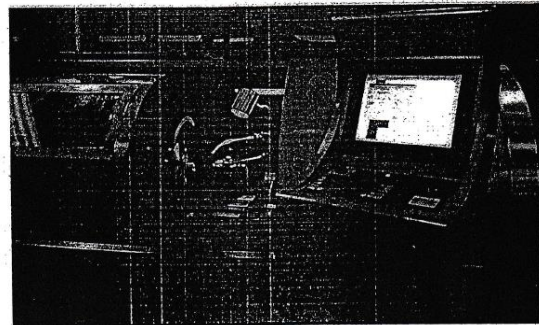
Magnetic core drilling machine



CNC MILLING



CNC TURNING

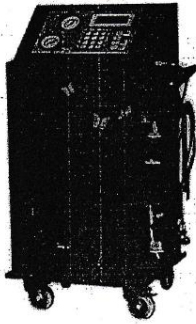


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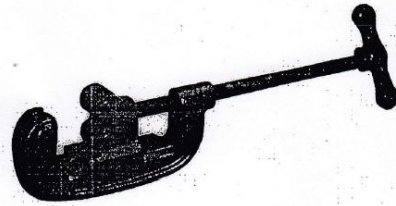
“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

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Refrigerant Recovery machine



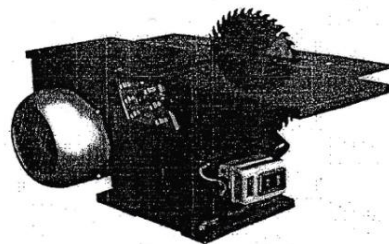
Pipe Bulging Tools



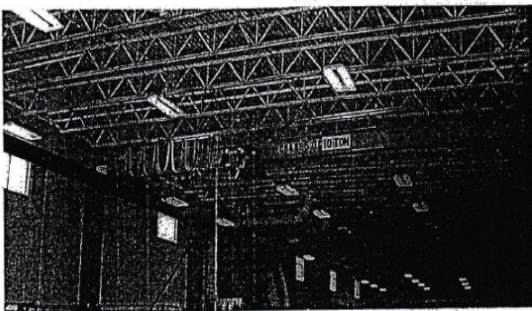
Sticker plotting Machine



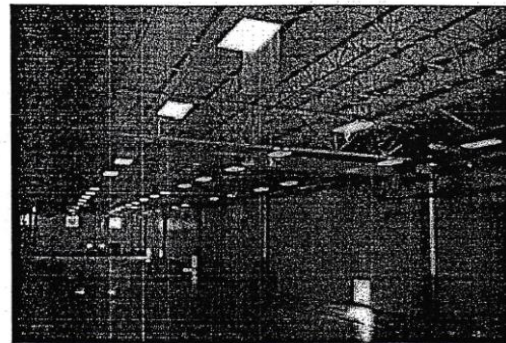
Bench saw Machine



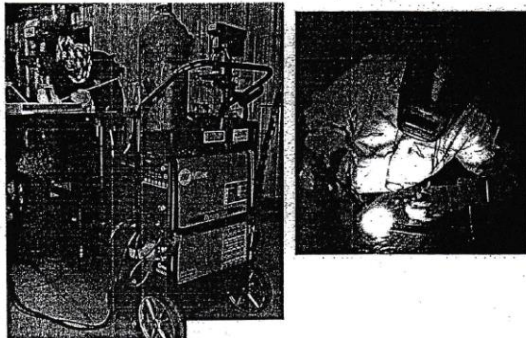
Overhead Crane 10 Tons



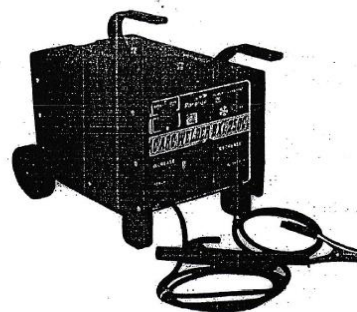
Overhead Crane 5 Tons



Welding machine (Argon)



Electric Arc welding Machine

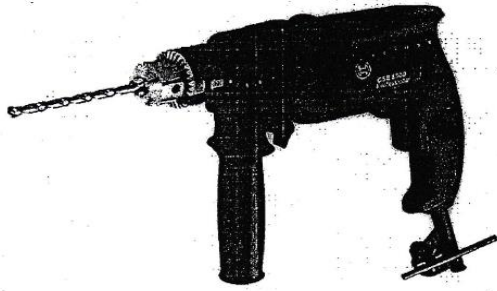


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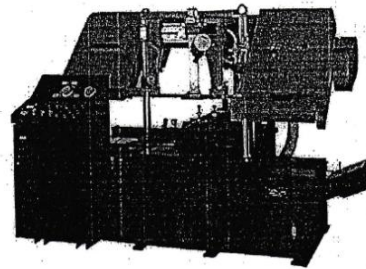
“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

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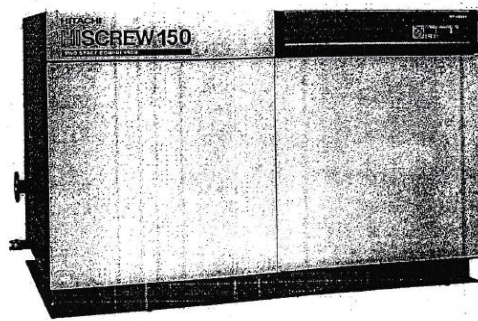
Drilling Machine



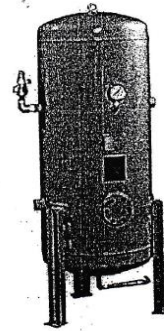
Metal Cutting Band saw Machine



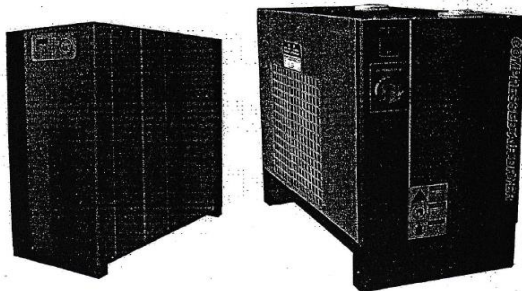
Air compressor set



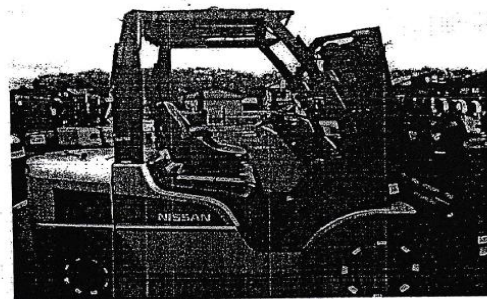
Receiver tank for Air compressor



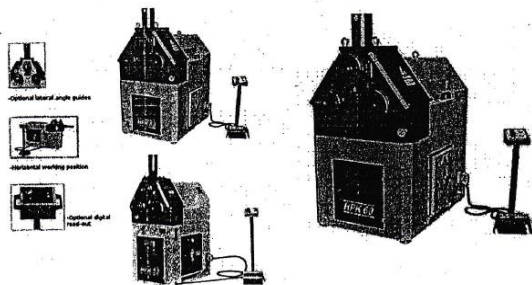
Dryer for Air compressor.



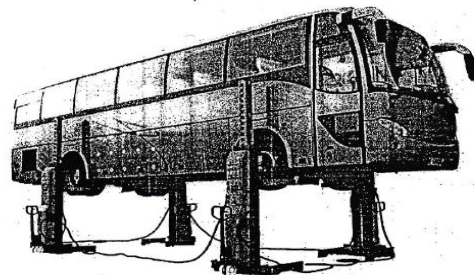
Forklift 3 Ton



Round pipe bending Machine



Vehicle lift set (4 pcs/set)



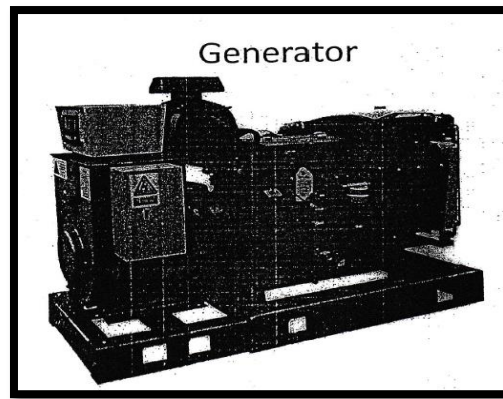


Figure 3.4 Photos Some using Machines

3.7 Product Profile and Production Capacity

The proposed investment business is the manufacturing, assembling and sales of buses, coaches, repair and maintenance services. The finished cars are driven to the factory’s storage area which is 4.5 acres. And then, the buiers carry to their own bus station. The production capacities are presented in Table 3.5.

Table 3.6 Production Capacities

No.	Particular	A/C unit	Year 1	Year 2	Year 3
			Sale Car Unit	Sale Car Unit	Sale Car Unit
1.	SC NEUSTAR (Local Sales) (28-55 seaters)	nos	40-60	70-90	90-120
2.	SC NEUSTAR (Export Sales) (28-55 seaters)	nos	30-40	30-50	40-60



Figure 3.5 Photos of Product Profile



Figure 3.6 Photo of Finish Product Storage Sytsem

3.8 Production Line

SC Auto Bus Production Line

- 1) Stage 1, Engineering Design
- 2) Stage 2, Raw Material cutting, bending, rolling
- 3) Stage 3, Parts Fabrication
- 4) Stage 4, Structure Frames, Engine, Axles, Gearbox, etc... Assembly
- 5) Stage 5, Body panel assembly & Interior Fittings
- 6) Stage 6, Air Conditioner System & electrical wiring Installation
- 7) Stage 7, Spray Painting
- 8) Stage 8, Quality Control & Checking

3.8.1 Stage 1-Engineering Design

Engineering design is based on the outcome from marketing team to build buses/coaches which meet customer need and want and to achieve socio economic environment (decreased energy consumption and resource efficiency, eg, decreased fuel consumption), Improvement of lifestyle, standard of bus transportation and, safety.



Figure 3.7 Engineers Design the Bus & Make Calculation

3.8.2 Stage 2-Raw Material Cutting, Bending, Rolling

In this stage of material preparation , raw material such as steel material , EG perforated sheet, and aluminum sheet will be pressed (cutting, banding, rolling) according to engineering design and calculation.



Raw Material Cutting



Raw Material Bending

Figure 3.8 Raw Material Cutting and Bending

3.8.3 Stage 3-Parts Fabrication

Those prepared material will be fabricated into parts (body side frame, roof structure) with precise engineering calculation in this stage.



Materials are fabricated into parts

Figure 3.9 Parts Fabrication

3.8.4 Stage 4-Structure Frames Assembly

After fabricated parts, next process is to structure frames and mounted onto chassis.

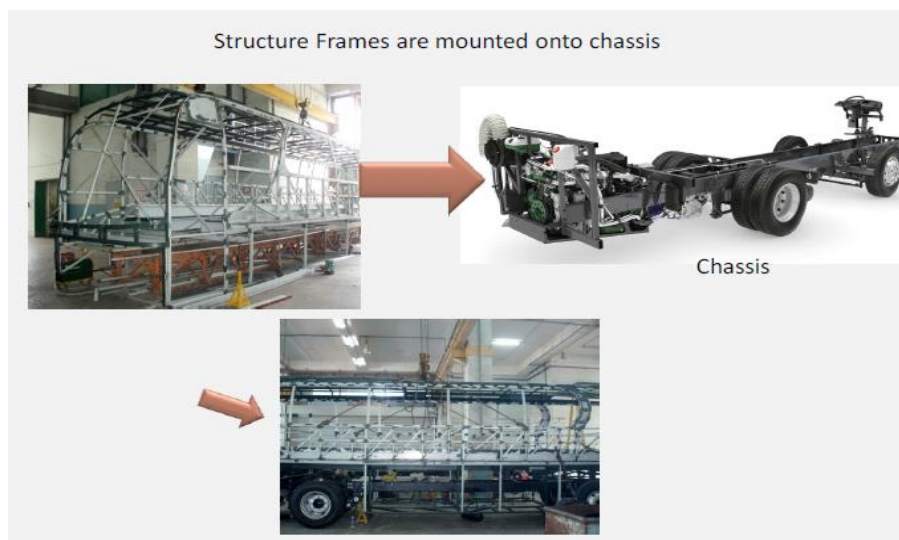


Figure 3.10 Structure Frame Assembly

3.8.5 Stage 5-Body Panel Assembly and Interior Fittings

After fabricated, the finished parts will be assembled into exterior body panel (exterior panels are mounted to structure frames) and then, interior fitting such as flooring, ceiling works, seats audio/video accessories are installed.



Exterior panels are mounted



Interior fittings such as flooring, ceiling works, seats audio/video accessories are installed

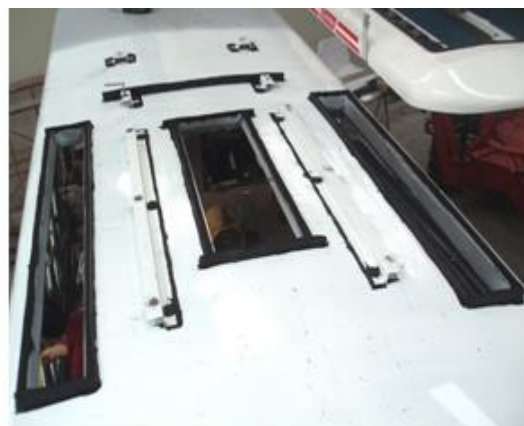


Interior Finishing

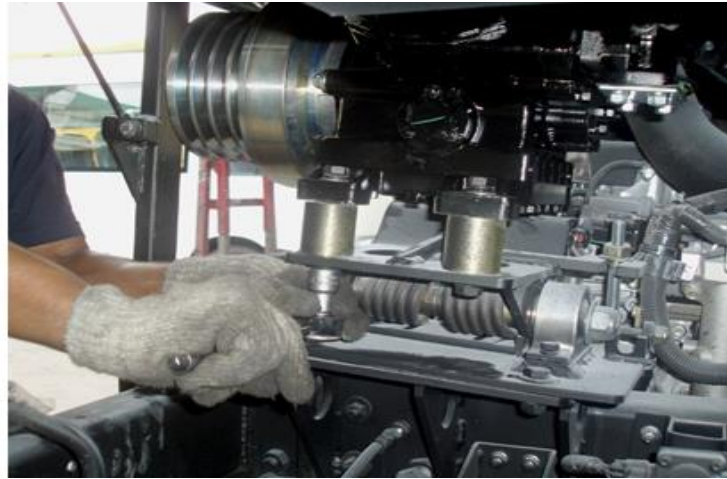
Figure 3.11 Body Panel Assembly

3.8.6 Stage 6-Air Conditioner System & Electrical Wiring Installation

After body panel has been assembled, the air conditioning system and electrical wiring will be installed.



Air Conditioner System & Electrical wiring Installation



Air Condition System & Electrical wiring is Installed

Figure 3.12 Air Conditioning and Wiring Assembly

3.8.7 Stage 7-Spray Painting

Now, the bus is ready for spray painting. Chemicals used in spray painting process are bought from foreign country and stored according to prevention of hazard from chemical and related substances law. Spray painting process will be carried out in spray paint booth based on customer confirm design. We will see completed vehicle at the end of this stage (after spray painting).



The Bus is spray painted

Figure 3.13 Spray Painting

3.8.8 Stage 8-Quality Control and Checking

Before completed assembling bus that is going on road will be quality control and checking such as air flow performance test, sound & noise performance test and vehicle performance test.

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Air Flow Performance Test



Sound & Noise Performance Test



Vehicle Performance Test

Figure 3.14 Quality Control

3.9 Manpower

SC Auto (Myanmar) Company Limited has the following list of employees.

Table 3.7 List of Local Employees

No.	Description	Year 1-2	Year 3-4	Year 5-10
PRODUCTION				
1	Factory Manager	1	1	1
2	Assistant Factory Manager	3	3	3
3	Supervisor	5	24	25
4	Team Leader	9	80	90
5	Operator	83	155	200
	Total	101	263	319
OFFICE & MANAGEMENT				
1	HR Staffs	3	3	3
2	Purchasing staff	3	3	3
3	Sales and marketing staff	7	7	8
4	Translator staff	1	3	3
5	Documentation	3	3	3
6	Accountant	6	6	7
7	Cleaning Clerk	2	2	2
8	Kitchen staff	2	2	2
9	Security guard	6	6	6
10	Driver	3	3	4
11	IT officer	2	2	2
12	M&E officer	2	2	2
13	General Manger	1	1	1
	Total	41	41	44
1	Ware House	8	8	8

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2	Engineer	20	20	22
	Total	28	28	30
1	Workshop			
2	Workshop Manager	1	1	1
3	Workshop supervisor	4	4	4
4	Technician	15	15	15
5	Sales & Marketing	3	3	3
	Total	23	23	23
	Grand Total	193	355	416

Table 3.8 List of Foreign Employees

No.	Description	Year 1-2	Year 3-4	Year 5-10
1	Supervisor	12	8	
2	Specialist	6	4	2
	Total	18	12	2

3.10 Project Schedule

The project is developed by SC Auto (Myanmar) Co., Ltd. in 2015. Construction period for this project is 1 year and 6 months. The validity of investment permit is 50 years. SC Auto (Myanmar) Limited has started its construction on 16th August 2016. The detail construction schedule is as shown in following figure.

Table 3.9 Project Schedule for the Project

Project Activities	Schedule
Project Starting Date	2015
Construction Period	August 2016~ February 2018 (1 year and 6 months)
Operation Period	50 years

Table 3.10 Project Implementation Schedule

Implementation Activities and Schedule	2016									2018									2019-2020	2021-2022	2023-2065
	Aug	Sep	Oct	Nov	Dec	Jan-Mar	April-Jun	July-Sept	Oct-Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep-Dec			
Construction Period	█																				
IEE Preparation			█																		
Trail Operation Period																	█				
Commerical Operation Period																			█		
Closing Period																					

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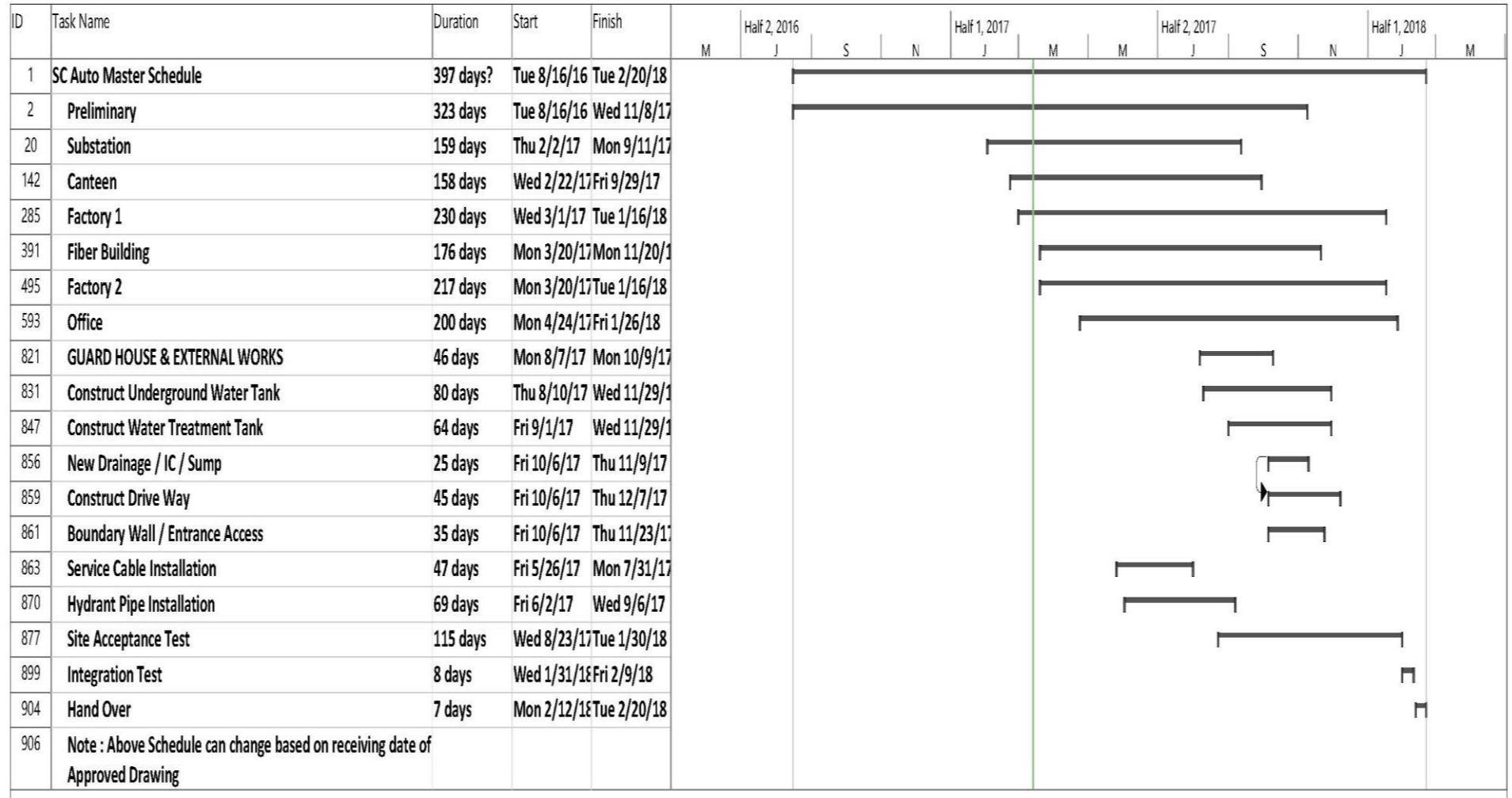


Figure 3.15 Construction Schedule

3.11 Operating Schedule

The operating schedule for this project is based on single shift basis and maximum 300 working days in a year.

Working hours	8:00 am ~12:00 am; 1:00 noon ~ 4:30pm;
Lunch break;	12:00 noon ~ 1:00 pm;
Working days / week	5 days; Monday to Friday

3.12 Utilities

Electricity

Electricity is transmitted from 11/0.4 KV national grid line to the Company's electrical system by connecting with one unit of 1000 kVA transformer at the factory. The necessary guidelines and precautionary measures relating to the use of electricity shall be adhered to. The internal infrastructure has to be designed. The necessary layouts and cable sizes needed are to be determined for the projected electrical demand.

Annual electricity requirement for the factory is tabulated in Table 3.10.



Figure 3.16 Transformer at Factory

Table 3.11 Electric Usage per Month (Yangon Electricity Supply Corporation)

No.	Month	Previous Month Unit	Current Month Unit	Difference
1	April 2019	161	202	41
2	May 2019	202	228	26
3	June 2019	228	254	26
4	July 2019	254	289	35
5	August 2019	289	324	35
6	September 2019	324	363	39
7	October 2019	363	402	39
8	November 2019	402	437	35
9	December 2019	437	480	43

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No.	Month	Previous Month Unit	Current Month Unit	Difference
10	January 2020	480	524	44
11	February 2020	524	576	52
12	March 2020	576	617	41
13	April 2020	617	647	30
14	May 2020	647	688	41
15	June 2020	688	730	42
16	July 2020	730	773	43
17	August 2020	773	817	44
18	September 2020	817	850	33
19	October 2020	850	882	32
20	November 2020	882	919	37
21	December 2020	919	947	28
22	January 2021	947	976	29
23	February 2021	976	993	17
24	March 2021	993	1008	15
25	April 2021	1008	1024	16
26	May 2021	1024	1041	17
27	June 2021	1041	1069	28
28	July 2021	1069	1090	21
29	August 2021	1090	1111	21
30	September 2021	1111	1136	25
31	October 2021	1136	1146	10
32	November 2021	1146	1194	48
33	December 2021	1194	1223	29
34	January 2022	1223	1246	23





Figure 3.17 Generators at Factory



Figure 3.18 Power Station Building

Fuel Requirements

Diesel is used as fuel for generators and cars. Consumption of diesel is 2,000 litre per month. Factory buys diesel from Terminal Mingalardon with oil tanker transportation method and stored in tank at factory.





Figure 3.19 Photos of Diesel Transportation and Storage Tank

Water Requirement

The project proponent uses 1200 litres per day of water from 2 inches diameter tube well in the project area. The water is pumped from tube well and stored in the 10,000 gallons ground tank.

3.13 Factory Buildings Description

Elevation and Section views of the factory building are shown in the following figure.

Table 3.12 Number of Buildings in the Factory

No.	Factory Building	Storey	Unit
1.	Office Building	3	1
2.	Canteen and Domentary	2	1
3.	Factory 1	1	1
4.	Factory 2	1	1
5.	Guard House	1	1
6.	Fiber Building	2	1
7.	Sub Station	2	1
8.	Pump House	1	1
9.	Guard House	2	1
10.	Service Factory	2	1

3.13.1 Factory Compound

Factory compound level must be had 1.2 m higher than existing road level. Factory Building finishing level is 100 mm higher than Factory compound level. Office Building level 1 finishing level is 150 mm higher than Factory compound. Drain level is as shown on the drawings. Bio Treatment underground tanks are installed for domestic wastewater base on 64.5 cubic meters per day of 80 office staff and 300 workers. Bio Treatment underground tank is located at beside of Canteen pump room (under car park no. 1, 2 & 3) and Underground water tank (10 Meter (L) x 10 Meter (W) x 1.2 Meter (D)) located at in front of canteen and dormitory. M&E services are as shown on the Figure 3.19.

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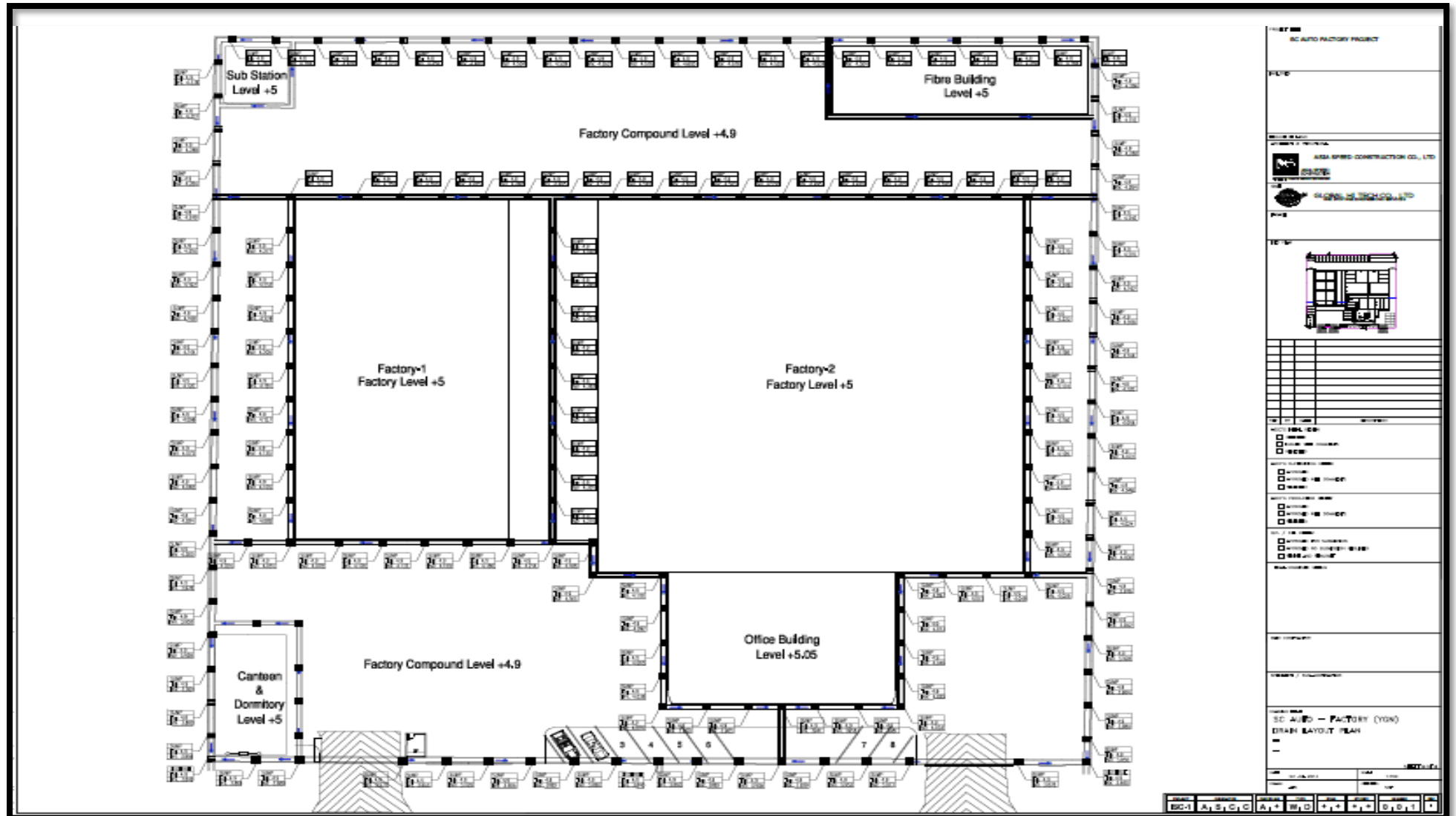


Figure 3.20 Factory Layout Plan

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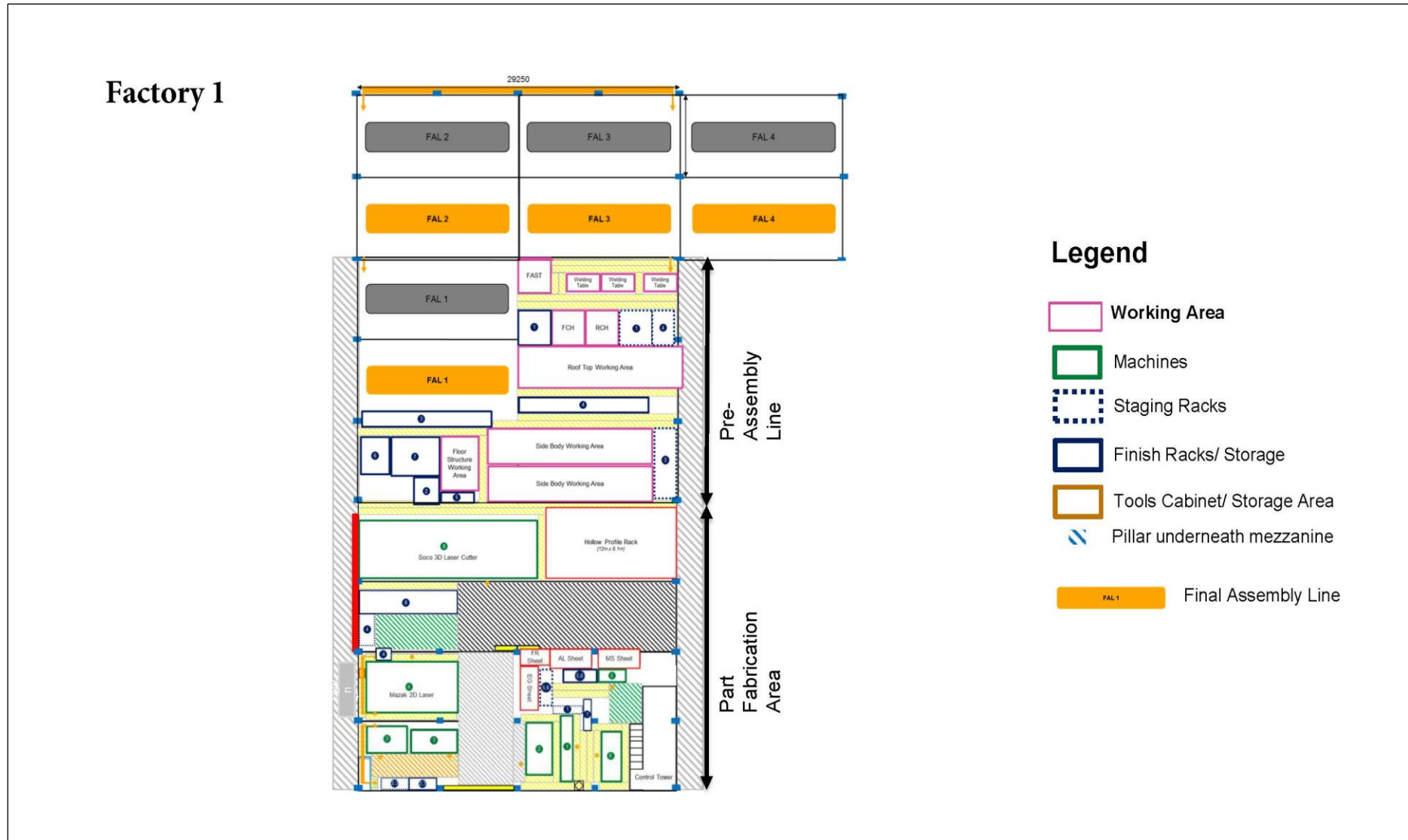


Figure 3.21 Machine Layout Plan of Factory 1

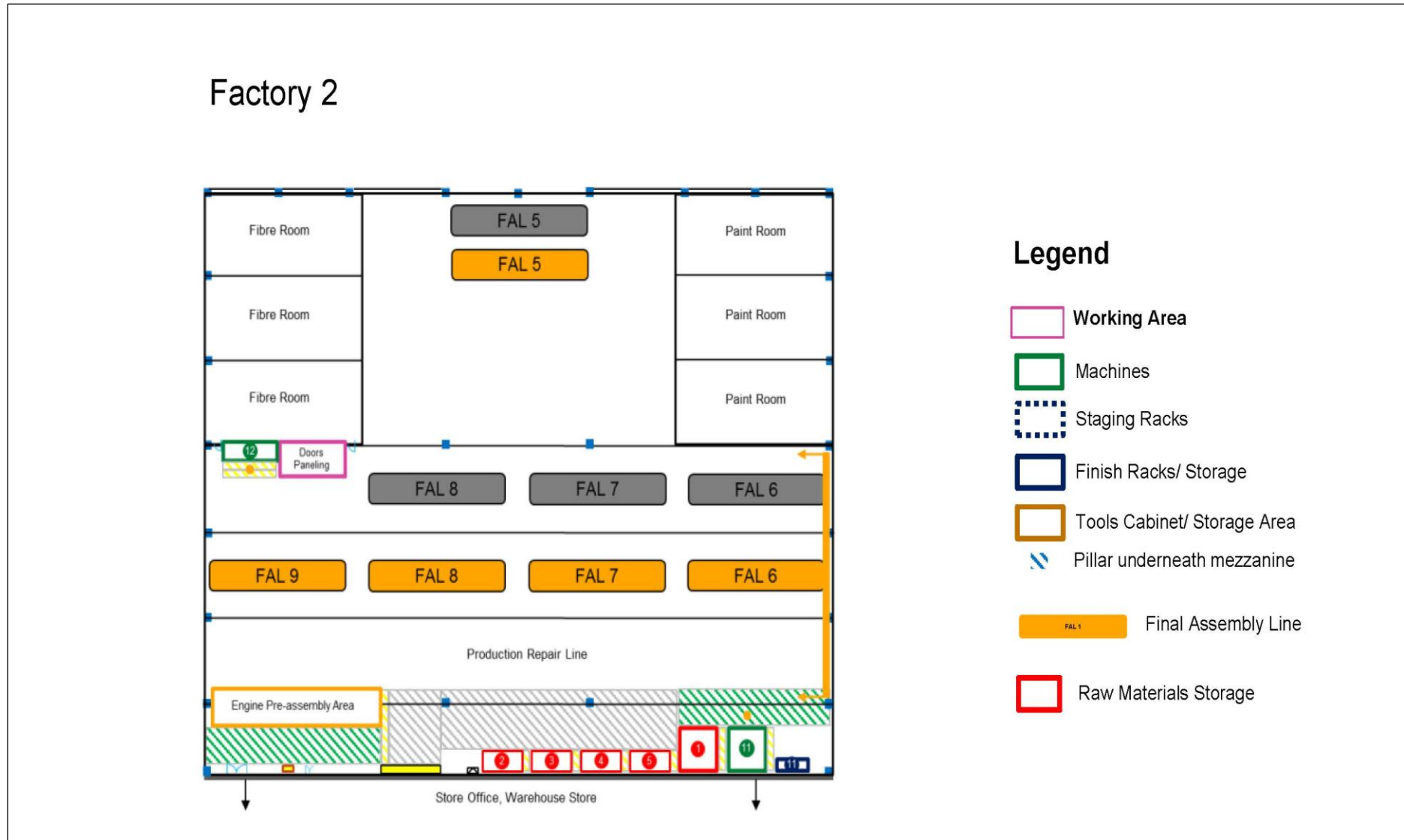


Figure 3.22 Machine Layout Plan of Factory 2

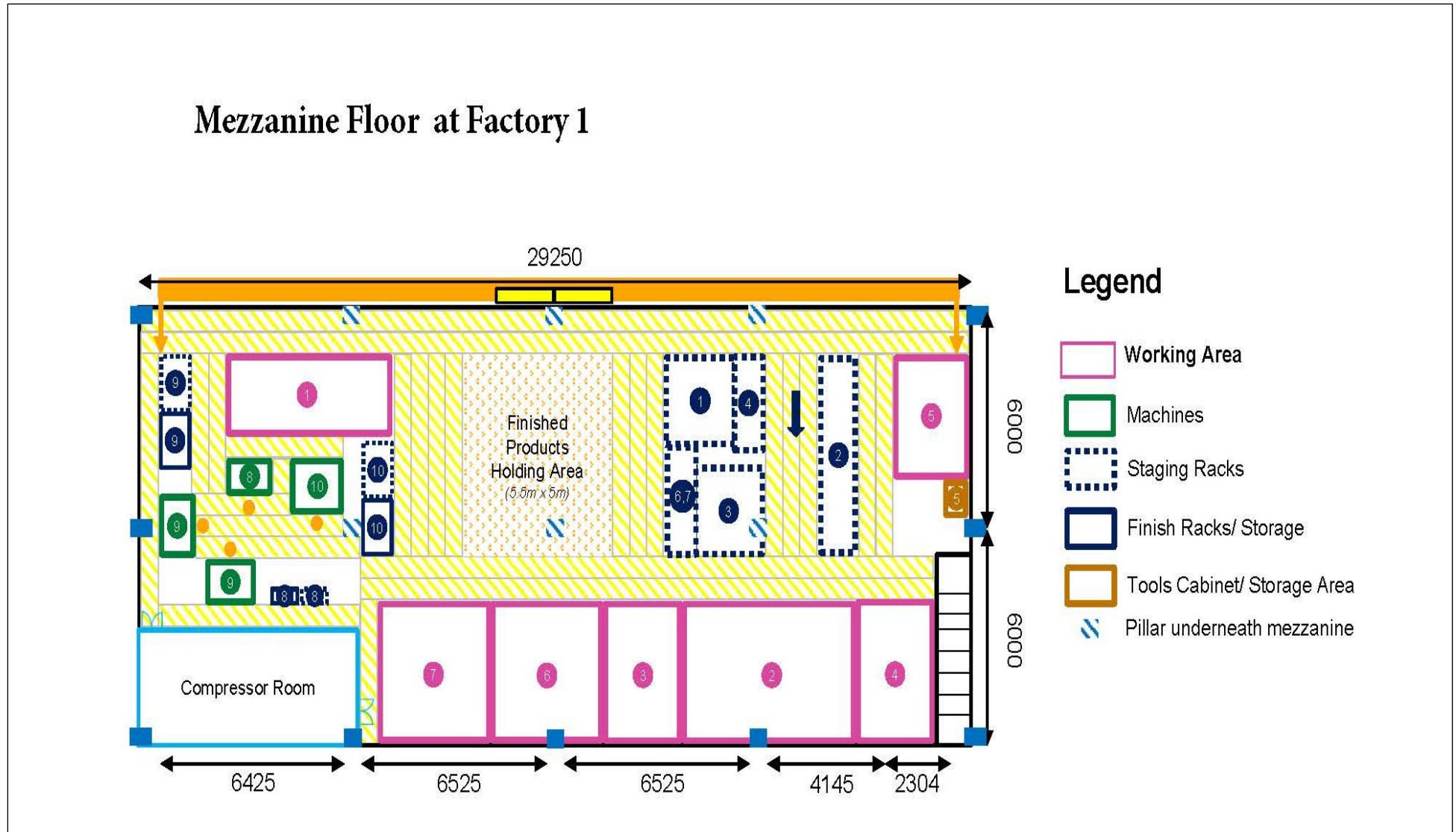


Figure 3.23 Machine Layout Plan of Mezzanine Floor at Factory 1

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Two main factories are linked with covered way and M&E services are as shown in the above Figure 3.22. The superstructure shall be in steel construction with RC stair cores.



Figure 3.24 Factory 1 and 2

3.13.2 Office Building

Office Building is a 3-storey building consisting office units, Meeting room, Toilet, Bed room, Kitchen, Laundry, GYM room, Dining room, common corridors, Canopy, escape staircases, Passenger lift, M&E services, risers, CSR etc as shown on the Figure 3.23. Water tank located on roof as shown on the Drawings shall be completed together with Office main building.

The superstructure shall be in accordance with selected Alternative Tender as specified the Contract (RC stair cores or CLT / Glulam construction with RC stair cores).



Figure 3.25 Main Office (HQ)

3.13.3 Fiber Building

Fiber building is a 2-storey building consisting Chemical store room, staircases, 3 Ton overhead crane, Toilet, M&E services as shown on the Drawings shall be completed together with Fiber main building. The superstructure shall be in steel construction with RC stair cores.



Figure 3.26 Fiber Room

Fiber Reinforced Plastic (FRP)

Polymeric materials in automobiles have experienced a real boom in the last twenty years, and their application is increasing with a tendency of further growth. The basic functions of such wide application of polymeric materials in vehicles dictate the appearance of the automobiles, their functionality, economy and low fuel consumption. The application of polymeric materials allows more freedom in design, and in many cases only the polymeric materials can enable safe geometrical or economical solutions for the design parts.

With Resin transfer molding (RTM), the mould cavity is feed with resin under moderately high flow rate and pressure that is only limited by the structural ability of the molding tool and perimeter clamping or press system to sustain mold closure. Working within these concerns, we then will build RTM tooling and clamping systems with structure great enough to sustain the flexing caused by the highest expected injection pressure during the molding cycle.

Resin transfer molding

Resin transfer molding (RTM) is a method for the production of component parts made of fiber-plastic composites. During the RTM procedure, dry semi-finished fiber parts are streamed and subsequently soaked with reaction resin by a pressure gradient within a closed vessel. The component hardens within the vessel. The pressure gradient can be produced by evacuation of the vessel or by admission of the resin with high pressure. The following methods can be distinguished with regard to the admission by the pressure gradient: high pressure injection, twin wall injection, vacuum injection, differential pressure injection.

With a specific focus on the environmental impact of injection molding – advancements in engineering means that injection molding machinery now

uses 20%-50% less energy compared to 10 years ago and energy consumption is also something that is of expressive importance.

Worker safety clothing and equipment

Operator exposure to VOCs can be monitored by portable testing kits. As well as the emission of VOCs there are other hazardous materials such as dust resulting from the trimming and machining of FRP parts. It is therefore essential that suitable protective clothing is worn. Gloves, coveralls, goggles, masks and a whole range of other personal protection equipment are available direct from manufacturers or via specialist FRP, fiber reinforced plastic, distributors on a one-stop-shop basis.

3.13.4 Sub-station Building

Sub-station building is a 2-storey building consisting Diesel tank, staircases, Switchgear room, Slab opening, M&E services as shown on the Drawings shall be completed together with Sub-station main building. The superstructure shall be in RC with RC stair cores.

3.13.5 Canteen and Dormitory Building

Canteen and dormitory Building is a 2-storey building consisting Dinning Hall, Kitchen, Pump room, Toilet & Locker room, Bed room, M&E services, etc as shown on the Drawings.

The superstructure shall be in accordance with selected Alternative Tender as specified in the Contract (RC stair cores or CLT / Glulam construction with RC stair cores).



Figure 3.27 Canteen and Dormitory

3.13.6 Gate House

The superstructure shall be in RC as shown on the Drawings. M&E services shall include as shown on the drawings.

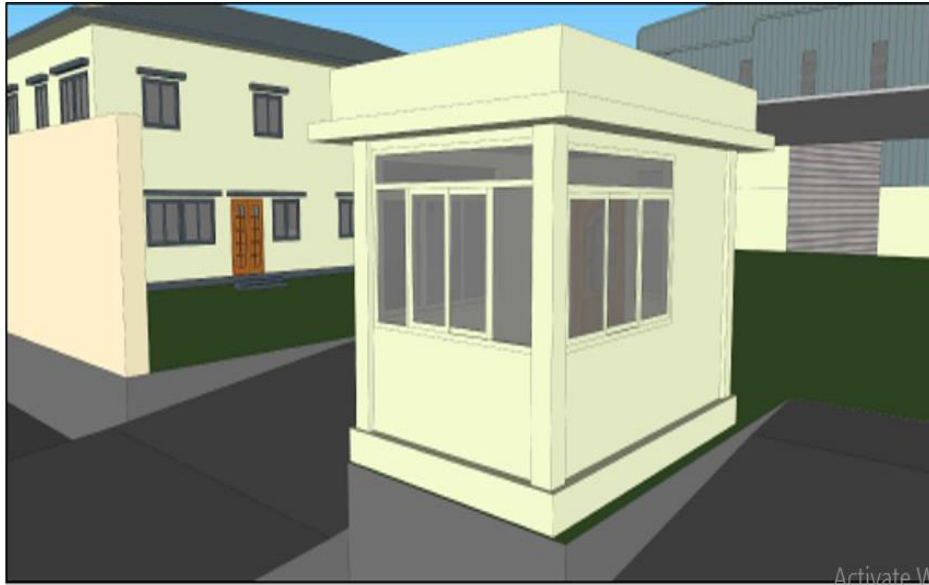


Figure 3.28 Guard House

3.13.7 External Works

External works including pedestrian footpath, accessible ramps, road ingress / egress, parking areas, concrete pavement, roads / driveways / lanes / circulation areas marking and painting works with traffic signage, M&E services cable trenches, drainage system, concrete covered drains including connection to existing drain, manholes / ICs, pipelines, water lines, kerbs dividers / islands, works, road humps, height restriction gantries with protective / safety barriers, Fencing wall, company name & logo signage, etc as shown on the Drawings.

3.13.8 Service Building

During normal vehicle repair and maintenance activities, vehicle fluids may drip or spill or otherwise enter floor drains and sinks in service areas. These fluids may include engine oil, transmission fluid, power steering fluid, brake fluid, hydraulic fluid, antifreeze, chlorinated or non-chlorinated cleaning solvents and degreasers. This would generally apply to businesses that have a floor drain or shop sink in an area where motorized vehicle service or repair work is performed or any area where the liquids associated with those activities are stored. Discharges from any new or existing motorized vehicle repair and/or maintenance operation may not be connected to an onsite subsurface wastewater disposal system such as a septic tank/absorption field or drywell.

SC Auto will apply grease interceptor at the outlet industrial waste water before joining to storm drain.

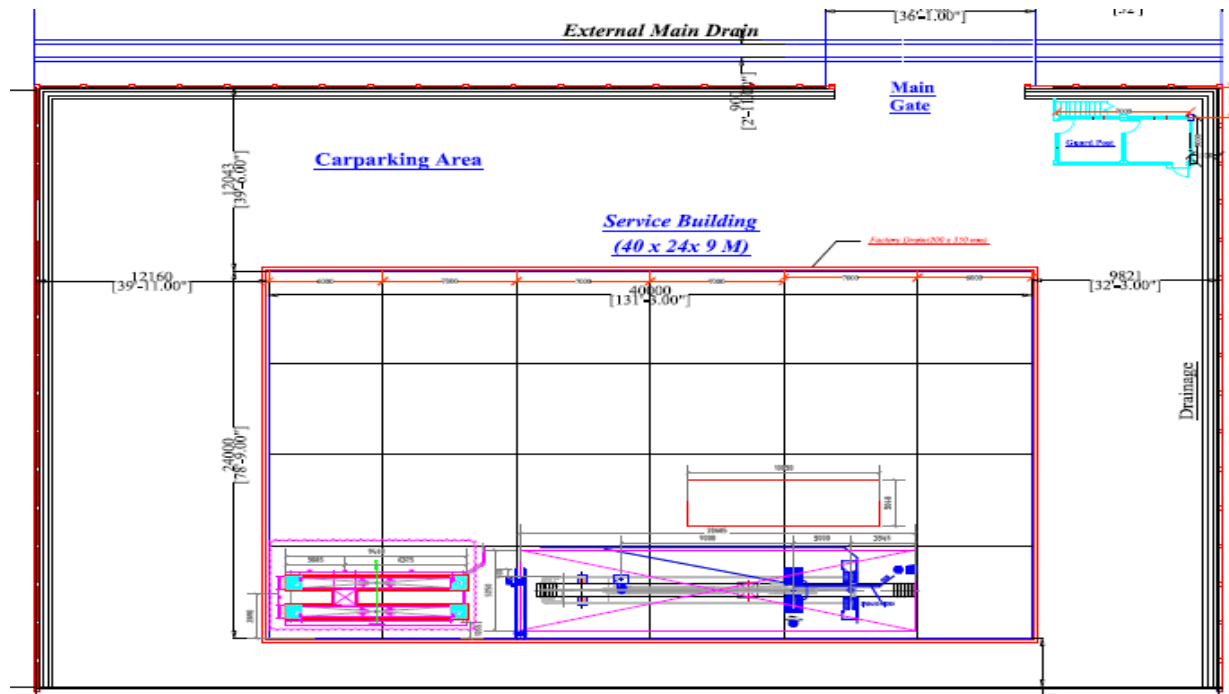


Figure 3.29 Layout Plan of Service Building

3.14 Waste Disposing System

3.14.1 Storm Water

Storm-water is rainwater that flows across outside surfaces into storm-water drains and gutters beside the street. The water is not treated and flows directly to creeks, rivers, groundwater and oceans. Storm-water should only contain clean rainwater, not pollutants such as general rubbish, industrial waste, heavy metals, oils and greases. This runoff is often polluted by materials that are handled or stored on the sites, and the facilities are subject to regulations to control the discharges.

Amount of wastewater from operation process and domestic usage is about 1,000 litres per day. SC Auto applies concrete pavement floor inside factory premises and storm-water drain. The drain system layout map is as shown in the Appendix (16).



Figure 3.30 Photos of concrete pavement and Drain Channel

It is recommended to follow the good practice mentioned here under;

- Prevent untreated spills from running into storm-water
- Bund all vehicle and parts wash areas.
- Bund all chemical storage areas.



Figure 3.31 Location of Storm Water Final Discharge Point at 16°56'50.2"N 96°11'40.6"E

3.14.2 Sanitary Water Disposal

Wastewaters originating from plumbing fixtures and appliances such as sanitary (toilets), bath, laundry, dish wash, garbage disposal, and cleaning wastewaters are as defined as domestic wastewater. Domestic wastewater is as routed to sewage disposal or bio-tank.

Bio-tank (septic tank) has many positive characteristics, confirming this is consumer feedback. This system is universal and compact. The first quality is as confirmed by the fact that the treatment plant can be located on sites with any geological conditions. The traditional septic tank is impossible to use it on clay soils or soils where underground waters are high.

As the clients emphasize, "Bio-tank" (septic tank) has very compact dimensions, it does not require too much space for its installation, so this option is the most suitable for small suburban areas. Consumers indicate that the area is also saved by the fact that the owner of the site does not need to install the infiltrator. It is impossible not to mention the simplicity of the design. The septic tank almost never fails, and if this happens, it is much less frequent compared to those models that have a more complex device. The sanitary drain system and sanitary treatment system

(septic tank) locations map area as shown in the Appendix (13). The sanitary system of Bio septic system process description and layout plan are as shown in the Appendix (17).

Description of Sanitary Drainage System

1. The skillful Plumber execute sanitary plumbing, sewerage and drainage. Installation which compliance with Client’s M&E Design drawings and specifications.
2. All the soil and waste from fixtures are discharged from the sanitary appliances into the sanitary main stack pipe, which is disposed directly into the bio-treatment tank located at the ground floor via underground inspection chambers and collection pit.
3. The collected soil in collection pit pump up by a set of sewage ejector pump set (located inside the collection pit and the control panel located at canteen store room) to bio-treatment (waste water treatment system) tank’s solid separation chamber. The kitchen wastewater from grease trap to discharge drain.
4. The wastewater in solid separation chamber then transfer to contact aeration biofilter chamber where the wastewater is aerated by means of blower and the excess sludge will return to solid separation chamber. From the aeration chamber, the over flow wastewater will flow to the sedimentation chamber.
5. The wastewater which is in the sedimentation chamber will also be aerated and the overflow water will only discharge to public drain.
6. The bio-treatment system is control by a panel located in canteen building – ground floor Store room. The control panel which is consists of air blower control circuit. Fiber Building – sanitary drainage system separately use septic tank and all the soil and waste from fixtures are discharged from the sanitary appliances into the sanitary main pipe, which is disposed directly into the septic tank located at the ground floor via underground inspection chambers. The wastewater which is in septic tank overflow water will only discharge to public drain.

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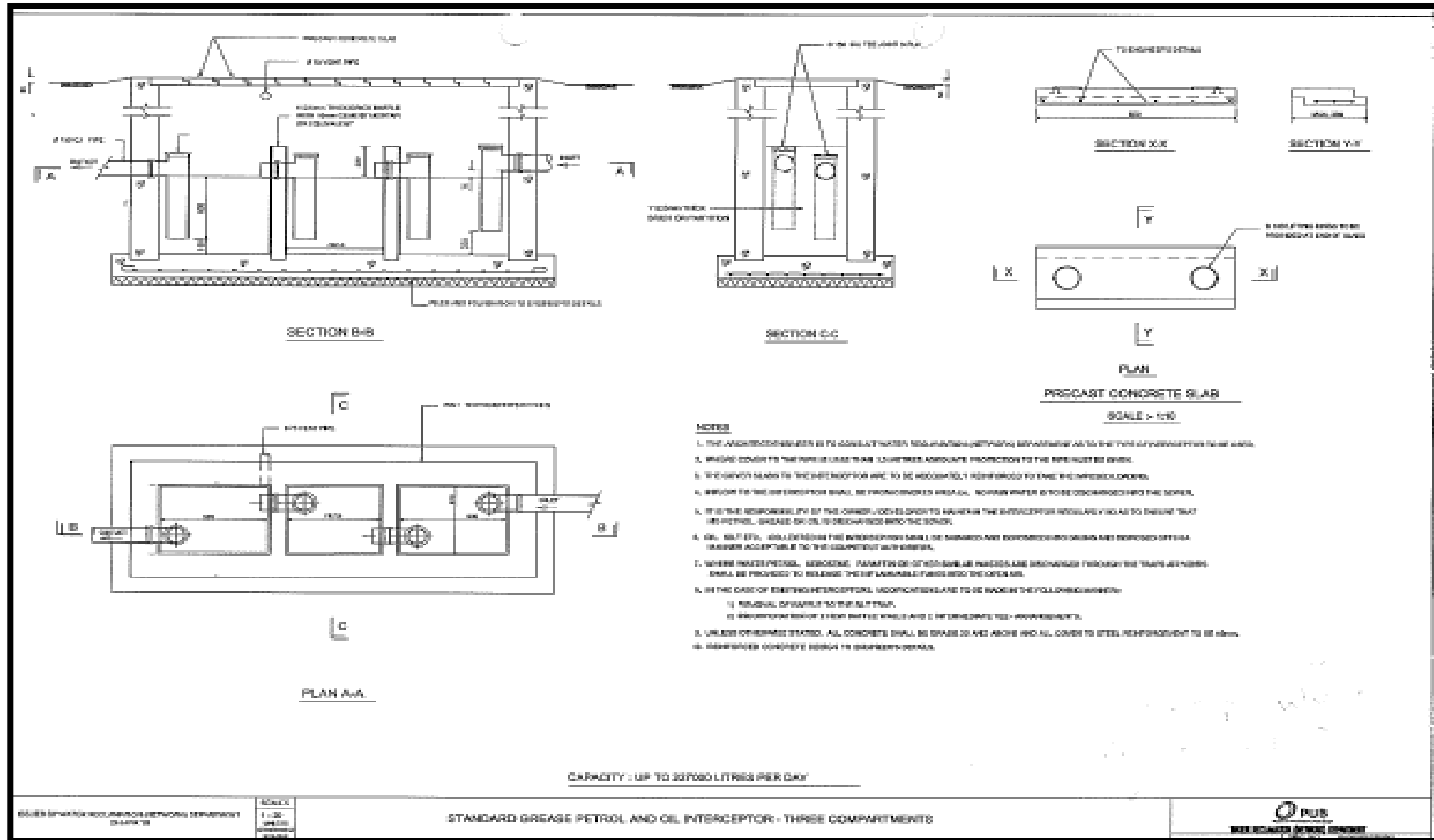


Figure 3.32 Grease Interceptor for Sanitary Water Drain from Service Building

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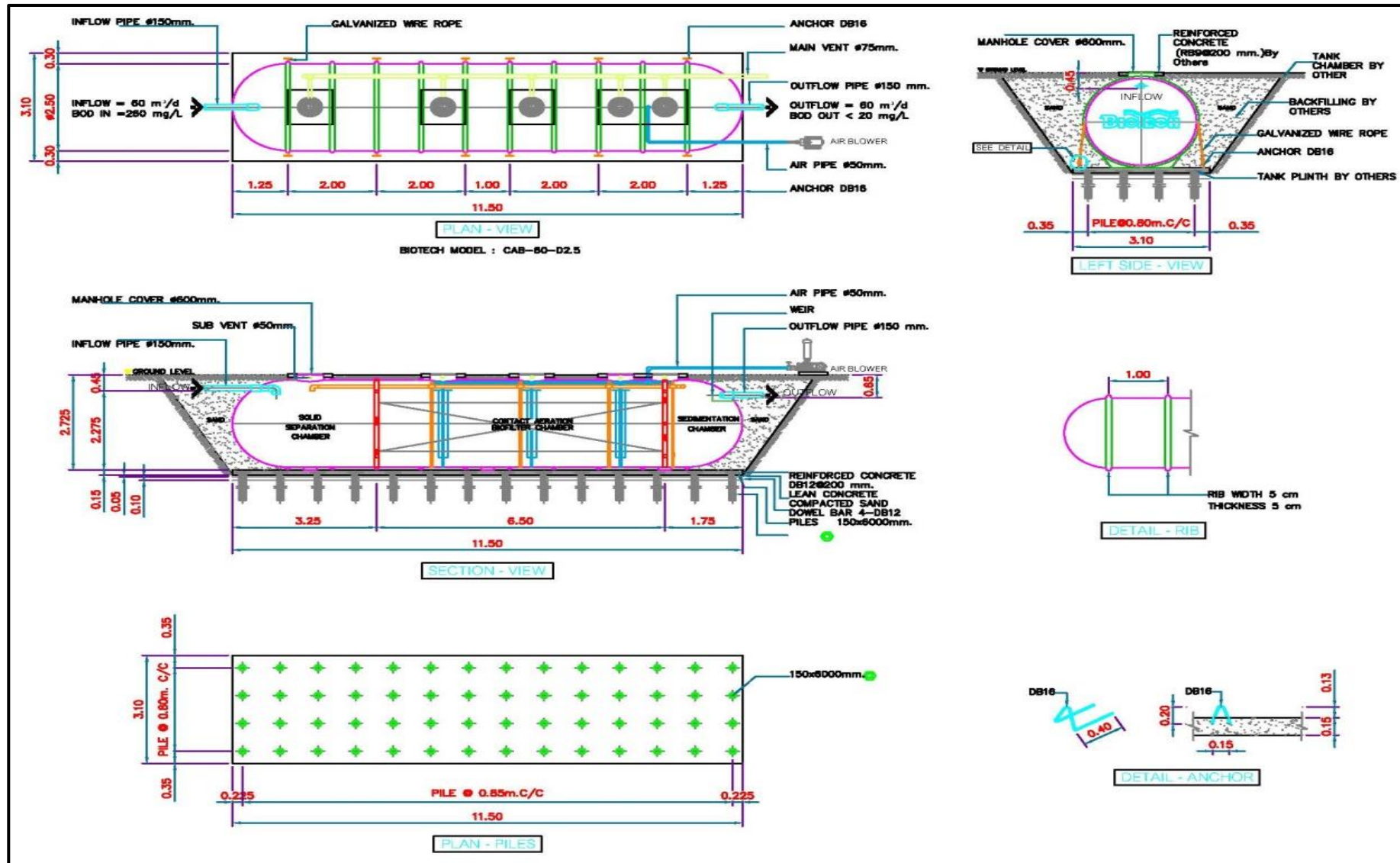


Figure 3.33 Sanitation System Outlet

Table 3.13 Specification of Bio Tank

1	Process	Contact aeration bio-filter	
2	Dimension	BOD IN 250 mg/l BOD OUT 20 mg/l $\phi = 2.5 \text{ m} , L = 50 \text{ m} , H = 2.75$ Thickness = 8 mm	
3	Media	BIO CELL SPECIFIC SURFACE AREA RANDOM FLOW TYPE < 170 m ² /m ³ EGGED Shape HDPE (MEIDA VOLUME 14.92 m ³)	
4	Material		
	4.1	Body	FRP
	4.2	Separation Plate Baffle	FRP
	4,3	Draft tube	FRP
	4.4	In flow pipe Out flow pipe Air pipe	PVC $\phi = 150 \text{ mm}$ $\phi = 50 \text{ mm}$
	4.5	RIB FRP WIDTH 5 cm and thickness 5 cm every 1 m	10 RIBS
5	Manhole cover	ABS	
6	Equipment		
	6.1	Air Blower 1.6 m ³ /min (AT 3000 mm aq) 2.2 kw) 38 volt/3 phase/ 50 HZ	I UNIT
	6.2	Sling galvanized wire rope	12 sets
	6.3	Control panel	1 set
7	Standard	ISO 9001	

3.14.3 Solid Waste Disposing System

Solid wastes may arise from several sources during assembly and the majority of wastes by volume result from packaging - reusable or disposable. Reusable packaging covers metal racks, bins and containers and disposable packaging covers wood pallets, cardboard, plastic, polystyrene and polythene film.

The company will establish proper management guidelines and ensure that all local requirements for on-site waste management are met, and train all employees on the waste management procedures.

The project proponent stores solid wastes temporary in factory's waste storage tank and manages arranges to dispose them by cooperation with Yangon City Development Committee via on call system.

3.15 Project Alternatives

The concept of alternative can be defined as a possible course of action, in place of another, that would meet the same purpose and need.

3.15.1 No Project Alternatives

These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans and program as well as projects. Consideration of such alternatives requires a change in the nature of the proposed activity.

It is the best option for the business of manufacturing and assembling of parts, buses/ coaches by importing base raw material and rather than starting from producing raw material.

3.15.2 Alternative Sites

As Yangon Industrial park is in close vicinity of No.3 high way and Yangon international airport, the existing project location is the best place for availability of workforce from nearby community and good access for material transportation.

3.15.3 Process Alternative

Process of assembling and manufacturing process is dry process and therefore there will be no concern of wastewater disposal to surrounding.

4.0 DESCRIPTION OF THE ENVIRONMENT

4.1 Location and Scale of Project

The project is located at No.188/189, 10th Road, Yangon Industrial Zone, Mingaladon Township Yangon Region. Total Land area is 4 Acres which include plot No.188/189. The scoping of the IEE study map is as shown in the following figure. The scope is determined the 1 km diameter because the factory is situated in the Industrial Zone. The surrounding of the SC Auto (Myanmar) Co., Ltd. is factories. According to the ECD comment, the factory is not located in the residential area. Therefore, religious building such as monastery, surface water such as river, creek and lake are not existing near the factory. The nearest surface water body is situated about 2.16 km that is Ngamoeweik Creek.

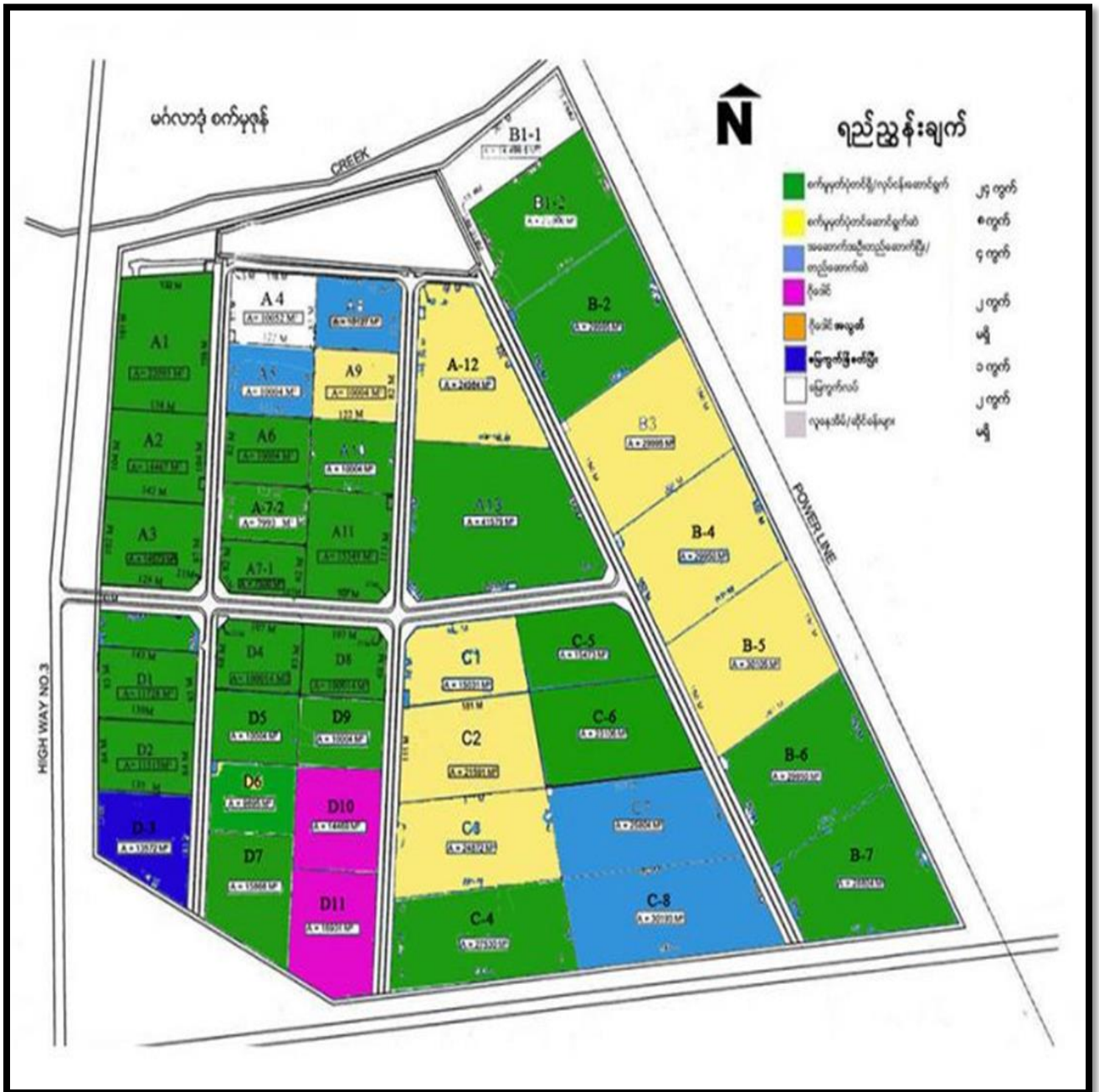


Figure 4.1 Plant Location Map

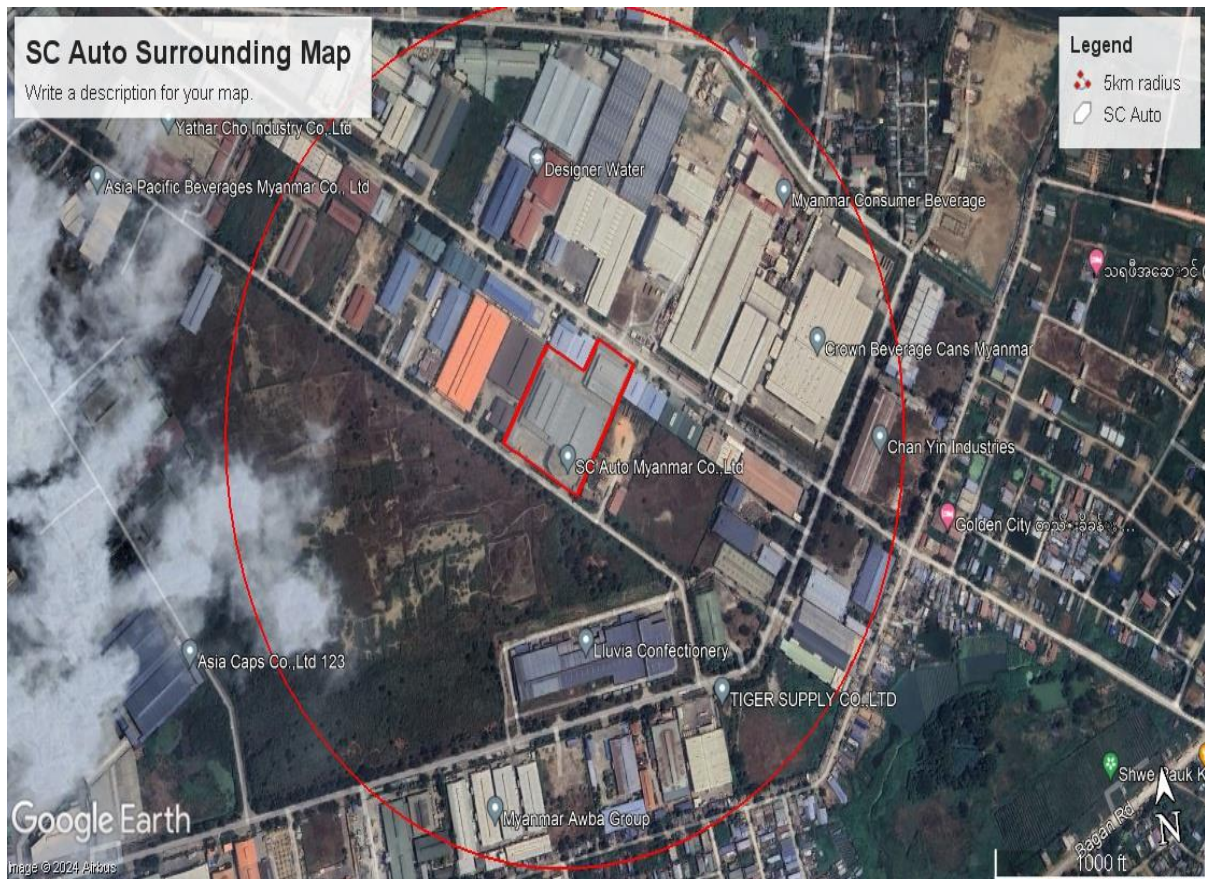


Figure 4.2 Surrounding Map of the SC Auto (Myanmar) Co., Ltd

4.2 Topography, Geography, Geology, and Soil

Mingalardon is located in the northernmost part of Yangon, Myanmar. The township comprises 27 wards, and shares borders with Hmawbi Township in the north, North Okkalapa Township in the east, Insein Township and Shwepyitha Township in the west, and Mayangon Township in the south.

In the west side of township, Ngwe Yar mountain range connecting from south to north. Hlawga Lake situated at the west closed to boundary Shwepyitha Township.

Mingaladon is 144 ft above the sea level .In this town ship there are almost no streams or creeks, only one stream called Balar Chaung exist, flowing from north to south in only 12 miles and west from east in 8 miles. Draft, water depth of stream in rainy season is around 12 ft and 8 ft in summer, and therefore it cannot be used as waterway for transportation.

There are no adverse geological conditions providing feasibility for the construction of factory building and no wetlands and no plantation of any kind of trees in and around the project area. Also there is no major conservation of wildlife in the area

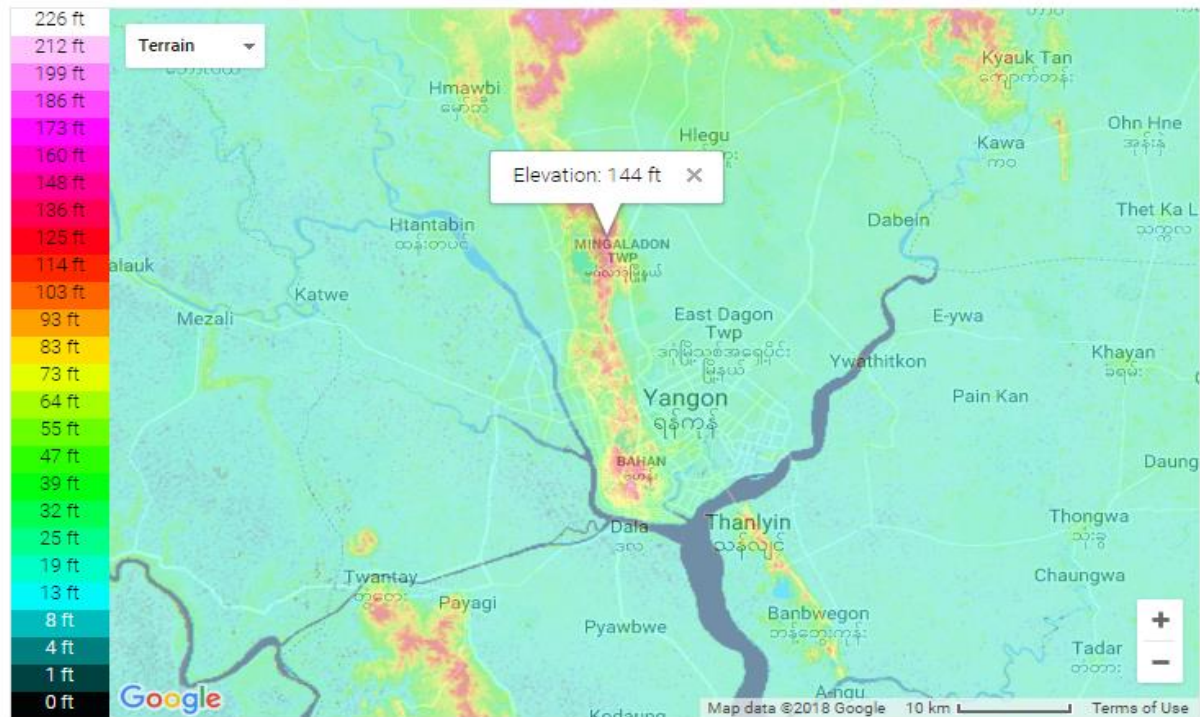


Figure 4.3 Topography of Mingaladon

4.3 Climate and Hydrology

The Mingaladon Township is located in the northernmost part of Yangon, Myanmar and has a tropical monsoon climate for hot and humid.

4.3.1 Temperature

Temperature profile is highest at 39 degrees Celsius and lowest at 15.5 °C. Reference from secondary data of Mingaladon Township from General Administration Department, here below is the temperature summary table for summer and winter.

Table 4.1 Temperature profile in summer and winter

Year	Temperature	
	Summer (°C)	Winter (°C)
	Highest	Lowest
2013	38	14.8
2014	37	15
2015	35	14.9
2016	38	15.4
2017	39	15.5

4.3.2 Wind

Over the course of the year typical wind speeds vary from 0 m/s to 5 m/s (calm to gentle breeze), rarely exceeding 6 m/s (moderate breeze).

The *highest* average wind speed of 2 m/s (light breeze) occurs around April 24, at which time the average daily maximum wind speed is 4 m/s (gentle breeze).

The lowest average wind speed of 1 m/s (light air) occurs around January 9, at which time the average daily maximum wind speed is 3 m/s (light breeze).

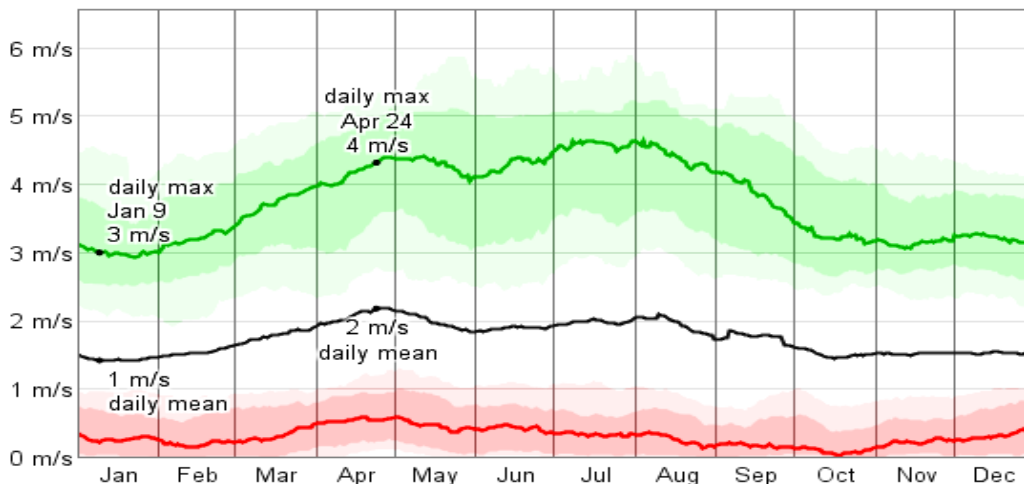


Figure 4.4 Wind Speed

The average daily minimum (red), maximum (green), and average (black) wind speed with percentile bands (inner band from 25th to 75th percentile, outer band from 10th to 90th percentile).

The wind is most often out of the west (17% of the time) and south west (13% of the time). The wind is least often out of the south east (3% of the time), north west (4% of the time), north (4% of the time), and east (5% of the time).

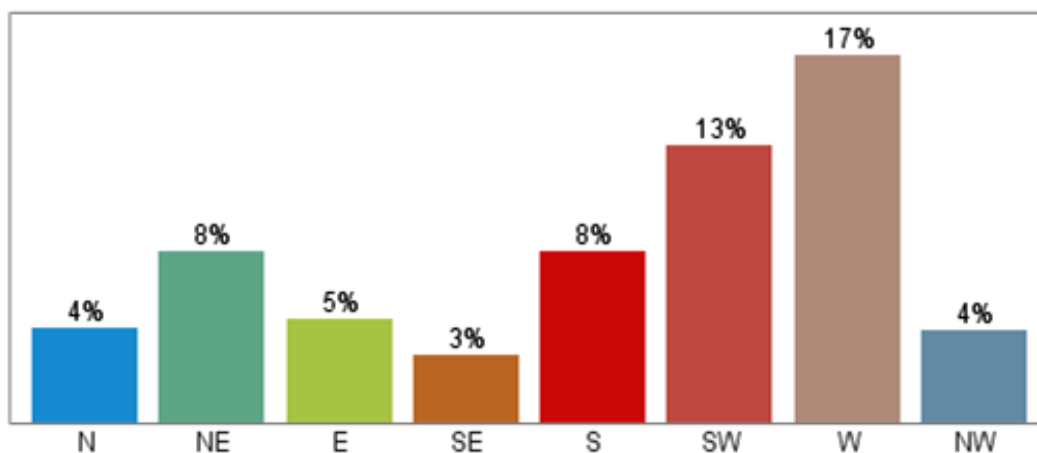


Figure 4.5 Wind Directions over the Entire Year

The fraction of time spent with the wind blowing from the various directions over the entire year. Values do not sum to 100% because the wind direction is undefined when the wind speed is zero.

Note: wind data is referring from Yangon City

4.3.3 Rainfall (Precipitation)

Yangon is supplied with an average of 2681 mm (105.6 in) of rainfall per year, or 223.4 mm (8.8 in) per month.

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- On average there are 125 days per year with more than 0.1 mm (0.004 in) of rainfall (precipitation).

The driest weather is in February when an average of 2 mm (0.1 in) of rainfall (precipitation) occurs

- The wettest weather is in August when an average of 602 mm (23.7 in) of rainfall (precipitation) occurs.

Table 4.2 Average Precipitation Table for Yangon





	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
 Average Precipitation mm (in)	5 (0.2)	2 (0.1)	7 (0.3)	15 (0.6)	303 (11.9)	547 (21.5)	559 (22)	602 (23.7)	368 (14.5)	206 (8.1)	60 (2.4)	7 (0.3)	2681 (105.6)
 Precipitation Litres/m ² (Gallons/ft ²)	5 (0.12)	2 (0.05)	7 (0.17)	15 (0.37)	303 (7.43)	547 (13.42)	559 (13.71)	602 (14.77)	368 (9.03)	206 (5.05)	60 (1.47)	7 (0.17)	2681 (65.76)
 Number of Wet Days (probability of rain on a day)	0 (0%)	0 (0%)	1 (3%)	2 (7%)	14 (45%)	23 (77%)	26 (84%)	25 (81%)	20 (67%)	10 (32%)	3 (10%)	1 (3%)	125 (34%)
 Percentage of Sunny (Cloudy) Daylight Hours	87 (13)	77 (23)	79 (21)	76 (24)	46 (54)	20 (80)	19 (81)	24 (76)	26 (74)	56 (44)	81 (19)	84 (16)	56 (44)

Table 4.3 Number of raining days and Rain fall in Mingaladon

Year	Temperature	
	Raining Days	Rain fall (inches)
2013	120	102
2014	115	99.89
2015	130	105
2016	126	104
2017	117	193

4.4 Air Quality

The ambient air quality measured at the perimeter of proposed project area can provide some indication of the air quality within the project area. The range of various pollutant levels measured at the perimeter of proposed project during the month of December are presented in Table 4.4 below. Details location of air quality monitoring point is 16°56'49.74"N & 96°11'42.29"E with Google Map is shown in Figure 4.6. The result of air quality is shown in Table 4.5. And then, National Environmental (Emission) Guideline is described in Chapter (2).

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Figure 4.6 Locations of Air Quality Monitoring Point

Table 4.4 Ambient Air Monitoring Results

No.	Parameter	Results	Unit	Measuring Avg. Period		NEQG Guideline Value	Guideline Avg. Period
1	Nitrogen dioxide	67.74	$\mu\text{g}/\text{m}^3$	1	Hour	$200 \mu\text{g}/\text{m}^3$	1-hour
2	Particulate Matter PM_{10}	42.67	$\mu\text{g}/\text{m}^3$	24	Hour	$50 \mu\text{g}/\text{m}^3$	24-hour
3	Particulate Matter $\text{PM}_{2.5}$	27.6	$\mu\text{g}/\text{m}^3$	24	Hour	$25 \mu\text{g}/\text{m}^3$	24-hour
4	Sulfur Dioxide	187.68	$\mu\text{g}/\text{m}^3$	10	Mins	$500 \mu\text{g}/\text{m}^3$	10-minute
5	Ozone	0.8	$\mu\text{g}/\text{m}^3$	24	Hour	$100 \mu\text{g}/\text{m}^3$	8-hour
6	Carbon Dioxide	348.09	ppm	24	Hours	NG	-
7	Carbon Monoxide	656.09	ppb	24	Hours	NG	-
8	Hydrocarbon	77.4	ppm	24	Hours	NG	-
9	Atomic Radiation	15.21	CPM	24	Hours	NG	-
10	Temperature	33.86	$^{\circ}\text{C}$	24	Hours	NG	-

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11	Volatile Organic Compound (VOC)	0.88	ppm	24	Hours	NG	-
12	Wind Speed	1.49	Kph	24	Hours	NG	-
13	Wind Direction	233.24	Deg	24	Hours	NG	-
14	Relative Humidity	55.48	RH%	24	Hours	NG	-

Note: NG – No Guideline

According to the above table, the results of having guideline parameters were acceptable limits.

4.5 Groundwater and Water Supply

Selected water quality parameters of ground and wastewater resources have been studied for assessing the water environment and evaluating the anticipated impact of the proposed project. The purpose of this study is to:

- Assess the water quality characteristics for critical parameters,
- Predict impact on water quality by this project and related activities and
- Suggest appropriate mitigation measures.

Water quality and wastewater quality at the project site and surrounding the project site were monitored at the two sampling points and detail descriptions of the locations of sampling points are shown in Table 4.5 and Figure 4.7.

Table 4.5 Locations of Water Sampling Points

Type of Water	Coordination	Description of Location
Tube Well Water	16° 56' 52.07" N 96° 11' 44.93" E	Temporary Water Storage Tank (in the project)
Wastewater	16° 56' 49.17" N 96° 11' 42.07" E	Municipal Drain Channel (In front of the project)



Figure 4.7 Locations of Water Sampling Points

4.5.1 Ground Water Quality

The ground water quality analyzed from the tube well located in the proposed project area can provide some indication of the water quality of the project area. The following Table 4.6 shows the water parameters measured during the month of November. [See Appendix (4)]

Table 4.6 Results of Ground Water Quality Analysis

No.	Parameters	Unit	Analysis Value	Drinking Water Standards		
			Tube Well	WHO (2011)	EPA (Spring 2012)	Indian Specification (IS:10500,2012)
1.	pH	-	6.72	6.5~8.5	6.5~8.5	6.5~8.5
2.	Chloride (Cl ⁻)	ppm	110	250	250	250
3.	Total Hardness as CaCO ₃	ppm	159	500	-	200
4.	Total Iron (Fe)	ppm	0.5	0.3	0.3	0.3
5.	Sulphate (SO ₄)	ppm	ND	250	250	200
6.	Total Alkalinity as CaCO ₃	ppm	157	-	-	200
7.	Turbidity	NTU	7.15	5	-	1
8.	Manganese (Mn)	ppm	0.3	0.4	0.05	0.1
9.	Aluminum (Al)	ppm	0.01	0.2	0.2	0.03
10.	Cyanide (CN)	ppm	ND	0.07	0.2	0.05
11.	Copper (Cu)	ppm	0.09	2	1	0.05
12.	Total Dissolved Solids (TDS)	ppm	213	600	500	500

Note: As most of the parameters measured are within the normal range. It can be concluded that the water from the tube well can be used as domestic water.

According to the above table, total iron (Fe) value of tube well water sample exceeded the Drinking Water Standards. And then, turbidity value also exceeded the WHO (2011) and Indian Specification (IS: 10500, 2012), and manganese (Mn) value also exceeded the EPA (Spring 2012) and Indian Specification (IS:10500, 2012). All other parameters were within the desirable Drinking Water Standards.



Figure 4.8 Photos of Tube Well Water Sampling

4.5.2 Wastewater Quality

In order to monitor the wastewater quality, wastewater sample from municipal sewage drain located in front of the factory was taken and tested at GMES laboratory. The results are presented in Table 4.7 and Appendix (6) and were compared with effluent level from National Environmental Quality (Emission) Guidelines (Dec, 2015) is shown in Appendix (4).

Table 4.7 Results of Wastewater Quality Analysis

No.	Parameters	Unit	Analysis Value	National Environmental Quality Emission Guidelines (2015)
			Municipal Drain in front of the factory	General Applications
1.	pH	-	8.71	6 ~ 9
2.	Chemical Oxygen Demand (COD)	ppm	473	250
3.	Biochemical Oxygen Demand (BOD ₅)	ppm	95	50
4.	Ammonia (NH ₃)	ppm	ND	10
5.	Total Cyanide (CN)	ppm	ND	1
6.	Copper (Cu)	ppm	0.09	0.5
7.	Total Iron (Fe)	ppm	ND	3.5
8.	Oil & Grease	ppm	ND	10
9.	Phenols	ppm	0.36	0.5
10.	Sulphide	ppm	ND	1
11.	Total Suspended Solids (TSS)	ppm	155	50
12.	Zinc (Zn)	ppm	0.07	2

Note: ND – Not Detectable

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According to the above table, COD, BOD and total suspended solids (TSS) values of municipal drain water sample exceeded NEQG (Effluent) – General Application. All other parameters were within the desirable limits of NEQG.



Figure 4.9 Photo of Wastewater Sampling from Municipal Drain in front of the Project

4.6 Soil Quality

In order to monitor the soil quality, soil sample in front of the project was taken and tested at GMES laboratory. The analysis results of the physico-chemical parameters are presented in Table 4.8.

Table 4.8 Results of Soil Quality

No.	Parameters	Unit	Analysis Value
			In front of the Project
1.	pH	-	6.94
2.	Chloride (Cl)	g/kg soil	0.085
3.	Total Iron (Fe)	mg/kg soil	1
4.	Arsenic (As)	g/kg soil	ND
5.	Cyanide (CN)	g/kg soil	ND
6.	Aluminum (Al)	mg/kg soil	ND
7.	Manganese (Mn)	mg/kg soil	ND
8.	P - Alkalinity	mmol/l extract	0
9.	Total Alkalinity	mmol/l extract	28.5
10.	Extractable Acidity	cmol/kg soil	6.25

Note: ND – Not Detectable



Figure 4.10 Photo of Soil Sampling

4.7 Surface Water

In the vicinity project area, there is no stream near the project area. That is as shown in the Figure 4.2 because the project is located in the industrial zone.

4.8 Noise Environment

Parameter for noise level survey was determined according to Myanmar National Environmental Quality (Emission) Guidelines (2015), and also determined by referring the National Environmental Quality Guideline-EQG (Dec, 2015) is shown in Chapter (2).

Noise survey has been conducted at the project site in order to establish an acoustic baseline onto which potential impacts from the proposed project may be superimposed. Noise level monitoring was also done at the same sampling points used for air quality monitoring. Noise levels measured with SOUND LEVEL METER (SL-4033SD) is showed in Figure 4.11 and the survey results are described in Table 4.9.

The noise level measured is lower than the permissible level for the commercial and industrial area. (Source: General EHS Guidelines: IFC-www.ifc.org). The location of noise measuring point is measured at the same place of the ambient measuring point, $16^{\circ}56'49.74''N$ & $96^{\circ}11'42.29''E$. According to the ECD comment that above three time measuring atleast, this fact will carried out during monitoring period after approving the IEE report.



Figure 4.11 Sound Level Meter



Figure 4.12 Locations of Ambient Noise Measuring Point

Table 4.9 Survey Results for Noise Level Determination

Locations	Noise Level (dBA)	NEQG (dBA)
Near the Temporary Office during Construction Period	63.11 (Day Time)	70
	58.32 (Night Time)	70

Note: * Equivalent continuous sound level in decibels

4.9 Social and Cultural Resources

Area of Mingaladon Township is 128 km² and density 2582/ km². Population of Mingaladon Township is 255,807 in 2014-2015. It was learnt that 93.00 % of the population is Bamar nationality, 1.21 % is Rakhine, 1.48% is Karan, 0.63% is Mon and the rest are Chin, Kachin ,Kayar and Shan.

Mingaladon has 27 Wards, 5 Village tracts and . According to statistics 29.38 % of the total population is under 18 year of age and 71.62% is above 18. The ratio of male to female is 1:1.1. The majority of the religion is Buddhist (95.49%), and Christian (1.63%), Hindu (1.26%), Islam (1.62%) respectively.

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Regarding about education, there are also 12 high schools, 13 Middle schools, 27 Primary schools and 22 monastic education schools.

For health-care facilities, 2 numbers of township level hospitals with 50 and 100 beds, 25 Private clinics, and 5 Village tract health care centers are available. There are three military hospitals for military services ;Defense Services General Hospital (1000-bed), Defense Services Orthopaedic Hospital (500-Bed), Defense Services Obstetric, Gynaecological and Paediatric Hospital (500 beds).

There are five NGO organizations and ten social organizations exist. Those who are Buddhists have chances do their religious deeds and 230 monasteries and to give their children basic education in 19 Nun schools.

For religion sector there are two Christian churches, two Islamic mosque and 5 hindu temple in township.

Hlawga National Park situated in Mingaladon, Yangon Division, Myanmar, 22 miles (35 km) north of Yangon. The 1,540-acre (623-hectare) park includes an 818-acre (313 hectare) wildlife park, a 62-acre (25-hectare) mini-zoo and a 660-acre (267-hectare) buffer zone .The park embraces the catchment area of the Zokanabe Lake, an extension dam built in 1921–24 to reinforce the greater Hlawga Lake which has supplied water to Yangon since 1904. The park was established in 1982 with joint-funding by the UNDP and the Burmese government[2] in order to protect the forests and vegetative cover in the catchment of Hlawga Lake, and to establish a representative collection of Burmese indigenous wildlife species of mammals, reptiles and birds, in their natural habitats.

One of the remarkable monument for the war is Allied War Memorial Cemetery at Htaukkyant, 32 km from Yangon, on the way to Bago. The Allied War Memorial Cemetery has 27, 000 tombstones of Allied soldiers who lost their lives in Myanmar during the World War II. The cemetery is peaceful and beautiful tended.

4.10 Ecological Resources

Ecological resources exist in National park of Mingalardon township.

4.10.1 History

The park embraces the catchment area of the Zokanabe Lake, an extension dam built in 1921–24 to reinforce the greater Hlawga Lake which has supplied water to Yangon since 1904. The park was established in 1982 with joint-funding by the UNDP and the Burmese government in order to protect the forests and vegetative cover in the catchment of Hlawga Lake, and to establish a representative collection of Burmese indigenous wildlife species of mammals, reptiles and birds, in their natural habitats.

4.10.2 Wildlife

The 818-acre (3.31 km²) wildlife park is home to various types of deer (eld's deer, hog deer, barking deer, sambar deer), as well as rhesus monkey, pythons, and pangolin. Their natural habitats consists of semi-evergreen forests, mixed deciduous forests, and swamp forests. According to a 1992 survey, the park was home to at least 21 species of mammals, 145 species of birds and 8 species of reptiles.Barking deer,

hog deer and wild boar are the most common mammal species. Slow lores, pangolin and a few species of jungle cats used to roam the park at night feeding on figs, which is abundantly found in the park. The semi-evergreen type of vegetation creates ideal habitats for a variety of reptiles from monitor lizards to cobra, and krait (*Bungarus fasciatus*) to pythons (*Python reticulatus*).

4.10.3 Birds

Resident and migratory birds are abundant inside the park. Identified species include: the jungle fowl (*Gallus gallus*), red-vented bulbul (*Pycnonotus cafer*), lesser whistling duck (*Dendrocygna javanica*), Asian openbill stork (*Anastomus oscitans*), black-crowned night heron (*Nycticorax nycticorax*) and white-throated babbler (*Turdoides gularis*). Black-headed Bulbul (*Pycnonotus atriceps*).

4.10.4 Flora

The evergreen forest contains at least 295 species of plants. Common species are dipterocarps and *Lagerstroemia speciosa*. Also found are deciduous species such as teak (*Tectona grandis*) and binga (*Mitragyna rotundifolia*), and medicinal plants such as *sinonma-nwe* (*Tinospora cordifolia*).

4.11 Economic Development

Mingaladon Township is gradually developing. Residents enjoy their livelihood in agricultural, industrial, private and government service sectors. The Number (3) National High way Road is next to the Township. Residents could merchandise the goods produced from Industries nearby.

According to the statistics from Township Administrator office, local people have grown major crop, paddy in 2,765 acreage in raining season..

In livestock breeding sector, 67 buffaloes, 27 cows, 353 pigs, 173 goats, 88173 hens and 19000 ducks have been bred in 2016-2017 fiscal year. In milk production, 3441037 viss of milk was received from 3,772 cows in township at same fiscal year.

Local residents had consumed 101,500 viss of fish in 2014-2015.

A lot of industries such as paper mill, printing house, fruit juice factory, drinking water factory, flour mill, garment factory, plastic printing factory, bread and biscuit factory, noodle factory, and ply wood factory, peanut oil mill, soft drink factory, and bakery factory exist in industrial zone. Township as a whole has 100 factories are being running by 70604 labors and 16 numbers of petrol stations and 5 gas filling stations are opened in Township.

Hlawga CCGT Power Plant Myanmar is located at Southeast Bank of Hlawga Lake, Yangon, Myanmar. Location coordinates are: Latitude= 16.9827, Longitude= 96.1249. This infrastructure is Gas Power Plant with a design capacity of 154 MWatt. It has 4 unit(s). The first unit was commissioned in 1996 and the last in 1999. It is operated by Myanmar Electric Power Enterprise (MEPE).

As for transportation, the township has a facility of Yangon international airport and there are also public transportation system for buses.

5.0 IMPACT ASSESSMENT AND MITIGATION MEASURES

Environmental impact assessment has been carried out considering the impacts of proposed project with associated activities on important components of the environment and society. Firstly, all of the environmental components sensitive to proposed activities were identified during the field visit, local people’s perception and worldwide practice of EIA. The mitigation measures for identified impacts are based on literature reviews, professional judgment and past experience from similar projects.

5.1 Methodology of Impacts Identification

The identification and assessment of impacts has been carried out by considering the proposed activities in terms of construction and operation stage. The impact of the activities will be on physical, biological, socio-economic and cultural resources within the industrial zone. The impacts generated are both beneficial as well as adverse. The environmental impacts have been identified for a number of issues based on the analysis of the environmental baseline information and activities that are to be undertaken (during construction, rehabilitation and subsequent operation phase). Most of the identified impacts have been quantified to the extent possible.

The impacts have been predicted in terms of their magnitude if significance (minor, moderate and high), extent (site specific, local and regional) and duration (short, medium and long term) as illustrated in Table 5.3.

5.1.1 Valued Ecosystem Components

Valued Ecosystem Components (VECs) are ecosystem components that are considered to be important or valuable and that merit detailed consideration in the EIA process (Treweek, 1999). The concept of VECs has been used in EIAs as a tool to highlight important receptors (individuals or groups) which could be effected (positively or negatively) by the different aspects of a project under a evaluation. The VECs are selected depending on the identification of pathways linking important environmental components with the totality of the project’s activities, and as such, VECs are fundamental to the EIA process. The environmental resources can be divided into their key characteristics or categories from which the VECs can be selected. Table xx-1 presents a list of each environmental resource associated with the VECs that are deemed significant in terms of environmental and social importance in the context of this Project. Each of these VECs has been evaluated in terms of the construction and operational aspects of the Project and relevant mitigation measures will be recommended to ensure that all negative impacts are mitigated.

Table 5.1 Valued Ecosystems Components

Environmental Resource	Valued Ecosystems Component	Importance of the Valued Ecosystem Component
Air and Climate	Air Quality	<ul style="list-style-type: none"> • Effects on air for local residents • Health implications for all users • Effects on the ecosystem
	Climate	<ul style="list-style-type: none"> • Contribution to global warming

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Land	Geomorphology and Landscape	<ul style="list-style-type: none"> • Changes in land morphology • Use of non-renewable resources • Importance to local community • Effects of waste disposal methods
Water	Groundwater Quality	<ul style="list-style-type: none"> • Sustainability issues is groundwater considered a highly limited renewable resource in the area • Effects on local use irrigation and drinking
	Surface water quality	<ul style="list-style-type: none"> • Sustainability issues • Effects on local use (irrigation, drinking and transportation) • Health implications for all users
	River Water Quality	<ul style="list-style-type: none"> • Effects on local use (fisheries, transportation) • Health implications for all users
Ecology and Biodiversity	Terrestrial Ecology and Biodiversity	<ul style="list-style-type: none"> • Importance to biodiversity value (International, National and Regional) • Important for ecosystem well being and proper functioning • Use to community
	Marine Ecology and Biodiversity	<ul style="list-style-type: none"> • Importance to the well being of all biological content of the ecosystem • High biological value (International, National and Regional) • Economic use to community
Human Environment	Socio-Economic Activities	<ul style="list-style-type: none"> • Employment opportunities • Community welfare
	Community Health and Safety	<ul style="list-style-type: none"> • Operations impact on community safety • Reduction of gas flaring
	Noise Pollution	<ul style="list-style-type: none"> • Nuisance to local community • Influence on biological diversity
	Agriculture	<ul style="list-style-type: none"> • Socio-economic importance • National and community value creation
	Light pollution	<ul style="list-style-type: none"> • Nuisance to local community and ecosystem

5.1.2 Environmental Aspects

The environmental aspects are defined as the elements of an operation or project’s activities, products, or services that can or does interact with the environment. The key environmental aspects associated with the Project are presented in Table 5.2 below.

Table 5.2 Environmental Aspects

Project Component	Environmental Aspect
Construction Activities – Site Preparation	Soil clearing and land leveling
	Transport and equipment use
	Purchase and delivery of construction materials and services
	Staffing
Construction Activities – Civil Works and Mechanical Erection	Worker’s temporary accommodation
	Excavation and earthworks for Plant foundation and buildings
	Transport and use of vehicles and construction equipment
	Construction of infrastructure
Operation Activities	Manufacturing car assembly

5.1.3 Assessment of Impact Significance

The followings items are to be considered in impact significance rating

- Character of the VEC impact
- Duration of the Magnitude of the impact
- Spatial Extent Type (direct, indirect, cumulative)
- Probability of Occurrence

Table 5.3 Criteria rating for Impact Significance

Duration –what is the length of the negative impact?	
None	No effect
Short	Less than 1 year
Medium	1 to 10 years
Long	Greater 10 years
Permanent	irreversible
Magnitude-what is the effect on the resource within the study area?	
None	No effect
Small	Affecting < 1% of the resource
Moderate	Affecting 1-10% of the resource
Great	Affecting > 10% of the resource
Spatial Extent – what is the scale of the impact in terms of area, considering Cumulative impacts and international importance?	
Local	Localized/immediate area impact
Regional/National	Large scale impact
International	International scope and dimension
Type – what is the impact?	
Direct	Caused by the Project and occur simultaneously with Project activities
Indirect	Associated with the Project and may occur at a later time or wider area
Cumulative	Combined effects of the Project with other existing/planned activities
Probability – what is the likelihood of an impact occurring?	

Low	< 25%
Medium	25-75%
High	> 75%

The significance classes defined are outlined in Table 5.4 below.

Table 5.4 Significance Classes for Environmental Impact

Class	Significance	Description/Comments
1	Significant, major impact	Impacts are expected to be permanent and non-reversible on a national scale and/or have international significance or result in legislative non-compliance
2	Significant, moderate impact	Impacts are long term but reversible.
3	Insignificant, minor impact	Impacts are considered to be short term, reversible and/or localized in extent.
4	Insignificant	No impact is expected.
5	Positive	impacts are beneficial to the key VECs

5.2 Construction Phase Impacts Identification, Evaluation of Impact Significance and Mitigations Measures

5.2.1 Construction Phase Impact Identifications

5.2.1.1 Topography

Project lies in the plain area of industrial park and excavation is involved for the construction of building and factory. So, the impact on topography will not be significant in nature. The changes due to construction of the proposed Factory building, however, will be of localized nature. This impact is irreversible and minor negative in nature.

5.2.1.2 Contamination of Soil

The project area is a plain terrain with paved road structure. Soil erosion and contamination may occur on roadside, at contractors’ camps due to the following likely impacts:

- Excavation of earth/cutting operations, clearing of vegetation and land leveling activities can destabilize the surrounding land surface, particularly if the excavated area is left unfilled for long, which may lead to rainfall induced soil erosion;
- The unspent materials and debris produced from consumed up materials, if left as such and allowed to mix with soil underneath, can degrade the quality of receiving soils and may render them unfit for plantation later on;
- Leakages of oils, lubricants, chemicals, and other similar substances from their storage sites and from engines of the generators, machines, equipment and vehicles can spoil the receiving soils and may undermine ability of the spoiled soils to support growth of vegetation and plants;

- Non-provision of septic tanks with the temporary worksite toilets, constructed for the labor and others, can contaminate the effluent receiving soils because of raw nature of the effluents;
- Also washing of the gadgets, machinery and equipment without proper drainage of the washout water can adversely affect the soil quality. This impact is, however, temporary and minor negative in nature.
- Onsite storage of the construction materials such as sand, aggregate, crushed stone, cement, bricks, lubricants, fuels and iron bars on the land without an intervening barrier, can degrade soil quality and may smear them with fine particulates of the dumped materials;
- Improper on site storage of equipment and machinery such as wheelbarrows, mixers and compactors and disorderly parking of machinery and equipment may cause soil contamination from trickling or accidental leakages of oils and lubricants there from.

5.2.1.3 Surface and Groundwater

There is no significant surface water resource of the project area so there will be no impact on surface water quality during the construction of the project area. There is a possibility that various materials like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater, if they are not handled properly. During the construction phase, the sanitary wastewater will be generated at the workers' camp(s). If this wastewater is allowed to stagnate in water ponds on the site, it can percolate into the soil, thereby, contaminating groundwater.

Persistent and prolonged withdrawal of groundwater higher than the safe yield limits of the aquifer can initiate early depletion of aquifer. This situation can result in reduced water supplies for other users who share the same groundwater resource. Abstraction of the groundwater over and above the safe yield limit can produce serious hydrological and environmental consequences. Over abstraction can lead to:

- Early depletion of the aquifer resources;
- Persistent lowering of the water table;
- Reduced availability or non-availability of the groundwater to the neighbouring communities sharing the same aquifer

Mitigation measures will include;

- Protection of groundwater reserves from any source of contamination such as the construction and oily waste that will degrade its potable quality;
- The solid waste will be disposed off in designated landfill sites to sustain the water quality for domestic requirements;

- Water required for construction is obtained in such a way that the water availability and supply to nearby communities remain unaffected;
- Regular water quality monitoring according to determined sampling schedule;
- Prohibit washing of machinery and vehicles in surface waters, provide sealed washing basins and collect wastewater in sedimentation/retention pond;
- Continuous withdrawal and over pumping of groundwater should be avoided. Instead, intermittent pumping be carried out to conserve the groundwater resources;
- Take precautions construct temporary or permanent devices to prevent water pollution due to increased siltation; and
- Wastes must be collected, stored and taken to approve disposal site.

Since the site would be de-watered, there is possibility of water draining out from wells within the neighbor-hoods. Furthermore, de-watering can introduce saline water into the water table and this could have an effect on the vegetation within the vicinity.

There are also sedimentation/ siltation of drainage or waterways from unconfined stockpiles of soil and other materials and pollution of nearby water body due to improper disposal of construction wastes.

5.2.1.4 Waste Generation

Construction projects produce a large amount of waste. The quantity of waste generated depends on various factors such as type, quality and contractor to mention a few.

Possible types of waste generated could be wood, concrete, metal, brick plastic etc... If the waste is not managed properly, this could be of nuisance to the neighborhood.

5.2.1.5 Noise Pollution

Operation of machineries and activities of foundation lying will generate considerable noise within the vicinity of the project site. However, noise related to construction would there be for a temporary duration.

The emergency power supply is obtained by a diesel generator and is built with a special noise elimination setting and the operating noise level is 75 dB within 7 meters. With the built-in special sound filter of the generator, any impact from the sound would be negligible.

5.2.1.6 Air Pollution

Land clearing, operation of diesel engines and use of toxic materials are some of the major activities that could lead to air pollution during

construction. Dust from cement, wood and aggregates are considered to be PM₁₀ or particulate matter less than 10 microns. This could be carried to long distances and is harmful for humans causing respiratory disease.

Another type of PM₁₀ is exhausted from the use of diesel known as diesel particulate matter (DPM). Use of diesel machines can exhaust toxic gases such as carbon monoxide, hydrocarbons, nitrous oxides and carbon dioxide. Noxious vapors from oils, glues, thinners, paints, treated woods, plastics, cleaners and other hazardous chemicals that are widely used on construction sites, also contribute to air pollution.

Air quality will be affected by fugitive dust emissions from construction machinery; dust from the unpaved surface and construction vehicles. Emissions may be carried over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability. Besides, multifarious construction activities and increased vehicular traffic (construction vehicles) would also contribute to the localized airborne dust. Once in the air, the larger sized particles, under influence of gravity, tend to settle down in the immediate vicinity of the source. The suspended particulate matter (SPM) of the size smaller than 10 micrometer (PM₁₀) tends to remain suspended in the environment for much longer and persistent time and is an environmental hazard. The objectionable impacts of settling of the suspended dust would be its dry deposition on vegetation, glass windows, motor vehicles, buildings, and other exposed surfaces. Exhausts from fossil fuel burning in the construction machinery will also deteriorate local air quality. Similarly, exhausts from generators can also have impacts on air quality in the vicinity

5.2.1.7 Closure of Construction Camps

The contractor is required to properly remove all temporary structures built for operation of construction and workers camps. While doing so, the land will be brought back to original state. The impact is predicted to be direct, of medium significance, confined to construction area, and short-term.

5.2.1.8 Social Impact Assessment

Population Influx occurs due to resettlement or migrant of construction workers to nearby residential area

- Worker camp sitting: consultation surrounding potential construction camp sites revealed concerns regarding the location of proposed sites for Worker Camps.
- Tension between Communities and Workers: cultural differences, behavior of construction workers, potential disregard for local cultural norms, potential for prostitution and the attraction of “hangers on” at camp sites could lead to increased tension between local communities and the workers and camps. The scale of this impact will depend on successful

implementation of mitigation measures and in part on the origin of the workforce staying in construction camps. Some communities have expressed particular concerns in this regard.

5.2.1.9 Health and Safety

Occupational Health and Safety

Health risks and work safety problems may result at the workplace if the working conditions provide unsafe and/or unfavorable working environment and due to storage, handling and transport of hazardous construction material. Workers should be provided with safe and healthy working environment taking into account risks inherent to the particular sector and specific classes of hazards in project area.

Community Health and Safety

The construction activities and vehicular movement at construction sites and access service roads may also result in road side accidents particularly inflicting local communities who are not familiar with presence of heavy equipment and machinery. This is a temporary and minor negative impact. Quality of ground water and surface water resources available in the nearby local communities may get contaminated due to the construction activities, oil spillage and leakage roadside accidents etc. The laborers work with different transmittable diseases may cause spread out of those diseases in the local residents.

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5.2.2 Determination of Significance of Impacts in Construction Phase

Table 5.5 Impact Significance during Construction Phase

Activity	VEC	Impact	Duration	Magnitude	Extent	Type	Probability	Significance
Soil and land leveling	Air Quality	Increased air emissions (dust and exhaust emission)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MODERATE
	Geomorphology and Landscape	Geomorphologic changes and visual impact	PERMANENT	SMALL	LOCAL	DIRECT	25-75%	MODERATE
	Terrestrial Ecology and Biodiversity	Effect on flora and fauna	PERMANENT	MODERATE	LOCAL	DIRECT	25-75%	MODERATE
	Socio-Economic Activities	Increased economic activity	MEDIUM	SMALL	LOCAL	DIRECT	25-75%	POSITIVE
	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
Construction of access roads	Air Quality	Increased air emissions (dust and exhaust emission)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Geomorphology and Landscape	Geomorphologic changes and visual impact	PERMANENT	SMALL	LOCAL	DIRECT	25-75%	MODERATE
	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-Economic Activities	Local employment prospects	MEDIUM	SMALL	LOCAL	DIRECT	25-75%	POSITIVE
Purchase of supplies and services	Air Quality	Increased air emissions (dust and exhaust emission)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
Human resource	Socio-economic activities	Local employment prospects	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE
Workers' Temporary Accommodat	Water resources and sewage	Potable water use and sewage disposal	MEDIUM	MODERATE	LOCAL	DIRECT	25-75%	MINOR

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ion	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE
Excavation, foundation, building works and mechanical erection	Air quality	Increased air emissions (exhaust, dust etc)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Geomorphology and landscape	Visual impact due to construction activities	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	REGIONAL	DIRECT	>75%	POSITIVE
	Noise Pollution	Increased noise levels	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
Use of vehicles and construction equipment	Air quality	Increased air emissions (exhaust, dust etc)	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE
Construction of infrastructure	Biodiversity	Degradation of ecosystem	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Noise Pollution	Increased noise levels	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-economic activities	Increased economic activity	MEDIUM	MODERATE	LOCAL	DIRECT	>75%	POSITIVE
Waste disposal	Groundwater quality	Leaching of waste into aquifer	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
	Community health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE

5.2.3 Mitigation Measures

5.2.3.1 Contamination of Soil

- Excavations would be kept confined to the specified foundation spots as per the approved engineering drawings. Unnecessary excavations should be avoided;
- Site camps for the resident labors should not be setup on the land earmarked for developing green belts and lawns;
- Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall and away from any potential source of fire;
- Septic tanks of adequate capacities should be constructed for receiving and treating wastewater from all temporary worksite toilets and at the temporary container offices, if any. The toilet wastewater should not be discharged untreated onto the adjacent lands;
- All machineries and materials should be stored at the designated areas and compounds;
- All the unspent and left over materials should be completely removed offsite upon completion of construction and the site should be restored to original or near to original condition; and
- Washout from washing of equipment and gadgets should be drained into either a septic tank or a sand-gravel bed for removal of the grit and contaminants

5.2.3.2 Contamination of Ground and Surface Water

- De-watering would be planned during the low tides and would be carried out in the shortest time possible
- Trees within the vicinity will be watered to minimize the effect due to introduction of water into the water body
- Proper stockpiling of soils (on flat areas and away from drainage routes)
- Soils generated from civil works be disposed as filling materials
- Set-up temporary disposal mechanism within the construction area and properly dispose the generated solid wastes.
- Set up proper and adequate toilet facilities
- Strictly require the contractor and its workers to observe proper waste disposal and proper sanitation

5.2.3.3 Waste Generation

- Reusable construction materials would be isolated with much effort as possible.
- Collected waste would be carried to the dump yard on a regular basis.

- A cleanup of the adjoining roads would be carried at the end of each day and adequate number and capacity of vehicles for removal would be maintained.

5.2.3.4 Noise Pollution

All the machineries used on site would be properly maintained to prevent unnecessary noise.

- The workers operating the machines would be wearing the proper protection gears.
- During the construction phase, work would be scheduled for the use of heavy vehicles (e.g. casting of slabs and beams) during the daytime to eliminate noise impact on sleeping.)

5.2.3.5 Air Quality

To avoid and minimize the fugitive dust emissions following measures will be implemented.

- The bare dry ground will be watered before excavation to minimize the dust emissions
- Water sprinkling will be undertaken in the excavation sites as require
- Regular watering of unpaved roads or exposed soils/ground
- Remove soil /mud from tires of trucks and equipment before leaving the area.
- Hauling trucks should be covered with canvas or any equivalent materials.
- Set-up temporary fence around the construction area.
- Dust sources will be screened by placing fine mesh over them. Other materials which could cause air pollution would be used covered and dampened down with use of water

5.2.3.6 Closure of Construction Camps

Contractor will prepare site restoration plans for approval by the Engineer. The plan will be implemented by the contractor prior to demobilization. Upon completion of the works, all temporary structures will be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the contractor's expense, to the entire satisfaction of the Engineer. Residual topsoil will be distributed on spoil disposal area.

5.2.3.7 Social Impact Assessment

In order to minimize social disturbances as a result of construction workers, existing camps from previous projects will be identified as a first preference. State land will be a second preference for worker camp locations, followed by land where there is a willing lessee.

- The project will seek to avoid sitting camps where their presence might contribute to any conflicts between residents.
- Employment policies which aim to maximize job opportunities for local people will help to minimize tensions caused by different socio-cultural values.
- Training will be provided to all staff on camp management rules and overall discipline and cultural awareness. This will include, in appropriate languages:
 1. A briefing on Camp Rules
 2. A community relations orientation to increase awareness about the local area, cultural sensitivities and the project Code of Conduct
 3. Awareness-raising on health considerations, including standards.
- A Code of Conduct and Camp Rules will be required within the Construction Camp Management Plan, which provides policies and a disciplinary framework with respect to worker behavior.

5.2.3.8 Health and Safety

Occupational Health and Safety

Mitigation measures will include:

- Obligatory insurance against accidents for laborers/workers;
- Providing basic medical training to specified work staff and basic medical service and supplies to workers;
- Layout plan for camp site, indicating safety measures taken by the contractor, e.g. firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents;
- Work safety measures and good workmanship practices are to be followed by the contractor to ensure no health risks for laborers;
- Protection devices (ear muffs) should be provided to the workers doing job in the vicinity of high noise generating machines;
- Provision of adequate sanitation, washing, cooking and dormitory facilities including light up to satisfaction;
- Proper maintenance of facilities for workers will be monitored;
- Provision of protective clothing for laborers handling hazardous materials, e.g. helmet, adequate footwear for bituminous pavement works, protective goggles, gloves etc;
- Ensure strict use of wearing these protective clothing during work activities;
- Elaboration of a contingency planning in case of major accidents;
- Instruct foremen to strictly enforce the keeping out of non-working persons, particularly children, off work sites; and

- Adequate signage, lightning devices, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads.

Community Health and Safety

Mitigation measures will include:

- There should be proper control on construction activities and Oil spillage leakage of vehicles.
- The labor works with different transmittable diseases should be restricted within the construction site.
- Efforts will be made to create awareness about road safety among the drivers operating construction vehicles;
- Timely public notification of planned construction works;
- Close consultation with local communities to identify optimal solutions for diversions to maintain community integrity & social links;
- Provision of proper safety and diversion signage, particularly at sensitive/accident-prone spots;
- Reducing the impacts of vector borne diseases on long-term health effect of workers should be accomplished through implementation of diverse interventions aimed at eliminating the factors that lead to disease, which includes: Prevention of larval and adult propagation of vectors through sanitary improvements and elimination of breeding habitat close to human settlements and by eliminating any unusable impounding of water;
- During construction work pedestrian and vehicular passages should be provided for crossing near settlement;
- Fencing around the camps should be strong enough so that it cannot be broken easily by local people for making passages; and
- Use of water should not disturb public water availability and source of water should be selected carefully

5.3 Identification of Impacts during Operation, Evaluation of Impact Significance and Mitigations Measures

5.3.1 Operation Phase Impact Identifications

The largest point-source emissions in the automotive industry are volatile organic compounds (VOCs) used as paint solvents. Fifty solvents found in paints and adhesive solvents are among the hazardous air pollutants. VOC emissions from these solvents occur during application, curing, and equipment cleaning operations. Several innovative paint technologies aimed at reducing the VOC burden associated with conventional solvent-base paint are emerging.

Solid waste associated with a typical automobile and other wastes have been the target of industry reuse and recycling efforts. Reuse and recycling are important in ongoing efforts to optimize, as cost effectively as possible, energy use and material life cycles.

In general, reuse and recycling occur together, and the amount of solid waste generated can be expressed in tons per vehicle for both hazardous and nonhazardous wastes. Lists of material types that are recycled, expressed in number of pounds per vehicle, are maintained by automobile makers. This provides companies with the opportunity to track and report on the recycled content of their products.

Reuse by suppliers has also been encouraged throughout the industry. Working with suppliers, auto companies have reduced the costs of their own solid waste management and the costs of supplier packaging by requiring that materials delivered to plants be packaged in returnable dunnage.

5.3.1.1 Air Pollution

The majority of the emissions to air generated during motor vehicle assembly are volatile organic compounds (VOCs) emitted from painting and finishing operations (paint storage, mixing, applications, and drying). The emissions are primarily organic solvents, which are used as carriers for the paint and solvents used for cleaning equipment between color changes and to clean spray booths. Other emissions to air include:

- VOC emissions - use of solvent based adhesives during Soft Trim;
- Isocyanates - Spray booths/ovens & paint mixing area during use of paint containing isocyanates;
- Particulates - Paint particulates from spray booths, dust from sanding. Spent filter material;
- Carbon dioxide and oxides of nitrogen where thermal or catalytic incinerators are used;
- Ozone may be released through the use of ultraviolet light curing lamps.

5.3.1.2 Hazardous Materials

Hazardous chemicals and process gases may be used in the assembly process of motor vehicles. Hazardous properties relating to these substances are many and varied and include flammability, combustion potential, toxicity, corrosive potential and oxidizing potential. Chemicals with such properties should be labeled with the appropriate internationally recognized hazard symbol. Some chemicals may only possess a hazard potential if they have the opportunity to react with other compounds.

Inadequate control or accidental releases of hazardous substances on site or in transit may result in significant environmental impacts in relation to soil, groundwater and surface water contamination and occupational health and safety, e.g. disposal of empty drums and packaging of fuel and chemicals.

5.3.1.3 Water Management and Wastewater

Under normal conditions, there should be no emissions to sewer or waters from vehicle coating and refinishing operations using solvent coatings. The new trend towards use of waterborne paints may result in some discharge to sewer, but pre-treatment will be required and authorisation to discharge to sewer or waters must be obtained in advance from regulating authorities. The source of such emissions would be waterborne paint gun washes and spray booth wash waters. Emerging treatment for such waste water is chemical flocculation followed by filtration or sedimentation.

There are several areas with a potential to contaminate waters via accidental discharge to drains and sewers or onto ground. These include gun wash within the paint gun cleaning unit. Residues from solvent-containing paint, waste gun cleaner or dirty water from wet filters (where used). There should be no open drains or sinks where solvent materials are being handled or stored. Other liquid waste include paint overspray caught by emissions control devices and unused paint.

Local communities and the environment may be affected by pollution due to discharge of untreated wastewater. The toxins in such water may affect local ecology as well as posing a hazard to drinking water supplies and contaminating land.

5.3.1.4 Solid Wastes

Solid wastes may arise from several sources during assembly and the majority of wastes by volume result from packaging - reusable or disposable. Reusable packaging covers metal racks, bins and containers and disposable packaging covers wood pallets, cardboard, plastic, polystyrene and polythene film. Other solid wastes include:

Scrap metal from the press shop, which is normally recycled off-site. Metal-rich dust generated by the abrasive disc smoothing of welds and soldered joints.

Sludge generated by wastewater treatment facilities of equipped vehicle manufacturing plants.

Additional wastes arise from general operations, cleaning and maintenance and the disposal of faulty equipment and parts. Improperly disposed of waste can lead to pollution and ground contamination.

5.3.1.5 Energy Consumption

Motor vehicle assembly plants use energy throughout the plants for many different end-uses. The main energy types used on-site are electricity, steam, gas and compressed air.

Paint shops are major energy consumers. Energy is used to condition the air for the painting and drying steps, and for treatment of the emissions and for ventilation.

Some forms of energy production are damaging to the environment, such as the production of carbon dioxide from fossil fuel combustion. Energy security and energy price fluctuation are a concern in many developed and developing countries. The motor vehicle assembly industry has responded with many motor vehicle assembly sites introducing renewable energy sources such as wind and solar.

5.3.1.6 Waste Used Oil

Waste Oil is simply waste oil, any petroleum or synthetic oil that has already finished its work in the engine it was used to lubricate. Used Lube Oil is defined as the petroleum derived or synthetic oil which remains after the application of Lube Oil in lubrication, cutting purposes, etc

Typical vehicle maintenance activities include oil and filter changes, battery replacement, light metal machining et cetera. Potential wastes generated as a result of vehicle maintenance and repair activities are: used oils, spent fluids, spent batteries, asbestos brake pads and linings, metal machining wastes, spent organic solvents, and tires.

These wastes have the potential to be released to the environment if not handled properly, stored in secure areas with secondary containment, and/or protected from exposure to weather. If released to the environment, the impact of these releases can be contamination of surface waters, ground water and soils, as well as toxic releases to the air

5.3.1.7 Occupational Health and Safety

Chemical Exposure

Chemicals involved in the motor vehicle assembly may have a wide range of hazardous effects, including being toxins, carcinogens or highly corrosive upon skin contact. Direct skin and eye exposure to and/or inhalation of hazardous chemicals can result in health impacts for workers. Prolonged exposure over years can induce chronic health effects. Particular substances to be aware of include:

- **Coating powder.** Some components of coating powders can cause irritation of lungs, eyes and skin and allergic skin reactions. They can also cause long-term health effects or asthma.
- **Curing agents.** Some curing agents may damage genetic material, which could cause some diseases including cancer and impaired fertility.
- **Organic solvents.** The most commonly used solvents for degreasing are chlorinated solvents such as trichloroethylene, dichloromethane (methylene chloride) and
- perchloroethylene. These substances may be harmful to health if inhaled. The ill-health effects from inhalation would depend on the

substance in use and the concentration and length of exposure. At high concentrations all organic solvents exert a strong narcotic effect and can be fatal. Skin exposure can cause irritation and dermatitis.

5.3.1.8 Noise and Vibration Pollution

Vehicle assembly plants can be noisy work places due to the high level of use of machinery. Transport of products by road may also generate noise. The main source of noise generation is due to plant operation, generation from vehicle movement and especially from the operation of generators, compressors, raw material cutting and bending, etc. Those at risk include machine operators and those working nearby, e.g., maintenance staff, cleaners, forklift truck drivers and shop floor supervisors.

Noise may reach levels that are hazardous to health, leading to symptoms associated with permanent deafness. Noise, particularly during unsocial hours, may cause annoyance or disruption to local communities.

Hand-arm vibration syndrome from the prolonged use of vibrating tools and machinery causes effects on the body's blood circulation known as 'vibration white finger' (VWF). Other damage may be caused to the nerves and muscles of the fingers and hands causing numbness and tingling, reduced grip strength and sensitivity. Pain and stiffness in the hands, and joints of the wrists, elbows and shoulders are other possible symptoms.

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5.3.2 Determination of Significance of Impacts in Operation Phase

Table 5.6 Significance Impacts Rating during Operation Phase

Activity	VEC	Impact	Duration	Magnitude	Extent	Type	Probability	Significance
1) Stage 1, Engineering Design	-	-	-	-	-	-	-	-
2) Stage 2, Raw Material cutting, bending, rolling	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
3) Stage 3, Parts Fabrication	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
4) Stage 4, Structure Frames Assembly	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
5) Stage 5, Body panel assembly & Interior Fittings	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
6) Stage 6, Air Conditioner System & electrical wiring Installation	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
7) Stage 7, Spray Painting	Air quality	VOC	LONG	MODERATE	LOCAL	DIRECT	<25%	MODERATE
	Occupational Health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
8) Stage 8, Quality Control & Checking	-	-	-	-	-	-	-	-
Solid Waste disposal	Ground water quality	Leaching of waste into aquifer	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
	Community health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE

5.3.3 Mitigation Measures

5.3.3.1 Air Pollution Control

- Consider use of alternative or low VOC coatings/paints.
- Increase the transfer efficiency of the application technique.
- Capture and concentrate VOC emissions, e.g. with activated carbon.
- Implement a Solvent Management Plan to monitor and control the use of solvents on site.
- Install or upgrade abatement technology to minimize exposure to hazardous substances and to control the release of emissions, e.g. enclosure of equipment, use of appropriate ventilation with filters, gas balancing systems, cyclones, and wet or alkali scrubbers.
- Monitor indoor air quality and use signage where there are elevated levels of emissions and personal protective equipment (PPE) is required. Therefore, PPE will be provided for operation starting. PPE samples are as shown in following Figure 5.1.



Figure 5.1 Personal Protective Equipments (PPEs)

- Implement prevention of a formal Leak

At Painting rooms and fiber making rooms, VOC emissions are exhaust installed. There are included filters. When painting, air will come from ventilators and air flow from up to down and then this air that is containing VOC pass through the filters to the ambient with exhausts.

Air Filtration System

Major source of VOC generation in project is from Spray booth and Fiber room. Project Proponent will install inlet and outlet air filtration system designed by INFITECH.

Filtration System by Infitech

Inlet Filter—Pocket filter

This is a double-filtering system for the fresh air which is driven by the ventilation-in and ventilation-ex fan simultaneously during painting phase and introduced to the operation area.

The first filtering device is placed to keep dust off the fresh air to prevent dust from contacting the ventilation-in fan, which provides longest durability/functionality for the fan(s).

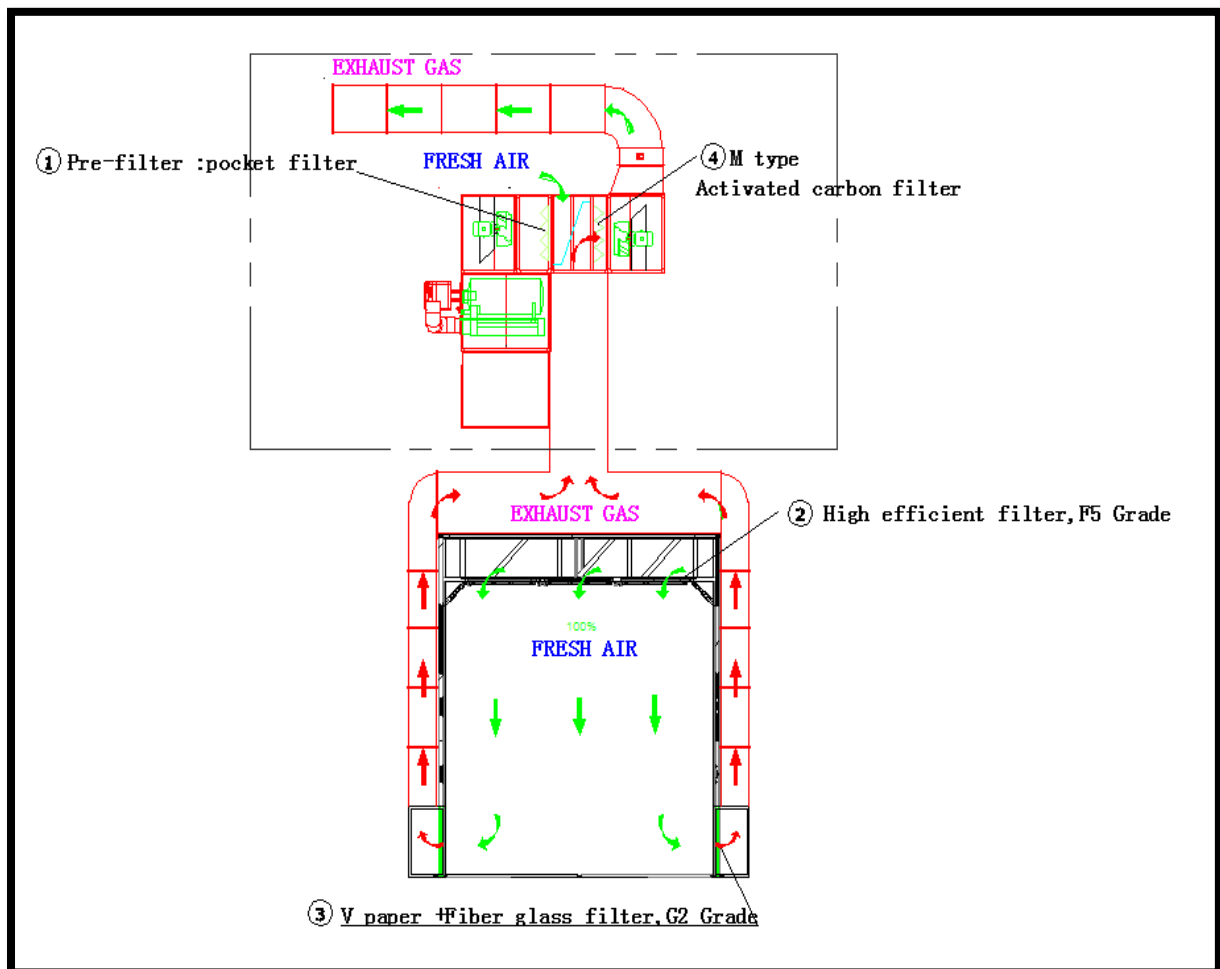


Figure 5.2 Inlet and Exhaust Air Filtration System

It is very important to guarantee large area for the filters to purify the incoming and outgoing air, and maintain suitable air flow without turbulence in the booth to achieve quality result for the painted surface, and cure the wasted air before it is exported to the atmosphere. Even though the machine applies big-area filter, the maintenance of replacing filters is designed to, and can be handled easily by one man.

Table 5.7 Exhaust Air Filtration System

Item	Specification
Inlet Filter	Pocket Filter
Micro dust Filter	High efficiency CC-600G
Floor Filter	V-paper and fiber glass filter
Exhaust Filter	Activated carbon filter mat, M style

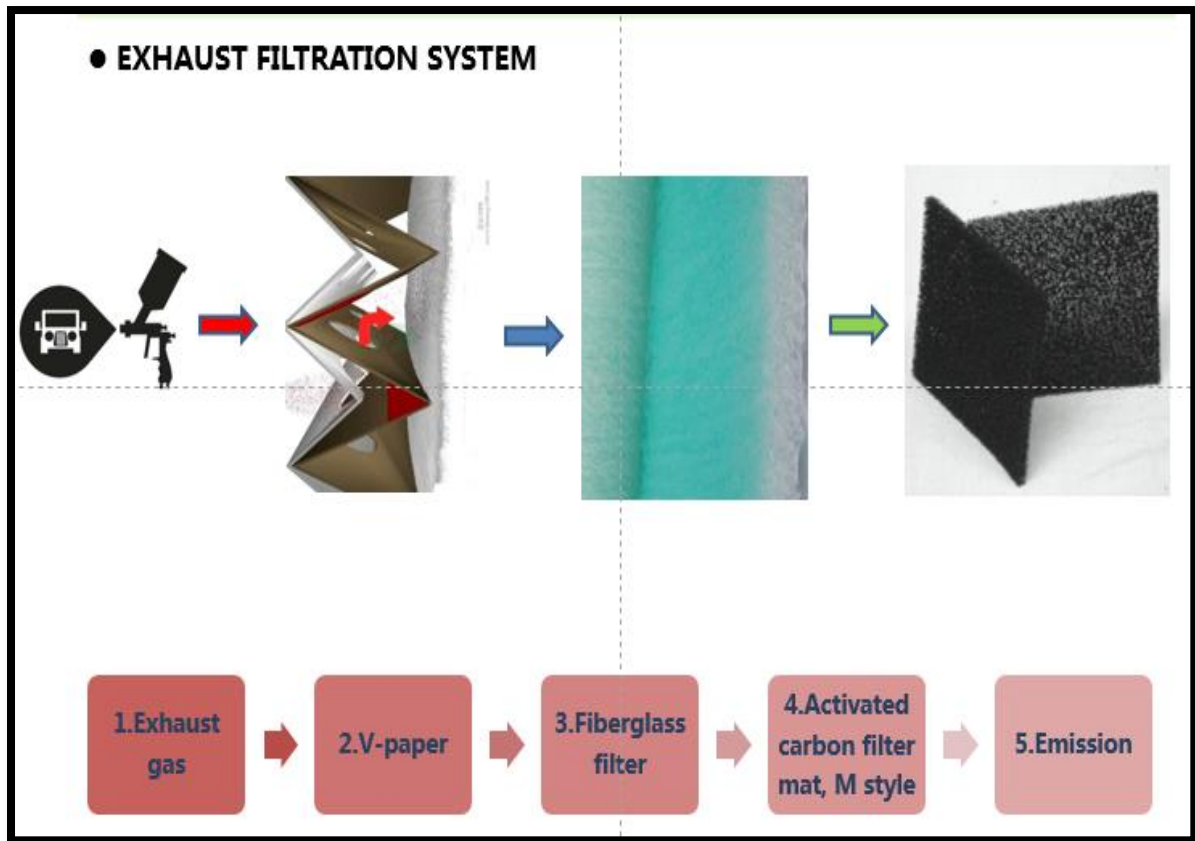


Figure 5.3 Exhaust Air Filtration System

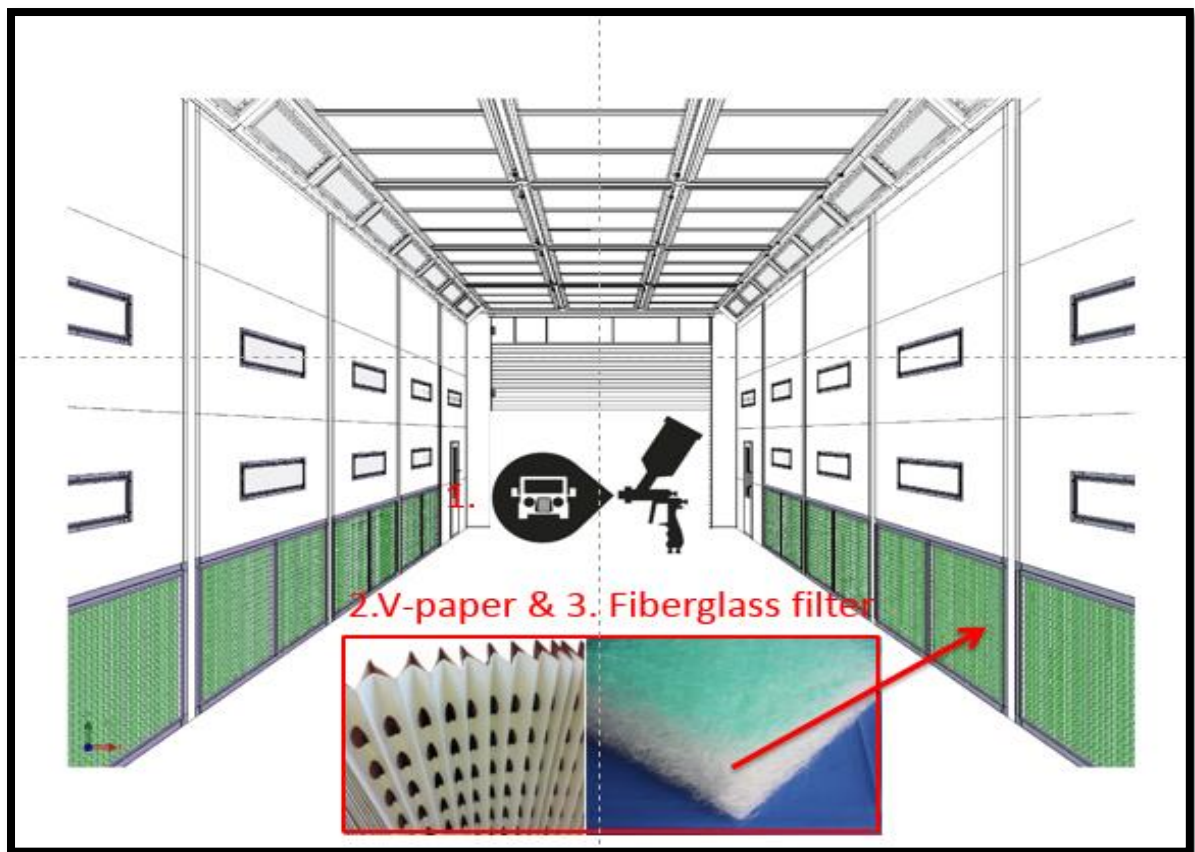


Figure 5.4 V paper and Exhaust Air Filtration System

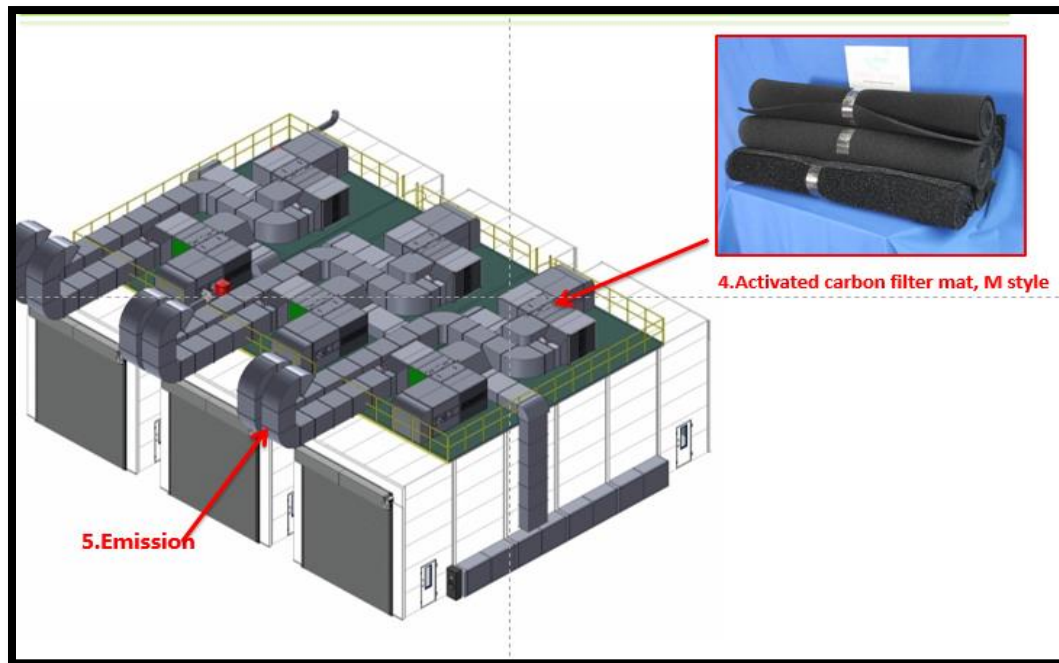


Figure 5.5 Activated carbon Filter

5.3.3.2 Hazardous Material

- Consider feasibility of substitution of hazardous chemicals such as solvent based paints with less hazardous alternatives. Label chemicals with appropriate, internationally recognised, hazard symbols.
- Chemicals with different hazard symbols should not be stored together - clear guidance on the compatibility of different chemicals can be obtained from the Materials Safety Data Sheets (MSDS) which should be readily available from the manufacturer and on site.
- Store chemicals in a dedicated, enclosed and secure facility with a roof and a paved/concrete floor. Chemical tanks should be completely contained within secondary containment such as bunding.
- Install devices to prevent spills and overfills, e.g. alarms to warn of overfilling and automatic shut-off devices or secondary spill containment.
- Maintain and inspect storage units regularly.
- Consider installation and use of groundwater monitoring points on site to check for contamination. Implement a Solvent/Hazardous Materials

Management Plan to monitor and control the use of solvents and hazardous materials on site.

5.3.3.3 Mitigation measure on Water Management and Wastewater

- Minimize the consumption of water used in production processes and equipment cleaning.
- Consider upgrades to wastewater treatment facilities.
- Recycle wastewater where possible, e.g. certain solvent wastes such as gun wash can be sent for recovery and reuse in another application where these facilities are available
- Ensure untreated wastewater does not discharge to watercourses through use of wastewater treatment facilities and monitoring of wastewater discharges.

5.3.3.4 Mitigation Measure on Energy Consumption

- Improve thermal efficiency of heating equipment to minimize heat loss.
- Monitor and target energy usage and implement behavioural change programmes.
- Consider opportunities to switch to cleaner fuels or renewable energy sources.
- Install compress air pipe line for using the compress air using machines to reduce the energy at factory.



Figure 5.6 Photo of Compressed Air Pipe Line

5.3.3.5 Mitigation Measure on Solid Waste

The following solid waste can recycled

- Cupboard- From dashboards to cotter pins, much of what is used in the assembly process arrives in cardboard boxes.
- Wood-Some items are too large or fragile to be shipped in cardboard and are sent via wooden shipping containers. There is also an abundance of wooden pallets used to stack and move a variety of parts and components. All this scrap wood is sent to a local mulch factory

- Metal scrap -Not often, but occasionally, metal components such as door panels and under body parts do not pass muster and are scrapped.

5.3.3.6 Mitigation Measure on used Oil

Project proponent will properly store used oil in containment and transferred to certified waste collector, township YCDC.

Auto-mechanics requires relatively higher levels of formal and informal education to enable them appreciate issues of good housekeeping including the use of preventive maintenance in an effort to reduce the number of leaks and spills of used oils that occur.

5.3.3.7 Mitigation Measure on Occupational Health and Safety

- Provide personal protective equipment (PPE) that is fit for the task to prevent injury and maintain hygiene standards. Train staff in the correct selection, use and maintenance of PPE, and put in place measures to encourage/ mandate its use.
- Implement a program of assessment of routine monitoring of workers' health.

5.3.3.8 Mitigation Measure on Noise and Vibration

- Conduct a noise survey and mark out dedicated areas with signage where there are elevated noise levels and PPE is required.
- Enclose noisy machines to isolate people from the noise where practicable.
- Noisy area must be covered the sound proof barriers. (e.g; generator room must be covered sound proof wall.)
- Reduce vibration exposure times and provide PPE where people may be exposed to vibration.
- Limit scrap handling and transport during unsocial hours to reduce noise.

5.4 Identification of Impacts during Decommissioning, Evaluation of Impact

SC Auto Myanmar would not have an operational life and decommissioning is based on SC auto proponent decision. Decommissioning of the SC Auto Plant would be carried out in accordance with legislative requirements at that time. However, if market conditions and/or electricity supply requirements at that time indicate that it would be appropriate to extend the life of the SC Auto Plant, then decommissioning could be deferred to a later date.

5.4.1 Decommissioning Phase Impact Identifications

Impacts during decommissioning will be generated from demolition of structure and major impacts will be solid waste disposal of destroyed infrastructure. During the decommissioning phase, there will be noise impact due to demolishing activities of office & factory buildings and other facilities. However, this impact will be short-term.

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5.4.2 Determination of Significance of Impacts in Decommissioning Phase Impact

Table 5.8 Significance Impacts Rating during Decommission Phase

Activity	VEC	Impact	Duration	Magnitude	Extent	Type	Probability	Significance
Waste Disposal	Groundwater quality	Leaching of waste into aquifer	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
	Community health and safety	Adverse health impacts	MEDIUM	SMALL	LOCAL	DIRECT	<25%	MODERATE
Dismantling infrastructure	Noise Pollution	Noise generation	SHORT	SMALL	LOCAL	DIRECT	25-75%	MINOR
	Socio-Economic Activities	Local employment prospects	MEDIUM	SMALL	LOCAL	DIRECT	25-75%	POSITIVE

5.4.2.1 Mitigation Measures in Decommissioning Phase

Mitigation measure during decommissioning phase is to develop waste management plan for decommissioning phase.

5.5 Emergency Risk Assessment and Response Plan

5.5.1 Initial Risk Assessment (Fire, Flood, Earthquake)

Catastrophic and disastrous events bring huge impacts to human beings and the environment. Therefore, it is required to evaluate emergency risk assessment for any project in an earlier stage even though they are low in probability of risks. There are various risk in operating carbon composite sport equipment manufacturing factory as in any other large scale infrastructure and factory operations. The following main emergency risks are taken into consideration as emergency risk assessment.

5.5.2 Fire

5.5.2.1 Forecast Item

The risk of fire, which can be impacted on the factory by its operations the vulnerability of the project site from fire hazards and if proper and adequate measures to prevent the disaster are not implemented, it could lead to loss of human lives and destruction of factory infrastructure and could mean the cease of factory operations.

5.5.2.2 Forecast Area

The area examined to forecast the impact was set in and around the proposed project Site.

5.5.2.3 Forecasted Period

The period examined to forecast the impact of fire hazard during operation stage was set throughout the factory operation period.

5.5.2.4 Forecast Method

The forecast of the risk for potential fire accidents are conducted by the following methods: To examine the risk for potential fire accidents in operation stage by considering the operation work plan and preventive measures of the proposed project.

5.5.2.5 Forecast Result

In the operation stage, there will be risk for potential fire accidents in the facilities such as Chemical Storage and some of the manufacturing process of the factory. Therefore adequate mitigation measures for the fire accidents were examined as a precondition to the proposed project as below:

- Regular training and exercise for the factory staff regarding the firefighting and other emergency response;
- Manufacturing area, working places, storage buildings and areas, chemical storage buildings, fire preventive measures, safe evacuation were designed

and implemented in compliance with relevant rules and regulations for the fire emergencies. For example, sufficient emergency escape route, exists, fire hydrants, fire hose rules, fire extinguishers provide in certain quantity and distances are considered are considered in the design of the facilities and operations;

- A dedicated water supply system for fire-fighting provisions is set up independently from the supply for the factory production and domestic usage, with provision of water tank and firewater pumps in quantity in two.
- Fire extinguishers suitable for each fire type, fire hose reels are installed and strategically located in all parts of the factory; Main building, Chemical storage building, air compressor room, generator room, around industrial water treatment and near boiler.
- Emergency escape exits are adequately provided, exit signs prominently displayed and visible even during electrical power failure.
- Emergency lighting for safe evacuation in all working area such storage area, main production buildings and office.
- Emergency preparedness and response plan is established for an emergency evacuation procedure to any emergency situation and to remove all occupants away from hazards in the shortest time possible and include appointment of an ERT (Emergency Response Team) trained and competent to perform and execute their assign duties, as well as training, identifying roles and responsibilities and requirements of factory personnel and drills relating to emergency evacuation will be conducted periodically.

5.5.2.6 Evaluation

Based on the above findings in the current operation stage, considering arrangement for mitigation taken by the project proponent in the current operation stage. The fire hazard is evaluated to be low and insignificant for operations because project proponent will take the necessary measure to reduce probability and severity in and around the factory area.

5.5.2.7 Firefighting System

Installed firefighting pump station, fire host wheel, extinguisher, sprinkler with using heat sensor and alarms.



Figure 5.7 Fire Fighting System

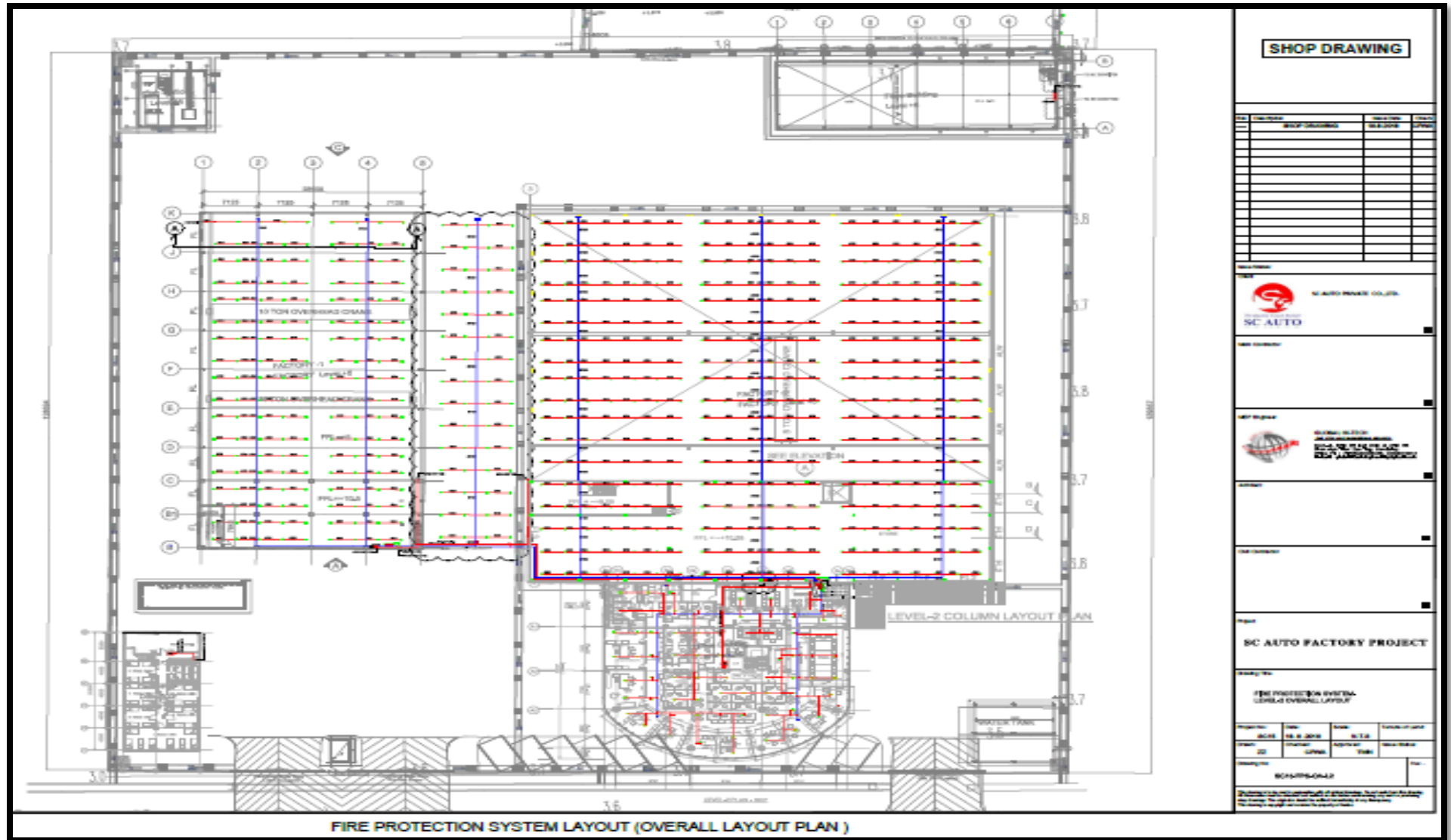


Figure 5.9 Second Floor Firefighting Plan

5.5.3 Flood

5.5.3.1 Forecast Item

The risk of flooding, which can be triggered by heavy rain, cyclone, high tidal waves increase the vulnerability of the project site from flooding and if proper and adequate measures to prevent the disaster are not implemented, it could lead to loss of human lives and destruction of factory infrastructure and could mean the cease of factory operations.

5.5.3.2 Forecast Area

The area examined to forecast the impact of flooding was set in and around the proposed project Site.

5.5.3.4 Forecasted Period

The period examined to forecast the impact of flooding hazard during operation stage was set throughout the factory operation period.

5.5.3.5 Forecast Method

The forecast of the risk for potential flooding accidents are conducted by the following methods: To examine the risk for potential flood risk triggered by heavy rain, cyclone that could occur in and around the proposed project site.

5.5.3.6 Forecast Result

Monsoon rains and increased water levels in major rivers have caused seasonal floods in Myanmar, primarily affecting Magway, Sagaing, Bago and Ayeyarwady regions and Mon State. Mandalay Region, Chin, Kayin, Rakhine and Shan states, as well as the Union Territory, are also affected by floods but with smaller-scale or no displacements reported at this stage.

Rapid development and population growth, as well as increasing environmental degradation and the effects of climate change made Yangon more vulnerable to fire, earthquake and flood than other areas of the country.

Factory has proper rain water drainages connected to municipal drains, so that rainfall on the concrete pavement inside factory is drained and discharged out of the factory in an organized manner to avoid flooding and water-logging inside factory.

Emergency preparedness and response plan is established for an emergency procedure to any emergency situation and to remove all occupants away from hazards in the shortest time possible and include appointment of an ERT (Emergency Response Team) trained and competent to perform and execute their assign duties, as well as training, identifying roles and responsibilities and requirements of factory personnel and drills relating to emergency evacuation will be conducted periodically.

5.5.3.7 Evaluation

Based on the results of forecast and considering arrangement for mitigation taken the project proponent in the current operation stage. The flood hazard is evaluated to be low and insignificant for operations because project proponent will take the necessary flooding counter measures to control and minimize the risk for flood disaster in and around the factory area.

5.5.4 Earthquake

5.5.4.1 Forecast Item

The risk of earthquake, which can be impacted by high magnitude earthquake occurring in the project area may increase the vulnerability of the project site from the earthquake and if proper and adequate measures to prevent the disaster are not implemented, it could lead to loss of human lives and destruction of factory infrastructure and could mean the cease of factory operations.

5.5.4.2 Forecast Area

The area examined to forecast the impact of earthquake was set in and around the proposed project Site.

5.5.4.3 Forecasted Period

The period examined to forecast the impact of earthquake hazard during operation stage was set throughout the factory operation period.

5.5.4.4 Forecast Method

The forecast of risk for earthquake are conducted by the following methods:

- Consideration of the potential earthquake risk in general preparedness, mitigation and preventive measurement for earthquake risk reduction of the project proponent are focused and mainly based on the history of earthquake occurrence near the Yangon area.
- Confirmation of the appropriate precautionary countermeasures planned by the Project proponent.

5.5.4.5 Forecast Result

Yangon is located adjacent to a high probability area of Sagaing Fault that has potential risk of high magnitude earthquake happening in the future. However as the design, construction and features of the factory's building and its other buildings are implemented by the project proponent to be earthquake resistant, the impact of earthquake hazard in the factory area is considered insignificant.

Emergency preparedness and response plan is established for an emergency procedure to any emergency situation and to remove all occupants away from hazards in the shortest time possible and include appointment of an ERT (Emergency Response Team) trained and competent to perform and execute their assign duties, as well as training, identifying roles and responsibilities and requirements of factory personnel and drills relating to emergency evacuation will be conducted periodically

5.5.4.6 Evaluation

Based on the results of forecast and considering arrangement for mitigation taken the project proponent in the current operation stage. The earthquake hazards are evaluated to be low and insignificant for operations because project proponent will take the necessary earthquake counter measures to control and minimize the risk for earthquake disaster in and around the factory area.

5.5.4.7 Response Plan

Emergencies can create a variety of hazards for workers in the impacted area. Preparing before an emergency incident plays a vital role in ensuring that employers and workers have the necessary equipment, know where to go, and know how to keep themselves safe when an emergency occurs. These Emergency Preparedness and Response pages provide information on how to prepare and train for emergencies and the hazards to be aware of when an emergency occurs.

6.0 INSTITUTIONAL REQUIREMENT AND ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

Implementation of the project will be managed by SC Auto (Myanmar). A Health, Safety and Environment (HSE) Coordinator is assigned for the project monitoring and coordinating purposes. HSE coordinator will be responsible for implementation and monitoring of the environmental management and monitoring plan as well as coordination with local authorities and the nearby communities. He/she shall work closely with the contractor during the construction, operation and abandonment phase and will be the first contact on the ground directly for SC Auto (Myanmar) . He/she shall receive all complaints and grievances arising in the course of the implementation of the EMP

6.1 Environmental Management Team

Table 6.1 Role and Responsibility

No.	Role	Responsibility
1.	Managing Director	<ul style="list-style-type: none"> ▪ Ensure operations are undertaken as per this EMP ▪ Ensure the mitigation measures as detailed in this EMP are actioned, as required
2.	HSE Officer	<ul style="list-style-type: none"> ▪ Ensure that the activities are undertaken as outlined in this EMP ▪ Ensure the monitoring requirements are met and the EMP is implemented in the factor ▪ Ensure environmental incidents are reported ▪ Ensure periodic environmental inspections are completed
3.	Administrative Officer	<ul style="list-style-type: none"> ▪ Ensure that plans for trainings programmes, drill are undertaken as outlined in this EMP ▪ Ensure that the communication to authorities and stakeholders for emergency cases are undertaken as outlined in this EMP
4.	Production Supervisor	<ul style="list-style-type: none"> ▪ Ensure that the operations are undertaken as detailed in this EMP ▪ Ensure that the management measures detailed in this EMP are implemented in production sections
5.	Maintenance Supervisor	<ul style="list-style-type: none"> ▪ Ensure that the maintenance activities are undertaken as outlined in this EMP ▪ Ensure that schedule of maintenance plans
6.	Warehouse Supervisor	<ul style="list-style-type: none"> ▪ Ensure that solid waste management activities are undertaken as outlined in this EMP
7.	Purchase Supervisor	<ul style="list-style-type: none"> ▪ Provide sufficient resources to implement the management measures in this EMP

6.2 Environmental Management Plan

The environmental management plan (EMP) that was prepared for the proposed project was the basis for determining the anticipated impacts, monitoring requirements, and development of mitigation measures with respect to the following stages:

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1. Construction
2. Operation
3. Decommissioning

Detailed, site-specific mitigation measures and monitoring plans are developed and will be implemented during the project implementation phase. The Detailed EMP is as follows;

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Table 6.2 Environmental Management Plan

Project / Activity Phase (Potential Environmental Impact)	Objectives	Mitigating & Enhancement Measures	Estimated Cost of Proposed Measures (USD)	Responsible Person / Unit
Construction Phase				
Soil disturbance/erosion	To lessen soil disturbance and prevent soil erosion due to construction activities	<ul style="list-style-type: none"> • Control earthworks and compact loose soils • Install drainage structure properly • Landscaping on project completion • Control and manage excavation activities • Control activities during rainy conditions • Provide soil erosion control and conservation structures/means where necessary • To the greatest extent possible, phase site clearance so as to minimize the area of exposed soil at any given time • Re-cover exposed soils with grass and other appropriate species as soon as possible. • Temporarily bund exposed soil and redirect flows from heavy runoff areas that threaten to erode or result in substantial surface runoff to adjacent drain waters • Monitor areas of exposed soil during periods of heavy rainfall throughout the construction phase 	No extra cost	SC Auto and construction contractor
Noise	To ensure cumulative noise impacts are acceptable	<ul style="list-style-type: none"> • Construction activities that will generate disturbing sounds should be restricted to normal working hours. • Workers operating equipment that generates noise should be equipped with noise protection gear. Workers operating equipment generating noise levels greater than 80 dBA continuously for 8 hours or more should use earmuffs. Workers experiencing prolonged noise levels of 70 – 80 dBA should wear 	No extra cost	Contractor

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		earplugs.		
Air Pollution (nuisance dust)	To minimize dust effectively and avoid complaint due to the air borne particulate matter release to the atmosphere	<ul style="list-style-type: none"> • Spray water during the construction phase of excavated areas during dry conditions • Control speed and operation of construction vehicles • Prohibit idling of vehicles • Ensure sound condition of construction machinery and equipment • Workers on the site should be issued with dust masks during dry and windy conditions. 	No extra cost	Contractor
Material transportation	To reduce dust/noise/waste generation and avoid spillage during transportation	<ul style="list-style-type: none"> • All fine earth materials must be enclosed during transportation to the site to prevent spillage and dusting. Trucks used for that purpose should be fitted with tailgates that close properly and with tarpaulins to cover the materials. The cleanup of spilled earth and construction material on the main roads should be the responsibility of the Contractor and should be done in a timely manner (say within 2 hours) so as not to inconvenience or endanger other road users. These requirements should be included as clauses within the contracts made with relevant sub-contractors. • The transportation of lubricants and fuel to the construction site should only be done in the appropriate vehicles and containers, i.e. fuel tankers and sealed drums. • As far as possible, transport of construction materials should be exit the project site 	No extra cost	Contractor
Material storage	To ensure proper storage of material and avoid accidental spillage	<ul style="list-style-type: none"> • The stockpiling of construction materials should be properly controlled and managed. Fine grained materials (sand, marl, etc.) should be stockpiled away from surface drainage channels and features. 	No extra cost	Contractor

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		<ul style="list-style-type: none"> • Low berms should be placed around the piles and/or tarpaulin used to cover open piles of stored materials to prevent them from being washed away during rainfall • Safe storage areas should be identified and retaining structures put in place prior to the arrival and placement of material. • Hazardous chemicals (e.g. fuels) should be properly stored in appropriate containers and these should be safely locked away. handling facilities 		
Sewage and litter management	To prevent soil/water contamination due to grey water discharge and overload or spillage of temporary septic tanks	<ul style="list-style-type: none"> • Install proper sewage treatment plant • Proper solid waste receptacles and storage containers should be provided in sufficient numbers, particularly for the disposal of lunch boxes and drinking bottles, so as to prevent littering on the site • Arrangements should be made for the regular collection of litter and for its disposal only at the dump site. 	No extra cost	Contractor
Construction waste disposal	To ensure adequate disposal options for all kinds of construction waste including glass, metal, wood, cement residues, plastic, paper based wastes, oil spills etc.	<ul style="list-style-type: none"> • Waste collection, segregation and disposal should be properly managed and contact to Mingaladon Township Municipality for final disposal. • Special attention should be given to minimizing and reducing the quantities of solid waste produced during site preparation and construction. To reduce organic waste, softer vegetation may be composted onsite and used for soil amendment during landscaping. • Reusable inorganic waste (e.g. excavated soil) should be stockpiled away from drainage features and used for in filling where necessary. • Unusable construction waste, such as damaged 	No extra cost	Contractor

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		pipes, formwork and other construction material, must be disposed of at Mingaladon Township Municipality dumpsite.		
Accident/ Injury/ Health Hazard	To minimize potential accidents/injuries and disease	<ul style="list-style-type: none"> • Proper personal protective equipment i.e. safety shoes, helmet, goggles, and gloves shall be used at all times on site • Use barriers and guards as necessary to protect employees from physical hazards, • Signage danger warning or CAUTION will be put at strategic places • Development of occupational safety and health guidance plans • Provide first aid kits and contact points in case of injury and accidents • Form a safety and health committee to coordinate safety and health issues at workplace • Provide regular safety awareness talks and trainings 	No extra cost	Contractor
Operation Phase				
Noise and vibration pollution	To ensure noise and vibration pollution effect on surrounding should be under the threshold limit by emission guide line.	<ul style="list-style-type: none"> • Conduct a noise survey and mark out dedicated areas with signage where there are elevated noise levels and PPE is required. • Enclose noisy machines to isolate people from the noise where practicable. • Reduce vibration exposure times and provide PPE where people may be exposed to vibration. • Limit scrap handling and transport during unsocial hours to reduce noise. 	Under EMP budget	HSE officer of SC Auto factory
Waste water	To minimize affect local ecology as well as posing a hazard to drinking	<ul style="list-style-type: none"> • Minimize the consumption of water used in production processes and equipment cleaning. • Consider upgrades to wastewater treatment facilities. • Recycle wastewater where possible, e.g. certain 	Under EMP budget	HSE officer of SC Auto factory

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	water supplies and contaminating land.	<p>solvent wastes such as gun wash can be sent for recovery and reuse in another application where these facilities are available</p> <ul style="list-style-type: none"> • Ensure untreated wastewater does not discharge to watercourses through use of wastewater treatment facilities and monitoring of wastewater discharges 		
Solid wastes	To prevent ground contamination due to improper solid waste management.	<ul style="list-style-type: none"> • Define waste management plan. • Contact certified waste collector, DOWA for waste disposal • Return packaging of hazardous and non-hazardous materials (wherever possible), such as empty drums, to supplier for reuse. • Recycle packaging wherever possible. • Develop and implement a waste management plan covering all aspects of waste treatment on site. Wherever possible, priority should be given to reduction of wastes generated, and recovery and re-use of raw materials 	Under approved EMP budget for waste management	HSE officer of SC Auto factory
Occupational Health and Safety				
Chemical exposure	To ensure safe working condition for workers	<ul style="list-style-type: none"> • Provide personal protective equipment (PPE) that is fit for the task to prevent injury and maintain hygiene standards. Train staff in the correct selection, use and maintenance of PPE, and put in place measures to encourage/ mandate its use. • Implement a program of assessment of routine monitoring of worker health. 	Under approved budget for HSE management plan for PPE	HSE officer of SC Auto factory
Noise and vibration	To ensure noise level should under the threshold limit with exposure limit	<ul style="list-style-type: none"> • Enclose noisy machines to isolate people from the noise where practicable. • Reduce vibration exposure times and provide PPE where people may be exposed to vibration. • Limit scrap handling and transport during unsocial 	Under approved budget for HSE management plan for PPE	HSE officer of SC Auto factory

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		hours to reduce noise.		
Machinery	To meet HSE objective of no LTA(Lost time accident)	<ul style="list-style-type: none"> • Train staff in correct selection, use and maintenance of PPE. • Train workers in correct use of machinery and safety devices. • Avoid direct handling of sharp edged items and/or remove sharp edges by machining. • Engineer out sharp edges and access to dangerous parts of machinery through a hierarchy of controls (permanently fixed physical barrier, interlocked physical barrier, physical barrier, presence sensing system). 	<p>SC Auto Management should define HSE objective</p> <p>SC Auto Management should define Incentive for HSE bonus.</p>	HSE officer of SC Auto factory
Manual handling and repetitive work	To meet HSE objective of no LTA(Lost time accident)	<ul style="list-style-type: none"> • Ensure that walkways are constructed of non-slip materials and route cables and pipe-work under walkways. 	<p>SC Auto Management should define HSE objective</p> <p>SC Auto Management should define Incentive for HSE bonus</p>	HSE officer of SC Auto factory
Working Condition	To meet HSE objective of no LTA(Lost time accident) due to fatigue condition of overload	<ul style="list-style-type: none"> • Implement a program of routine monitoring of worker health. • Implement a grievance/dispute resolution mechanism for workers. 	<p>SC Auto Management should define HSE objective</p> <p>SC Auto Management should define Incentive for HSE bonus.</p>	HSE officer of SC Auto factory

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Decommissioning Phase				
Waste disposal due to dismantling activities	To minimize generation of scraps and other debris on sites	<ul style="list-style-type: none"> • Use of an integrated solid waste management system i.e. through a hierarchy of options: • Wastes generated as a result of facility decommissioning activities will be characterized in compliance with standard waste management procedures. • All buildings, machinery, equipment, structures and tools that will not be used for other purposes should be removed and recycled/ reused say in other projects • Where recycling/reuse of the machinery, equipment, implements, structures, tools and other waste is not possible, the materials should be disposed to approved dumpsites • To contact Mingaladon Township Municipality for final waste disposal. 	1,000	Contractor
Ground water pollution due to dismantling activities	To prevent potential pollution	<ul style="list-style-type: none"> • procedures for finding contaminated material during excavations will be established • covering and damping of excavated materials • appropriate storage of contaminated material if found. • Ground contamination and storm water contamination will be limited on site by proper handling and storage of materials and equipment. 	2,000	SC Auto
Rehabilitation of project site	To ensure less vegetation disturbance, land deformation and restoration of site	<ul style="list-style-type: none"> • Implement an appropriate re-vegetation program to restore the site to its original status • During the re-vegetation period, appropriate surface water run off controls will be taken to prevent surface erosion; • Monitoring and inspection of the area for indications 	10,000	SC Auto

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		<p>of erosion will be conducted and appropriate measures taken to correct any occurrences;</p> <ul style="list-style-type: none"> • Fencing and signs restricting access will be posted to minimize disturbance to newly-vegetated areas; • Scoop out any contaminated soils and replace with uncontaminated soil from another source <p>Comprehensive Landscaping.</p>		
Health and safety impacts	To avoid potential occupational hazards	<ul style="list-style-type: none"> • The safety of the workers should surpass as a priority of all other objectives in the decommissioning project • Provide appropriate Personal Protective Equipment (PPE) as necessary. • Staircases and other hazardous areas shall be suitably protected say using strong rails to avoid occurrence of incidences • Provide emergency health care and sanitation to employees. • Ensure sufficient emergency firefighting tools (fire extinguishers, hooks, buckets and water tanks) are standby at demolishing site 	1,000	Contractor
Socio-economic impacts	To prevent loss of income, quality of life and benefits such as medical, insurance cover etc...	<ul style="list-style-type: none"> • Assist with re-employment and job seeking of the involved workforce. • Compensate and suitably recommend the workers to help in seeking opportunities elsewhere. • Offer advice and counseling on issues such as financial matters. • Ensure assistance with re-employment and job seeking of the involved workforce. • Make sure to compensate and suitably recommend the workers to help in seeking opportunities elsewhere. 	2,000	SC Auto

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		<ul style="list-style-type: none">• Offer advice and counseling on issues such as financial matters.		
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6.2.1 Health and Safety Management of Operation Phase for Workers

(1) Occupational Health and Safety Management

Occupational health and safety management program is implemented to promote the health conditions, physical conditions, mental conditions of the employees and to prevent from the risk of workplace hazard and incidents, acute sickness and chronic disease. There was not enough evidence to determine whether working in paint manufacturing facility increased cancer risk. However, some ingredients used in paint manufacturing are hazardous chemicals and these chemicals may pose a risk to acute and chronic health concerns if prolonged or repeated exposure without any precaution and prevention. Therefore, the following mitigation plan should be implemented to minimize the probable health impacts.

Table 6.3 Occupational Health and Safety Management Plan-Operation Phase

Control for Chemical Exposure

A wide variety of volatile solvents are used in paint manufacturing and which includes aliphatic and aromatic hydrocarbons, alcohols, ketones and so forth. The most exposure to volatile solvents can occur during mixing, blending and thinning, filling and cleaning processes. The probable chemical exposure can be by means of ingestion, inhalation and skin contact. The potential of chemical exposure can be reduced by implementing the followings.

- Make sure the employees wear necessary PPE for precaution such as safety glasses, gloves, safety shoes and when necessary, respirators should be used. Provided PPE list are as shown in the Appendix (14).
- Follow confined space procedures for vessel cleaning.
- Install emergency shower and eye washers near the production area, chemicals storage area. etc.
- Provide good ventilation in production area.

Control for emission of VOC

- Use enclosures or lids for mixing tanks.
- Provide local exhaust ventilation system in operation area.
- Hazardous materials shall be provisioned in a separate room by providing good ventilation devices.
- Keep the solvent chemicals in low temperature to reduce vaporization of it.
- Install air pollution control system for removal of VOC.
- Plan to reduce the solvent usage.
- Make sure employees wear masks.

Control for Workplace Emission of Dust and Particulate Matter

- Install dust collector around process area.
- Provide good local exhaust ventilation system.
- Maintain proper housekeeping in workplace.
- Make sure employees who work in the production area must wear masks.

Control for materials handling and accidents

Manual handling of boxes, containers and drums of raw materials and finished paint products may pose a high risk of physical injuries due to improper lifting, slips, falls, dropping containers and so on. The risk of physical hazard can be mitigated by means of followings.

- Use materials handling aids such as rollers, jacks and platform and mechanical

equipment such as conveyors, hoists and fork-lift trucks.

- Apply non-skid paint to the floor.
- Any slippery area should be signposted.
- Make sure all employees wear necessary PPE such as safety shoes, head gear, gloves and safety glasses.
- Provide trainings for safe materials handling procedures and safe working procedures to employees.

Control for Noise and Vibration

Production and process area is usually noisy and as a result noise is a workplace hazard for operators and the risk can be mitigated by implementing following plan.

- Provide ear protection equipment to workers who work in noisy area.
- Do regular maintenance of machineries.
- Select low noise equipment and tools for purchasing where feasible.
- Arrange to rotate the working shifts for employees who work in noisy area to reduce the exposure time to noise.
- Do hearing test for workers annually.

Working Conditions

For providing safe and healthy working environment to employees, SC Auto shall follow the following recommendations.

- Provision of hygienic canteen, kitchen and eating area.
- Provide for safe and sufficient drinking water.
- Provision of adequate sanitary toilets.
- Maintain greenery area for fresh and cool working environment.
- Provide good ventilation system in working area for receiving fresh air and dilution pollution.
- Provide good health care system such as annual medical checkup.
- Provide necessary trainings with their related jobs for safe and effective production.

Plan for Contagious Disease Control

- Provide specific awareness training during seasonal flu, or other pandemic such as Covid-19 outbreak for safe social distancing, hand washing, wearing masks and avoiding crowded place, etc.
- Share knowledge about how transmitting the disease such as tuberculosis, hepatitis, HIV and seasonal flu.
- Educate the employees regarding with the precaution measures to prevent from getting the contagious disease.
- Do regular cleaning of toilets and canteen area.
- Provide adequate number of toilets for all employees.
- Cover waste bins to avoid breeding of flies and other insects.
- Provide wash basin with soap.
- Make sure there will be no water ponding within premise to avoid breeding of mosquitos.

Medical -precautionary measures

- Pre-employment medical examination must be done for all employees.
- Annual medical examinations for Pulmonary Function Test, Vision Test, Audiometry, Hematology profiles, Liver Function Test and Renal Function Tests are also recommended.

Medical records of the employees are properly maintained and updated from time to time.

- Provide the trainings for first aid procedures, safe working procedures, safe use of equipment, good personnel hygiene practice and industrial hygiene to the

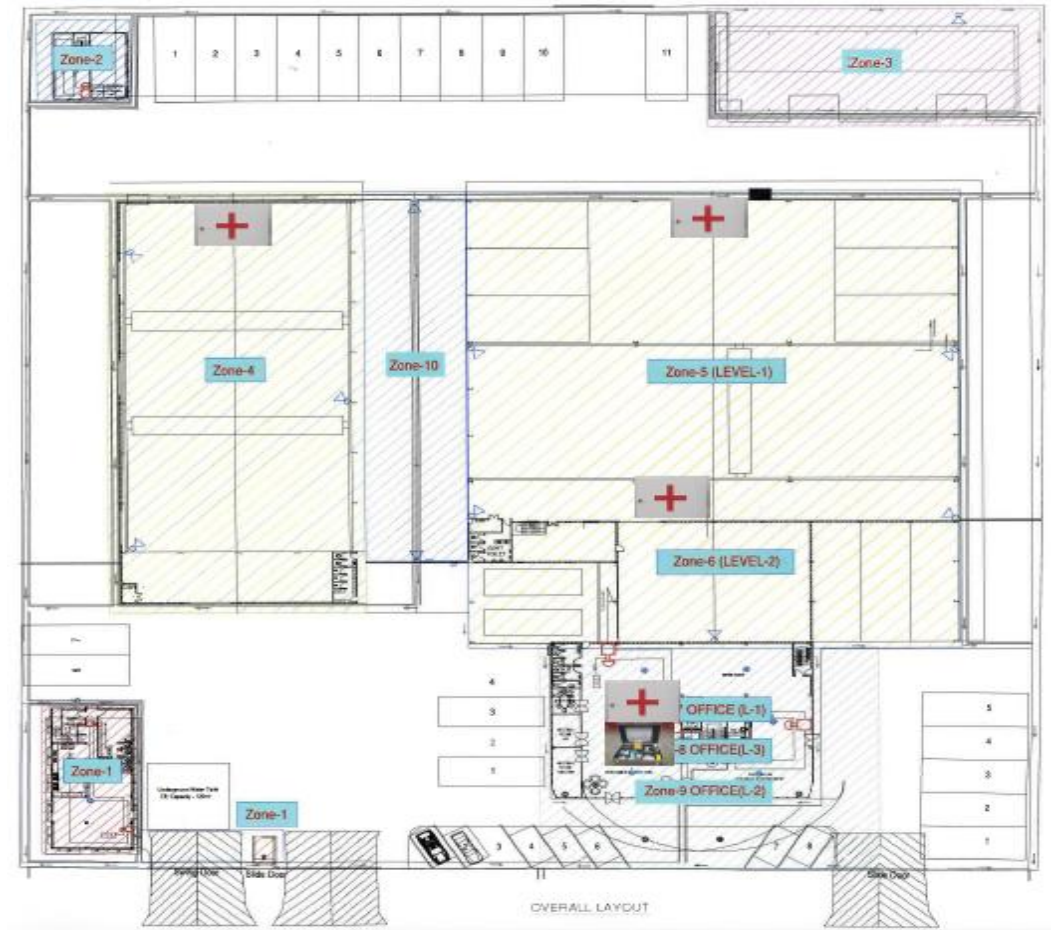
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employees.

- Provision of adequate first aid kit. Supply PPE list are as shown in the Appendix (14) and first aid kit supply location is as shown in the following Figure
- Medical personnel should be available on-site or by phone for advice and consultation.
- Emergency phone numbers should be posted near the telephones.
- Immediate, temporary treatment of First Aid Procedure must be prepared. First aid procedure is as shown in the Appendix (14).



Emergency and First-aid Procedures

First aid is immediate, temporary treatment given in the event of accident or illness.

- Check first whether the scene is safe to enter.
- Find out what happened.
- Take first aid kit, use appropriate PPE and wear gloves.
- Interview the injured person or bystander or reporter if possible.
- Conduct a head to toe check first to decide the overall condition.
- Identify the nature of the injury or illness as far as possible.
- Arrange for emergency services to attend.
- Manage the casualty promptly in appropriate ways.
- Wait until health care professional arriving to hand over.
- For treating burning injury, determine the burn type and severity, disinfectant and cover with thin and loose cloth to prevent from infection.
- For treating of cut and bruises, wash with water, apply pressure on affected area, use disinfectant and cover with damage.
- For treating of sprains, use ice pack to reduce swollen.

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- For eye incident such as entering debris or contaminants, do eye wash for a few minutes and go to hospital if required for medical assistance. Do not apply any eye drop if it is not prescribed by the physician.
- For treating of fractures, immobilize the area and apply cool pack. Elevate the injury part.
- Perform CSR if someone is stopped breathing.
- Make emergency call to 911.
- Record the information about the incident and report to EHS manager.
 - name
 - type of injury
 - type of incident
 - date and time of incident
 - method of treatment given by first aid team



Awareness

To increase the safety awareness of the employees _

- Displaying safety caution billboards and safety posters mentioning Do's & Don'ts at various prominent location _at outdoor area, at canteen, at workplace, at aisles and at car-park.
- The Safety Notice Boards displayed should specify
 - Safety Advice
 - Project Safety Statistics
 - Topical HSE information
 - Safety Committee Meeting Minutes
 - Emergency notifications
 - Muster Point locations
- Displaying health awareness posters as well during flu season or pandemic such as corona virus outbreak (for safe social distancing, wearing masks, washing hands,

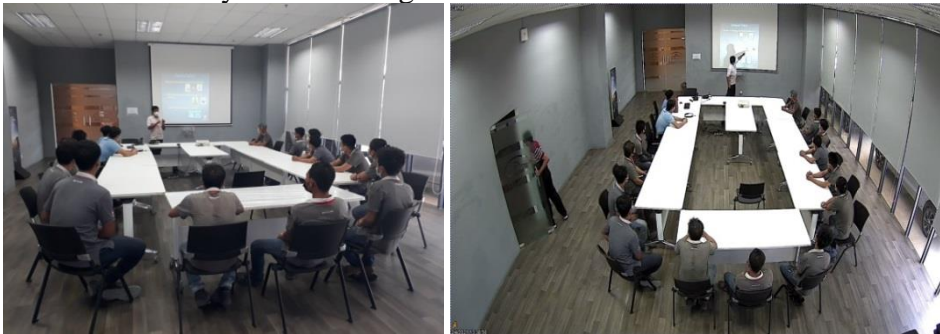
etc.)

- Arranging housekeeping competition.
- Holding safety slogan competition.

Training

To refresh and upgrade the knowledge of the safety issues, training program shall be organized at all levels of employees for safety and accident prevention. The following training program will be conducted periodically in a planned manner.

- Safe working procedures and practice.
- Proper use of tools and tackles.
- Handling of hazardous chemicals training.
- Health awareness talk.
- Personnel hygiene practice.
- General safety rules training.



Responsible Team

EMT team leader, members and all employees.

Responsibilities

- To prepare and implement EMP for occupational health and safety.
- To arrange the trainings.
 - General safety training
 - Safe handling procedures for chemical
 - Health awareness training
- To make sure all employees follow the plan.
- To keep the records and make sure the records to be documented.
- To review the environmental quality monitoring parameters.
- To do modification of EMP if the environmental quality monitoring parameters are not within acceptable value.

6.3 Environmental Monitoring Plan

The local authority should be responsible for monitoring and management of all indirect impacts occurring in the project area. An environment management team shall be created to manage all environmental issues during operation phase.

Table 6.4 Environmental Monitoring Plan

Environmental Parameters	Monitoring Item	Location	Frequency	Responsibilities
Construction Phase/ Decommissioning Phase				
Air quality	<ul style="list-style-type: none"> • PM₁₀, PM_{2.5}, Ozone, VOC, CO, CO₂, NO₂, SO₂ 	Construction / Closing site	Once during construction period	Construction Contractor

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	<ul style="list-style-type: none"> Recorded the machineries maintenance Recorded dust emission activities Recorded traffic 	Construction / Closing site	Monthly	Construction supervisor
Soil quality	<ul style="list-style-type: none"> Chemical and toxic material emission/ leakage status from storage area Other possible leakage of chemicals due to the vehicular movement and bitumen mixing 	Construction/ Closing site	Monthly	Construction Contractor
Water quality	<ul style="list-style-type: none"> Checking temporary septic tank and disposed system, temporary drain 	Construction/ Closing site	Monthly	Construction Contractor
Water Use	<ul style="list-style-type: none"> Daily amount of water use 	Construction/ Closing site	Daily Observation	Construction Contractor
Noise	<ul style="list-style-type: none"> Intensity measurement 	Construction/ Closing site	Monthly	Construction Contractor
Waste Disposal	<ul style="list-style-type: none"> Recorded disposal amount of solid wastes and sewage of the workers Checking the waste storage area 	Areas around workers quarters	Daily Observation	Construction Contractor
	<ul style="list-style-type: none"> Recorded disposal amount of construction wastes, compliance with the disposal requirements Separate hazardous and No-hazardous Checking the waste storage 	Construction/ Closing site	Weekly	Construction Contractor

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	area			
Employment	Number of people employed	Construction/ Closing site	Monthly	Construction Contractor
Other Social Considerations	CSR activities record	Monitoring team	Monthly	Construction Contractor
Occupational Health and Safety	Safety activities, Record of accident and OHS training and activities, Record of worker argument and conflict	Workers	Monthly	Safety Supervisor
Community Health and Safety	Record of accident and OHS training and activities, Recorded of training for driver and worker	Local residents	Upon conditions	Safety Supervisor
Emergency risk	Accident record, safety, training	Construction/ Closing site	Monthly	Safety Supervisor

Operation Phase

Air Quality	PM ₁₀ , PM _{2.5} , Ozone, VOC, CO, CO ₂ , NO ₂ , SO ₂	Ambient air	Annual	Factory Manager and HSE officer
	Particulate matters, VOC	Workplaces such as painting area, ware house, car parts assembling area	Annual	Factory Manager and HSE officer
	Generator exhaust gas (CO, CO ₂ , NO ₂ , SO ₂)	Stack	Annual	Factory Manager and HSE officer
Water Quality	<ul style="list-style-type: none"> Wastewater (pH, oil & grease, suspended solid, BOD, COD, color and Temperature, etc) 	Municipal drain and factory drain outlet	Bi-annual	Factory Manager and HSE officer
	<ul style="list-style-type: none"> Ground water (pH, Arsenic, Cl⁻) 	Water reservoir	Bi-annual	Factory Manager and HSE officer
Waste Disposal	<ul style="list-style-type: none"> Recorded disposal amount 	Plant premises	Monthly	Factory Manager and HSE officer

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	<p>of plastic, drum, paper box, used wedding rock</p> <ul style="list-style-type: none"> • Check collection system • Check storage • Separation of waste type (Hazardous & No-hazardous) 			
Soil Contamination	<ul style="list-style-type: none"> • Oil leakage, Spill of solvent, Paint • Measuring heavy metal 	Plant premises, paint storage area, fuel storage area, generator room,	Annual	Factory Manager and HSE officer
Noise and Vibration	Noise & Vibration level	<ul style="list-style-type: none"> • Plant premises • workplaces area such as painting area, warehouse, car parts assembling area 	Annually and upon complaint	Factory Manager and HSE officer
Odor	Inspection of ventilation condition	Factory and storage buildings	Monthly	Factory Manager and HSE officer
Hazardous and Chemical Substance	<ul style="list-style-type: none"> • Check handling and using of paint, reinforced fiber • Check storage area • Check disposal system 	Factory and storage buildings	Monthly	Factory Manager and HSE officer
Occupational Health and Safety	<ul style="list-style-type: none"> • Record of accident and record of occupation/ safety training, • Each employee medical checkup record. • Checking PPE and • Provide 	Plant premises	Bi-annual	HSE officer

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	adequate PPE • Provide OHS training			
Other Social Considerations	Check and Record CSR plan and job opportunities	Monitoring team	Annual	HR Manger
Emergency Risks	<ul style="list-style-type: none"> Record of emergency case of accident and its response plan Checking Firefighting equipment Provide fire drill and training 	Plant premise	Annual	HSE officer
Transboundary or Global issues	N/A	-	-	-

6.4 Environmental Monitoring Cost Estimate

There are three different phases in developing and implementing the EMP for this Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services.

- Organization of the Environmental Management Team
- Environmental Measures during the Operation Phase
- Long-Term Environmental Measures during the life of the project.

The following table lists the various environmental measures important for each project phase, the agencies responsible for and executing each measure, the duration of the activity, initially budgeted unit costs and total costs. This table is not definitive and should be treated as preliminary and representative. If estimated budget for environmental monitoring is not enough, SC Auto (Myanmar) Co., Ltd. will use till enough. And SC Auto will arrange the another bank account for environmental conservation.

Table 6.5 Estimated Cost of Basic Environmental Monitoring

No	Environmental Measures	Responsible Agency	Executing Agency	Cost Estimate LS or per unit (Kyats)	Total Cost per year (Kyats)
Organization of the Environmental Management Team					
1	Appointment of EM & Constitution of EMT	SC Auto		Lump sum	250,000
2	Create & capacity building of EMT	SC Auto	HSE consultants	Lump sum	450,000

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					Sub-total	700,000
Measures During Operation Phase						
1	Provide operating budget for EMT	SC Auto	EMT	100,000/month		1,200,000
2	Water quality monitoring Number of locations: 2 Measurements per year:2 Total Quantity of units = 2 x 2 = 4	SC Auto / EMT	Laboratory	80,000		320,000
3	Air quality monitoring Number of locations: 4 Measurements per year: 1 Total Quantity of units = 4 x 1 = 4	SC Auto / EMT	Third Party	500,000		2,000,000
4	Noise monitoring Number of locations: 4 Measurements per year: 1 Total Quantity of units = 4x 1 = 4	SC Auto / EMT	Third Party	200,000		800,000
5	Soil monitoring Number of location:1 Measurements per year:1	SC Auto / EMT	Laboratory	100,000		100,000
					Sub-total	4,420,000
					Total = Sub-total + Sub-total	5,120,000

EM = Environmental Manager

EMT = Environmental Management Team

6.5 Reporting

An environmental management plan will usually require reporting arrangements. Reporting arrangements assist with effective implementation and with external reporting. External reports may include reports on environmental incidences to the regulator, reports to stakeholders, reports to inform reviews of the plan and reports to meet the reporting requirements of the conditions of approval.

The description of reporting requirements should include:

- a list of required reports including where appropriate monitoring, environmental incidents, --non-compliance, corrective action and auditing
- a description of the standard report content
- the schedule or triggers for preparing a report
- who the report is provided to
- document control procedures

Reporting commitments should also be consistent with any reporting to the Department required by the conditions of approval.

Annual reporting on the implementation of mitigation measure and on monitoring activities in operation of manufacturing process is essential. Reporting is the responsibility of

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Company Management. Report on environmental monitoring and implementation of EMP will be prepared annually.

Table 6.6 Performance Monitoring Indicators

Major Environmental Component	Key indicator	Performance	Data Source
Air quality	Dust, noise , vibration,	Level never exceed ECD guide lines	Monitoring by certified third party
Ground water quality	pH, Fe, Hardness, Cl	Government environmental standards and criteria met	Monitoring by certified third party
Wastewater quality	BOD, COD, TDS, TSS	Government environmental standards and criteria met	Monitoring by certified third party
Soil quality	Heavy Metal	Government environmental standards and criteria met	Monitoring by certified third party

6.6 Corporate Social Responsibilities (CSR)

SC Auto (Myanmar) Co., Ltd will undertake that 1 % of net profit earned from our business will be contributed towards CSR in the Republic of the Union of Myanmar.

The CSR fund will be used for:

- 50% in environmental conservation activities,
- 10% in social activities of the nearby wards,
- 15% in educational development program,
- 10% in donation to welfare states, and
- 15% in donation to orphanage and religious places.

Currently, the project proponent has used CSR budger for paving of roads, digging of drainage ditches, repairing road and planting of trees for green environment.



Figure 6.1 Activities Records

7.0 CAPACITY DEVELOPMENT AND TRAINING

To improve competencies of employees, specific operations are conducted. For emergency preparedness, all employees actively participated in Fire drill, First AID course and Health and safety measure.

7.1 Training Employees about Chemical Hazards

Before they start their jobs or are exposed to new hazardous chemicals, employees must attend a hazard communication training that covers the following topics:

- An overview of the requirements in OSHA’s Hazard Communication Standard.
- Hazardous chemicals present in their workplace.
- Any operations in their work area where hazardous chemicals are used.
- The location of the written hazard communication plan and where it may be reviewed.
- How to understand and use the information on labels and in Safety Data Sheets.
- Physical and health hazards of the chemicals in their work areas.
- Methods used to detect the presence or release of hazardous chemicals in the work area.
- Steps we have taken to prevent or reduce exposure to these chemicals.
- How employees can protect themselves from exposure to these hazardous chemicals through use of engineering controls/work practices and personal protective equipment.
- An explanation of any special labeling present in the workplace.
 - What are pictograms?
 - What are the signal words?
 - What are the hazard statements?
 - What are the precautionary statements?
- Emergency procedures to follow if an employee is exposed to these chemicals.

Safety Manager is responsible for managing the training program) is responsible to ensure that employees receive this training. After attending the training, employees will sign a form verifying that they understand the above topics and how the topics are related to our hazard communication plan.

Prior to introducing a new chemical hazard into any department, each employee in that department will be given information and training as outlined above for the new chemical hazard.

7.2 Social Security

Social security is "any government system that provides monetary assistance to people with an inadequate or no income." Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality. SC Auto Myanmar Company need to engage government social program.

8.0 PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

SC Auto (Myanmar) Co., Ltd. will implement manufacturing, assembling and sales of buses/coaches, repair and maintenance services at No 188/189, 10th Road, Yangon Industrial Zone, Mingalardon Township, Yangon Region, the Republic of the Union of Myanmar, on the area of 4 acres (16,187.44 square meter). Green Myanmar Environmental Services Co., Ltd has been responsible for the assessment of environmental and social impact for the project. As part of this procedure, public participation involved meetings with nearest local residents.

8.1 Consultation with Nearest Local Residents

There are two ways of discussion, one way is participants can involve themselves in public consultation meeting and another way is by writing suggestions on distributed suggestion form.

Meeting attendees were encouraged to ask questions and give comments during and after the presentation. Comment forms were available at each meeting for attendees to write comments at the time of the meeting.

On June 18th 2018 at Supervise and Administrative office of ZayKabar Company Limited, Thingangyun Gyi village group, Mingalardone Industrial Park, Mingalardone Township, Yangon Region the public meeting for disseminating project information to general public including stakeholder and requesting (22) suggestions letter on the project was carried out (23) participants from local community attended the public meeting and participated in open discussion. Attendee lists were shown to Appendix (9). Their comments and suggestions were attached as Appendix (10).

The main points of discussion, questions and answers were mentioned in the following table.

Table 8.1 Excerpts of Suggestion Letters from Public Consultation Meeting

No	Participants	Suggestions and Discussions
1	U Myint Maung (Supervise and Administrative officer, ZayKabar Company Limited, ThingangyunGyi village group, Mingalardone Industrial Park, Mingalardone Township)	<ul style="list-style-type: none"> • I advise to take noise control due to outcome from the assembling, repair and maintenance services • Not to polluting to the environment by waste water from the workplace
2	Chaw Su Yin	<ul style="list-style-type: none"> • Reek from the drain • Ensure to keep drainage system • Lane shoulder are dirty when it is so raining
3	Win Linn Tun	<ul style="list-style-type: none"> • It is need to take Air ventilation system • Automotive paint can be disperse if it was sprayed to the car
4	Than Myo Win	<ul style="list-style-type: none"> • Wastewater dispose systematically • The person who should be inspect to the factory from GMES Co., Ltd., bi-monthly or quarterly

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		<ul style="list-style-type: none"> • Employer should be provide PPE to the workers
5	U Zaw Htet (Hundred House -hold Administrative Officer)	<ul style="list-style-type: none"> • To prevent Air and water pollution
6	Yin Yin Khaing	<ul style="list-style-type: none"> • To provide PPE for the workers
7	Tin Tun Win	<ul style="list-style-type: none"> • It is need to take drainage systematically
8	Phyo Wai Aung	<ul style="list-style-type: none"> • Ensure to keep drainage system for the surrounding of the factory
9	Win Ko	<ul style="list-style-type: none"> • To conserve Air, Water and Soil • To keep environment for healthy and happy
10	Than Toe Aung	<ul style="list-style-type: none"> • Ensure to keep not to effect to the workers • To conserve and prevent to the environment • Not to pollute for the environment
11	Mg Hein Soe Tun	<ul style="list-style-type: none"> • It has a little effluent by the factory • Ensure to keep drainage system • Now, I have no suggestion to the factory because the factory is not operating.
12	Soe Lin	<ul style="list-style-type: none"> • Automotive paint can be disperse if it was sprayed to the car
13	Phyo Kyaw	<ul style="list-style-type: none"> • Ensure to keep drainage system for the surrounding of the factory
14	Yan Linn Aung	<ul style="list-style-type: none"> • I advise to take Air, water and soil quality of the factory by the monitoring team. Air and noise pollution is very important • To provide PPE for the workers
15	U Hlaing Min Tun	<ul style="list-style-type: none"> • I advise to take for flooding and damaging of the road by Industrial Zone Management Committee
16	Zin Min Latt	<ul style="list-style-type: none"> • To keep workers
17	Nay Lin Aung	<ul style="list-style-type: none"> • PPE for workers (employees) • Medical insurance for employees
18	Than Tun Aung	<ul style="list-style-type: none"> • Occupation health and safety
19	U Naing Win	<ul style="list-style-type: none"> • To provide allowances, benefits and Health for workers • To held suggestion meeting • To take festivities for healthy and happy of workers
20	Aung Myo Kyaw	<ul style="list-style-type: none"> • Automotive paint can be dispersed if it was sprayed to the car • Ensure to keep drainage system
21	Hein Thet Aung	<ul style="list-style-type: none"> • To keep water pollution of the surrounding of the factory
22	Khin Maung Than	<ul style="list-style-type: none"> • No comment

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Figure 8.1 Recorded Photos taken from Public Consultation Meeting

8.2 Response for Comments and Suggestions

Green Myanmar Environmental Services (GMES) Co., Ltd requested client, SC Auto (Myanmar) Co., Ltd to commitments on the suggestions of public consultation meeting and employee discussion program by email at 20.8.2018. The client replied at 23.8.2018 by email. The GMES requesting letter and the proponent’s commitment letters are attached as Appendix (11) and (12) respectively.

We, SC Auto (Myanmar) Co., Ltd. will disclose the information of the factory through local authorities in due course. The suggestion box, email and contact is also provided in the factory. Job vacancies are advertised in front of factory on white board. If there is any public complaint concern the project, public can send complaint letters to administration department and directly contact to responsible persons from SC Auto (Myanmar) Co., Ltd. Once get complaint letters or information, the responsible persons immediately investigate with related case and give a solution as fast as possible. The complaint response team is as shown in the following table.

Table 8.2 Complaint Response Team

Sr. No.	Member Name	Name of Affiliated Department/ Title
1	Ko Wai Phyo Aung	Admin Manager
2	Daw Thiri Kyaw	HR Manager
3	Daw Hsu Zaw Myint	General Affair Leader
4	Ko Lin Htet Oo	Security Team Supervisor
5	Ko Wai Phyo Aung	Discipline Management

9.0 FINDINGS, RECOMMENDATIONS AND CONCLUSION

9.1 Findings and Recommendations

Beside significant beneficial impacts, and despite the use of a modern, clean technology, the project may have minor negative effects on the environment. But the design, approach and implementation are to be intended to minimize such negative effects as much as possible.

The growth of automobile use and the increasing resistance to road building have made our highway systems both congested and obsolete. Authorities concerned from Transport Sectors have to work together with relevant department to ease the situation.

For construction phase, all non-significant impacts recorded are minor or no significant environmental impacts such as dust particles dispersion, noise, waste generation, water pollution and potential health and safety impacts on employees such as accidents. All these impacts are minimal, short term, limited to the site and controllable.

The following recommendations have been made for efficient and effective implementation of environmental conservation, ecosystem management, health & safety, social responsibilities measures through the lifespan of the proposed project:

- Follow the comments and suggestions made by ECD after reviewing this IEE report
- Once EMP is approved by concerned authorities, strict implementation is essential
- For full and proper implementation of EMP, well understanding and supports by proponent and its administrative authority is deem necessity
- Fully implement Corporate Social Responsibility (CSR) Plan as an ethical business obligation, so as to be regarded as good neighbor/investor in the neighborhood
- Daily, monthly and annual action plan shall be formulated based on EMP and fully practiced
- Environmental Management Plan in IEE reports mainly deals through awareness campaigns, provision of safety measures and sanitation such as construction of pit toilets, provision of first aid kit, training. Cost required for implementation of Environmental Management Plan and mitigation measures in this project is also mentioned in the IEE report.

9.2 Conclusion

There will be positive impacts as the proposed project will generate local employment opportunity to enhance their capabilities and work skills. As a result, their socio-economic conditions will be improved.

Therefore, project section of SC Auto Myanmar’s Manufacturing, Assembling and Sales of buses/coaches, repair and maintenance services meets regional development.

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APPENDIX (1): Certificate for Transitional Consultant Registration of Organization


REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
 (ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)





No. 0006 Date 01 JUL 2017

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the organization under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို အဖွဲ့အစည်းအား ထုတ်ပေးလိုက်သည်။)

(a) Name of Organization (အဖွဲ့အစည်းအမည်)	Green Myanmar Environmental Services Co., Ltd.
(b) Name of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ အမည်)	Engr. U Sein Thaug Oo
(c) Citizenship of the representative in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ နိုင်ငံသား)	Myanmar
(d) Identity Card /Passport Number of the representative person in the organization (အဖွဲ့အစည်းကိုယ်စားလှယ်၏ မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ် အမှတ်)	12/ Ma Ya Ka (N) 082871
(e) Address of organization (ဆက်သွယ်ရန်လိပ်စာ)	115, Kanaung Min Thargyi Road, Hlaing Thar Yar Industrial City, Zone (1), Hlaing Thar Yar Township, Yangon. gmescompany@gmail.com , 09 5122448
(f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Organization
(g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 March 2018



EXTENSION
သက်တမ်းတိုးချိန်ပြင်
The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၀-၄-၂၀၁၈) မှာနေ့မှ (၃၀-၃-၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးချိန်ပြင်သည်။

For Director General (See Naing, Director)
Environmental Conservation Department

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

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EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023)
ဤလက်မှတ်အား(၁-၇-၂၀၂၃)ရက်နေ့မှ(၃၁-၈-၂၀၂၃)ရက်နေ့အထိ (၂)လသက်တမ်းတိုးမြှင့်သည်။
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Air Pollution Control
2. Facilitation of meeting
3. Meteorology, Modeling for Air Quality
4. Risk Assessment and Hazard Management
5. Socio-Economy
6. Water Pollution Control
7. Waste Management
8. Chemical Engineering Plant Design
9. Chemical Engineering Process Design
10. Chemical Engineering, Laboratory Analysis for water and waste water
11. Environmental Management
12. Industrial Management

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား(၁-၁-၂၀၂၃)ရက်နေ့မှ(၃၀-၆-၂၀၂၃)ရက်နေ့အထိ (၆)လသက်တမ်းတိုးမြှင့်သည်။
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား(၁-၁-၂၀၂၂)ရက်နေ့မှ(၃၁-၁၂-၂၀၂၂)ရက်နေ့အထိ တစ်နှစ်သက်တမ်းတိုးမြှင့်သည်။
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.1.2021) to (30.6.2021)
ဤလက်မှတ်အား(၁-၁-၂၀၂၁)ရက်နေ့မှ(၃၀-၆-၂၀၂၁)ရက်နေ့အထိ (၆)လသက်တမ်းတိုးမြှင့်သည်။
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား(၁-၄-၂၀၁၉)ရက်နေ့မှ(၃၁-၁၂-၂၀၁၉)ရက်နေ့အထိ (၉)လသက်တမ်းတိုးမြှင့်သည်။
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား(၁-၇-၂၀၂၁)ရက်နေ့မှ(၃၁-၁၂-၂၀၂၁)ရက်နေ့အထိ (၆)လသက်တမ်းတိုးမြှင့်သည်။
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား(၁-၁-၂၀၂၀)ရက်နေ့မှ(၃၁-၁၂-၂၀၂၀)ရက်နေ့အထိ တစ်နှစ်သက်တမ်းတိုးမြှင့်သည်။
For Director General
(Soe Naing, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

APPENDIX (2): Certificate for Transitional Consultant Registration of Personal



REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
 (ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)



No. 0023 Date 31.03.2018

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

(a) Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်)	Engr. U Sein Thuang Oo
(b) Citizenship (နိုင်ငံသား)	Myanmar
(c) Identity Card / Passport Number (မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ်အမှတ်)	12/ Ma Ya Ka (N) 082871
(d) Address (ဆက်သွယ်ရန်လိပ်စာ)	No. 17/D, Aung Theikdi Yeik Thar, Mayangone Township, Yangon. gmescompany@gmail.com , seinthaungoo@gmail.com 09 5122448
(e) Organization (အဖွဲ့အစည်း)	Green Myanmar Environmental Services Co.,Ltd.
(f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)	Person
(g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်)	31 March 2018

EXTENSION

သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
 ဤလက်မှတ်အား (၀-၄-၂၀၁၈) ရက်နေ့မှ (၃၁.၃.၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။

Soe Naing
14.7.2018

For Director General
(Soe Naing, Director)
Environmental Conservation Department



Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation




Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Areas of Expertise Permitted (ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Air Pollution Control

2. Chemical Engineering Process Design, Industrial Management

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six month from (1.1.2021) to (30.6.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၃၀-၆-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁.၁၂.၂၀၁၉) ရက်နေ့အထိ (၉)လ သက်တမ်း တိုးမြှင့်သည်။
Soe Naing
12.6.2019
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
16.1.2021
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
25.3.2022
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
25.3.2022
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023)
ဤလက်မှတ်အား (၁-၇-၂၀၂၃) ရက်နေ့မှ (၃၁-၈-၂၀၂၃) ရက်နေ့အထိ (၂)လ သက်တမ်းတိုးမြှင့်သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



REPUBLIC OF THE UNION OF MYANMAR
 Ministry of Natural Resources and Environmental Conservation
 CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
 (ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)



No. **0019** Date **17 JUL 2017**

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

- | | |
|---|--|
| (a) Name of Consultant
(အကြံပေးပုဂ္ဂိုလ်အမည်) | Engr. U Kyaw Soe Win |
| (b) Citizenship
(နိုင်ငံသား) | Myanmar |
| (c) Identity Card / Passport Number
(မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ် အမှတ်) | 12/ Ou Ka Ta (Naing) 038453 |
| (d) Address
(ဆက်သွယ်ရန်လိပ်စာ) | No. 135, Kanaung Min Thargyi Road, Hlaing Thar Yar Industrial City, Zone(1), Hlaing Thar Yar Township, Yangon
gmescompany@gmail.com
ksw1963@gmail.com , 09 5081451 |
| (e) Organization
(အဖွဲ့အစည်း) | Green Myanmar Environmental Services Company Limited |
| (f) Type of Consultancy
(အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား) | Person |
| (g) Duration of validity
(သက်တမ်းကုန်ဆုံးရက်) | 31 March 2018 |



EXTENSION
 သက်တမ်းတိုးမြှင့်ခြင်း
 The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
 ဤလက်မှတ်အား (၁-၄-၂၀၁၈) ရက်နေ့မှ (၃၁-၃-၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။
 Soe Naing
 14.9.2018
 For Director General
 (Soe Naing, Director)
 Environmental Conservation Department

Handwritten signature in blue ink.

Director General
 Environmental Conservation Department
 Ministry of Natural Resources and Environmental Conservation

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Areas of Expertise Permitted (ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Facilitation of meeting

2. Industrial Management

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.1.2021) to (0.6.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၁-၆-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁.၁၂.၂၀၁၉) ရက်နေ့အထိ (၉)လ သက်တမ်း တိုးမြှင့်သည်။
Soe Naing
12.6.2019
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
1.1.2021
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
25.3.2022
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023)
ဤလက်မှတ်အား (၁-၇-၂၀၂၃) ရက်နေ့မှ (၃၁-၈-၂၀၂၃) ရက်နေ့အထိ (၂)လ သက်တမ်းတိုးမြှင့်သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
(ကြားကာလအကြိမ်းပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)



No. 0021 Date 11.03.2018

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

- | | |
|---|--|
| (a) Name of Consultant
(အကြံပေးပုဂ္ဂိုလ်အမည်) | Engr. Daw Khin Swe Aye |
| (b) Citizenship
(နိုင်ငံသား) | Myanmar |
| (c) Identity Card / Passport Number
(မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ် အမှတ်) | 12/Sa Kha Na (N) 017708 |
| (d) Address
(ဆက်သွယ်ရန်လိပ်စာ) | 14 B, Wai Lu Wun Main Street, Sanchaung,
Yangon.
khinsweawe.daw@gmail.com , 09 5015475 |
| (e) Organization
(အဖွဲ့အစည်း) | Green Myanmar Environmental Services Co.,Ltd. |
| (f) Type of Consultancy
(အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား) | Person |
| (g) Duration of validity
(သက်တမ်းကုန်ဆုံးရက်) | 31 March 2018 |



EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended
for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၈) ရက်နေ့မှ (၃၁-၃-၂၀၁၉)
ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။
Soe Naing
14.9.2018
For Director General
(Soe Naing, Director)
Environmental Conservation Department

Soe Naing

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Areas of Expertise Permitted (ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Air Pollution Control

2. Waste Management

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six month from (1.1.2021) to (30.6.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၃၀-၆-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁-၁၂-၂၀၁၉) ရက်နေ့အထိ (၉)လ သက်တမ်း တိုးမြှင့်သည်။
Soe Naing 12.6.2019
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing 16.1.2020
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing 21.3.2022
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)



No. 0028 Date 07.03.2018

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

- (a) Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်) Prof. Engr. Daw Tin May Soe
- (b) Citizenship (နိုင်ငံသား) Myanmar
- (c) Identity Card / Passport Number (မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ် အမှတ်) 12/ Ka Ma Ya (N) 016072
- (d) Address (ဆက်သွယ်ရန်လိပ်စာ) 115, Kanaung Min Thargyi Road, Hlaing Thar Yar Industrial City, Zone (1), Hlaing Thar Yar Township, Yangon.
tinmaysoe949@gmail.com , 09 5077081
- (e) Organization (အဖွဲ့အစည်း) Green Myanmar Environmental Services Co., Ltd.
- (f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား) Person
- (g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်) 31 March 2018



EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The **VALIDITY** of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၈) မှတ်ပုံတင် (၃၁-၃-၂၀၁၉) မှတ်ပုံတင်ထိ ထပ်မံသက်တမ်း တိုးမြှင့်သည်။
Soe Naing
17.9.2018
For Director General
(Soe Naing, Director)
Environmental Conservation Department

Soe Naing

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Areas of Expertise Permitted (ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Water Pollution Control

2. Chemical Engineering Process Design

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six month from (1.1.2021) to (30.6.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၃၀-၆-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁.၁၂.၂၀၁၉) ရက်နေ့အထိ (၉)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။
Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။
Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation



CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 10026 Date 09.03.2018

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

- (a) Name of Consultant U Myo Myint
(အကြံပေးပုဂ္ဂိုလ်အမည်)
- (b) Citizenship Myanmar
(နိုင်ငံသား)
- (c) Identity Card / Passport Number 12/ Pa Ba Ta (N) 015315
(မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ်အမှတ်)
- (d) Address 115, Kanaung Min Thargyi Road, Hlaing Thar Yar Industrial City, Zone (1), Hlaing Thar Yar Township, Yangon.
(ဆက်သွယ်ရန်လိပ်စာ)
- (e) Organization gmescompany@gmail.com, 09 2012723
(အဖွဲ့အစည်း) Green Myanmar Environmental Services Co.,Ltd.
- (f) Type of Consultancy Person
(အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား)
- (g) Duration of validity 31 March 2018
(သက်တမ်းကုန်ဆုံးရက်)



EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၀-၄-၂၀၁၈) မှတ်ပေး (၃၁.၃.၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။
Soe Naing
4.9.2018
For Director General
(Soe Naing, Director)
Environmental Conservation Department

Soe Naing

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Chemical Engineering, Laboratory Analysis for Water and Wastewater

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for six month from (1.1.2021) to (30.6.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၃၀-၆-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁.၁၂.၂၀၁၉) ရက်နေ့အထိ (၉)လ သက်တမ်း တိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)

The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)

The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023)
ဤလက်မှတ်အား (၁-၇-၂၀၂၃) ရက်နေ့မှ (၃၁-၈-၂၀၂၃) ရက်နေ့အထိ (၂)လ သက်တမ်းတိုးမြှင့်သည်။

Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation



CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 10022 Date 11.03.2018

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

- (a) Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်) Daw Khin Shwe Htay
- (b) Citizenship (နိုင်ငံသား) Myanmar
- (c) Identity Card / Passport Number (မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ် အမှတ်) 12/ Tha Ga Ka (N) 008808
- (d) Address (ဆက်သွယ်ရန်လိပ်စာ) No. 115, Kanaung Min Thargyi Road, Hlaing Thar Yar Industrial City, Zone (1), Hlaing Thar Yar Township, Yangon
shwehtay.khin@gmail.com , 09 5032910
- (e) Organization (အဖွဲ့အစည်း) Green Myanmar Environmental Services Co.,Ltd.
- (f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား) Person
- (g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်) 31 March 2018



EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၀-၄-၂၀၁၈) မှစ၍ (၃၁-၃-၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။
See No. 3
14.9.2018
For Director General
(Soe Naing, Director)
Environmental Conservation Department

Soe Naing

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Water Pollution Control

2. Waste Management

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for six month from (1.1.2021) to (30.6.2021) ဤလက်မှတ်အား(၁-၁-၂၀၂၁)ရက်နေ့မှ(၃၀-၆-၂၀၂၁)ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019) ဤလက်မှတ်အား(၁-၄-၂၀၁၉)ရက်နေ့မှ(၃၁.၁၂.၂၀၁၉)ရက်နေ့အထိ (၉)လသက်တမ်း တိုးမြှင့်သည်။

Soe Naing
12.6.2019
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021) ဤလက်မှတ်အား(၁-၇-၂၀၂၁)ရက်နေ့မှ(၃၁-၁၂-၂၀၂၁)ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020) ဤလက်မှတ်အား(၁-၁-၂၀၂၀)ရက်နေ့မှ(၃၁-၁၂-၂၀၂၀)ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။

Soe Naing
12.1.2020
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022) ဤလက်မှတ်အား(၁-၁-၂၀၂၂)ရက်နေ့မှ(၃၁-၁၂-၂၀၂၂)ရက်နေ့အထိ တစ်နှစ်သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
25.3.2022
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)
The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023) ဤလက်မှတ်အား(၁-၁-၂၀၂၃)ရက်နေ့မှ(၃၀-၆-၂၀၂၃)ရက်နေ့အထိ (၆)လသက်တမ်းတိုးမြှင့်သည်။

Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023) ဤလက်မှတ်အား(၁-၇-၂၀၂၃)ရက်နေ့မှ(၃၁-၈-၂၀၂၃)ရက်နေ့အထိ (၂)လ သက်တမ်းတိုးမြှင့်သည်။

Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation
CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION



(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 0025 Date 17.3.2018

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the person under Environmental Impact Assessment Procedure, Notification No. 616/2015.

(ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို လူပုဂ္ဂိုလ်အားထုတ်ပေးလိုက်သည်။)

- (a) Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်) U Khin Aung
- (b) Citizenship (နိုင်ငံသား) Myanmar
- (c) Identity Card / Passport Number (မှတ်ပုံတင်/နိုင်ငံကူးလက်မှတ်အမှတ်) 12/ Ma Ya Ka (N) 047032
- (d) Address (ဆက်သွယ်ရန်လိပ်စာ) 115, Kanaung Min Thargyi Road, Hlaing Thar Yar Industrial City, Zone (1), Hlaing Thar Yar Township, Yangon.
khinaung1@gmail.com , 09 43066741
- (e) Organization (အဖွဲ့အစည်း) Green Myanmar Environmental Services Co.,Ltd.
- (f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား) Person
- (g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်) 31 March 2018



EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for one year from (1.4.2018) to (31.3.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၈) ရက်နေ့မှ (၃၁-၃-၂၀၁၉) ရက်နေ့အထိ တစ်နှစ်သက်တမ်း တိုးမြှင့်သည်။
Soe Naing
14.9.2018
For Director General (Soe Naing, Director)
Environmental Conservation Department

Handwritten signature

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

Areas of Expertise Permitted
(ခွင့်ပြုသည့် ကျွမ်းကျင်မှုနယ်ပယ်များ)

1. Socio-Economy

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for six month from (1.1.2021) to (30.6.2021)
ဤလက်မှတ်အား (၁-၁-၂၀၂၁) ရက်နေ့မှ (၃၀-၆-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for nine months from (1.4.2019) to (31.12.2019)
ဤလက်မှတ်အား (၁-၄-၂၀၁၉) ရက်နေ့မှ (၃၁-၁၂-၂၀၁၉) ရက်နေ့အထိ (၉)လ သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for six months from (1.7.2021) to (31.12.2021)
ဤလက်မှတ်အား (၁-၇-၂၀၂၁) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၁) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for one year from (1.1.2020) to (31.12.2020)
ဤလက်မှတ်အား (၁-၁-၂၀၂၀) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၀) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)

The VALIDITY of this certificate is extended for one year from (1.1.2022) to (31.12.2022)
ဤလက်မှတ်အား (၁-၁-၂၀၂၂) ရက်နေ့မှ (၃၁-၁၂-၂၀၂၂) ရက်နေ့အထိ တစ်နှစ် သက်တမ်းတိုးမြှင့်သည်။

Soe Naing
For Director General
(Soe Naing, Director)
Environmental Conservation Department

EXTENSION (သက်တမ်းတိုးမြှင့်ခြင်း)

The VALIDITY of this certificate is extended for six months from (1.1.2023) to (30.6.2023)
ဤလက်မှတ်အား (၁-၁-၂၀၂၃) ရက်နေ့မှ (၃၀-၆-၂၀၂၃) ရက်နေ့အထိ (၆)လ သက်တမ်းတိုးမြှင့်သည်။

Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း

The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023)
ဤလက်မှတ်အား (၁-၇-၂၀၂၃) ရက်နေ့မှ (၃၁-၈-၂၀၂၃) ရက်နေ့အထိ (၂)လ သက်တမ်းတိုးမြှင့်သည်။

Sa Aung Thu
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



THE REPUBLIC OF THE UNION OF MYANMAR
Ministry of Natural Resources and Environmental Conservation



CERTIFICATE FOR TRANSITIONAL CONSULTANT REGISTRATION
(ကြားကာလအကြံပေးလုပ်ကိုင်သူမှတ်ပုံတင်ခြင်းအထောက်အထားလက်မှတ်)

No. 00275 Date 13 FEB 2023

The Ministry of Natural Resources and Environmental Conservation, hereby, issues this certificate to the organization under Environmental Impact Assessment Procedure, Notification No. 616/2015. (ပတ်ဝန်းကျင် ထိခိုက်မှုဆန်းစစ်ခြင်းဆိုင်ရာ လုပ်ထုံးလုပ်နည်း၊ အမိန့်ကြော်ငြာစာအမှတ်၊ ၆၁၆/၂၀၁၅ အရ သယံဇာတနှင့် သဘာဝပတ်ဝန်းကျင်ထိန်းသိမ်းရေးဝန်ကြီးဌာနသည် ဤအထောက်အထားလက်မှတ်ကို ထုတ်ပေးလိုက်သည်။)

- (a) Name of Consultant (အကြံပေးပုဂ္ဂိုလ်အမည်) Mr. Kyi Han Bo
- (b) Citizenship (နိုင်ငံသား) Myanmar
- (c) Identity Card / Passport Number (မှတ်ပုံတင်/ နိုင်ငံကူးလက်မှတ် အမှတ်) 12/DaGaMa (N) 022231
- (d) Address (ဆက်သွယ်ရန်လိပ်စာ) No.(8), Room (201), Yuzana Street, Sittaung Villa, Dagon Myothit Satekan Tsp, Yangon.
Mobile phone: 0943197960
E mail: kyihanbo@gmail.com
- (e) Organization (အဖွဲ့အစည်း) Green Myanmar Environmental Services Co., Ltd
- (f) Type of Consultancy (အကြံပေးလုပ်ကိုင်မှုအမျိုးအစား) Person
- (g) Duration of validity (သက်တမ်းကုန်ဆုံးရက်) 30th June, 2023.

EXTENSION
သက်တမ်းတိုးမြှင့်ခြင်း
The VALIDITY of this certificate is extended for two months from (1.7.2023) to (31.8.2023)
ဤလက်မှတ်အား (၁-၇-၂၀၂၃) ရက်နေ့မှ (၃၁-၈-၂၀၂၃) ရက်နေ့အထိ (၂)လသက်တမ်းတိုးမြှင့်သည်။
For Director General
(Sa Aung Thu, Director)
Environmental Conservation Department



၁၃-၂-၂၀၂၃

Director General
Environmental Conservation Department
Ministry of Natural Resources and Environmental Conservation

ဤအထောက်အထားလက်မှတ်သည် တစ်နှစ်ပတ်ဝန်းကျင်ဆန်းစစ်ခြင်းနှင့် ပတ်ဝန်းကျင်ထိခိုက်မှုဆန်းစစ်ခြင်းပြုလုပ်သည့် တတိယပုဂ္ဂိုလ် သို့မဟုတ် အဖွဲ့အစည်းများလုပ်ငန်းလိုင်စင်ဆိုင်ရာ လုပ်ထုံးလုပ်နည်း ထုတ်ပြန်သည့်ရက်မှစ၍ (၆) လ ပြည့်မြောက်သည့်နေ့တွင် ပျက်ပြယ်မည် ဖြစ်သည်။

APPENDIX (3): Laboratory Analysis of Wastewater



Green Myanmar
Environmental Services Co., Ltd

No.115, Kanning Min Thar Gyi Road Industrial Zone (I), Hlaing Thar Yar Industrial City,
Yangon, Myanmar
Tel: 01-685572, 01-685571, 09-5081451, 09-5122448 E-mail: gmescompams@gmail.com

Name of Client :S.C Auto Myanmar Company Limited. Date of Arrival at Lab : 11.12.2017

Date of Collection : 10.12.2017

Date of Issue of Results : 21.12.2017

Sr. No.	Parameters	Unit	Analysis Value	National Environmental Quality Emission Guidelines (2015)
			Type of Surface Water	General Applications
			ထပ်မံစစ်ဆေးခြင်း	
1.	pH	-	8.71	6 – 9
2.	Chemical Oxygen Demand (COD)	ppm	473	250
3.	Biochemical Oxygen Demand (BOD ₅)	ppm	95	50
4.	Ammonia (NH ₃)	ppm	ND	10
5.	Total Cyanide (CN)	ppm	ND	1
6.	Copper (Cu)	ppm	0.09	0.5
7.	Total Iron (Fe)	ppm	ND	3.5
8.	Oil & Grease	ppm	ND	10
9.	Phenols	ppm	0.36	0.5
10.	Sulphide	ppm	ND	1
11.	Total Suspended Solids (TSS)	ppm	155	50
12.	Zinc (Zn)	ppm	0.07	2

ND-Not Detected

Analyzed By

Daw Aye Thuzar Hein
Technician (Laboratory)

Checked By

Daw Wint Phyu Htway
Incharge (Laboratory)

Approved By

Daw Cherry Thwin
Manager (Laboratory)

APPENDIX (4): Laboratory Analysis Results of Ground Water



Green Myanmar

Environmental Services Co., Ltd

No.115, Kamung Min Thar Gyi Road Industrial Zone (I), Hlaing Thar Yar Industrial City,
Yangon, Myanmar

Tel: 01-685572, 01-685571, 09-5081451, 09-5122448 E-mail: gmescompany@gmail.com

Name of Client: S.C Auto Myanmar Company Limited. Date of Arrival at Lab :11.12.2017

Date of Collection :10.12.2017

Date of Issue of Results :21.12.2017

Laboratory Analysis Results of Ground Water

Sr. No.	Parameters	Unit	Analysis Value	Drinking Water Standards		
			Type of Water	WHO (2011)	EPA (Spring 2012)	Indian Specification (IS :10500,2012)
			Tube Well			
1.	pH	-	6.72	6.5-8.5	6.5-8.5	6.5-8.5
2.	Chloride (Cl ⁻)	ppm	110	250	250	250
3.	Total Hardness as CaCO ₃	ppm	159	500	-	200
4.	Total Iron (Fe)	ppm	0.5	0.3	0.3	0.3
5.	Sulphate (SO ₄)	ppm	ND	250	250	200
6.	Total Alkalinity as CaCO ₃	ppm	157	-	-	200
7.	Turbidity	NTU	7.15	5	-	1
8.	Manganese (Mn)	ppm	0.3	0.4	0.05	0.1
9.	Aluminum (Al)	ppm	0.01	0.2	0.2	0.03
10.	Cyanide (CN)	ppm	ND	0.07	0.2	0.05
11.	Copper (Cu)	ppm	0.09	2	1	0.05
12.	Total Dissolved Solids (TDS)	ppm	213	600	500	500

ND-Not Detected

Analyzed By

Daw Aye Thuzar Hein
Technician (Laboratory)

Checked By

Daw Wint Phyu Htway
Incharge (Laboratory)

Approved By

Daw Cherry Thwin
Manager (Laboratory)

APPENDIX (5): Laboratory Analysis Results of Soil



Green Myanmar
Environmental Services Co., Ltd

No.115, Kanaung Min Thar Gyi Road Industrial Zone (1), Hlaing Thar Yar Industrial City,
Yangon, Myanmar
Tel: 01-685572, 01-685571, 09-5081451, 09-5122448 E-mail: gmescorpany@gmail.com

Name of Client :S.C Auto Myanmar Company Limited. Date of Arrival at Lab : 11.12.2017
Date of Collection : 10.12.2017 Date of Issue of Results : 21.12.2017

Laboratory Analysis Results of Soils

Sr. No.	Parameters	Unit	Analysis Value
			on 21.12.2017
1.	pH	-	6.94
2.	Chloride (Cl ⁻)	g/kg soil	0.085
3.	Total Iron (Fe)	mg/kg soil	1
4.	Copper (Cu)	mg/kg soil	ND
5.	Cyanide (CN)	g/kg soil	ND
6.	Aluminum (Al)	mg/kg soil	ND
7.	Manganese (Mn)	mg/kg soil	ND
8.	P - Alkalinity	mmol/l extract	0
9.	Total Alkalinity	mmol/l extract	28.5
10.	Extractable Acidity	cmol/kg soil	6.25

ND-Not Detected

Analyzed By

Daw Aye Thazar Hein
Technician (Laboratory)


Checked By

Daw Wint Phyu Htway
Incharge (Laboratory)

Approved By

Daw Cherry Thwin
Manager (Laboratory)

APPENDIX (6): Attendance List from Public Consultation Meeting



Green Myanmar

Environmental Services Co., Ltd

No.115, Kanaung Min Thar Gyi Road, Industrial Zone (1), Hlaing Thar Yar Industrial City,
Yangon, Myanmar

Tel: 01-3685572, 01-3685571, 09-5081451, 09-5122448 E-mail: gmesccompany@gmail.com

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ မင်္ဂလာဒုံစက်မှုဇုန်၊
 (၁၀)လမ်း၊ အမှတ်(၁၈၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့်
 ဝန်ထုပ်ထုပ်တင်စက်ယာဉ်နှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့်
 ပြုပြင်ထိန်းသိမ်းရေးလုပ်ငန်း
 ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အစီရင်ခံစာရေးဆွဲမှုသို့ တက်ရောက်သူများစာရင်း
 ရက်စွဲ ၊ ။ ၂၀၁၈ ခုနှစ်၊ ဇွန်လ (၁၈)ရက်

စဉ်	အမည်	နေရပ်လိပ်စာ	လက်မှတ်
၁	ဖိုးဝေဒောင်း	၁၂ ရွှေပေါက်၊ ရွှေပေါက်	
၂	ဝင်းတို့	ကောင်တောကလေး၊ သာသနာ့ရွက်	
၃	သန့်-တိုး-ဒောင်း	ရွှေပေါက်၊ သာသနာ့ရွက်	
၄	မိုးမိုး-သွန်း	ရွှေပေါက်၊ သာသနာ့ရွက်၊ ရွှေလမ်း	
၅	သန့်-ဦး-ဝင်း	ရွှေပေါက်၊ သာသနာ့ရွက်	
၆	ခင်မောင်သိန်း	ရွှေပေါက်၊ သာသနာ့ရွက်	
၇	ဝင်းမင်းထွန်း	ရွှေပေါက်၊ သာသနာ့ရွက်	
၈	ဦးလင်း	ရွှေပေါက်၊ သာသနာ့ရွက်	
၉	ကျော်သူ	ရွှေပေါက်၊ သာသနာ့ရွက်၊ ရွှေလမ်း	
၁၀	မြိုးကျော်	မြောက်ဥက္ကလာ	
၁၁	ဂိုလမ်းကောင်	မြောက်ဥက္ကလာ	
၁၂	ကျွန်းစိမ်း	မြောက်ဥက္ကလာ	
၁၃	ခင်မင်းလတ်	ရွှေပေါက်၊ သာသနာ့ရွက်	
၁၄	မောင်-မောင်	ရွှေပေါက်၊ သာသနာ့ရွက်	
၁၅	သန်းထွန်း-မောင်	ရွှေပေါက်၊ သာသနာ့ရွက်	
၁၆	ဦးဝင်း	ရွှေပေါက်၊ သာသနာ့ရွက်၊ ရွှေလမ်း	
၁၇	မောင်ဖိုးကျော်	ရွှေပေါက်၊ သာသနာ့ရွက်	
၁၈	မာရ် သက်သေခံ	၁၂၊ (၁)ရွာ၊ ခုမံသာကလေး	

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စဉ်	ဆွေးနွေးအကြံပြုချက်
၁-	ရန်ကင်း၊ နားကား၊ တပ်ကွက်၊ ရှေ့ပိုင်း၊ တိုက်မသေ နား၊ အမှတ်(၁၈၈/၁၈၉)

လက်မှတ် _____
 အမည် _____
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 ဆက်သွယ်ရန်လိပ်စာ _____

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စဉ်	ဆွေးနွေးအကြံပြုချက်
	အင်္ဂလိပ်ကျောင်း၊ ဧရာဝတီ၊ နားကား၊ တပ်ကွက်၊ ရှေ့ပိုင်း၊ တိုက်မသေ နား၊ အမှတ်(၁၈၈/၁၈၉)

လက်မှတ် _____
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စဉ်	ဆွေးနွေးအကြံပြုချက်
	ပတ်ကွက်၊ ကျောင်း၊ ရှေ့ပိုင်း၊ တိုက်မသေ နား၊ အမှတ်(၁၈၈/၁၈၉)

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စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	ပတ်ကွက်၊ ကျောင်း၊ ရှေ့ပိုင်း၊ တိုက်မသေ နား၊ အမှတ်(၁၈၈/၁၈၉)
၂	ပတ်ကွက်၊ ကျောင်း၊ ရှေ့ပိုင်း၊ တိုက်မသေ နား၊ အမှတ်(၁၈၈/၁၈၉)
၃	ပတ်ကွက်၊ ကျောင်း၊ ရှေ့ပိုင်း၊ တိုက်မသေ နား၊ အမှတ်(၁၈၈/၁၈၉)

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 (၁၀)လမ်း၊ အမှတ်(၁၀၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့်
 ခရီးသည်တင်ပို့ရေးကုမ္ပဏီနှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့်
 မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ
 ရင်းနှီးမှုနှင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း
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စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	စက်မှုအစွမ်း ၅ ရှေးစိုက်ကုမ္ပဏီမှ အုတ်ကုန် ၅၅၆၆ ပါသည်။ သို့သော်လည်း စက်မှုလုပ်ငန်းတွင် ရေမြောင်းဖန်တီးမှု သော့ကုမ္ပဏီမှ သံသယ ရှိမည် ဖြစ်ပါသည်။ ရှေးစိုက်ကုမ္ပဏီမှ ရေကန်ဖန်တီးမှုလုပ်ငန်းပါသည်။ စက်မှုဇုန်လုပ်ငန်းမှ စတင်သော စက်မှုဇုန်ဖန်တီးမှု အကြံပြုချက် ပေးလိုသေးပါ။ စက်မှုဇုန်ဖန်တီးမှု စတင်ပါက အကြံပြုချက်ကို ပေးပြီးမှ ရှေးစိုက်ကုမ္ပဏီမှ ပါသည်။

လက်မှတ် _____
 အမည် Mg. Hein Soe Tun
 မှတ်ပုံတင်အမှတ် 21/MKN(Wing) 185477
 ရာထူး _____
 ဖုန်းနံပါတ် ၀၉-၄၇၄၀၃၄၁၀၀
 ဆက်သွယ်ရန်လိပ်စာ _____

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 မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ
 ရင်းနှီးမှုနှင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း
 တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	စက်မှု ဗဟိုကုမ္ပဏီမှ စက်မှုဇုန် ၅၅၆၆ ပါသည်။ စီ.ပစ် ရှိ မျှ. အ.ဝ. ပါကြောင်း ၂ Green Myanmar မှ အစီအစဉ် အကျိုးလုပ်ကိုင် စက်မှုဇုန် ၂၀၀ တို့ကို ပုံနှိပ်ခြင်း မှတ်ပုံတင်စေ. ဆ. ပါ ကြောင်း ၃ စက်ရုံရှိ အစီအစဉ် အကျိုးလုပ်ကိုင်. သက်ဆိုင်ရာ အစီအစဉ် ကာကွယ်မှုနှင့် ပတ်သက်၍ အကြံပြုချက်ကို စီမံကိန်း တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

လက်မှတ် _____
 အမည် _____
 မှတ်ပုံတင်အမှတ် ၁၂၅၈၀၀၀၀၀၀၀၀၀၀
 ရာထူး _____
 ဖုန်းနံပါတ် ၀၉-၇၇၆၆၀၂၂၂၂
 ဆက်သွယ်ရန်လိပ်စာ _____

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ မင်္ဂလာဒုံတော်လှန်ရေး
 (၁၀)လမ်း၊ အမှတ်(၁၀၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့်
 ခရီးသည်တင်ပို့ရေးကုမ္ပဏီနှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့်
 မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ
 ရင်းနှီးမှုနှင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း
 တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	စက်မှုဇုန်အစီအစဉ်အကျိုးလုပ်ကိုင်စေပါ။ စက်မှုဇုန်အစီအစဉ်အကျိုးလုပ်ကိုင်စေပါ။ စက်မှုဇုန်အစီအစဉ်အကျိုးလုပ်ကိုင်စေပါ။

လက်မှတ် _____
 အမည် _____
 မှတ်ပုံတင်အမှတ် ၄/၂၀၀၀၀၀၀၀ ၀၂၅၅၅၅
 ရာထူး _____
 ဖုန်းနံပါတ် ၀၉-၂၅၄၂၅၀၀၀၀
 ဆက်သွယ်ရန်လိပ်စာ _____

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ မင်္ဂလာဒုံတော်လှန်ရေး
 (၁၀)လမ်း၊ အမှတ်(၁၀၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့်
 ခရီးသည်တင်ပို့ရေးကုမ္ပဏီနှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့်
 မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ
 ရင်းနှီးမှုနှင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း
 တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	စက်မှုဇုန်အစီအစဉ်အကျိုးလုပ်ကိုင်စေပါ။ စက်မှုဇုန်အစီအစဉ်အကျိုးလုပ်ကိုင်စေပါ။ စက်မှုဇုန်အစီအစဉ်အကျိုးလုပ်ကိုင်စေပါ။

လက်မှတ် _____
 အမည် _____
 မှတ်ပုံတင်အမှတ် ၇/၀၀၀၀၀၀၀ ၇၆၀၀၀၀
 ရာထူး _____
 ဖုန်းနံပါတ် ၀၉-၂၆၀၀၀၀၀၀
 ဆက်သွယ်ရန်လိပ်စာ _____

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ မင်္ဂလာဒုံစက်မှုဇုန်၊ (၁၀)လမ်း၊ အမှတ်(၁၈၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် ဝန်ဆောင်ခတ်မော်တော်ယာဉ်နှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ

ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
1.	PPE FOR WORKERS (EMPLOYEES)
2.	MEDICAL INSURANCE FOR EMPLOYEES

လက်မှတ် _____
 အမည် NAY LIN AUNG
 မှတ်ပုံတင်အမှတ် 12/ANSA NA (M) 158048
 ဝန်ထုပ် W/H MANAGER
 ဝန်နံပါတ် 09467914297
 ဆက်သွယ်ရန်လိပ်စာ SHWE PAUK KAN, (12th)
 WARD

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ မင်္ဂလာဒုံစက်မှုဇုန်၊ (၁၀)လမ်း၊ အမှတ်(၁၈၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် ဝန်ဆောင်ခတ်မော်တော်ယာဉ်နှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ

ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	လုပ်ငန်းခွင် အန္တရာယ် လင်းရှင်းရေး၊ ကွန်ကရစ်အောက်ဖျားအောက်အောက်ခြင်း

လက်မှတ် _____
 အမည် None
 မှတ်ပုံတင်အမှတ် ၃၂/၁၁၃(ရင်း) 1၁၆၄၅၅
 ဝန်ထုပ် _____
 ဝန်နံပါတ် ၀၇ ၄၄၄၃၂၇၅၄၃
 ဆက်သွယ်ရန်လိပ်စာ ကျွန်းတိုက် (၂၅) ဘလောက်

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ မင်္ဂလာဒုံစက်မှုဇုန်၊ (၁၀)လမ်း၊ အမှတ်(၁၈၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် ဝန်ဆောင်ခတ်မော်တော်ယာဉ်နှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ

ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	အလုပ်သမား ရရှိနိုင်မှု မှည့် အကျိုးခံစားခွင့်/ ကျန်းမာရေးပွင့် ဦးစွာ စောင့်ရှောက်ရန် စီစဉ်ပေးခြင်း အကြံပြု ဓန ဓန ပွဲများ ပြုလုပ်ခြင်း အလုပ်သမားများ စိတ် ကျေနပ်စေရန် ကျန်းမာရေး အစာအာဟာရ အစီအစဉ်များ ဆောင်ရွက်ပေးခြင်းများ ပြုလုပ်

လက်မှတ် _____
 အမည် စိုးစိုးစိုး
 မှတ်ပုံတင်အမှတ် ၅/၂၂၂၂၂(ရင်း) ၀၇၇၂၂၂၂
 ဝန်ထုပ် _____
 ဝန်နံပါတ် ၀၇၇၆၂၀၇၃၈၂
 ဆက်သွယ်ရန်လိပ်စာ ကျွန်းတိုက် (၁၁) ဘလောက်
 ကျွန်းတိုက်

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ မင်္ဂလာဒုံမြို့နယ်၊ မင်္ဂလာဒုံစက်မှုဇုန်၊ (၁၀)လမ်း၊ အမှတ်(၁၈၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် ဝန်ဆောင်ခတ်မော်တော်ယာဉ်နှင့် အဝေးပြေးဘတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ

ရင်းနှီးပွင့်လင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့်လူကြီးမင်းတို့၏ အကြံပြုချက်များကို စီမံကိန်း တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	အသံအာနိတ်/ ယော်စူ ခံနိုင်ရည် အစွမ်း ပတ်ဝန်းကျင် ကို မထိခိုက်စေရန် ပြုလုပ်ခြင်း
၂	အစားအသွယ် ပြုစုမှု အစီအစဉ် အကျိုးအမြတ် ပေး စေရန် စီစဉ်ပေးခြင်း၊ ပတ်ဝန်းကျင် ကို စောင့်ရှောက် စီမံကိန်း ပြုလုပ်ခြင်း၊ စက်မှု ဓန ဓန စားသောက်ရေး ဓန ဓန မကောင်းမှု အစွမ်း ပတ်ဝန်းကျင် ကို ခံနိုင်ရည် စီမံပေးခြင်း
၃	ကျန်းမာရေး အစီအစဉ် အသံအာနိတ် စီမံပေးခြင်း ပြုလုပ်

လက်မှတ် _____
 အမည် မောင်ကျော်စွာ
 မှတ်ပုံတင်အမှတ် ၁/၂၂၂၂(ရင်း) ၁၂၂၂၂၂
 ဝန်ထုပ် _____
 ဝန်နံပါတ် ၀၇၄၃၄၃၃၈၀၂၃
 ဆက်သွယ်ရန်လိပ်စာ _____

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“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ ဟင်္သာတမြို့နယ်၊ ဟင်္သာတတိုက်ရုံရန် (၁၀)ကွက်၊ အမှတ်(၁၈၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် ဝန်ဆောင်ခတ်မော်တော်ယာဉ်နှင့် အထောက်အကူပြုကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ ရင်းနှီးမြှုပ်နှံလင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့် လုပ်ငန်းပင်တို့၏ အကြံပြုချက်များကို စီမံကိန်း တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
၁	ဟင်္သာတမြို့၊ ဧရာဝတီမြစ်၊ ကင်း-ဧကင်း အစိုပြေပါသည့်

လက်မှတ် _____
 အမည် _____
 မှတ်ပုံတင်အမှတ် _____
 ဧရာဝတီ _____
 ဝန်ဆောင်ခတ် _____
 ၀၇၂၅၄၂၇၃၇၇၇

 **Green Myanmar**
 Environmental Services Co., Ltd
 No.115, Kamsang Min Thar Gyi Road, Industrial Zone (I), Hlaing Thar Yar Industrial City,
 Yangon, Myanmar
 Tel: 01-3685572, 01-3685571, 09-5081451, 09-5122448 E-mail: gmescompany@gmail.com

SC Auto (Myanmar) Co., Ltd. ၏ ရန်ကင်းတိုင်းဒေသကြီး၊ ဟင်္သာတမြို့နယ်၊ ဟင်္သာတတိုက်ရုံရန် (၁၀)ကွက်၊ အမှတ်(၁၈၈/၁၈၉) တွင် အကောင်အထည်ဖော်ဆောင်ရွက်မည့် ဝန်ဆောင်ခတ်မော်တော်ယာဉ်နှင့် အထောက်အကူပြုကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် မြှုပ်နှံထိန်းသိမ်းရေးလုပ်ငန်းနှင့် ပတ်သက်၍ အကြံပြုစာ ရင်းနှီးမြှုပ်နှံလင်းစွာ အကြံပြုရေးသားနိုင်ပါကြောင်းနှင့် လုပ်ငန်းပင်တို့၏ အကြံပြုချက်များကို စီမံကိန်း တာဝန်ရှိသူများနှင့် တင်ပြဆွေးနွေးပေးသွားမည် ဖြစ်ပါသည်။

စဉ်	ဆွေးနွေးအကြံပြုချက်
	ဟင်္သာတမြို့၊ ဧရာဝတီမြစ်၊ ကင်း-ဧကင်း အစိုပြေပါသည့်

လက်မှတ် _____
 အမည် _____
 မှတ်ပုံတင်အမှတ် _____
 ဧရာဝတီ _____
 ဝန်ဆောင်ခတ် _____
 ၀၇-၄၄-၂၄၅၈၄၅၅

APPENDIX (8): Requesting Letter of GMES on the Suggestion Letters



Green Myanmar Environmental Services Co., Ltd

No.115, Kamang Min Thar Gyi Road Industrial Zone (1), Hlaing Thar Yar Industrial City, Yangon, Myanmar Tel: 01-685572, 01-685571, 09-5081451, 09-5122448 E-mail: gmescorpany@gmail.com

သို့

စက်မှုတာဝန်ခံ SC Auto (Myanmar) Company Limited အမှတ် (၁၈၈/၁၈၉)၊ မင်္ဂလာဒုံစက်မှုဇုန်၊ မင်္ဂလာဒုံမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။

ရက်စွဲ ။ ၂၀၁၈ ခုနှစ်၊ ဩဂုတ်လ () ရက်

အကြောင်းအရာ ။

SC Auto (Myanmar) Company Limited. ၏ ခရီးသည်တင် ဖော်စောက် ယာဉ်နှင့် အဝေးပြေးသတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် ပြုပြင်ထိန်းသိမ်းရေးလုပ်ငန်းအပေါ် ရုပ်စီရင်စာချုပ်များ၏ ဆန္ဒသဘောထား အခြေများ အကြံပြုချက်များကို ညှိနှိုင်းပြန်ကြားပေးပါရန်တောင်း

ရည်ညွှန်းချက် ။

၂၀၁၇ ခုနှစ်၊ နိုဝင်ဘာလ (၉) ရက်နေ့ တွင် စိမ်းလန်းမြန်မာပတ်ဝန်းကျင်ဆိုင်ရာ ဝန်ဆောင်မှုလုပ်ငန်းကုမ္ပဏီနှင့် SC Auto (Myanmar) Company Limited. တို့၏ နှစ်ဦးသဘောတူစာချုပ်။

အထက်ပါအကြောင်းအရာကိုရရှိသည့်စွဲစိမ်းလန်းမြန်မာပတ်ဝန်းကျင်ဆိုင်ရာဝန်ဆောင်မှုလုပ်ငန်းကုမ္ပဏီနှင့် SC Auto (Myanmar) Company Limited. ၏ အမှတ် (၁၈၈/၁၈၉)၊ မင်္ဂလာဒုံစက်မှုဇုန်၊ မင်္ဂလာဒုံမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီးတွင် ခရီးသည်တင်ဖော်စောက်ယာဉ်နှင့် အဝေးပြေးသတ်(စ်)ကားများကို တပ်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် ပြုပြင်ထိန်းသိမ်းရေးလုပ်ငန်းအတွက် ကနဦးပတ်ဝန်းကျင်စစ်ဆေးခြင်း(IEE) နှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်(EMP) ဖော်ပြချက်များ ရည်ညွှန်းပါ သဘောတူစာချုပ် ချုပ်ဆိုကြပါသည်။ အစီရင်ခံစာတွင် အများပြည်သူသဘောထားရယူခြင်းနှင့် သတင်းအချက်အလက် များထုတ်ပြန်ခြင်း ဖော်ပြချက်များ ဖော်ပြချက် ၂၀၁၈ ခုနှစ်၊ ဇူလိုင်လ (၁၈) ရက်နေ့တွင် ဖော်ပြချက်များနှင့် တွေ့ဆုံ၍ ဆန္ဒသဘောထား အကြံပြုချက်များ ရယူခဲ့ပါသည်။ ယင်းအကြံပြုချက်များကို ဖတ်ရှုလေ့လာခဲ့ရာတွင် ဖော်ပြပါ အချက်များကို စက်မှုရှိ တာဝန်ခံမှ ပြန်လည်ရှင်းလင်းပေးစေလိုပါသဖြင့် မြေရှင်းရမည့်အကြံပြုချက်များကို ပူးတွဲတင်ပြထားပါသည်။

လေးစားစွာဖြင့်

ပူးတွဲ


- ဒေသစီရင်စာချုပ်စာချုပ်၏ အကြံပြုချက်ကောက်နုတ်ချက်များ

SC Auto (Myanmar) Company Limited. ၏ ဓဇ်းသည့်တင်မော်တော်ယာဉ်နှင့်အဝေးပြေးသင်္ဘော(စ်)ကား
များကို တင်ဆင်ခြင်း၊ ထုတ်လုပ်ခြင်းနှင့် ပြုပြင်ထိန်းသိမ်းရေးလုပ်ငန်းစက်ရုံအပေါ် အသစ်များ၏
အကြံပြုချက်လေ့လာစာတမ်းများ

အသစ်များ၏ လေ့လာစာတမ်းအခြေများ

- (၁) ယာဉ်များတင်ဆင်ထုတ်လုပ်ခြင်းနှင့် ထိန်းသိမ်းရေးလုပ်ငန်းခြစ်သဖြင့် တင်ဆင်မှုများအတွက် ခြစ်ပေါ်
လာသည့် ဆူညံသံများအား အတတ်နိုင်ဆုံးထိန်းချုပ်ပေးရန်လိုအပ်ပါသည်။
- (၂) လုပ်ငန်းခွင်တွင် ဓရုဆိုးရွှံ့နံ့ပစ်မှုများအတွက် နနစ်တကျပြုလုပ်ရန် လိုအပ်ပါသည်။
- (၃) ဓရုပြောင်းနနစ်၊ ဓရုစီးခရုလာနနစ်၊ စက်ရုံအတွက်သော ရွှံ့ပစ်ခရုများကို နနစ်တကျကောင်းမွန်အောင်
လုပ်ဆောင်သင့်ပါသည်။
- (၄) အလုပ်သမားများ၏ လုပ်ငန်းခွင်အန္တရာယ်ကင်းရှင်းရေးအတွက် (PPE)အထောက်ပံ့ပေးရန်၊ ပညာရေး
ကျွမ်းမာရေး၊ လုံခြုံမှု စောင့်ရှောက်ပေးရန်
- (၅) သဘာဝပတ်ဝန်းကျင် မပျက်စီးစေရန်၊ ဓလတုညစ်ညမ်းမှုမဖြစ်စေရန်၊ ဆူညံသံမထွက်စေရန်၊ ဆောင်ရွက်
ပေးပါ
- (၆) အလုပ်သမားရရှိနိုင်မည့် အကျိုးခံစားခွင့်၊ ကျွန်ုပ်တို့အဖွဲ့နှင့်ညီညွတ်သော နေရာထိုင်ခင်းများ စီစဉ်ပေးခြင်း၊
အလုပ်သမားများ စိတ်ပျက်စီးမှုကိုလျှော့ချပေးရန်၊ ကျွန်ုပ်တို့အဖွဲ့အတွက် အစီအစဉ်များ ဆောင်ရွက်ပေးရန်
- (၇) Green Myanmar မှ တာဝန်ရှိသူများထက်ရှိသည့် ၂ လ၊ ၃ လ တစ်ကြိမ် လာရောက်စစ်ဆေးသင့်ပါကြောင်း
- (၈) တာဝန်ခံဆောင်ရွက်လျှင် အမှုများလွှင့်နိုင်သောကြောင့် ဓလသန်ရှင်းစေရန် ပြုလုပ်ပေးပါ
- (၉) စက်ရုံအနီးပတ်ဝန်းကျင်ရှိ ဓရုပြောင်းများ၊ ဓရုစီးခရုလာကောင်းအောင်ပြုလုပ်ပေးပါ

APPENDIX (9): Proponent Commitment Letter on Suggestion Letters



SC Auto (Myanmar) Co., Ltd.
 Room 46, 47, Block CC 44-65, Thiriadana Wholesale Market,
 No (3) Highway Road, North Okkalapa Township, Yangon, Myanmar
 Tel: 01-1220933

The Quality Coach Builder

သို့၊
 မန်နေဂျင်မိန့်တော်တာ
 စီမံကိန်းနှင့်ပြန်လည်ထူထောင်ရေးဦးစီးဌာန၊ ဘဏ္ဍာရေးဝန်ကြီးဌာန၊
 အမှတ်(၁၁၅)၊ ကဆုန်မင်းသားကြီးလမ်း၊
 လှိုင်သာယာစက်မှုဇုန်(၁)၊ လှိုင်သာယာမြို့နယ်၊
 ရန်ကင်းတိုင်းဒေသကြီး။


ရက်စွဲ - ၂၀၁၈ ခုနှစ် ဩဂုတ်လ (၂၃) ရက်

အကြောင်းအရာ ။ SC Auto (Myanmar) Company Limited ၏ စက်ရုံအပေါ် ပတ်ဝန်းကျင်
 ရုပ်ပုံဆွဲချက်၊ အကြံပြုချက်များ၊ ဆောင်ရွက်ပေးမည့် ပြန်ကြားခြင်း
 ကိစ္စ။

ရည်ညွှန်းချက် ။ ၂၀၁၈ ခုနှစ် ဩဂုတ်လ (၂၃) ရက်နေ့တွင် စီမံကိန်းနှင့်ပြန်လည်ထူထောင်ရေးဦးစီးဌာန၊
 ဝန်ဆောင်မှုလုပ်ငန်းကုမ္ပဏီလီမိတက်၏ ပေးပို့စာ။

အထက်ဖော်ပြပါကိစ္စနှင့် စပ်လျဉ်း၍ ရည်ညွှန်းပါစာဖြင့် SC Auto (Myanmar) Company Limited ၏
 စက်ရုံအပေါ် ပတ်ဝန်းကျင်ရုပ်ပုံဆွဲချက်၊ ဆွေးနွေးအကြံပြုချက်များကို စက်ရုံမှ
 ဆောင်ရွက်ပေးမည် အစီအစဉ်များကို ပြန်ကြားအပ်ပါသည်။

ပူးတွဲ ။ ပတ်ဝန်းကျင် ရုပ်ပုံဆွဲချက်၊ ဆွေးနွေးအကြံပြုချက်များအပေါ် စက်ရုံမှ
 ဆောင်ရွက်ပေးမည် အစီအစဉ်။

 ၂၃-၈-၂၀၁၈
 စက်ရုံတာဝန်ခံ

SC Auto (Myanmar) Company Limited
 အမှတ် (၁၁၅/၁၅၅)၊ မင်္ဂလာဒုံစက်မှုဇုန်၊
 မင်္ဂလာဒုံမြို့နယ်၊ ရန်ကင်းတိုင်းဒေသကြီး။

SC Auto (Myanmar) Company Limited မှ ပတ်ဝန်းကျင်ဆိုင်ရာ အန္တရာယ်များ၏ ဆန္ဒသဘောထားများအပေါ် စက်မှုဆောင်ရွက်ပေးမည့် အစီအစဉ်

အကြံပြုချက်ဆန္ဒသဘောထားများ	ဆောင်ရွက်ပေးမည့်အစီအစဉ်
<p><u>အသံများ၏ ဆန္ဒသဘောထားအကြောင်းများ</u></p>	
<p>(၁) သာဓ်များတစ်ဆင့်ထုတ်လုပ်ခြင်းနှင့် ထိန်းသိမ်းရေးလုပ်ငန်းခြင်းသဖြင့် တစ်ဆင့်မှများအတွက် ခြင်္သေ့ လာသည့် ဆူညံသံများအား အတတ်နိုင်ဆုံးထိန်းချုပ်ပေးရန်လိုအပ်ပါသည်။</p>	<p>(၁) ဆူညံသံလျော့နည်းရန်အတွက် စက်ပစ္စည်းများအား ခြင်္သေ့ခြင်း၊ ဆူညံသံထုတ်သည့် စက်ပစ္စည်းများကို ကာရံခြင်းများ ပြုလုပ်ပါမည်။ ၎င်းနေရာတွင် လုပ်ကိုင်နေသော ဝန်ထမ်းများအတွက် အကာအကွယ်ပစ္စည်းများ စီစဉ်ထားရှိပေးပါမည်။</p>
<p>(၂) လုပ်ငန်းခွင်တွင် ရေဆိုးရွှံ့ပစ်မှုများ အတွက် နေ့စဉ်ကျွေးလုပ်ရန် လိုအပ်ပါသည်။</p>	<p>(၂) ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ် အရ နိုင်ငံတော်မှ သတ်မှတ်ချက်များနှင့်အညီ ဆောင်ရွက်ပါမည်။</p>
<p>(၃) ရေမြောင်းစနစ်၊ ရေစီးရေလွှာစနစ်၊ စက်မှုထုတ်သော ရွှံ့ပစ်ရေများကို နေ့စဉ်ကျွေးကောင်းစွာအောင် လုပ်ဆောင်သင့်ပါသည်။</p>	<p>(၃) သက်ဆိုင်ရာစက်မှုရွှံ့ပစ်စီမံခန့်ခွဲရေးကော်မတီသို့ တင်ပြ၍ လုပ်ဆောင်ပါမည်။</p>
<p>(၄) အလုပ်သမားများ၏ လုပ်ငန်းခွင်အန္တရာယ်ကင်းရှင်းရေးအတွက် (PPE)အောက်ပုံပေးရန်၊ ပညာရေး၊ ကျန်းမာရေး၊ လုံခြုံမှု စောင့်ရှောက်ပေးရန်</p>	<p>(၄) လုပ်သားများ လုပ်ငန်းခွင် ဘေးအန္တရာယ်ကင်းရှင်းရေးအတွက် ဆောင်ရွက်ပေးပါမည်။</p>
<p>(၅) သဘာဝပတ်ဝန်းကျင် မပျက်စီးစေရန်၊ လေထုညစ်ညမ်းမှုခြင်းစေရန်၊ ဆူညံသံထုတ်စေရန် ဆောင်ရွက်ပေးပါ</p>	<p>(၅) ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်အရ နိုင်ငံတော်မှ ဖြုတ်ထားသော လမ်းညွှန်ချက်နှင့်အညီဆောင်ရွက်ပါမည်။</p>
<p>(၆) အလုပ်သမားရရှိနိုင်မည့် အကျိုးခံစားခွင့်၊ ကျန်းမာရေးနှင့်ညီညွတ်သောနေရာတိုင်ခံစားရန် စီစဉ်ပေးခြင်း၊ အလုပ်သမားများ စိတ်ပျော့ ကိုယ်ပါ ကျန်းမာခြင်း အတွက် အစီအစဉ်များ ဆောင်ရွက်ပေးရန်</p>	<p>(၆) အလုပ်သမားစံနှုန်းများနှင့်ညီညွတ်စွာ ပညာရေးအားလည်း အလုပ်သမားများနှင့်ပတ်သက်သည့် ဝန်ထမ်းခံစားခွင့်နှင့်အညီ ဆောင်ရွက်ပေးပါမည်။</p>
<p>(၇) Green Myanmar မှ တာဝန်ရှိသူများစက်မှုသို့ ၂ လ၊ ၃ လ တစ်ကြိမ် လာရောက်စစ်ဆေး သင့်ပါကြောင်း</p>	<p>(၇) ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှုအစီအစဉ်ပါ စောင့်ကြည့်အဖွဲ့များမှ စောင့်ကြည့်တိုင်းတာ စစ်ဆေးခြင်းနှင့် ပတ်ဝန်းကျင်စီမံခန့်ခွဲမှု အစီအစဉ်အတိုင်း ဆောင်ရွက်ပါမည်။</p>
<p>(၈) ကာကွယ်ရေးမှတ်လျှင် အမှန်များ လွှင့်နိုင်သောကြောင့် လေထုညစ်ညမ်းစေရန် ပြုလုပ်ပေးပါ</p>	<p>(၈) ကာကွယ်ရေးမှတ်လျှင် အထူးသီးသန့် အလုပ်များတွင် နေ့စဉ်ကျွေး စီစဉ်ထားရှိပြီး အမှန်များမလွှင့်စေရန် အကာအရံများနှင့်အမှန်ပစ်စနစ်များ စီစဉ်ဆောင်ရွက်ပါမည်။ ဝန်ထမ်းများ အတွက် အကာအကွယ်ပစ္စည်းများ ခြင်္သေ့ခြင်းပေးပါမည်။</p>
<p>(၉) စက်မှုအစီအစဉ်ပတ်ဝန်းကျင်ရှိ ရေမြောင်းများ ရေစီးရေလွှာကောင်းအောင် ပြုလုပ်ပေးပါ</p>	<p>(၉) သက်ဆိုင်ရာစက်မှုရွှံ့ပစ်စီမံခန့် ခွဲရေးကော်မတီသို့ သတင်းပို့၍ ရေစီးရေလွှာကောင်းစေရန် ပြုလုပ်ပေးပါမည်။</p>

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PU Foam B3

14.2 UN proper shipping name:
 Proper shipping name: Aerosols

14.3 Transport hazard class(es):
 Class: 2
 Classification code: 2F

14.4 Packing group:
 Packing group: I
 Label: 2.1

14.5 Environmental hazards:
 Environmentally hazardous substance mark: No

14.6 Special precautions for use:
 Special provisions: 490
 Special provisions: 327
 Special provisions: 344
 Special provisions: 323
 Limited quantities: Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)

Sea (IMDG)
 14.1 UN number:
 UN number: 1930

14.2 UN proper shipping name:
 Proper shipping name: Aerosols

14.3 Transport hazard class(es):
 Class: 2.1

14.4 Packing group:
 Packing group: I
 Label: 2.1

14.5 Environmental hazards:
 Marine pollutant: No
 Environmentally hazardous substance mark: No

14.6 Special precautions for use:
 Special provisions: 490
 Special provisions: 327
 Special provisions: 344
 Special provisions: 323
 Limited quantities: Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code:
 Annex II of MARPOL 73/78: Not applicable, based on available data

Air (IATA/ICAO-TI/IATA-DGR)
 14.1 UN number:
 UN number: 1930

14.2 UN proper shipping name:
 Proper shipping name: Aerosols, flammable

14.3 Transport hazard class(es):
 Class: 2.1

14.4 Packing group:
 Packing group: I
 Label: 2.1

14.5 Environmental hazards:
 Environmentally hazardous substance mark: No

14.6 Special precautions for use:
 Special provisions: 490
 Special provisions: 327
 Special provisions: 344
 Special provisions: 323
 Passenger and cargo transport limited quantities: maximum net quantity per packaging: 30 kg

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13.1 Waste treatment methods:
 13.1.1 Provisions relating to waste
 Waste treatment code (Directive 2008/98/EC, decision 2000/532/EC):
 08 04 08 (waste of residues and sludges containing organic solvents or other dangerous substances). Depending on branch of industry and production process, a bio- or other EU/UK codes may be applicable. Hazardous waste according to Directive 2008/98/EC.

13.1.2 Other methods
 Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or create problems for the further management of the waste. Hazardous waste shall be managed, respectively, in a manner that is to be reported under hazardous waste shall take the necessary measures to prevent risk of pollution or damage to people or animals. Specific treatment. Do not discharge into air or the environment.

13.1.3 Packaging/Container
 Waste treatment code packaging (Directive 2008/98/EC):
 1701 10 (packaging containing residues of or contaminated by dangerous substances).

SECTION 14: Transport information

Road (ADR)
 14.1 UN number:
 UN number: 1930

14.2 UN proper shipping name:
 Proper shipping name: Aerosols

14.3 Transport hazard class(es):
 Hazard classification number: 2
 Class: 2
 Classification code: 2F

14.4 Packing group:
 Packing group: I
 Label: 2.1

14.5 Environmental hazards:
 Environmentally hazardous substance mark: No

14.6 Special precautions for use:
 Special provisions: 490
 Special provisions: 327
 Special provisions: 344
 Special provisions: 323
 Limited quantities: Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)

Rail (RID)
 14.1 UN number:
 UN number: 1930

14.2 UN proper shipping name:
 Proper shipping name: Aerosols

14.3 Transport hazard class(es):
 Hazard classification number: 2.1
 Class: 2
 Classification code: 2F

14.4 Packing group:
 Packing group: I
 Label: 2.1

14.5 Environmental hazards:
 Environmentally hazardous substance mark: No

14.6 Special precautions for use:
 Special provisions: 490
 Special provisions: 327
 Special provisions: 344
 Special provisions: 323
 Limited quantities: Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)

Inland waterways (ADN)
 14.1 UN number:
 UN number: 1930

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PU Foam B3					
tris(2-chloro-1-methyl-ethyl) phosphate					
BCF Fishes					
Parameter	Method	Value	Duration	Species	Value determination
BCF		0.2 - 4.6		Cyprinus carpio	Experiment value
Log Kow					
Method	Remark	Value	Reference	Value determination	
		2.39			Experimental value
poly(methyl methacrylate)					
BCF Fishes					
Parameter	Method	Value	Duration	Species	Value determination
BCF		1		Fishes	Literature study
Log Kow					
Method	Remark	Value	Reference	Value determination	
	No data available				
propene					
BCF Fishes					
Parameter	Method	Value	Duration	Species	Value determination
BCF		0 - 2.5		Fishes	CSA R
Log Kow					
Method	Remark	Value	Reference	Value determination	
		2.36			
isobutene					
BCF Fishes					
Parameter	Method	Value	Duration	Species	Value determination
BCF		20 - 50		Fishes	CSA R
BCF for other aquatic organisms					
Parameter	Method	Value	Duration	Species	Value determination
BCF		20 - 50		De phnia magna	CSA R
Log Kow					
Method	Remark	Value	Reference	Value determination	
		2.76 - 2.88			Experimental value
dimethyl ether					
Log Kow					
Method	Remark	Value	Reference	Value determination	
		0.30			Experimental value
Conclusion					
No strong information conclusion can be drawn based upon the available numerical values					
12.4 Mobility in soil:					
dimethyl ether					
Volatility (Henry's law constant)					
Value	Method	Reference	Remark	Value determination	
518.6 Pa m ³ /mol				Literature study	
Conclusion					
No strong information conclusion can be drawn based upon the available numerical values					
12.5 Results of PBT and vPvB assessment:					
Due to insufficient data, no statement can be made whether the component fulfills the criteria of PBTs and vPvBs according to Annex XIII of Regulation (EC) No 1907/2006.					
12.6 Other adverse effects:					
PU Foam B3					
Global warming potential (GWP)					
None of the known components is included in the list of substances which may contribute to the greenhouse effect (Regulation (EC) No 842/2006)					
Ozone-depleting potential (ODP)					
Not classified as dangerous for the ozone layer (Regulation (EC) No 1272/2008 and 1009/2009)					
SECTION 13: Disposal considerations					
The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.					
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PU Foam B3								
dimethyl ether								
Parameter	Method	Value	Duration	Species	Test design	Reshuffle water	Value determination	
Acute toxicity fishes	LC50	Other	> 4300 mg/l	96 h	Rochele reticulata	Static	Experimental value	
Acute toxicity invertebrates	EC50	Other	> 4400 mg/l	96 h	De phnia magna		Experimental value	
Toxicity algae and other aquatic plants	EC0	EC0	60054 Fy1.00154.9 mg/l	96 h	Algae		CSA R	
Acute toxicity other aquatic organisms	LC50		> 4400 mg/l	96 h	De phnia magna		Experimental value	
Toxicity aquatic micro-organisms	EC10		> 1600 mg/l		Neelotomonas pulchra	Static	Literature study	
Classification of the mixture is based on the relevant ingredients of the mixture								
Conclusion								
Not classified as dangerous for the environment according to the criteria of Directive 67/542/EEC								
Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008								
12.2 Persistence and degradability:								
tris(2-chloro-1-methyl-ethyl) phosphate								
Biodegradability								
Method	Value	Duration	Value determination					
OECD 301: Modified OECD Screening Test	36%	28 days	Experimental value					
OECD 304C: Modified MITI Test (I)	0%	28 days	Experimental value					
poly(methyl methacrylate)								
Biodegradability								
Method	Value	Duration	Value determination					
OECD 302C: Inherent Biodegradability: Modified MITI Test (I)	60%		Experimental value					
propene								
Biodegradability								
Method	Value	Duration	Value determination					
OECD 301: Modified OECD Screening Test	70%		Experimental value					
Other	70%	14 days	Experimental value					
isobutene								
Biodegradability								
Method	Value	Duration	Value determination					
Half-life soil (11/2 soil)		Primary degradation/mineralisation	Value determination					
Notes applicable								
isobutene								
Biodegradability								
Method	Value	Duration	Value determination					
Half-life soil (11/2 soil)		23 days	Literature study					
Method	Value	Duration	Value determination					
Notes applicable								
dimethyl ether								
Biodegradability								
Method	Value	Duration	Value determination					
OECD 301D: Closed Bottle Test	0%	28 days	Experimental value					
Half-life soil (11/2 soil)		Primary degradation/mineralisation	Value determination					
Method	Value	Duration	Value determination					
Notes applicable								
Conclusion								
Contains non readily biodegradable component(s)								
12.3 Bioaccumulative potential:								
Log Kow								
Method	Parameter	Value	Reference	Value determination				
	Notes applicable [mixture]							
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<p>Suspected of causing cancer. Not classified for mutagenic or genotoxicity. Not classified for reproductive toxicity.</p>																																																																																																																															
<p>Toxicity other effects: PU Foam B3 No test data on the mixture available.</p>																																																																																																																															
<p>Chronic effects from short and long-term exposure: PU Foam B3 ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: Irritation of the eyes, itching, skin rash/irritation, dry skin, coughing. Possible information of the respiratory tract. Respiratory difficulties.</p>																																																																																																																															
<p>11.1.2 Other information: PU Foam B3 EC classification: Category 2 CLP classification: Category 2 Polymethylene polyphenyl isocyanate: EC classification: Category 2 CLP classification: Category 2 HAR - line hazard category: 3 PBT classification: TLV - Carcinogen: 1</p>																																																																																																																															
SECTION 12: Ecological information																																																																																																																															
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

PU Foam B3									
No test data on the mixture available									
tri(2-chloro-1-methyl-ethyl) phosphite									
Route of exposure	Result	Method	Exposure time	Dose/concentration	Species	Gender	Value determination		
Skin	Not irritating	OECD 402			Mouse		Weighted value		
poly(methyl methacrylate)									
Route of exposure	Result	Method	Exposure time	Dose/concentration	Species	Gender	Value determination		
Skin	Not irritating						Life-time study		
Inhalation	Not irritating						Life-time study		
Classification of the mixture is based on the relevant ingredients of the mixture									
Conclusion									
Why cause a allergic skin reaction.									
Why cause a respiratory symptoms or breathing difficulties if inhaled.									
Specific target organ toxicity									
PU Foam B3									
No test data on the mixture available									
tri(2-chloro-1-methyl-ethyl) phosphite									
Route of exposure	Parameter	Method	Value	Dose	Effect	Exposure time	Species	Gender	Value determination
Oral	NOAEL	Equivalent to OECD 408	200 ppm	1 liter	Weight gain	12 weeks (14 days)	Rat	Male	Experimental value
Oral	NOAEL	Equivalent to OECD 408	2000 ppm		No effect	12 weeks (14 days)	Rat	Female	Experimental value
poly(methyl methacrylate)									
Route of exposure	Parameter	Method	Value	Dose	Effect	Exposure time	Species	Gender	Value determination
Inhalation		STOT RE cat.2							Life-time study
polymers									
Route of exposure	Parameter	Method	Value	Dose	Effect	Exposure time	Species	Gender	Value determination
Oral									Date weighing
Dermal									Date weighing
Inhalation	NOAEC	OECD 422	12000 ppm	60 ml	Body weight reduction	6 weeks (14 days/week)	Rat	Male	Experimental value
Inhalation	NOAEC	OECD 422	12000 ppm	60 ml	Respiratory system	6 weeks (14 days/week)	Rat	Male/Female	Experimental value
Inhalation	Dose level		300 ppm		Respiratory system	10 days (14 days)	Human		Read-across
dinitroether									
Route of exposure	Parameter	Method	Value	Dose	Effect	Exposure time	Species	Gender	Value determination
Inhalation	NOAEC	Equivalent to OECD 432	47106 mg/m ³		No effect	2 years (14 days/week)	Rat		Life-time study
Classification of the mixture is based on the relevant ingredients of the mixture									
Conclusion									
Low acute toxicity by the dermal route									
Low acute toxicity by the oral route									
Low acute toxicity by the inhalation route									
Corrosion/irritation									
PU Foam B3									
No test data on the mixture available									
tri(2-chloro-1-methyl-ethyl) phosphite									
Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination			
Eye	Not irritating	Equivalent to OECD 503	72 h	3h, 48h, 72 hours	Rabbit	Experimental value			
Skin	Not irritating	OECD 404	4 h		Rabbit	Experimental value			
poly(methyl methacrylate)									
Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination			
Eye	Irritating					Life-time study			
Skin	Irritating					Life-time study			
Inhalation	Irritating					Life-time study			
Classification of the mixture is based on the relevant ingredients of the mixture									
Conclusion									
Why cause respiratory irritation.									
Causes skin irritation.									
Causes serious eye irritation.									
Respiratory or skin sensitization									
PU Foam B3									
Reason for revision: CLP									
Publication date: 2008-01-07									
Date of revision: 2013-02-25									
Revision number: 0300									
Product number: 47306									
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PU Foam B3							
No test data on the mixture available							
tri(2-chloro-1-methyl-ethyl) phosphite							
Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination
Oral	LD50	Equivalent to OECD 401	5011-1224 mg/kg bw		Rat	Male/female	Experimental value
Dermal	LD50	OECD 402	52000 mg/kg bw	24 h	Rabbit	Male/female	Experimental value
Inhalation (neurotoxic)	LC50	Equivalent to OECD 505	5.5 mg/l air	4 h	Rat	Male/female	Weight of evidence
poly(methyl methacrylate)							
Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination
Oral	LD50		530000 mg/kg		Rat		Life-time study
Dermal	LD50		53000 mg/kg		Rabbit		Life-time study
Inhalation (neurotoxic)	LD50		50-20 mg/l	4 h			Life-time study
polymers							
Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination
Inhalation (gases)	LC50		200000 ppm	15 minutes	Rat	Male/female	Experimental value
Inhalation (gases)	Dose level		1000 ppm	2 h	Human		Read-across
isobutene							
Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination
Inhalation	LC50		30 mg/l	4 h	Rat		Life-time study
dinitroether							
Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination
Oral							Not relevant, experimental judgement
Dermal							Not relevant, experimental judgement
Inhalation	LC50		509 mg/l	4 h	Rat		Life-time study
Inhalation	LC50		56399.1 ppm	4 h	Rat		Life-time study
Classification of the mixture is based on the relevant ingredients of the mixture							
Conclusion							
Low acute toxicity by the dermal route							
Low acute toxicity by the oral route							
Low acute toxicity by the inhalation route							
Corrosion/irritation							
PU Foam B3							
No test data on the mixture available							
tri(2-chloro-1-methyl-ethyl) phosphite							
Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	
Eye	Not irritating	Equivalent to OECD 503	72 h	3h, 48h, 72 hours	Rabbit	Experimental value	
Skin	Not irritating	OECD 404	4 h		Rabbit	Experimental value	
poly(methyl methacrylate)							
Route of exposure	Result	Method	Exposure time	Time point	Species	Value determination	
Eye	Irritating					Life-time study	
Skin	Irritating					Life-time study	
Inhalation	Irritating					Life-time study	
Classification of the mixture is based on the relevant ingredients of the mixture							
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PU Foam B3			
7.2.1 Safe storage requirements: Storage temperature: $+5\text{ to }+30\text{ }^\circ\text{C}$. Store in a cool area. Use point of insects sunlight. Ventilation floor level. Fireproof room. Unauthorized persons are not admitted. Meet the legal requirements. Max. storage time: 1 year (p).			
7.2.2 Use pathway form: Hastrouces, ignition sources, strong acids, strong bases, amines.			
7.2.3 Suitable packaging materials: As tool			
7.2.4 Non suitable packaging materials: No data available			
7.3 Specific end use(s): If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.			
SECTION 8: Exposure controls/personal protection			
8.1 Control parameters: 8.1.1 Occupational exposure <u>Occupational exposure limit values</u> If limit values are applicable and available these will be listed below.			
<u>The Netherlands</u>			
Dimethyl ether	Short time value	723 ppm 1900 mg/m ³	Public occupational exposure limit value
	Time-weighted average exposure limit 8 h	396 ppm 990 mg/m ³	Public occupational exposure limit value
EU			
Dimethyl ether	Time-weighted average exposure limit 8 h	600 ppm 1520 mg/m ³	Indicative occupational exposure limit value
<u>Germany</u>			
Oxide de dimethyl	Time-weighted average exposure limit 8 h	6000 ppm 1520 mg/m ³	
Hydrocarbons aliphatices sous forme gazeuse : (Alcanes C 3-C 4)	Time-weighted average exposure limit 8 h	6000 ppm	
	Time-weighted average exposure limit 8 h	6000 ppm	
<u>USA (TLV-ACGIH)</u>			
Aliphatic hydrocarbon gases - all isomers (C 3-C 4)	Time-weighted average exposure limit 8 h	6000 ppm	TLV- Adopted Value
<u>Germany</u>			
Isobutan	Time-weighted average exposure limit 8 h	6000 ppm 2400 mg/m ³	TRGS 900
Dimethyl ether	Time-weighted average exposure limit 8 h	6000 ppm 1500 mg/m ³	TRGS 900
Propan	Time-weighted average exposure limit 8 h	6000 ppm 1200 mg/m ³	TRGS 900
<u>France</u>			
Oxide de dimethyl	Time-weighted average exposure limit 8 h	6000 ppm 1520 mg/m ³	VPL: Valeur limite recommandee
<u>UK</u>			
Isocyanates, all isomers - NCO (Excluding methyl isocyanate)	Short time value	0.07 mg/m ³	Workplace exposure limit (EH40/2005)
	Time-weighted average exposure limit 8 h	0.02 mg/m ³	Workplace exposure limit (EH40/2005)
Dimethyl ether	Short time value	300 ppm 768 mg/m ³	Workplace exposure limit (EH40/2005)
	Time-weighted average exposure limit 8 h	600 ppm 1536 mg/m ³	Workplace exposure limit (EH40/2005)
<u>Additional biological limit values</u> If limit values are applicable and available these will be listed below.			
8.1.2 Sampling methods			
Reason for revision: CLP	Publication date: 2008-01-07 Date of revision: 2013-02-25		
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PU Foam B3	
4.2 Most important symptoms and effects, both acute and delayed: 4.2.1 Acute symptoms After inhalation: Dry/soe throat, Coughing, Irritation of the respiratory tract, Irritation of the nasal mucous membranes, Runny nose, FOLLOWING SYMPTOMS MAY APPEAR LATER: Possible inflammation of the respiratory tract, Risk of lung oedema, Respiratory difficulties. After skin contact: Tingling/irritation of the skin. After eye contact: Irritation of the eye tissue, Lacrimation. After ingestion: Not applicable. 4.2.2 Chronic symptoms No effects known.	
4.3 Indication of any immediate medical attention and special treatment needed: If applicable and available, it will be listed below.	
SECTION 5: Firefighting measures	
5.1 Extinguishing media: 5.1.1 Suitable extinguishing media: Quantities of water, Polyvalent foam, BC powder, Carbon dioxide. 5.1.2 Unsuitable extinguishing media: No unsuitable extinguishing media known.	
5.2 Special hazards arising from the substance or mixture: On burning: release of toxic and corrosive gases/vapours (phosphorus oxides, nitrous vapour, hydrochloric acid, carbon monoxide - carbon dioxide). May polymerize on exposure to moisture. On heating: release of toxic/combustible gases/vapours (hydrogen cyanide).	
5.3 Advice for firefighters: 5.3.1 Instructions: If exposed to fire, cool the closed container by spraying with water. Physical explosion risk during use/hoo from behind cover. Do not move the bed if exposed to heat. After cooling, persistent risk of physical explosion. Dilute toxic gases with water spray. 5.3.2 Special protective equipment for firefighters: Gloves, Protective goggles, Head/neck protection, Protective clothing, Heat/fire exposure: compressed air/oxygen apparatus.	
SECTION 6: Accidental release measures	
6.1 Personal precautions, protective equipment and emergency procedures: Stop fires and no smoking. No naked flames or sparks and explosion proof appliances and lighting equipment. 6.1.1 Protective equipment for non-emergency personnel: See heading 8.2 6.1.2 Protective equipment for emergency responders: Gloves, Protective goggles, Head/neck protection, Protective clothing. <u>Suitable protective clothing</u> See heading 8.2	
6.2 Environmental precautions: Do not up the solid spill. Use appropriate container to avoid environmental contamination.	
6.3 Methods and material for containment and cleaning up: Allow product to solidify and remove it by mechanical means. Carefully collect the spill/leakage. Clean (treat) contaminated surfaces with acetone. The collected spill to manufacturer's competent authority. Wash clothing and equipment after handling.	
6.4 Reference to other sections: See heading 33.	
SECTION 7: Handling and storage	
The information in this section is general in description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.	
7.1 Precautions for safe handling: Use a spark/leak proof apparatus and lighting system. Keep away from naked flames/heat. Use pathway from ignition sources/sparks. Gas/vapour heavier than air at 20°C. Observe safety hygiene - avoid contact. Remove contaminated clothing immediately.	
7.2 Conditions for safe storage, including any incompatibilities:	
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SC Auto (Myanmar) Co., Ltd.


PU Foam B3																																																							
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<p>2.3 Other hazards:</p> <p>CLP</p> <p>May be ignited by sparks</p> <p>Gas/vapours spreads at floor level; ignition hazard</p> <p>Aerosol may explode under the effect of heat</p> <p>DSD/DPD</p> <p>May be ignited by sparks</p> <p>Gas/vapours spreads at floor level; ignition hazard</p> <p>Aerosol may explode under the effect of heat</p>																																																							
SECTION 3: Composition/information on ingredients																																																							
<p>3.1 Substances:</p> <p>Not applicable</p>																																																							
<p>3.2 Mixtures:</p> <table border="1"> <thead> <tr> <th>Name (REACH Registration No)</th> <th>CAS No EC No</th> <th>Conc. (%)</th> <th>Classification according to DSD/DPD</th> <th>Classification according to CLP</th> <th>Note</th> <th>Remark</th> </tr> </thead> <tbody> <tr> <td>trip-chloro-1-methyl-ethyl phosphite [01-2198477-16-31]</td> <td>8674-84-3 257-131-7</td> <td>0% (0.00%)</td> <td>Xn; R22</td> <td>Acute Tox. 4; H302</td> <td>[1][10]</td> <td>Constituent</td> </tr> <tr> <td>polymethylene poly(phenyl isocyanate) [-]</td> <td>9046-27-9</td> <td>>2.0%</td> <td>Car. 1; Car. 2; R40 Xn; R20-40/20 N; R36/37/38 R52/53</td> <td>Car. 2; H351 Acute Tox. 4; H332 STOT RE 2; H373 Eye Irrit. 2; H335 STOT SE 3; H353 Skin Irrit. 2; H315 Res p. Sen. 1; H334 Skin Sens. 1; H317</td> <td>[1][10]</td> <td>UVCB</td> </tr> <tr> <td>propene [-]</td> <td>74-98-6 200-827-9</td> <td>0% (0.00%)</td> <td>P; R12</td> <td>Flam. Gas 1; H230 Press. Gas - Liquefied gas; H280</td> <td>[1][10]</td> <td>Propellant</td> </tr> <tr> <td>isobutane [-]</td> <td>75-28-5 200-829-2</td> <td>0% (0.00%)</td> <td>P; R12</td> <td>Flam. Gas 1; H230 Press. Gas - Liquefied gas; H280</td> <td>[1][10]</td> <td>Propellant</td> </tr> <tr> <td>dimethyl ether [01-219472128-57]</td> <td>115-10-6 204-063-2</td> <td>0% (0.00%)</td> <td>P; R12</td> <td>Flam. Gas 1; H230 Press. Gas - Liquefied gas; H280</td> <td>[1][10]</td> <td>Propellant</td> </tr> <tr> <td>1,3-butadiene, concd. 0.5% [-]</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>[1] For R-phrases and H-statements in full see heading 16 [2] Substance with a Community workplace exposure limit [30] Subject to restrictions of Annex XVII of Regulation [EC] No. 1907/2006</p>							Name (REACH Registration No)	CAS No EC No	Conc. (%)	Classification according to DSD/DPD	Classification according to CLP	Note	Remark	trip-chloro-1-methyl-ethyl phosphite [01-2198477-16-31]	8674-84-3 257-131-7	0% (0.00%)	Xn; R22	Acute Tox. 4; H302	[1][10]	Constituent	polymethylene poly(phenyl isocyanate) [-]	9046-27-9	>2.0%	Car. 1; Car. 2; R40 Xn; R20-40/20 N; R36/37/38 R52/53	Car. 2; H351 Acute Tox. 4; H332 STOT RE 2; H373 Eye Irrit. 2; H335 STOT SE 3; H353 Skin Irrit. 2; H315 Res p. Sen. 1; H334 Skin Sens. 1; H317	[1][10]	UVCB	propene [-]	74-98-6 200-827-9	0% (0.00%)	P; R12	Flam. Gas 1; H230 Press. Gas - Liquefied gas; H280	[1][10]	Propellant	isobutane [-]	75-28-5 200-829-2	0% (0.00%)	P; R12	Flam. Gas 1; H230 Press. Gas - Liquefied gas; H280	[1][10]	Propellant	dimethyl ether [01-219472128-57]	115-10-6 204-063-2	0% (0.00%)	P; R12	Flam. Gas 1; H230 Press. Gas - Liquefied gas; H280	[1][10]	Propellant	1,3-butadiene, concd. 0.5% [-]						
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SECTION 4: First aid measures																																																							
<p>4.1 Description of first aid measures:</p> <p>General</p> <p>Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiatory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: help seated. Victim in shock: on his back with legs slightly raised. Womiting: prevent asphyxiation/pronation. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/hospital.</p> <p>After inhalation:</p> <p>Remove the victim into fresh air. Respiatory problems: consult doctor/medical service.</p> <p>After skin contact:</p> <p>Wash immediately with lots of water. Take victim to a doctor if irritation persists.</p> <p>After contact:</p> <p>Rinse immediately with plenty of water. Do not apply neutralising agents. Take victim to an ophthalmologist if irritation persists.</p> <p>After ingestion:</p> <p>Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Consult a doctor/medical service if you feel unwell.</p>																																																							
Reason for revision: CLP			Publication date: 2009-01-07 Date of revision: 2013-02-25																																																				
Revision number: 0300			Product number: 47306 3 / 17																																																				


PU Foam B3			
<p>2.2 Label elements:</p> <p>Labelling according to Regulation EC No 1272/2008 (CLP)</p> <div style="display: flex; justify-content: space-around;">    </div> <p>Contains polymethylene poly(phenyl isocyanate).</p> <p>Signal word: Danger</p> <p>H-statements</p> <p>H222: Extremely flammable aerosol.</p> <p>H351: Suspected of causing cancer.</p> <p>H373: May cause damage to organs through prolonged or repeated exposure if inhaled.</p> <p>H335: Causes serious eye irritation.</p> <p>H336: May cause respiratory irritation.</p> <p>H315: Causes skin irritation.</p> <p>H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.</p> <p>H317: May cause an allergic skin reaction.</p> <p>P-statements</p> <p>P301: If medical advice is needed, have product container or label at hand.</p> <p>P302: Keep out of reach of children.</p> <p>P210: Keep away from heat/sparks/open flames/hot surfaces. - No smoking.</p> <p>P251: Pressurized container. Do not pierce or burn, even after use.</p> <p>P280: Wear protective gloves and eye protection/face protection.</p> <p>P260: Do not breathe spray.</p> <p>P309 + P311: IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.</p> <p>P410 + P412: Protect from sunlight. Do not expose to temperatures exceeding 50 °C / 122 °F.</p> <p>P501: Dispose of contents/container to manufacturer/competent authority.</p> <p>Supplemental information</p> <p>- Persons already sensitised to diisocyanates may develop allergic reactions when using this product.</p> <p>- Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.</p> <p>- This product should not be used under conditions of poor ventilation unless a protective mask with an appropriate gas filter (i.e. type A1 according to standard EN 14387) is used.</p>			
<p>Labelling according to Directive 67/548/EEC-1999/45/EC (DSD/DPD)</p> <div style="display: flex; justify-content: space-around;">   </div> <p>Extremely flammable Harmful</p> <p>Contains: polymethylene poly(phenyl isocyanate).</p> <p>R-phrases</p> <p>20 Harmful by inhalation</p> <p>36/37/38 Irritating to eyes, respiratory system and skin</p> <p>40 Limited evidence of a carcinogenic effect</p> <p>42/43 May cause sensitisation by inhalation and skin contact</p> <p>48/20 Harmful: danger of serious damage to health by prolonged exposure through inhalation</p> <p>S-phrases</p> <p>(02) (Keep out of the reach of children)</p> <p>16 Keep away from sources of ignition - No smoking</p> <p>23 Do not breathe spray</p> <p>36/37 Wear suitable protective clothing and gloves</p> <p>45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)</p> <p>51 Use only in well-ventilated areas</p> <p>(63) (In case of accident by inhalation: remove casualty to fresh air and keep at rest)</p> <p>Additional recommendations</p> <p>Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C.</p> <p>Do not pierce or burn, even after use.</p> <p>Do not spray on a naked flame or any incandescent material.</p> <p>Contains isocyanates. See information supplied by the manufacturer.</p>			
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“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

 SAFETY DATA SHEET <small>Based upon Regulation (EC) No. 1907/2006, as amended by Regulation (EC) No. 453/2010</small>		
PU Foam B3		
SECTION 1: Identification of the substance/mixture and of the company/undertaking		
1.1 Product identifier:		
Product name	:	PU Foam B3
Registration number REACH	:	Not applicable (mixture)
Product type REACH	:	Mixture
1.2 Relevant identified uses of the substance or mixture and uses advised against:		
1.2.1 Relevant identified uses		
polyurethane		
1.2.2 Uses advised against		
No uses advised against known		
1.3 Details of the supplier of the safety data sheet:		
Supplier of the safety data sheet:		
Soudal N.V. Everdongenlaan 18-20 B-2300 Turnhout Tel: +32 34 42 42 31 Fax: +32 34 44 39 71 msds@soudal.com		
Manufacturer of the product:		
Soudal N.V. Everdongenlaan 18-20 B-2300 Turnhout Tel: +32 34 42 42 31 Fax: +32 34 44 39 71 msds@soudal.com		
1.4 Emergency telephone number:		
24h/24h: +32 34 58 45 45 (BIG) (Telephone advice: English, French, German, Dutch)		
SECTION 2: Hazards identification		
2.1 Classification of the substance or mixture:		
2.1.1 Classification according to Regulation EC No 1272/2008		
The classification of the mixture is not yet evaluated according to CLP		
Class	Category	Hazard statements
Flam. Aerosol	category 1	H222: Extremely flammable aerosol.
Carc.	category 2	H351: Suspected of causing cancer.
STOT RE	category 2	H373: May cause damage to organs through prolonged or repeated exposure if inhaled.
Eye Irrit.	category 2	H335: Causes serious eye irritation.
STOT SE	category 3	H335: May cause respiratory irritation.
Skin Irrit.	category 2	H335: Causes skin irritation.
Resp. Sens.	category 1	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sens.	category 1	H317: May cause an allergic skin reaction.
2.1.2 Classification according to Directive 67/548/EEC/1999/45/EC		
Classified as a dangerous in accordance with the criteria of Directives 67/548/EEC and 1999/45/EC		
Carc. Cat. 3; R40 - Limited evidence of a carcinogenic effect		
F+; R12 - Extremely flammable		
Xn; R20 - 4S/20 - Harmful by inhalation. Harmful: danger of serious damage to health by prolonged exposure through inhalation.		
Xi; R36/37/38 - Irritating to eyes, respiratory system and skin		
R42/43 - May cause sensitisation by inhalation and skin contact.		
Created by: Brandveerinformaticentrum voor gevaarlijke stoffen vzw (BIG) Technische Schoolstraat 43 A, B-2440 Geel http://www.big.be © BIG vzw		Publication date: 2009-01-07 Date of revision: 2013-02-25
Reason for revision: CLP		Product number: 47806
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SAFETY DATA SHEET <small>according to 1907/2006/EC as amended by 453/2010/EC</small>		
PC9b	Fillers, putties, plasters, modelling clay	
PROC2	Use in closed, continuous process with occasional controlled exposure	
PROC3	Use in closed batch process (synthesis or formulation)	
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises	
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/or significant contact)	
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non dedicated facilities	
PROC8b	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities	
PROC10	Roller application or brushing	
PROC24	High (mechanical) energy work-up of substances bound in materials and/ or articles	
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles	
ERC5	Industrial use resulting in inclusion into or onto a matrix	
ERC12a	Industrial processing of articles with abrasive techniques (low release)	
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers	
Glossary		
SU	Sector of use	
PC	Product category	
PROC	Process category	
ERC	Environmental release category	
AC	Article category	
spERC	Sector specific environmental release category (for ACEA uses)	
ACEA	European automobile manufacturers association	
AIRC	Federation of vehicle repair organisations	
CEPE	European council of producers and importers of paints, printing inks and artists' colours	
OC	Operational condition	
DOA	Duration of activity	
LEV	Local exhaust ventilation	
TRV	Technical room ventilation	
RMM	Risk Management Measures	
RPE	Respiratory protection equipment	
DPE	Dermal protection equipment	
WWTP	Waste water treatment plant (on site)	
STP	Sewage treatment plant (municipal)	
SVHC	Substance of very high concern	
LSI	Lead substance indicator	
M(sperc)	Maximum volume of lead substance which can be used safely under conditions described by CEPE spERC	
DNEL	Derived No Effect Level	
DMEL	Derived minimum effect level	
PNEC	Predicted No Effect Concentration	
ECETOC TRA	Targeted risk assessment as proposed by European center for ecotoxicology and toxicology of chemicals	
RCR	Risk characterisation ratio	
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SC Auto (Myanmar) Co., Ltd.

SAFETY DATA SHEET				
according to 1907/2006/EC as amended by 453/2010/EC				
PROC	Factor for TRV	Factor for LEV Industrial setting	Factor for LEV Professional setting	Factor for LEV Dermal impact
2	0.3	0.1	0.2	0.1
3	0.3	0.1	0.2	0.1
4	0.3	0.1	0.2	0.1
5	0.3	0.1	0.2	0.005
8a	0.3	0.1	0.2	0.01
8b	0.3	Sol 0.05	Sol 0.2	0.1
9b	0.3	Vol 0.03	Vol 0.1	0.1
10	0.3	0.1	0.2	0.05
24		0.2	0.25	0.1

PROC	Factor	PROC	Adjusted factor Professional	Adjusted factor Industrial
4 (high volatility)	1	2 (high volatility)	0.2	0.5
5 (high volatility)	1	3 (high volatility)	0.2	0.4
8a (high volatility)	1	8b (high volatility)	0.5	0.6
4 (medium volatility)	1	2 (medium volatility)	0.4	0.5
5 (medium volatility)	1	3 (medium volatility)	0.25	0.5
8a (medium volatility)	1	8b (medium volatility)	0.5	1
4 (low volatility)	1	2 (low volatility)	0.5	0.2
5 (low volatility)	1	3 (low volatility)	0.3	0.6
8a (low volatility)	1	8b (low volatility)	0.4	0.5

Additional explanation

Use by private end consumers (SU 21) not considered as product is assigned for professional use only
 Wide dispersive use (ERC 8a-Bf) not assessed as professional use in paintshops is considered as non dispersive (point source)
 No relevant substance transfer expected to marine water, sediment, or soil due to use in dedicated installations.
 Environmental assessment only relevant in case of substance transfer into a waste water stream
 Environmental assessment based on ACEA sector specific ERC approach (spERC factors for solids and volatiles)
 The spERC approach is only applicable to demonstrate safe use of a substance for environmental aspects under REACH.
 It is not suitable to demonstrate compliance with applicable local waste water regulations.
 Ingestion (oral route) not assessed as not considered to occur in case of industrial / professional use
 Hazards due to particle shape negligible due to inclusion into polymer matrix (silicogenic or similar compounds)
 Worker exposure assessment based on DNELs is only applicable to demonstrate safe use of substances under REACH.
 It is not suitable to demonstrate compliance with applicable occupational exposure limits (as displayed in section 8 of SDS).
 Occupational exposure limits may apply for residual monomers (e.g. formaldehyde, monomeric isocyanates) which are not assessed under REACH.
 Exposure assessment is performed for coating material as supplied.
 Adaptation may be required for ready for use mixture depending on selection of specific hardener and diluent
 Exposure assessment is performed for application of coating material at ambient temperature.
 Adaptation may be required for application at elevated temperature (e.g. hot spraying).
 Loss during service life negligible, in any case less than 1 %
 Waste stage not assessed as incineration / biological treatment of waste and safe deposition of inert residues is assumed
 Use for coating of toys, articles designed for prolonged skin contact or indirect food contact needs further assessment
 No SVHC above declaration threshold contained unless disclosed in section 3 of SDS

Good practice advice

Following advice shall be pursued as long as exposure assessment in part 3 does not contain sufficient information

Recommendation to use technical room ventilation.
 Advice to wear skin/body protection as standard RMM due to risk of splashes/droplets.
 Advice to use integrated dust evacuation, in case of air recirculation in accordance to EN 60335.
 Recommendation to use respiratory protection equipment when sanding, even in combination with integrated dust evacuation.
 Advice to use local exhaust ventilation according to EN 15012 for welding of coated substrates.
 Advice to provide spill retention system according to applicable regulation.
 Recommendation to avoid contact with water.

Standardised use descriptors according European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, chapter R.12

SU 3	Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 22	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)

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SAFETY DATA SHEET				
according to 1907/2006/EC as amended by 453/2010/EC				
	M(sperc)	Transfer to process waste water	Release after on-site WWTP	Municipal STP
spERC x5 (solids)	Solids in dry film	2%	100%	yes

2.2. Contributing worker scenarios

Sanding and welding of cured putty

	PROC	DOA	LEV/TRV	RPE	DPE
Sanding	24	> 4 h	LEV Prof	no	yes level 2

Further specification:

Above parameters represent standard (default) assumptions according to CEPE mapping of operational conditions. Valid information on risk management measures for specific formulation is provided in part 3. Deviation options are explained in part 4 (scaling).

3. Exposure estimation and reference to its source

Exposure assessment based on initial scenarios for the used chemicals in this preparation as provided by manufacturers and importers. Identification of a lead substance indicator per route is based on the DPD+ methodology, taking into account content, dustiness and hazard characteristics. Use of the mixture is considered safe when conditions for safe use of the lead substance indicator are respected. Risk assessment is not applicable as long as no initial exposure scenarios are available.

3.1. Environmental assessment

No relevant ecotoxicological impact expected; specific description and assessment of environmental exposure obsolete.

3.2. Worker assessment

No relevant toxicological impact expected; specific description and assessment of worker exposure obsolete.

Further specification:

Above exposure assessment is performed for dry content of coating material as supplied. Exposure assessment requires adaptation to ready for use mixture (including reacted compounds where appropriate)

4. Guidance to downstream user to evaluate whether he works inside the boundaries set by the exposure scenario

By variation of operational conditions and risk management measures (scaling), a downstream user can check whether he works inside the exposure scenario boundaries.
 Standard scaling can be based on exposure modifying factors as used by ECETOC TRA which are listed below.
 $RCR(s) = RCR(o) \cdot EMF(s)/EMF(o)$
 $RCR(s)$ shall be < 1
 $RCR(s) =$ scaled risk characterisation ratio; $RCR(o) =$ original risk characterisation ratio (in part 3)
 $EMF(s) =$ exposure modifying factor selected for scaling; $EMF(o) =$ original exposure modifying factor (in part 3)
 Scaling may be used consecutively for multiple determinants.
 Example: No technical room ventilation for mixing of tints ($EMF(o) = 0.3$), duration of activity restricted to 1 h/d ($EMF(s) = 0.2$)

Specific scaling may be based on measured values at the individual site.

Content % range	Content Factor	DOA h	DOA Factor	Respiratory protection equipment	Factor
> 25	1	> 4	1	No RPE	1
5 - 25	0,6	1 - 4	0,6	Filler mask	0,1 Level 1
1 - 5	0,2	0,25-1	0,2	Air-fed mask	0,05 Level 2
< 1	0,1	< 0,25	0,1	Air-fed mask	

Skin protection equipment	Factor
No gloves	1
Suitable gloves	0,2 Level 1
Resistant gloves, training	0,1 Level 2
Resistant gloves, specific training	0,05 Level 3


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	PROC	Route	LSI	LSI % range	DOA	LEV / TRV	RPE	DPE	DNEL	RCR	
Applying with putty knife	10	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—
Curing	4 (covering 2)	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—

Further specification:
Above exposure assessment is performed for coating material as supplied. Exposure assessment requires adaptation to ready for use mixture (addition of peroxide component)

4. Guidance to downstream user to evaluate whether he works inside the boundaries set by the exposure scenario
Part 4 is common and is available at the end of the Annex.

1. Consolidated exposure assessment (type 3) for sanding

Free short title:
Industrial or professional sanding of cured putty (professional use in close to industrial setting)

Systematic title based on use descriptors:

Sector of use	SU 22; SU 3
Product category	PC9a
Process category	PROC24
Environmental release category	ERC12a

Activities covered:
Sanding of cured putty

Contributing scenarios:

spERC x4	Wet sanding/wet dust collection in serial production
spERC x5	Wet sanding/wet dust collection in refinishing process
PROC24	Applicable for: Sanding, grinding or chipping of cured putty

2. Operational conditions and risk management measures


2.1. Contributing environmental scenario
Sanding of cured putty

Process conditions:
Potential transfer to process waste water stream when applying wet sanding techniques or wet dust collection

	M(spERC)	Transfer to process waste water	Release after on-site WWTP	Municipal STP
spERC x4 (solids)	Solids in dry film	2%	10%	yes

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	PROC	Route	LSI	LSI % range	DOA	LEV / TRV	RPE	DPE	DNEL	RCR	
Mixing	5 (covering 3)	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—
Transferring	8a (covering 8b)	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—
Applying with putty knife	10	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—
Curing	4 (covering 2)	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—

dustiness and hazard characteristics. Use of the mixture is considered safe when conditions for safe use of the lead substance indicator are respected. Risk assessment is not applicable as long as no initial exposure scenarios are available.

3.1. Environmental assessment
No relevant ecotoxicological impact expected; specific description and assessment of environmental exposure obsolete;

3.2. Worker assessment

Assessment method:
ECETOC TRA version 3.0

Advice on dermal protection equipment is based on Axalta expert judgement Reactive diluant (styrene) is released in range 1 to 5 % only.
Preparing, transferring/loading, application with a putty knife, drying and curing of putty - professional setting

Preparing, transferring/loading, application with a putty knife, drying and curing of putty - industrial setting

	PROC	Route	LSI	LSI % range	DOA	LEV / TRV	RPE	DPE	DNEL	RCR	
Mixing	5 (covering 3)	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—
Transferring	8a (covering 8b)	Inhalation	styrene	>5-25	> 4hr	Technical room ventilation	none	—	—	—	—
		Skin	styrene	>5-25	> 4hr	—	—	Resistant gloves, training	—	—	—


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Annex - Exposure scenarios

Consolidated exposure assessment for industrial and professional use of coating material

The consolidated exposure assessment provides specific information on how a hazardous substance (in a mixture) is to be managed and controlled. It considers specific conditions of use, in order to ensure that a use is safe to humans and the environment. Compliance with operational conditions and risk management measures is required if the exposure assessment is annexed to a mandatory safety data sheet. In this case, identified risk management measures are to be implemented unless the downstream user is able to ensure safe use in a diverging way.

1. Consolidated exposure assessment (type 1) for application of putty

Free short title:
Industrial or professional application of putties with a putty knife (professional use in close to industrial setting)

Systematic title based on use descriptors:

Sector of use	SU 22, SU 3
Product category	PC9b
Process category	PROC4 (covering PROC2), PROC5 (covering PROC3), PROC8a (covering PROC8b), PROC10
Environmental release category	ERC4, ERC5, ERC6d

Activities covered:
Preparing (adding activator), transferring/loading, application of putty, drying and curing of putty

Contributing scenarios:

PROC4 (covering PROC2)	Applicable for: Drying and curing of coatings
PROC5 (covering PROC3)	Applicable for: Adding of activator, adjustment of viscosity
PROC8a (covering PROC8b)	Transfer of substance or preparation (charging/discharging)
PROC10	Applicable for: Application with a putty knife

2. Operational conditions and risk management measures

2.1. Contributing environmental scenario

Preparing, transferring/loading, application with a putty knife, drying and curing of putty

Process conditions:
No transfer to process waste water stream; specific assessment of environmental exposure obsolete

2.2. Contributing worker scenarios

Preparing, transferring/loading, application with a putty knife, drying and curing of putty

	PROC	DOA	LEV/TRV	RPE	DPE
Mixing	5 (covering 3)	> 4 h	TRV	no	yes level 2
Transferring	8a (covering 8b)	> 4 h	TRV	no	yes level 2
Applying with putty knife	10	> 4 h	TRV	no	yes level 2
Curing	4 (covering 2)	> 4 h	TRV	no	yes level 2


Further specification:
Above parameters represent standard (default) assumptions according to CEPE mapping of operational conditions. Valid information on risk management measures for specific formulation is provided in part 3. Deviation options are explained in part 4 (scaling).

3. Exposure estimation and reference to its source

Exposure assessment based on initial scenarios for the used chemicals is provided by manufacturers and importers. Identification of a lead substance indicator per route is based on the DPD+ methodology, taking into account content.

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Training advice
Directive 76/769/EC
Directive 98/24/EC

Further information
The information of this SDS is based on the present state of our knowledge and meets the requirements of EU and national laws. The user's working conditions however, are beyond our knowledge and control. The product is not to be used for purposes other than those specified under section 1 without a written permission. It remains the responsibility of the user to ensure that the necessary steps are taken to meet the laws and regulations. Handling of the product may only be done by people above 18 years of age, who are satisfactorily informed of how to do the work, the hazardous properties and necessary safety precautions. The information given in this SDS is to describe the product only in terms of health and safety requirements and should not, therefore, be construed as guaranteeing specific properties.

Report version

Version	Changes
13,13	3, 8, 11, 16

Revision Date: 2014-07-22


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Section 15. Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National legislation

This safety datasheet has been prepared according to British legislation.

The product is labeled according to the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 as amended (CHIP Regulations). The risk associated with the use of this product must be assessed in accordance with the Control of Substances Hazardous to Health (COSHH) Regulations and the Dangerous Substances and Explosive Atmospheres Regulations.

Restricted to professional users.

15.2. Chemical Safety Assessment

No safety checks were carried out on the mixture.

Section 16. Other information

Full text of R phrases with no. appearing in section 3

R10	Flammable.
R20	Harmful by inhalation.
R36/37/38	Irritating to eyes, respiratory system and skin.
R48/20	Harmful; danger of serious damage to health by prolonged exposure through inhalation.
R65	Harmful; may cause lung damage if swallowed.

Full text of H phrases with no. appearing in section 3

H226	Flammable liquid and vapour.
H304	May be fatal if swallowed and enters airways.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H372	Causes damage to the kidneys/ liver/ eyes/ brain/ digestive system/ central nervous system through prolonged or repeated exposure if swallowed.


Information taken from reference works and the literature.

Substance No.	CAS no: www.cas.org/EO/rogsys.html EC no: http://ecb.jrc.it/esis/index.php?PGM=eln
Substances presenting a health or environmental hazard within the meaning of Directive 67/548/EEC.	http://ecb.jrc.it/existing_chemicals/ http://ecb.jrc.it/classification_labelling/ http://toxnelt.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB http://www.cdc.gov/niosh/ipcs/start.html
Other directives, limitations and prohibitory regulations	Directive 76/769/EC Directive 98/24/EC Directive 90/394/EC Directive 79/393/EC Directive 1999/45/EC Directive 2006/8/EC EUR-LEX: http://europa.eu.int/eur-lex/lex
Exposure limit for the pure substance	http://osha.europa.eu/OSHA

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14.2. UN proper shipping name

ADR/RID; IMDG; ICAO/IATA: PAINT

14.3. Transport hazard class(es)


Hazard class

ADR/RID; IMDG; ICAO/IATA: 3

Subsidiary hazard class

ADR/RID; IMDG; ICAO/IATA: Not applicable.

Labels



Tunnel restriction code

ADR/RID: D/E

Special Provisions

ADR/RID: 640E

Kemler Code

ADR/RID: 30

Hazchem Code

ADR/RID: 3Y

EmS

IMDG: F-E,S-E

14.4. Packaging group

ADR/RID; IMDG; ICAO/IATA: III

14.5. Environmental hazards

ADR/RID; IMDG; ICAO/IATA: none

Marine pollutant

IMDG: no

14.6. Special precautions for user

please see section 6 - 8

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Deliveries shall only be made based on appropriate packaging and in compliance with traffic laws.

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Section 12. Ecological information

There are no data available on the product itself. The product should not be allowed to enter drains or watercourses. The data in this section is consistent with data from chemical safety reports available at the date of revision.

12.1. Toxicity

No information available.

12.2. Persistence and degradability

No information available.

12.3. Bioaccumulative potential

No information available.

12.4. Mobility in soil

No information available.

12.5. Results of PBT and vPvB assessment

Based on available data no ingredient is classified for this hazard property (please see section 3).

12.6. Other adverse effects

The preparation was evaluated in accordance with the conventional method of the preparation directive 1999/45/EG and was not classified as environmental dangerous.

Adsorbed organic bound halogens (AOX)

Product does not contain organic linked halogens contributing to AOX.

Section 13. Disposal considerations

13.1. Waste treatment methods

Dispose of in accordance with local regulations.

Product

Recommendation:
A disposal process that converts the waste into energy is recommended. If this is not possible the hazardous waste must be disposed of by incineration.

Waste Key Number	Description
08 01 11	waste paint and varnish containing organic solvents or other dangerous substances

Uncleaned packaging

Recommendation:
Properly emptied containers are to be scrap processed or reconditioned. Improperly emptied containers are considered hazardous waste (waste key number 150110). Waste, including emptied containers, is controlled waste. Do not allow into drains or watercourses or dispose of where ground or surface waters may be affected. If fully drained containers are compacted they can be regarded as Controlled Waste and disposed of in accordance with the requirements of the Control of Pollution Act 1974 and the Environmental Protection Act 1990 (GB), the Pollution Control and Local Government (NI) Order 1978 (NI) or of the EC (Waste) Regulations 1979 and the EC (Toxic & Dangerous Waste) Regulations 1982 (IRL).

Section 14. Transport information

Transport only in accordance with the requirements of the Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labeling), ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport.


14.1. UN number

ADR/RID; IMDG; ICAO/IATA: 1263

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9.2. Other data

Solvent separation test	< 3%	ADR/RID
Content of volatile components (including water)	12.6 %	Basis Vapour pressure >= 0.01 kPa
organic solvent content	12.6 %	Basis Vapour pressure >= 0.01 kPa
European VOC	12.6 %	Basis Vapour pressure >= 0.1 hPa

Section 10. Stability and reactivity

10.1. Reactivity

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.

10.2. Chemical stability

The product is chemically stable.

10.3. Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use.

10.4. Conditions to avoid

Stable under recommended storage and handling conditions (see section 7).

10.5. Incompatible materials to avoid

not required under normal use

10.6. Hazardous decomposition products

None known.

Section 11. Toxicological information

11.1. Information on toxicological effects

General observations

There is no data available on the product. The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and classified for toxicological hazards accordingly. See sections 2 and 3 for details.

Practical experience

Swallowing may cause nausea, diarrhoea, vomiting, gastro intestinal irritation and chemical pneumonia. Exposure to component solvents vapours concentration in excess of the stated occupational exposure limit may result in adverse health effect such as mucous membrane and respiratory system irritation and adverse effect on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Solvents may cause some of the above effects by absorption through the skin. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin.

Acute toxicity

Acute inhalation toxicity

EINECS-No.	Chemical Name	Species	Typo	Exposure time	Value	Method
202-851-5	styrene	rat		LC50	4 h	2,770 ppm


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Glove material	Glove thickness	Break through time
Nitrile rubber	0.33 mm	60 min

The protective glove should be checked in each case for their work specific suitability (e.g. mechanical stability, product compatibility, and anti-static properties). When the intended use is for spray application a nitrile glove of the chemical resistance group 3 (e.g. Dermarite® glove) is to be used. After contamination, the glove has to be changed. If immersing the hands into the product is not avoidable (e.g. maintenance work) a butyl or fluorocarbon rubber glove should be used. When skin exposure may occur to materials specified in section 3 of this SDS, advice should be sought from the glove supplier as to appropriate type to use with this product and the permeation breakthrough times. Care should be taken when working with sharp edged articles as these can easily damage the gloves and make them ineffective. The instructions and information provided by the glove supplier on use, storage, maintenance and replacement must be followed. Damaged gloves or those showing signs of wear should be replaced immediately.

Eye protection
Wear protective eyewear for protection against solvent spatter.

Skin and body protection
Wear suitable protective clothing. Personnel should wear antistatic clothings made of natural fiber or of high temperature resistant synthetic fiber.

Hygiene measures
Wash skin thoroughly with soap and water or use recognized skin cleanser. Do not use organic solvent!

Environmental exposure controls
Do not let product enter drains. For ecological information refer to section 12.

Section 9. Physical and chemical properties

9.1. Information on basic physical and chemical properties


Appearance
Form: liquid Colour: brown Odour: Odour is not perceptible.


Important health, safety and environmental information

Property	Value	Method
pH	pH cannot be measured due to less solubility in water.	
Melting point/freezing point	Not applicable.	
Boiling point/boiling range	145 °C	
Flash point	32 °C	DIN 53213/ISO 1523
Evaporation rate	Slower than Ether	
Flammability (solid, gas)	not relevant as product is liquid	
Lower explosion limit	no data available	
Upper explosion limit	no data available	
Vapour pressure	0.7 hPa	
Vapour density	no data available	
Relative density	1.87 g/cm ³	20 °C - DIN 53217/ISO 2811
Solubility (ies)		
Water solubility	partly miscible	
Solubility in other solvents	miscible with most organic solvents Listed in: Section 3. Composition/information on ingredients	
Partition coefficient: n-octanol/water	This product is a mixture. For ingredient details see section 12	
Auto-ignition temperature	490 °C	DIN 51794 based on organic solvent content
Decomposition temperature	This product is a mixture. For further information see section 10.	
Viscosity (23 °C)	>100 s	ISO 2431 - 1993 6 mm
Explosive properties	Not explosive	
Oxidizing properties	not oxidizing	

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7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers
Observe label precautions. Store between 5 and 25 °C in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. No smoking. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage. The storage and use of this product is subject to the requirements of the Dangerous Substances and Explosive Atmospheres Regulations (DSEAR). Up to 250 litres of such flammable liquids may be stored in a work area provided they are kept in a fire-proof cupboard or bin. Larger quantities must be kept in a separate storeroom conforming to the structural requirements of the regulations. Further guidance is contained in the HSE ACOF L135, "Storage of Dangerous Substances."

Advice on common storage
Store separately from oxidizing agents and strongly alkaline and strongly acidic materials.
Do not store together with explosives, gases, oxidizing solids, products which form flammable gases in contact with water, oxidizing products, infectious products and radioactive products.

7.3. Specific end use(s)
Please see exposure scenarios as given in the annex.

Section 8. Exposure controls/personal protection

8.1. Control parameters

DNEL
No information available.

PNEC
No information available.

Community / national occupational exposure limits

CAS-No.	Chemical Name	Source	Time	Type	Value	Note
100-42-5	styrene		15 min	STEL	1,080 mg/m ³	
			15 min	STEL	250 ppm	
			8 hr	TWA	430 mg/m ³	
			8 hr	TWA	100 ppm	

8.2. Exposure controls

Additional technical information on the plant
Provide adequate ventilation. This should be achieved by a good general extraction and -if practically feasible- by the use of a local exhaust ventilation. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn. Mask with gas filter, type A (EN 141)


Protective equipment
Personal protective equipment should be worn to prevent contact with eyes, skin or clothing.

Respiratory protection
When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection
The breakthrough time of gloves is unknown for the product itself. The glove material given is recommended on basis of the substances in the preparation.

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Extinguishing media which shall not be used for safety reasons High volume water jet
5.2. Special hazards arising from the substance or mixture Hazardous combustion products Fire will produce dense black smoke containing hazardous combustion products. Exposure to decomposition products may be a hazard to health.
Hazardous decomposition products When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, oxides of nitrogen.
5.3. Advice for firefighters Fire and Explosion Hazards Flammable liquid. Vapours may form explosive mixtures with air. Remove all sources of ignition. Solvent vapours are heavier than air and may spread along floors.
Special Protective Equipment and Fire Fighting Procedures Wear as appropriate: Full protective flameproof clothing. Wear self contained breathing apparatus for fire fighting if necessary. In the event of fire, cool tanks with water spray. Do not allow run-off from fire fighting to enter drains or water courses.
Section 6. Accidental release measures 6.1. Personal precautions, protective equipment and emergency procedures Keep in a well-ventilated place. Keep away from sources of ignition. Do not inhale vapours.
6.2. Environmental precautions Do not let product enter drains. Notify the respective authorities in accordance with local law in the case of contamination of rivers, lakes or waste water systems. Please avoid any emission of volatile organic compounds as possible.
6.3. Methods and materials for containment and cleaning up Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations. Clean preferably with a detergent; avoid use of solvents.
6.4. Reference to other sections Comply with safety directives (see chapters 7 and 8).
Section 7. Handling and storage 7.1. Precautions for safe handling Safe handling advice Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Preparation may charge electrostatically: always use grounded leads when transferring from one container to another. Operators should wear antistatic footwear and clothing. No sparking tools should be used. Avoid skin and eye contact. Do not breathe vapours or spray mist. Smoking, eating and drinking should be prohibited in the application area. For personal protection see section 8. Comply with the health and safety at work laws. If material is a coating, do not sand, flame out, braze or weld dry coating without an appropriate respirator or appropriate ventilation, and gloves. Advice on protection against fire and explosion Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Never use pressure to empty container: container is not a pressure vessel. Always keep in containers of same material as the original one. The accumulation of contaminated rags may result in spontaneous combustion. Good housekeeping standards and regular safe removal of waste materials will minimize the risks of spontaneous combustion and other fire hazards.
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SAFETY DATA SHEET according to 1907/2006/EC as amended by 453/2010/EC
CAS 100 42 5 styrene EC 202-851-5 REACH 01-2119457861-32 10.00 - < 12.50 % Classification R10; Xn: R20; Xi: R36/37/38; Xn: R49/20; Xn: R65; NotAD
Substances presenting a health or environmental hazard within the meaning of Regulation (EC) No 1272/2008 CAS 100-42-5 styrene EC 202-851-5 REACH 01-2119457861-32 10.00 - < 12.50 % Classification Flam. Liq. 3, H226; Asp. Tox. 1, H304; Skin Irrit. 2, H315; Eye Irrit. 2, H319; Acute Tox. 4, H332; STOT SE 3, H335; STOT RE 1, H372,
Up to the given revision date of this safety data sheet only the above mentioned REACH registration numbers are assigned to the chemical substances used in this mixture.
Additional advice See full text of R-phrases in chapter 15. See full text of H-phrases in chapter 16.
Section 4. First aid measures 4.1. Description of first aid measures General advice When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person. Inhalation Avoid inhalation of vapour or mist. Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician. Skin contact Do NOT use solvents or thinners. Take off all contaminated clothing immediately. Eye contact Remove contact lenses. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Seek medical advice. Ingestion If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting. Keep at rest.
4.2. Most important symptoms and effects, both acute and delayed Please see practical experience in section 11.
4.3. Indication of any immediate medical attention and special treatment needed If unconscious place in recovery position and seek medical advice.
Section 5. Firefighting measures 5.1. Extinguishing media Suitable extinguishing media Universal aqueous film-forming foam, Carbon dioxide (CO2), Dry chemical, Water spray.
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according to 1907/2006/EC as amended by 453/2010/EC	
Contains	styrene.
R-phrases(s)	
R10 R48/20	Flammable. Harmful: danger of serious damage to health by prolonged exposure through inhalation.
S-phrases(s)	
S23 S38	Do not breathe vapour. In case of insufficient ventilation, wear suitable respiratory equipment.
Labelling according to Regulation (EC) No 1272/2008.	
Pictogram and Signal word of the product	
Signal word: Danger	
Hazardous components which must be listed on the label	
Contains	styrene
Hazard statements	
H226 H315 H319 H372	Flammable liquid and vapour. Causes skin irritation. Causes serious eye irritation. Causes damage to organs through prolonged or repeated exposure.
Precautionary statements	
P210 P260 P280 P314 P337 + P313 P403 + P235	Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Do not breathe dust/ fume/ gas/ mist/ vapours/ spray. Wear protective gloves/protective clothing/eye protection/face protection. Get medical advice/ attention if you feel unwell. If eye irritation persists: Get medical advice/ attention. Store in a well-ventilated place. Keep cool.
2.3. Other hazards	
This mixture contains no substance considered to be persistent, bioaccumulating nor toxic (PBT). This mixture contains no substance considered to be very persistent nor very bioaccumulating (vPvB).	
Restricted to professional users.	
Section 3. Composition/information on ingredients	
3.1. Substances	
This product is a mixture. Health hazard information is based on its components.	
3.2. Mixtures	
Chemical characterization	
Mixture of synthetic resins, pigments, and solvents	
Hazardous components	
Substances presenting a health or environmental hazard within the meaning of Directive 67/548/EEC.	
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SAFETY DATA SHEET	
according to 1907/2006/EC as amended by 453/2010/EC	
Section 1. Identification of the substance/mixture and of the company/undertaking	
1.1. Product identifier	
Product name	Raderal IR Premium Spachtel 2035
Product code	402531234050
1.2. Relevant identified uses of the substance or mixture and uses advised against	
Identified uses	
based on use descriptor system given by guideline of the European Chemical Agency	
Sector of use	SU 3, SU 22
Product category	PC9b
Further information see chapter Exposure scenario	
The product is only for industrial and/or professional use, not for any private consumer use.	
1.3. Details of the supplier of the safety data sheet	
Company/Undertaking Identification	
Producer/Supplier	Axalta Coating Systems Germany GmbH
Street/Box	Horbeller Str. 15
Nat.-Code/Postal code/City	DE 50958 Köln
Telephone	+49(0) 2234 6019 01
Information on SDS	
Responsible Department	Regulatory Affairs
Telephone	+49 (0)202 529-2385
Telefax	+49 (0)202 529-2804
1.4. Emergency telephone	
Emergency telephone number of manufacturer	+44 (0)845 600-6640
For further information, please also consult our Internet site	
http://www.spieshecker.com	
Section 2. Hazards identification	
The product is classified as dangerous in accordance with Directive 1999/45/EC.	
The product is classified as dangerous in accordance with Regulation (EC) No. 1272/2008.	
2.1. Classification of the substance or mixture	
Classification of the mixture	
According to European Directive 1999/45/EC as amended.	
Classification : Harmful; Flammable;	
[R10] Flammable, [R48/20] Harmful: danger of serious damage to health by prolonged exposure through inhalation.	
According to Regulation (EC) No 1272/2008	
Flam. Liq. 3, H226; Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT RE 1, H372;	
2.2. Label elements	
Labelling according to European Directive 1999/45/EC.	
Symbol and indication of hazard.	
	Xn Harmful
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Ems
 IMDG: F-E, S-E

Packaging group
 SS 586:Part 1: 2014; IMDG; ICAO/IATA: III

Environmental hazards
 SS 586:Part 1: 2014; IMDG; ICAO/IATA: yes


Marine pollutant
 IMDG: yes [zinc oxide]

Special precautions for user
 please see section 6 - 8

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
 Deliveries shall only be made based on appropriate packaging and in compliance with traffic laws.

Section 15. Regulatory information
Safety, health and environmental regulations/legislation specific for the substance or mixture
 Restricted to professional users.

Chemical Safety Assessment
 No safety checks were carried out on the mixture.

Section 16. Other information
 Revision Note

Version	Changes
4.3	2, 5, 9


Revision Date: 2016-03-11
 B11979494

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.

Attention in medical use: Avoid medical use accompanying permanent implant in human body.

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Mobility in soil
 No information available.

Section 13. Disposal considerations
Waste treatment methods
 Dispose of in accordance with local regulations.

Product
 Recommendation:
 A disposal process that converts the waste into energy is recommended. If this is not possible the hazardous waste must be disposed of by incineration.

Uncleaned packaging
 Recommendation:
 Properly emptied containers are to be scrap processed or reconditioned.


Section 14. Transport information
 Transport only in accordance with the requirements of the Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labeling), ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport.

UN number
 SS 586:Part 1: 2014; IMDG; ICAO/IATA: 1263

UN proper shipping name
 SS 586:Part 1: 2014; IMDG; ICAO/IATA: PAINT

Transport hazard class(es)
Hazard class
 SS 586:Part 1: 2014; IMDG; ICAO/IATA: 3

Subsidiary hazard class
 SS 586:Part 1: 2014; IMDG; ICAO/IATA: Not applicable.

Labels


Special Provisions
 SS 586:Part 1: 2014: 640E

Hazchem Code
 SS 586:Part 1: 2014: 3Y


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CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
1330-20-7	xylene	rat	LC50	4 h	5,000 ppm	
100-41-4	ethylbenzenc	rat	LC50	4 h	4,000 ppm	

Acute dermal toxicity

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
1330-20-7	xylene	rabbit	LD50		> 1,700 mg/kg	

Acute oral toxicity

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
71-36-3	n-butanol	rat	LD50		790 mg/kg	

Irritant effects

The liquid splashed in the eyes may cause irritation and reversible damage. Inhalation of mist causes irritation of respiratory system. May cause skin irritation in susceptible persons.

Sensitisation

Contains: epoxy resin (number average molecular weight 700 <= 1200). May produce an allergic reaction.

Section 12. Ecological information

There are no data available on the product itself. The product should not be allowed to enter drains or watercourses. The data in this section is consistent with data from chemical safety reports available at the date of revision.

Toxicity

Aquatic toxicity

Acute toxicity aquatic invertebrates

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
1314-13-2	zinc oxide	Daphnia	EC50	48 h	1,000 mg/l	

Acute and extended toxicity of fishes

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
1314-13-2	zinc oxide	Oncorhynchus mykiss (rainbow trout)	LC50	96 h	1.1 mg/l	

Persistence and degradability


No information available.

Bioaccumulative potential

No information available.

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Other data

Solvent separation test	< 3%	ADR/RID
Content of volatile components (including water)	71.4 %	Basis Vapour pressure >= 0.01 kPa
organic solvent content	71.2 %	Basis Vapour pressure >= 0.01 kPa
European VOC	71.2 %	Basis Vapour pressure >= 0.1 hPa

Section 10. Stability and reactivity

Reactivity

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.

Chemical stability

The product is chemically stable.

Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid

Stable under recommended storage and handling conditions (see section 7).

Incompatible materials to avoid

not required under normal use

Hazardous decomposition products

None known.

Section 11. Toxicological information

Information on toxicological effects

General observations

There is no data available on the product. See sections 2 and 3 for details.

Practical experience

Swallowing may cause nausea, diarrhoea, vomiting, gastro-intestinal irritation and chemical pneumonia. Exposure to component solvents vapours concentration in excess of the stated occupational exposure limit may result in adverse health effect such as mucous membrane and respiratory system irritation and adverse effect on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Solvents may cause some of the above effects by absorption through the skin. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin. Based on the properties of the epoxy constituent(s) and considering toxicological data on similar preparations, this preparation may be a skin sensitizer and an irritant. Low molecular epoxy constituents are irritating to eyes, mucous membranes and skin. Repeated skin contact may lead to irritation and to sensitization, possibly with cross-sensitization to other epoxies. Skin contact with the preparation and exposure to spray mist and vapour should be avoided.

Acute toxicity

Acute inhalation toxicity


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Chemical Name	Glove material	Glove thickness	Break through time
	Viton (R) [®]	0.7 mm	480 min

The protective glove should be checked in each case for their work specific suitability (e.g. mechanical stability, product compatibility, and anti-static properties). When the intended use is for spray application a nitrile glove of the chemical resistance group 3 (e.g. Dermatrill [®] glove) is to be used. After contamination, the glove has to be changed. If immersing the hands into the product is not avoidable (e.g. maintenance work) a butyl or fluorocarbon rubber glove should be used. When skin exposure may occur to materials specified in section 3 of this SDS, advice should be sought from the glove supplier as to appropriate type to use with this product and the permeation breakthrough times. Care should be taken when working with sharp edged articles as these can easily damage the gloves and make them ineffective. The instructions and information provided by the glove supplier on use, storage, maintenance and replacement must be followed. Damaged gloves or those showing signs of wear should be replaced immediately.

Eye protection

Wear protective eyewear for protection against solvent spatter.

Skin and body protection

Wear suitable protective clothing. Personnel should wear antistatic clothings made of natural fiber or of high temperature resistant synthetic fiber.

Hygiene measures

Wash skin thoroughly with soap and water or use recognized skin cleanser. Do not use organic solvents!

Environmental exposure controls

Do not let product enter drains. For ecological information refer to section 12.

Section 9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance


Form: liquid; Colour: yellow; Odour: Odour is not perceptible.;

Important health, safety and environmental information

Property	Value	Method
pH	no data available	
Melting point/freezing point	Not applicable.	
Boiling point/boiling range	97 °C	
Flash point	26 °C	DIN 53213/ISO 1523
Evaporation rate	Slower than Ether	
Flammability (solid, gas)	not relevant as product is liquid	
Lower explosion limit	1.2 vol-% based on organic solvent content	
Upper explosion limit	13.7 vol-% based on organic solvent content	
Vapour pressure	9.1 hPa	
Vapour density	no data available	
Relative density	0.98 g/cm ³	20 °C: DIN 53217/ISO 2811
Solubility(ies)		
Water solubility	appreciable	
Solubility in other solvents	miscible with most organic solvents Listed in: Section 3. Composition/Information on ingredients	
Partition coefficient: n-octanol/water	This product is a mixture. For ingredient details see section 12	
Auto-ignition temperature	270 °C	DIN 51794 based on organic solvent content
Decomposition temperature	This product is a mixture. For further information see section 10.	
Viscosity (23 °C)	41 s	ISO 2431 - 1993 8 mm
Explosive properties	Not explosive	
Oxidizing properties	not oxidizing	

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CAS-No.	Chemical Name	Source	Time	Type	Value	Note
1330 20 7	xylene	ACGIH Singapore	15 min	STEL	150 ppm	
			8 hr	TWA	100 ppm	
				TWA	100 ppm	
				STEL	651 mg/m ³	
100-41-4	ethylbenzene	ACGIH Singapore	8 hr	TWA	20 ppm	
				TWA	100 ppm	
				STEL	543 mg/m ³	
				TWA	434 mg/m ³	
14807 96 6	Talc (Mg3H2(SiO3)4)	ACGIH Singapore	8 hr	TWA	2 mg/m ³	Respirable Dust
				TWA	2 mg/m ³	

Exposure controls

Additional technical information on the plant

Provide adequate ventilation. This should be achieved by a good general extraction and -if practically feasible- by the use of a local exhaust ventilation. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn. Mask with gas filter, type A (EN 141)

Protective equipment

Personal protective equipment should be worn to prevent contact with eyes, skin or clothing.

Respiratory protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection

The breakthrough time of gloves is unknown for the product itself. The glove material given is recommended on basis of the substances in the preparation.

Chemical Name	Glove material	Glove thickness	Break through time
propan-1-ol	Viton (R) [®]	0.7 mm	480 min
	Nitrile rubber	0.33 mm	481 min
n-butyl acetate	Viton (R) [®]	0.7 mm	10 min
	Nitrile rubber	0.33 mm	30 min
n-butanol	Viton (R) [®]	0.7 mm	480 min
	Nitrile rubber	0.33 mm	480 min
xylene	Nitrile rubber	0.33 mm	30 min


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Section 4. First aid measures

Eye contact
Remove contact lenses. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Seek medical advice.

Skin contact
Do NOT use solvents or thinners. Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. If skin irritation persists, call a physician.

Inhalation
Avoid inhalation of vapour or mist. Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

Ingestion
If swallowed, seek medical advice immediately and show this safety data sheet (SDS) or product label. Do NOT induce vomiting. Keep at rest.

Most Important Symptoms/effects, acute and delayed

Inhalation
May cause nose and throat irritation. May cause nervous system depression characterized by the following progressive steps: headache, dizziness, nausea, staggering gait, confusion, unconsciousness. Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage.

Ingestion
May result in gastrointestinal distress.

Skin or eye contact
May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis.

Protection of first-aiders
No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.

Notes to physician
No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media
Universal aqueous film-forming foam, Carbon dioxide (CO₂), Dry chemical, Water spray.


Extinguishing media which shall not be used for safety reasons
High volume water jet

Special hazards arising from the substance or mixture

Hazardous combustion products
Fire will produce dense black smoke containing hazardous combustion products. Exposure to decomposition products may be a hazard to health.

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Precautionary statements

Toxic to aquatic life with long lasting effects.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ventilating/lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust/vapours/spray
Use only outdoors or in a well-ventilated area.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.
Wear protective gloves/protective clothing/eye protection/face protection.
IF ON SKIN: Wash with plenty of soap and water.
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or if you feel unwell: Call a POISON CENTER or doctor/ physician.
Specific treatment (see supplemental first aid instructions on this label).
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.
Collect spillage.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local regulations.

Other hazards which do not result in classification
Contains epoxy constituents. See information supplied by the manufacturer.

Section 3. Composition/information on ingredients

Chemical nature
Mixture of synthetic resins, pigments, and solvents

Hazardous components

CAS No.	Chemical Name	Concentration	GHS Hazardous
71-23-8	propan-1-ol	20 - 30%	✓
123-86-4	n-butyl acetate	10 - 20%	✓
71-36-3	n butanol	10 - 20%	✓
25068-38-6	epoxy resin (number average molecular weight 700 <= 1200)	5 - 10%	✓
1314-13-2	zinc oxide	5 - 10%	✓
107-98-2	1-methoxy-2-propanol	3 - 5%	✓
1330-20-7	xylene	3 - 5%	✓
100-41-4	ethylbenzene	1 - 3%	✓
14807-96-6	Talc (Mg ₃ H ₂ (SiO ₃) ₄)	1 - 3%	

Non-regulated ingredients 10 - 20%


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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



SAFETY DATA SHEET

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name PERMAFLEET
1:1 Wash Primer lasierend 3688

Product code 4025331236603

Relevant identified uses of the substance or mixture and uses advised against

Coating for professional use

Details of the supplier of the safety data sheet

Company/Undertaking identification

Producer/Supplier	Axalta Coating Systems Germany GmbH & Co. KG
Street/Box	Horbeller Str. 15
Nat. Code/Postal code/City	DE 50858 Köln
Telephone	+49(0) 2234 6019-01
Importer	Axalta Coating Systems Singapore Holding Pte Ltd.
Street/Box	1 Robinson Road, #15-02 AIA Tower, Singapore 048542
Nat. Code/Postal code/City	

Information on SDS

Responsible Department	Regulatory Affairs
Telephone	+49 (0)202 529-2385
Telefax	+49 (0)202 529-2804
E-mail address	sds-service@axaltacs.com

Emergency telephone

Emergency telephone number of manufacturer (65) 65429595

For further information, please also consult our Internet site

Section 2. Hazards identification


This preparation is hazardous per the following GHS criteria

GHS-Classification

Flammable liquids	Category 3
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Skin sensitisation	Category 1
Target Organ Systemic Toxicant - Single exposure	Category 3
Chronic aquatic toxicity	Category 2

Endpoints which are "not classified", "cannot classified" and "not applicable" are not shown.

GHS-Labeling

Hazard symbols	
Signal word	Warning
Hazard statements	Flammable liquid and vapour. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause respiratory irritation.

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4025331236603 v4.3
Revision Date: 2016-03-11
Print Date: 2016-03-11
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Chemwatch: 4894-07 Page 21 of 21 Issue Date: 03/07/2014
Version No: 11.1.1.1 Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) Print Date: 23/08/2016

paraffin wax: 8002-74-2, 12704-91-5, 105094-83-1, 105845-09-7, 115251-23-5, 115251-24-6, 12704-92-6, 12795-75-4, 169396-34-5, 37220-23-8, 37339-80-3, 39355-22-1, 33373-78-9, 51331-35-2, 54632-42-1, 57572-43-7, 57608-04-1, 58057-11-7, 61742-43-4, 64742-51-4, 68607-06-9, 68649-50-3, 70431-26-4, 72993-88-5, 72993-89-6, 72993-90-9, 8035-62-9, 8044-02-8, 8044-79-9, 9093-41-4, 92045-74-4

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at: www.chemwatch.net

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC – TWA: Permissible Concentration-Time Weighted Average
PC – STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL: No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit of Detection
OTV: Odour Threshold Value
BCF: BioConcentration Factors
BEI: Biological Exposure Index

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end of SDS

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Chemwatch: 4804-97 Page 20 of 21 Issue Date: 03/07/2014
Version No: 11.11.1 Megular's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) Print Date: 23/08/2016

UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains beta-pinene and alpha-pinene)	
Transport hazard class(es)	IMDG Class	9
	IMDG Subrisk	Not Applicable
Packing group	III	
Environmental hazard	Marine Pollutant	
Special precautions for user	EMS Number	F-A, S-F
	Special provisions	274 335 969
	Limited Quantities	5 L

Transport in bulk according to Annex II of MARPOL and the IBC code
Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

DISTILLATES, PETROLEUM, LIGHT, HYDROTREATED(64742-47-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards	Australia Inventory of Chemical Substances (AICS)
Australia Hazardous Substances Information System - Consolidated Lists	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

PETROLEUM DISTILLATES HFP(64742-48-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards	Australia Inventory of Chemical Substances (AICS)
Australia Hazardous Substances Information System - Consolidated Lists	International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

PARAFFIN AND HYDROCARBON WAXES, OXIDISED, LITHIUM SALTS(86649-48-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)	
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BETA-PINENE(19902-08-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)	
---	--

ALPHA-PINENE(80-56-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)	
---	--

POLYDIMETHYLSILOXANE(83148-62-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Inventory of Chemical Substances (AICS)	
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PARAFFIN WAX(8902-74-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS

Australia Exposure Standards	Australia Inventory of Chemical Substances (AICS)
Australia Hazardous Substances Information System - Consolidated Lists	

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (petroleum distillates HFP; polydimethylsiloxane; paraffin and hydrocarbon waxes, oxidised, lithium salts; beta-pinene; distillates, petroleum, light, hydrotreated; paraffin wax)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (polydimethylsiloxane)
Japan - ENCS	N (petroleum distillates HFP; polydimethylsiloxane; paraffin wax)
Korea - KEC	Y
New Zealand - NZIoC	N (paraffin and hydrocarbon waxes, oxidised, lithium salts)
Philippines - PICCS	Y
USA - TSCA	Y

Legend: Y = All ingredients are on the inventory
N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
petroleum distillates HFP	64742-48-9, 64742-88-7
beta-pinene	19902-08-9, 18172-67-3, 127-91-3
alpha-pinene	80-56-8, 1330-16-1, 2437-95-8, 7785-79-8, 7785-26-4

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Waste treatment methods

Containers may still present a chemical hazard/danger when empty.

- Return to supplier for reuse/recycling if possible.

Otherwise:

- If container cannot be cleaned sufficiently well to ensure that residues do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent reuse, and bury at an authorised landfill.
- Where possible retain label warnings and SDS and observe all notices pertaining to the product.
- DO NOT allow wash water from cleaning or process equipment to enter drains.
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposed to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Buy or incinerate residues at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Environmentally Hazardous Substance, Liquid, N.O.S. (contains beta-pinene and alpha-pinene)	9
Marine Pollutant	
HAZCHEM	-S2

Land transport (ADG)

UN number	3082	
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains beta-pinene and alpha-pinene)	
Transport hazard class(es)	Class	9
	Subrisk	Not Applicable
Packing group	III	
Environmental hazard	Not Applicable	
Special precautions for user	Special provisions	274 331 335 375 AUJ01
	Limited quantity	5 L

Environmentally Hazardous Substances meeting the descriptions of UN 3077 or UN 3082 are not subject to this Code when transported by road or rail, if:

- packagings;
- IBCs; or
- any other receptacle not exceeding 500 kg/L.

- Australian Special Provisions (SP AUJ-1) - ADG Code 7th Ed.

Air transport (ICAO-IATA / DGR)

UN number	3082	
UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s. (contains beta-pinene and alpha-pinene)	
Transport hazard class(es)	ICAO/IATA Class	9
	ICAO/IATA Subrisk	Not Applicable
Environmental hazard	ERG Code	6L
	Packing group	III
Special precautions for user	Special provisions	A97 A158A197
	Cargo Only Packing Instructions	664
	Cargo Only Maximum Qty / Pack	450 L
	Passenger and Cargo Packing Instructions	664
	Passenger and Cargo Maximum Qty / Pack	450 L
	Passenger and Cargo Limited Quantity Packing Instructions	Y064
Passenger and Cargo Limited Maximum Qty / Pack	30 kg G	

Sea transport (IMDG-Code / GGVSee)

UN number	3082
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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Version No: 11.11.11		Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)		Print Date: 23/08/2016	
Photocopy tone, printed paper, styrene polymers	Styrene	Formaldehyde, benzaldehyde			
Environmental tobacco smoke	Styrene, acetone, nicotine	Formaldehyde, benzaldehyde, hexanal, glyoxal, N-methylformamide, nicotinamide, cotinine			
Soiled clothing, fabrics, bedding	Squalene, unsaturated steroids, oleic acid and other saturated fatty acids	Acetone, geranyl acetone, 6MHO, 4OPA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid			
Soiled particle filters	Unsaturated fatty acids from plant waxes, leaf litter, and other vegetable debris; soot; diesel particles	Formaldehyde, nonanal, and other aldehydes; azelaic acid; nonanoic acid; 9-oxo-nonanoic acid and other oxo-acids; compounds with mixed functional groups (=O, -OH, and -COOH)			
Ventilation ducts and duct liners	Unsaturated fatty acids and esters; unsaturated oils; resins	C5 to C10 aldehydes			
“Urban grime”	Polycyclic aromatic hydrocarbons	Oxidized polycyclic aromatic hydrocarbons			
Perfumes, colognes, essential oils (e.g. lavender, eucalyptus, lemongrass)	Limonene, alpha-pinene, linalool, linalyl acetate, terpinene-4-ol, gamma-terpinene	Formaldehyde, 4-AMC, acetone, 4-hydroxy-4-methyl-5-hexen-1-ol, 5-ethyl-2-thio-5-methyl-2-thio) furanone, SOAs including ultrafine particles			
Overall home emissions	Limonene, alpha-pinene, styrene	Formaldehyde, 4-AMC, pinonaldehyde, acetone, pinic acid, pinonic acid, formic acid, benzaldehyde, SOAs including ultrafine particles			
Abbreviations: 4-AMC, 4-acetyl-1-methylcyclohexane; 6MHO, 6-methyl-5-heptene-2-one, 4OPA, 4-oxopentanal, SOA, Secondary Organic Aerosols					
Reference: Charles J Wieschler, Environmental Health Perspectives, Vol 114, October 2006					
For allergens (defns)					
Environmental fate					
Ecotoxicity studies conducted with a wide range of products have shown little potential for toxicity to aquatic organisms under expected conditions of use or in the event of an accidental release. Not all alpha olefins are readily biodegradable; however, they will ultimately biodegrade. While the octanol/water partition coefficients of alpha olefins suggest a potential for bioaccumulation of these materials in aquatic organisms, the volatility of these materials (especially for the liquid alpha olefins) and the low water solubility (indicative of limited bioavailability), would indicate that bioaccumulation will not occur. Under most environmental conditions, extensive evaporation and subsequent degradation in the atmosphere would preclude bioaccumulation. Therefore, alpha olefins are not expected to be toxic to aquatic organisms, will biodegrade, and will not bioaccumulate.					
The potential for exposure of aquatic organisms to members of the higher olefins will be influenced by their physico-chemical properties. The predicted or measured water solubilities of these olefins range from 50 mg/L at 20°C for hexene to 0.00015 mg/L at 25°C for 1-octadecene, and to 6.33 [E-23] mg/L at 25°C for C54 alpha olefin, which suggests there is a lower potential for the larger olefins to be bioavailable to aquatic organisms due to their low solubilities. Their vapor pressures range from 230.5 hPa at 25°C for hexene to 0.00009 hPa at 25°C for 1-octadecene, and to 1.13 [E-16] hPa at 25°C for C54 alpha olefin, which suggests the shorter chain olefins will tend to partition to the air at a significant rate and remain in the other environmental compartments for long periods of time, while the longer chain olefins will tend to partition primarily to water, soil or sediment, depending on water solubility and sorption behavior. The predicted soil adsorption coefficients (K _{oc}) range from 149 for C6 to 230,800 for C18 and to 1.0 [E-10] for C54, indicating increasing partitioning to soil/sediment with increasing carbon number. Level III fugacity modeling predicts that the C5-12 olefins volatilize primarily to air, while the C16 and longer chain olefins would partition primarily to soil. Results of Level III fugacity modeling suggest that the C5-9 olefins will partition primarily to the water compartment; and, as the chain length increases beyond C10, soil and sediment become the primary compartments. These chemicals have a very low potential to hydrolyse and do not photodegrade directly. However, in the air, all members of the category are subject to atmospheric oxidation from hydroxyl radical attack, with calculated degradation half-lives of 1.8 to 4.8 hours. C6-30 olefins have been shown to degrade to an extent of approximately 8-92% in standard 28 day biodegradation tests. These results were not clearly correlated with carbon number or any other identifiable parameter; however, the weight of evidence shows that the members of the higher olefins have potential for degradation in the environment. Volatilisation from water is predicted to occur rapidly (hours to days), with Henry's Law Constants (bond method) ranging from 0.423 (C6) to 10.7 (C16), and to 2.89 [E-4] atm·m ³ /mol. Consideration of these degradation processes supports the assessment that these substances will degrade relatively rapidly in the environment and not persist. Based on calculated bioconcentration factors, the C8, C7, and C16 and longer chain length category members are not expected to bioaccumulate (BCF: C6 = 44.46, C7 = 236, C16 = 71.92 and >= C18 = 3.24.6). Although the C6-15 olefins have BCFs ranging from 313 to 2030, and K _{ow} values ranging from 4.13 to 17.49, and thus are considered to have the potential for bioaccumulation, their physico-chemical properties and fate indicate that there would be limited environmental exposure because of volatility, biodegradability and limited solubility.					
Ecotoxicity:					
Data indicate that acute aquatic toxicity can be observed for C6 through the C10 olefins (C5: ECALC50 range of 1-10 mg/L; C7-C10: ECALC50 range of 0.1-1.0 mg/L), and that toxicity increases with increasing carbon number within that range, which is consistent with increasing K _{ow} values (0.07-51.0). Above a chain length of 10, toxicity is not observed within the limits of solubility. However, data indicate that chronic aquatic toxicity can be observed in the C10 olefins (EC10 = 20.0 µg/L; EC50 = 19.04 µg/L). Data also suggest that aquatic toxicity does not differ with bond location or presence of branching.					
For lithium (anion):					
Environmental fate:					
Experiments with experimental animals have shown that lithium can have reproductive effects, and increasing consumption might therefore result in adverse effects on health and environment. Lithium has significant bioavailability only when administered as a partially soluble salt such as lithium carbonate. Lithium is not a dietary mineral for plants but it does stimulate plant growth.					
Ecotoxicity:					
Fish LC50 (96 h): rainbow trout 9.28, 1.4 mg/L (salt)					
Fish LC50 (96 h): fathead minnow 42 mg/L; NCEC 13 mg/L (salt)					
Daphnia magna EC50 (48 h): 24 mg/L; NOEC 11 mg/L					
Lithium is not expected to bioaccumulate in mammals and its human and environmental toxicity are low. Lithium does accumulate in several species of fish, molluscs and crustaceans where it is stored in the digestive tract and exoskeleton.					
Methanogenesis of granular anaerobic sludge (initial COD 5750 mg/L O ₂ , pH 7.2) was stimulated at lithium ion concentration 10-20 mg/L, slightly inhibited at lithium ion concentration 350 mg/L and severely inhibited at lithium ion concentration > 500 mg/L.					
Microinjection of lithium chloride into prospective ventral blastomeres of a 32-cell <i>Xenopus laevis</i> embryo gives rise to duplication of dorsal organizer structures such as the notochord, neural tube and eyes.					
DO NOT discharge into sewer or waterways.					
Persistence and degradability					
Ingredient	Persistence: Water/Soil	Persistence: Air			
beta-pinene	HIGH	HIGH			
alpha-pinene	HIGH	HIGH			
Bioaccumulative potential					
Ingredient	Bioaccumulation				
distillates, petroleum, light, hydrorefined	LOW (BCF = 159)				
beta-pinene	MEDIUM (LogKOW = 4.16)				
alpha-pinene	MEDIUM (LogKOW = 4.44)				
Mobility in soil					
Ingredient	Mobility				
beta-pinene	LOW (KOC = 1204)				
alpha-pinene	LOW (KOC = 1204)				
SECTION 13 DISPOSAL CONSIDERATIONS					

Continued...

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Version No: 11.11.11		Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)		Print Date: 23/08/2016	
Stability in Water: Chemicals that have a potential to hydrolyse include alkyl halides, amides, carbamates, carboxylic acid esters and lactones, epoxides, phosphates, esters, and sulfuric acid esters. Because lubricating base oils do not contain significant levels of these functional groups, materials in the lubricating base oils category are not subject to hydrolysis.					
Chemical Transport and Distribution in the Environment: Based on the physical-chemical characteristics of component hydrocarbons in lubricating base oils, the lower molecular weight components are expected to have the highest vapour pressures and water solubilities, and the lowest partition coefficients. These factors enhance the potential for widespread distribution in the environment. To gain an understanding of the potential transport and distribution of lubricating base oil components, the EOC (Equilibrium Criterion) model was used to characterize the environmental distribution of different C15 compounds representing different structures found in lubricating base oils (e.g., paraffins, naphthenes, and aromatics). The modelling found partitioning to soil or air is the ultimate fate of these C15 compounds. Aromatic compounds partition primarily to soil. Linear paraffins partition mostly to soil, while branching appears to allow greater distribution to air. Naphthenes distribute to both soil and air, with increasing proportions in soil for components with the greater number of ring structures. Because the modelling does not take into account degradation factors, levels modelled in the atmosphere are likely overestimated in light of the tendency for indirect photodegradation to occur.					
Biodegradability: The extent of biodegradation measured for a particular lubricating oil base stock is dependent not only on the procedure used but also on how the sample is presented in the biodegradation test. Lubricant base oils typically are not readily biodegradable in standard 28-day tests. However, since the oils consist primarily of hydrocarbons that are ultimately assimilated by microorganisms, and are therefore inherently biodegradable, twenty-eight biodegradability studies have been reported for a variety of lubricating base oils. Based on the results of ultimate biodegradability tests using modified Slurm and nonmetric respirometry testing the base oils are expected to be, for the most part, inherently biodegradable. Biodegradation rates found using the modified Slurm procedure ranged from 13 to 29%. Results from the nonmetric respirometry tests on similar materials showed biodegradation rates from 31 to 50%. Biodegradation rates measured in 21-day CEC tests for similar materials ranged from 13 to 79%.					
Ecotoxicity:					
Numerous acute studies covering fish, invertebrates, and algae have been conducted to assess the ecotoxicity of various lubricating base oils. None of these studies have shown evidence of acute toxicity to aquatic organisms. Eight, 7-day exposure studies using rainbow trout failed to demonstrate toxicity when tested up to the maximum concentration of 1000 mg/L, applied as dispersions. Three, 96-hour tests with rainbow trout also failed to show any toxic effects when tested up to 1000 mg/L, applied as dispersions. Similarly, three 96-hour tests with fathead minnows at a maximum test concentration of 100 mg/L, water accommodated fractions (WAF) showed no adverse effects. Two species of aquatic invertebrates (<i>Daphnia magna</i> and <i>Gammarus sp.</i>) were exposed to WAF solutions up to 10,000 mg/L for 48 and 96-hours, respectively with no adverse effects being observed. Four-day exposures of the freshwater green alga (<i>Scenedesmus subspicatus</i>) to 500 mg/L WAF solutions failed to show adverse effects on growth rate and algal cell densities in four studies. Multiple chronic toxicity studies have shown no adverse effects to daphnid survival or reproduction. In 10 of 11 chronic studies, daphnids were exposed for 21 days in WAF preparations of lubricating base oils with no effects on survival or reproduction at the maximum concentration of 1000 mg/L. One test detected a reduction in reproduction at 1000 mg/L. Additional data support findings of no chronic toxicity to aquatic invertebrates and fish. No observed effect levels ranged from 550 to 5,000 mg/L when tested as either dispersions or WAFs.					
The data also show a clear trend of increasing ecotoxicity with increasing carbon number. The author concluded that the water solubility of carbon number 10 and above is too limited to elicit acute toxicity. This also was shown for alkylbenzene compounds having carbon numbers C15. Since base oils consist of carbon compounds of C15 to C50, component hydrocarbons that are of acute toxicological concern are, for the most part, absent in these materials. Similarly, due to their low solubility, the alkylated two to three ring polycyclic aromatic hydrocarbons in base oils are not expected to cause acute or chronic toxicity. This lack of toxicity is borne out in the results of the reported studies.					
The effects of crude and refined oil on organisms found in fresh and sea water have been extensively reviewed.					
sea water. Where spillages occur the non-mobile species suffer the greatest mortality, whereas fish species can often escape from the affected region. The extent of the initial mortality depends on the chemical nature of the oil, the location, and the physical conditions, particularly the temperature and wind velocity. Most affected freshwater and marine communities recover from the effects of an oil spill within a year. The occurrence of biogenic hydrocarbons in the world's oceans is well recorded. They have the characteristic isoprenoid structure, and measurements made in water columns indicate a background concentration of 1.0 to 10.0 µl/l. The higher molecular weight materials are dispersed as particles, with the highest concentrations of about 20 µl occurring in the top 3 cm layer of water.					
A wide variation in the response of organisms to oil exposures has been noted. The larvae of fish and crustaceans appear to be most susceptible to the water-soluble fraction of crude oil. Exposures of plankton and algae have indicated that certain species of diatoms and green algae are inhibited, whereas microflagellates are not.					
For the most part, molluscs and most intertidal worm species appear to be tolerant of oil contamination.					
For biotic monoterpenes:					
Photodegradation: The calculated photodegradation half-lives for the structurally defined materials in this group are in the range from 1.4 to 9.4 hours. These calculations are based on measured OH-rate constants for alpha-pinene, beta-pinene, camphene and trans-pinene, measured ozone and NO ₃ rate constants with the exception of trans-pinene.					
Stability in Water: No hydrolysis is possible for any of the materials in this group. All are expected to be very stable in aqueous solution.					
Biodegradability: Studies evaluating biodegradability are available for this group of substances using standard OECD Guideline protocols. Additional studies in soil horizons obtained from coniferous and deciduous forests provide a broader perspective on the biodegradation of biogenic terpene hydrocarbons in the environment. Four studies on alpha-pinene showed limited biodegradability. The first, evaluated inherent biodegradability, and reported 37% biodegradation at 31 days; the second, evaluated ready biodegradability, and reported 38% biodegradation at 28 days; and a third evaluated ready biodegradability using a mixture matrix of alpha and beta-pinene in a closed bottle test, reported very little biodegradability. In the fourth experiment, a mixture of 50.5% alpha-pinene and 49.5% beta-pinene was considered to be inherently biodegradable based on the results of a closed bottle Slurm test. The mixture was 52% biodegraded within 28 days, but there was no indication that biodegradation had ceased.					
Very limited biodegradability was also reported for 3-carene and for camphene (less than 20%). In studies showing limited biodegradability, the authors concluded that the high vapour pressure and low water solubility of these substances led to volatilization of the test substance in the upper parts of the test vessel, thereby limiting aerobic biodegradation.					
Additional studies in extracts and slurries prepared from soils of coniferous and deciduous forest indicate rapid and complete biodegradation of alpha-pinene in a closed bottle test. Soil extracts from coniferous and hardwood watersheds were added to sealed flasks containing oxygen-saturated media that were preconditioned with alpha-pinene for 24 hours. Alpha-pinene underwent 100% biodegradation after approximately 6 days in acclimated medium and after day 15 in non-acclimated medium. The authors concluded the pinene is completely degradable in extracts prepared from watershed soils of coniferous or deciduous forests.					
Ecotoxicity:					
Fish LC50 (96 h): fathead minnow 0.28 mg/L (alpha-pinene); 0.5 mg/L (beta-pinene); Brachydanio rerio 0.72 mg/L (camphene) (closed system flow through).					
The calculated values for camphene, cis-pinene, dihydro-pinene, and alpha-pinene, are 0.62, 0.63, 0.63 and 0.28 mg/L, respectively. These values indicate that all of these materials and mixtures that are made up primarily of these substances, should have acute fish toxicities on the order of 0.5 mg/L.					
Daphnia magna LC50 (48 h): 1.44 mg/L (alpha-pinene); 1.256 mg/L (beta-pinene)					
The calculated values for camphene, cis-pinene, dihydro-pinene, and alpha-pinene, are 0.79, 0.8, 0.8 and 0.22 mg/L, respectively, indicates that all of these materials and mixtures that are made up of these substances, should all have acute aquatic invertebrate toxicities on the order of 1.0 mg/L.					
The 96-hour calculated values for camphene, cis-pinene, dihydro-pinene, and alpha-pinene, are 0.56, 0.57, 0.57 and 0.22 mg/L, respectively, indicates that all of these materials and mixtures that are made up of these substances, should all have acute aquatic toxicity on the order of 0.5 mg/L.					
Terpenes such as limonene and isoprene contribute to aerosol and photochemical smog formation. Emissions of biogenic hydrocarbons, such as the terpenes, to the atmosphere may either decrease ozone concentrations when oxides of nitrogen are low or, if emissions take place in polluted air (ie containing high concentrations of nitrogen oxides), leads to an increase in ozone concentrations. Lower terpenoids can react with unstable reactive gases and may act as precursors of photochemical smog therefore indirectly influencing community and ecosystem properties.					
Complex chlorinated terpenes such as toxaphene (a persistent, mobile and toxic insecticide) and its degradation products, were produced by photolimited reactions in an aqueous system, initially containing limonene and other monoterpenes, simulating pulp bleach conditions.					
The reactions of ozone with larger unsaturated compounds, such as the terpenes can give rise to oxygenated species with low vapour pressures that subsequently condense to form secondary organic aerosol.					
Substances containing unsaturated carbons are ubiquitous in indoor environments. They result from many sources (see below). Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health. The potential for surfactants in an enclosed space to facilitate reactions should be considered.					
Some of unsaturated substances Unsaturated substances: (Reactive Emissions) Major Stable Products produced following reaction with ozone					
Occupants (shaded breath): oleic acid and other unsaturated fatty acids; unsaturated oxidisation products	Isoprene, nitric oxide, squalene, unsaturated steroids, oleic acid	Methacrolein, methyl vinyl ketone, nitrogen dioxide, acetic acid, gamma acetone, 4OPA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid			
Soft woods, wood flooring including cypress, cedar and silver birch boards, houseplants	Isoprene, limonene, alpha-pinene, other terpenes and sesquiterpenes	Formaldehyde, 4-AMC, pinonaldehyde, pinic acid, pinonic acid, methacrolein, methyl vinyl ketone, SOAs including ultrafine particles			
Carpets and carpet backing	4-Phenylcyclohexene, 4-vinylcyclohexene, styrene, 2-ethylhexyl acrylate; unsaturated fatty acids and esters	Formaldehyde, acetaldehyde, benzaldehyde, hexanal, nonanal, 2-nonenal			
Linoleum and paint/polishes containing linseed oil	Linoleic acid, linolenic acid	Propanal, hexanal, nonanal, 2-heptenal, 2-nonenal, 2-decanal, 1-pentene-3-one, propionic acid, n-butyl acid			
Lates paint	Residual monomers	Formaldehyde			
Certain cleaning products, polishes, waxes, air fresheners	Limonene, alpha-pinene, terpinolene, alpha-terpinol, linalool, linalyl acetate and other terpenoids, longifolene and other sesquiterpenes	Formaldehyde, acetaldehyde, glyoxaldehyde, formic acid, acetic acid, acrolein and organic peroxides, acetone, benzaldehyde, 4-hydroxy-4-methyl-5-hexen-1-ol, 5-ethyl-2-thio-5-methyl-2(3H)-furanone, 4-AMC, SOAs including ultrafine particles			
Natural rubber adhesive	isoprene, terpenes	Formaldehyde, methacrolein, methyl vinyl ketone			

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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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oil may significantly attenuate the rate of this process.

Aquatic Fate: If released to water, kerosene is expected to biodegrade under both aerobic and anaerobic conditions. Bioconcentration factors for components of kerosene were estimated to be 190 to 5800 (based on estimated log octanol/water partition coefficients of 3.3 to 5.25) indicating that some components of kerosene may significantly bioconcentrate in fish and aquatic organisms. Soil adsorption coefficients for kerosene ranging from 1500 to 17,000 indicate that it may strongly adsorb to sediment and suspended organic matter. The estimated half-life for volatilisation of kerosene from a model 1m² deep flowing at 1 m/sec with a wind speed of 3 m/sec which does not take into account adsorptive processes is 3-6 hrs. The estimated half-life for volatilisation of kerosene from a model lake, which accounts for adsorptive processes, is >30 days.

Atmospheric Fate: If released to the atmosphere, kerosene may undergo oxidation by a gas-phase reaction with photochemically produced hydroxyl radicals. Estimated rate constants for the oxidation of these representative classes of compounds ranging from 1.2-2.2x10⁻¹¹ cm³/mole-sec at 25 deg C translates to an atmospheric half-life for kerosene of 2-3.4 days using an average atmospheric hydroxyl radical concentration of 5x10⁶ molecule/cm³.

The stability of kerosene in soils as affected by volatilization was determined in a laboratory column experiment by following the losses in the total concentration and the change in composition of the residues in a dune sand, a loamy sand, and a silty loam soil during a 50 day period. Seven major compounds ranging between C9 and C15 were selected from a large variety of hydrocarbons forming kerosene and their presence in the remaining petroleum product was determined. The change in composition of kerosene during the experimental period was determined by gas chromatography and related to the seven major compounds selected. The experimental conditions air-dry soil and no subsequent addition of water excluded both biodegradative and leaching losses. The losses of kerosene in air-dried soil columns during the 50-day experimental period and the changes in the composition of the remaining residues due to volatilization are reported. The volatilization of all the components determined was greater from the dune sand and loamy sand soils than from the silty loam soil. It was assumed that the reason for this behavior was that the dune sand and the loamy sand soils contain a greater proportion of large pores (> 4.5 um) than the silty loam soil, even though the total porosity of the loamy sand and the silty loam is similar. In all the soils in the experiment, the components with a high carbon number formed the main fraction of the kerosene residues after 50 days of incubation.

Volatilisation in the air phase and saturated mass flow of kerosene in the three sands (fine, medium and coarse) were studied in the laboratory under controlled conditions. Volatilisation was the major physico-chemical process affecting the fate of kerosene in the inert porous medium. During volatilization the liquid kerosene changed its composition by gradually losing its light components (C9-C13), and the viscosity of the remaining liquid kerosene increased. The increase in viscosity led to a decrease in the infiltration rate, for example, by about 20% when the viscosity increased.

Ecotoxicity: Data for various kerosene streams is available. Kerosenes and jet fuels are moderately to acutely toxic to aquatic organisms. A studies used exposures to water accommodated fractions (WAF) of the process streams. Each of the different streams exhibited similar toxicity to rainbow trout (*Oncorhynchus mykiss*, 96-hour LC 50 values of 18 - 25 mg/L), likewise, toxicity to the alga *Scenedesmus capricornutum*, with 96-hour growth rate EC50 values of 5.0 - 6.2 mg/L, and biomass inhibition EC50 values of 5.9 - 11 mg/L, did not vary greatly among the streams. There was considerable variation in the toxicity of the kerosene member (CAS No. 64742-81-0) to daphnids (*Daphnia magna*) when evaluated in different tests: in the test using daily renewal of freshly-prepared WAF, the 48-hr EC50 was estimated at 1.4 mg/L, while in the test where solution was not renewed it was estimated at 4.0 and 89 mg/L. In spite of daily renewal, a sample of sweetened kerosene (CAS No. 91770-15-9) exhibited considerably less toxicity than the hydrodesulfurized and hydrocracked materials tested in the same laboratory, indicating the difference in that measurement is due to the nature of the sample rather than variations in the testing approach.

For siloxanes:

Environmental fate: It is well accepted that polydimethylsiloxane fluids become permanent residents of sediment but should not exert adverse environmental effects. Siloxane fluids are very surface active because the flexible siloxane linkages permit alignment of the hydrophobic methyl substituents towards the non-polar phase, and of the polysiloxane backbone towards the polar phase. The polar medium is generally water, and a polar media to which polydimethylsiloxanes become attached to be limes, sewage sludge, hair, algae, sediment etc. In aqueous environments, polydimethylsiloxanes are adsorbed onto sedimenting particles. Also, in the presence of nitrate ions, which exist at various concentrations in the environment, short chain siloxanes are photodegraded to the level of silicate within days.

The stability of the siloxanes, desirable from a technical point of view, makes the siloxanes very persistent, and once released to the environment the siloxanes remain for many years. The main source of releases of siloxanes to the air is volatile siloxanes used in cosmetics, wax, polishes, and to a minor extent in several other applications. The volatile siloxanes may account for a significant part of the siloxanes used for cosmetics.

Non-volatile siloxane fluids used in cosmetics, wax, polishes, cleaning products and for textile applications (softeners) will to a large extent end up in wastewater and be directed to wastewater treatment plants.

The cyclic siloxanes and small-chain linear siloxanes are bioconcentrated (bioconcentration factors for long-chained siloxanes have not been assessed). The estimated bioconcentration factors (BCF) of the small siloxanes range from 340 for HMDCS to 40,000 for a phenyl trimethylsiloane (phenyl trimethylsiloane). The small phenylated siloxanes seem to have a very high BCF, and model estimates indicate that these substances are the most toxic for aquatic organisms.

PBT profiler screening

In order to make a first comparison between the substances as to persistence, bioaccumulation and toxicity, the substances were screened using the PBT profiler developed by U.S. EPA (U.S. EPA 2003). The profiler uses a procedure to predict persistence, bioaccumulation, and toxicity of organic chemicals on the basis of the chemical structure and physical parameters of the substances combined with experimental parameters for substance with a similar structure, using a QSAR approach.

The results for six members of the siloxane family predict the highest bioconcentration factors for the two phenyl siloxanes, one order of magnitude higher than the values for the cyclic siloxanes and two orders of magnitude higher than the values for the small linear methyl siloxanes. The predicted toxicity is as well significantly higher (lowest ChV values) for the phenyl siloxanes. The predicted half-life is nearly the same for all substances.

Using U.S. EPA's criteria, the screening indicates that all substances are of high concern as to environmental toxicity, and that the phenyl siloxanes are considered very bioaccumulative.

Ecotoxicity:

The environmental fate and effects of volatile methylsiloxanes (mainly cyclosiloxanes) and polydimethylsiloxane (PDMS) have been reported:

For acetylmethylsiloxanes:
Fish acute LC50 (14 day): rainbow trout 10 ug/L; sheephead minnow >6.3 ug/L
Daphnia magna acute EC50 (48 h): >15 ug/L; NOEC 15 ug/L
Mysid shrimp acute LC50 (96 h): >9.1 ug/L; NOEC 9.1 ug/L

For PDMS:
Daphnia magna NOEC 572 mg/kg
Physical effects such as surface entrapment have been observed when testing aquatic invertebrates in clean laboratory water, but similar effects are not expected in natural environments where a large variety of other surfaces provide opportunities for desorption for lubricating oil base stocks:

Vapor Pressure: Vapor pressures of lubricating base oils are reported to be negligible. In one study, the experimentally measured vapor pressure of a solvent-devised heavy paraffinic distillate base oil was 1.7 x 10⁻⁶ Pa. Since base oils are mixtures of C15 to C50 paraffinic, naphthenic, and aromatic hydrocarbon isomers, representative components of those substances were selected to calculate a range of vapor pressures. The estimated vapor pressure values for these selected components of base oils ranged from 4.5 x 10⁻¹¹ Pa to 2 x 10⁻¹⁰ Pa. Based on Dalton's Law the expected total vapor pressure for base oils would fall well below minimum levels (10⁻¹⁰ Pa) of recommended experimental procedures.

Partition Coefficient (log K_{ow}): In mixtures such as the base oils, the percent distribution (i.e., paraffins, naphthenes, and aromatics) and the carbon chain lengths determines in part the partitioning characteristics of the mixture. Generally, hydrocarbon chains with fewer carbon atoms tend to have lower partition coefficients than those with higher carbon numbers. However, due to their complex composition, unequivocal determination of the log K_{ow} of these hydrocarbon mixtures cannot be made. Rather, partition coefficients of selected C15 chain-length hydrocarbon structures representing paraffinic, naphthenic, and aromatic constituents in base oil lubricants were modeled. Results showed typical log K_{ow} values from 4.9 to 7.7, which were consistent with values of 4-8 for lubricating oil base stocks.

Water Solubility: When released to water, base oils will float and spread at a rate that is viscosity dependent. While water solubility of base oils is typically very low, individual hydrocarbons exhibit a wide range of solubility depending on molecular weight and degree of unsaturation. Decreasing molecular weight (i.e., carbon number) and increasing levels of unsaturation increases the water solubility of these materials. As noted for partition coefficient, the water solubility of lubricating base oils cannot be determined due to their complex mixture characteristics. Therefore, the water solubility of individual C15 hydrocarbons representing the different groups making up base oils (i.e., linear and branched paraffins, naphthenes, and aromatics) was modeled. Based on water solubility modeling of those groups, aqueous solubilities are typically much less than 1 ppm, (0.003-0.63 mg/l).

Environmental Fate:

Photodegradation: Chemicals having potential to photolyse have UV/visible absorption maxima in the range of 290 to 800 nm. Some chemicals have absorption maxima significantly below 290 nm and are therefore not expected to undergo direct photolysis in sunlight (e.g., chemicals such as alkanes, alkenes, alkyne, saturated alcohols, and saturated acids). Most hydrocarbon constituents of the materials in this category are not expected to photolyse since they do not show absorbance within the 290-800 nm range. However, photodegradation of polyaromatic hydrocarbons (PAHs) can occur and may be a significant degradation pathway for these constituents of lubricating base oils. The degree and rate at which PAHs may photodegrade depend upon whether conditions allow penetration of light with sufficient energy to effect a change. For example polycyclic aromatic compounds (PAC) compounds bound to sediments may persist due to a lack of sufficient light penetration.

Atmospheric gas-phase reactions: can occur between organic chemicals and reactive molecules such as photochemically produced hydroxyl radicals, ozone and nitrogen oxides. Atmospheric oxidation as a result of radical attack is not direct photochemical degradation. In general, lubricating base oils have low vapor pressures and volatilisation is not expected to be a significant removal mechanism for the majority of the hydrocarbon components. However, some components (e.g., C-15 branched paraffins and naphthenes) appear to have the potential to volatilise. Atmospheric half-lives of 0.10 to 0.56 days have been calculated for representative C15 hydrocarbon components of lubricating base oils.

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bicyclic terpenes would exhibit a significant genotoxic potential in vivo.

A member or analogue of a group of aliphatic and aromatic terpene hydrocarbons generally considered as safe (GRAS) based, in part, on their self-limiting properties as flavouring substances in food: their rapid absorption, metabolic detoxication, and excretion in humans and other animals; their low level of flavour; the wide margins of safety between the conservative estimates of intake and the no-observed-adverse effect levels determined from subchronic and chronic studies and the lack of significant genotoxic potential.

Consumers are exposed to aliphatic and terpene hydrocarbons from a variety of ingested and environmental source. Quantitative natural occurrence data for 17 aliphatic terpene hydrocarbons in the group demonstrate that their consumption occurs predominantly as natural components of traditional food.

Oral LD50 values have been reported for 15 of the 17 substances in this group. LD50 values range from 1930 to greater than 8000 mg/kg bw in rats, and 2000 to greater than 13,360 mg/kg bw in mice. These values indicate that aliphatic and aromatic hydrocarbons exhibit low acute oral toxicity.

Although members of this group have been shown to exhibit renal carcinogenic potential in the male F344/N rat, the mechanism leading to these findings is known and strongly indicates that the nephropathy associated with monoterpene hydrocarbons has no significance for human risk.

Flavor and Extracts Manufacturers Association (FEMA)

Acute Toxicity	☐	Carcinogenicity	☐
Skin Irritation/Corrosion	☑	Reproductive	☐
Serious Eye Damage/Irritation	☐	STOT - Single Exposure	☑
Respiratory or Skin Sensitization	☑	STOT - Repeated Exposure	☑
Mutagenicity	☑	Aspiration Hazard	☑

Legend: ✗ - Data available but does not fill the criteria for classification
☑ - Data required to make classification available
☐ - Data Not Available to make classification

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
distillates, petroleum, light, hydroretated	LC50	96	Fish	2.2mg/L	4
distillates, petroleum, light, hydroretated	NOEC	3072	Fish	=1mg/L	1
petroleum distillates HFP	EC50	96	Algae or other aquatic plants	64mg/L	2
petroleum distillates HFP	EC50	48	Crustacea	>100mg/L	1
petroleum distillates HFP	EC50	96	Algae or other aquatic plants	=450mg/L	2
beta-pinene	EC50	384	Crustacea	0.13mg/L	3
beta-pinene	EC50	96	Algae or other aquatic plants	0.563mg/L	3
beta-pinene	LC50	96	Fish	0.445mg/L	3
alpha-pinene	NOEC	96	Crustacea	=0.18mg/L	1
alpha-pinene	EC50	384	Crustacea	0.129mg/L	3
alpha-pinene	EC50	96	Algae or other aquatic plants	0.663mg/L	3
alpha-pinene	LC50	96	Fish	0.28mg/L	2
polydimethylsiloxane	LC50	96	Fish	3.16mg/L	4

Legend: ✗ - Data available but does not fill the criteria for classification
☑ - Data required to make classification available
☐ - Data Not Available to make classification

Excerpted from 1. IUCLD Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPWMI Suite V3.12 - Aquatic Toxicity Data (Estimated) 4. U.S. EPA, Ecoloc database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. IRETI (Japan) - Bioconcentration Data 8. Vendor Data

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Do NOT allow product to come in contact with surface waters or intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment wash-waters.
Wastes resulting from use of the product must be disposed of on site or at approved waste sites.
When spilled the product may act as typical oil, causing a film, sheen, emulsion or sludge on or beneath the surface of the body of water. The oil film on water surface may physically affect the aquatic organisms due to the interruption of the oxygen transfer between the air and the water.
Oils of any kind can cause:
→ drooping of water-fowl due to lack of buoyancy; loss of insulating capacity of feathers; starvation and vulnerability to predators due to lack of mobility
→ lethal effects on fish by coating gill surfaces, preventing respiration
→ asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom and
→ adverse aesthetic effects of fouled shoreline and beaches

In case of accidental releases on the soil, a fine film is formed on the soil, which prevents the plant respiration process and the soil particle saturation. It may cause deep water infiltration.
For kerosene:
For kerosene-range refinery streams ("kerosenes")
Kerosene is the name for the lighter end of a group of petroleum streams known as the middle distillates.
Kerosene may be obtained either from the distillation of crude oil under atmospheric pressure (straight-run kerosene) or from catalytic, thermal or steam cracking of heavier petroleum streams (cracked kerosene). The kerosenes are further treated by a variety of processes (including hydrogenation) to remove or reduce the level of sulfur, nitrogen or olefinic materials. The precise composition of any particular kerosene will depend on the crude oil from which it was derived and on the refinery processes used for its production.
The streams are complex mixtures of paraffinic, isoparaffinic, naphthenic, cycloparaffinic and aromatic (mainly alkylbenzene) hydrocarbons ranging in carbon number from C5-26 (mainly C9-16) and in the range 145 to 300 C. Chlorine contents less than 5% of the mixtures, by volume, and polycyclic aromatic hydrocarbons (PAHs) (3-7 fused rings content is typically very low. Jet fuels (e.g., Jet A, JP-8, etc.) are included because they are composed almost entirely of two of these streams straight run kerosene (CAS No. 8008-20-6) or hydrodesulfurized kerosene (CAS No. 64742-81-0).

Environmental Fate

Terrestrial fate: If released to soil, kerosene is expected to biodegrade under both aerobic and anaerobic conditions. Kerosene is a mixture of petroleum hydrocarbons, chiefly C10-C16 alkanes, and a typical analysis includes the identification of n-dodecane, alkyl benzene derivatives, naphthalene, and tetrahydronaphthalenes. Soil adsorption coefficients for these representative classes of compounds ranging from 1500 to 17,000 obtained from estimated log octanol/water partition coefficients of 3.3 to 5.25 indicate that some components of kerosene may display low mobility and some will be essentially immobile in soil. The vapour pressure of kerosene, 0.48 mm Hg indicates that it may rapidly volatilise from dry soil to the atmosphere although its expected strong adsorption to

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SC Auto (Myanmar) Co., Ltd.

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<p>was found between respiratory complaints related to fragrances and contact allergy to fragrance ingredients. In addition to hand eczema, which were independent risk factors in a multivariate analysis.</p> <p>Fragrance allergens act as haptens, i.e. low molecular weight chemicals that are immunogenic only when attached to a carrier protein. However, not all sensitizing fragrance chemicals are directly reactive, but require previous activation. A prehapten is a chemical that itself is non- or low-sensitizing, but that is transformed into a hapten outside the skin by simple chemical transformation (air oxidation, photoactivation) and without the requirement of specific enzymatic systems.</p> <p>In the case of prehapten, it is possible to prevent activation outside the body to a certain extent by different measures, e.g. prevention of air exposure during handling and storage of the ingredients and the final product, and by the addition of suitable antioxidants. When antioxidants are used, care should be taken that they will not be activated themselves and thereby form new sensitizers.</p> <p>Prenhapten</p> <p>Most terpenes with oxidizable allylic positions can be expected to autooxidize on air exposure due to their inherent properties. Depending on the stability of the oxidation products that are formed, a difference in the sensitization potency of the oxidized terpenes can be seen.</p> <p>Autooxidation is a free radical chain reaction in which hydrogen atom abstraction in combination with addition of oxygen forms peroxy radicals. The reaction shows selectivity for positions where stable radicals can be formed. So far, all fragrance substances that have been investigated with regard to the influence of autooxidation on the allergenic potential, including identification of formed oxidation products, have oxidizable allylic positions that are able to form hydroperoxides and/or hydrogen peroxide as primary oxidation products upon air exposure. Once the hydroperoxides have been formed outside the skin they form specific antigens and act as skin sensitizers. Secondary oxidation products such as aldehydes and epoxides can also be allergenic. Thus further increasing the sensitization potency of the autooxidation mixture. The process of photoactivation may also play a role, but further research is required to establish whether this activation route is currently underestimated in importance due to insufficient knowledge of the fine structure in this context.</p> <p>It should be noted that activation of substances via air oxidation in various haptens that might be the same or cross-reacting with other haptens (allergens). The main allergens after air oxidation of linolol and linyl acetate are the hydroperoxides. If linolol acetate is chemically hydrolyzed outside the skin it can thereafter be oxidized to the same haptens as seen for linolol. A corresponding example is trinalol and trinalyl acetate. In clinical studies, concomitant reactions to oxidized linolol and oxidized linyl acetate have been observed. Whether these reactions depend on cross-reactivity or are due to exposure to both fragrance substances cannot be elucidated as they have an allergenic effect themselves. Linolol and linyl acetate are the main components of lavender oil. They autooxidize on air exposure also when present in the essential oil, and form the same oxidation products found in previous studies of the pure synthetic terpenes. Experimental sensitization studies showed that air exposure of lavender oil increased the sensitization potency. Patch test results in dermatitis patients showed a connection between positive reactions to oxidized linolol, linyl acetate and lavender oil.</p> <p>Prenhapten</p> <p>Compounds that are bioactivated in the skin and thereby form haptens are referred to as prehapten.</p> <p>In the case of prehapten, the possibility to become activated is inherent to the molecule and activation cannot be avoided by extrinsic measures. Activation processes increase the risk for cross-reactivity between fragrance substances. Cross-reactivity has been shown for certain alcohols and their corresponding aldehydes, i.e. between geraniol and geranyl alcohol and chrysanthenol and chrysanthenol.</p> <p>The human skin expresses enzyme systems that are able to metabolize xenobiotics, modifying their chemical structure to increase hydrophilicity and allow elimination from the body. Xenobiotic metabolism can be divided into two phases: phase I and phase II. Phase I transformations are known as activation or functionalization reactions, which normally introduce or unmask hydrophilic functional groups. If the metabolites are sufficiently polar at this point they will be eliminated. However, many phase I products have to undergo subsequent phase II transformations, i.e. conjugation to make them sufficiently water soluble to be eliminated. Although the purpose of xenobiotic metabolism is detoxification, it can also convert relatively harmless compounds into reactive species. Cutaneous enzymes that catalyze phase I transformations include the cytochrome P450 mixed-function oxidase system, alcohol and aldehyde dehydrogenases, monoamine oxidases, flavin-containing monooxygenases and hydrolytic enzymes. Acyltransferases, glutathione S-transferases, UDP-glucuronosyltransferases and sulfotransferases are examples of phase II enzymes that have been shown to be present in human skin. These enzymes are known to catalyze both activating and deactivating biotransformations, but the influence of the reactions on the allergenic activity of skin sensitizers has not been studied in detail. Skin sensitizing prehapten can be recognized and grouped into chemical classes based on knowledge of xenobiotic bioactivation reactions, clinical observations and/or <i>in vivo</i> and <i>in vitro</i> studies of sensitization potential and chemical reactivity.</p> <p>QSAR prediction: The relationships between molecular structure and reactivity that form the basis for structural alerts are based on well established principles of mechanistic organic chemistry. Examples of structural alerts are aliphatic aldehydes (relating to the possibility of sensitization via a Schiff base reaction with protein amino groups), and alpha,beta-unsaturated carbonyl groups, C=C=O (relating to the possibility of sensitization via Michael addition of protein thiol groups). Prediction of the sensitization potential of compounds that can act via abiotic or metabolic activation (pre- or prehapten) is more complex compared to that of compounds that act as direct haptens without any activation. The activation patterns can differ due to differences in the stability of the intermediates formed, e.g. it has been shown that autooxidation of the structural isomers linolol and geranyl results in different major haptens/allergens. Moreover, the complexity of the prediction increases further for those compounds that can act both as pre- and prehapten. In such cases, the impact on the sensitization potency depends on the degree of abiotic activation (e.g. autooxidation) in relation to the metabolic activation.</p> <p>For biocyclic terpenes:</p> <p>Acute toxicity: The literature abounds with clinical reports of accidental and intentional acute poisoning with pinene-based turpentine.</p> <p>Rat oral LD50 values are available for alpha-pinene, beta-pinene, camphene and turpentine oil and indicate these materials to be very low in oral acute toxicity with LD50 values in the range from 3389 mg/kg to greater than 5000 mg/kg. Rabbit dermal LD50 values similarly indicate very low toxicities with values greater than the limit doses of 2000 or 5000 mg/kg.</p> <p>Acute inhalation toxicity has been measured in different animal species. The acute LC50 was reported to be 13,500 mg/m³ in rats, 13,500 mg/m³ in guinea pigs, and 9000 mg/m³ in mice. The acute inhalation LC50 of commercial grade turpentine in Vistar rats is reported to be in the range of 12,000-20,000 mg/m³ for 1 to 4 hour exposures and the LC50 for a 2-hour exposure in Swiss-Wistar mice is 29,000 mg/m³. Based on these results the acute oral, dermal, and inhalation toxicities of biocyclic terpene hydrocarbons is concluded to be low.</p> <p>Repeat dose toxicity: A 28-day repeat dose study has been performed with camphene according to an OECD Guideline 407 in both sexes of Wistar rats. Animals of both sexes at the 1000 mg/kg bw/day dose exhibited vacuolization of hepatocytes and increase liver weights. Male rats also exhibited alpha-2-microglobulin-type nephropathy at all dose levels.</p> <p>Subsequent investigations have shown that the alpha-2-microglobulin nephropathy found in the F344/N male rat does not develop in animals that do not receive the hepatic form of alpha-2-microglobulin (e.g. other strains of rats, mice, dogs, humans). Therefore, the nephropathy observed in the camphene study in male F344 rats is not relevant to the human health risk assessment. Based on liver toxicity, the NOAEL for this study is concluded to be 250 mg/kg bw/day.</p> <p>Reproductive toxicity: In the <i>a</i>-animal species study, no reproductive effects were observed when dose levels of up to 250 to 600 mg/kg bw of an essential oil predominantly composed of biocyclic terpene hydrocarbons (alpha-pinene, beta-pinene, and sabinene) was administered daily to mice, rats, or hamsters during gestation. When this data is combined with the fact that no adverse effects were observed to the reproductive organs in a 28-day study with camphene at dose levels up to 250 mg/kg bw/day, it is concluded that biocyclic terpene hydrocarbons including alpha-pinene and beta-pinene are not reproductive toxicants.</p> <p>The nearly day inhalation studies have been performed for alpha-pinene in which a full complement of male and female sex organs and tissues were subjected to histopathological examination. Both studies reported no microscopic changes that could be associated with exposure to the test substance. Taking into account the lack of any effects to females in an earlier teratology study, the absence of any maternal or developmental effects in a reproductive/developmental study of a pinene-based oil and for a structurally related monoterpene hydrocarbon, myrcene, it can be concluded that the members of this category show no significant reproductive or developmental toxicity.</p> <p>Developmental toxicity: Based on the NOAELs for maternal and developmental toxicity in studies with camphene (250 and 1000 mg/kg bw/day) and a terpene hydrocarbon mixture containing alpha- and beta-pinene and camphene (688 mg/kg bw/day), and the lack of any signs of maternal or developmental toxicity in a mice, rats, or hamsters given 260 to 600 mg/kg bw/day of a mixture composed primarily (>80%) of alpha- and beta-pinene and sabinene, it is concluded that biocyclic terpene hydrocarbons are not maternal or developmental toxicants.</p> <p>Genotoxicity:</p> <p><i>In vitro</i> / <i>in vivo</i> genotoxicity assays available for alpha-pinene, beta-pinene and camphene demonstrate that these substances have a little, if any, genotoxic potential. In standard Ames assays of alpha-pinene, beta-pinene and camphene, <i>Salmonella typhimurium</i> strains TA97, TA98, TA100, TA102, TA1537, and TA1538 provided no evidence of mutagenicity at any dose tested.</p> <p><i>In vivo</i>: Based on the lack of any evidence of genotoxicity in numerous <i>in vitro</i> assays with and without metabolic activation, it is unlikely that any of these</p>	<p>BETA-PINENE & ALPHA-PINENE</p> <p>(with/without activation)</p> <p>In vivo Genotoxicity: Multiple <i>in vivo</i> genotoxicity studies have been done on a variety of terpenes-based materials. Four samples of terpenes were negative and a sample of Jet A was positive in <i>in vivo</i> bone marrow cytogenetic tests in Sprague-Dawley rats. One of the terpenes samples produced a positive response in male mice and negative results in females when tested in a sister chromatid exchange assay. Both deodorized terpenes and Jet A samples produced negative results in dominant lethal assays. The terpenes was administered to both mice and rats intraperitoneally, while the jet fuel was administered orally to mice via inhalation.</p> <p>Reproductive/Developmental Toxicity: Either 0, 20, 40 or 60% (v/v) terpenes in mineral oil was applied to the skin of the rats. The dose per body weight equivalents were 0, 165, 330 and 494 mg/kg. Test material was applied daily, 7 days/week from 14 days pre-mating through 20 days of gestation. There were no treatment-related effects on mortality and no clinical signs of toxicity were observed. There were no compound-related effects on any of the reproductive/developmental parameters. The authors concluded that the no observable effect level (NOEL) for reproductive/developmental toxicity of HDS terpenes under the treatment conditions of the study was 494 mg/kg/day.</p> <p>Developmental toxicity screening studies on a terpenes and a sample of Jet A have been reported. There were no compound-related deaths in either study. While terpenes produced no clinical signs, the jet fuel produced a dose-related eye irritation (or infection). The signs of irritation lasted from 2 to 8 days with most animals showing signs for 3 days. Neither of the test materials had an effect on body weights or food consumption. Examination of offspring at delivery did not reveal any treatment-related abnormalities, soft tissue changes or skeletal abnormalities. The sex ratio of the fetuses was also unaffected by treatment with either of the compounds.</p> <p>Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADDS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADDS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADDS. RADDS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterized by dyspnea, cough and mucus production.</p> <p>Adverse reactions to fragrances in perfumes and in fragranced cosmetic products include allergic contact dermatitis. Irritant contact dermatitis, photoallergy, immediate contact reactions (contact urticaria), and pigmented contact dermatitis. Airborne and inhaled contact dermatitis occur. Intolerance to perfumes, by inhalation, may occur if the perfume contains a sensitizing principle. Symptoms may vary from general illness, coughing, phlegm, wheezing, chest-tightness, headache, exertional dyspnea, acute respiratory illness, hayfever, and other respiratory diseases (including asthma). Perfumes are also known to induce hyper-reactivity of the respiratory tract without producing an IgE-mediated allergy or demonstrable respiratory obstruction. This was shown by placebo-controlled challenges of nine patients to "perfume mix". The same patients were also subjected to perfume provocation, with or without a carbon filter mask, to ascertain whether breathing through a filter with active carbon would prevent symptoms. The patients breathed through the mouth during the provocations, as a nose clamp was used to prevent nasal inhalation. The patient's earlier symptoms were induced, breathing through the carbon filter had no protective effect. The symptoms were not transmitted via the olfactory nerve but they may have been verified by ligamental reflex via the respiratory tract by the eyes.</p> <p>Cases of occupational asthma induced by perfume substances such as isoamyl acetate, limonene, cinnamaldehyde and benzaldehyde, tend to give persistent symptoms even though the exposure is below occupational exposure limits.</p> <p>Inhalation intolerance has also been produced in animals. The emissions of the fragrance products for one hour, produced various combinations of sensory irritation, pulmonary irritation, decreases in expiratory airflow velocity as well as alterations of the functional observational battery indicative of neurotoxicity in mice. Neurotoxicity was found to be more severe after mice were repeatedly exposed to the fragrance products, being four brands of cologne and one brand of toilet water.</p> <p>Contact allergy to fragrances is relatively common, affecting 1 to 3% of the general population, based on limited testing with eight common fragrance allergens and about 16 % of patients patch tested for suspected allergic contact dermatitis.</p> <p>Contact allergy to fragrance ingredients occurs when an individual has been exposed, on the skin, to a sufficient degree of fragrance contact allergens. Contact allergy is a life-long, specifically attered reactivity in the immune system. This means that once contact allergy is developed, cells in the immune system will be present which can recognize and react towards the allergen. As a consequence, symptoms, i.e. allergic contact dermatitis, may occur upon re-exposure to the fragrance allergens in question. Allergic contact dermatitis is an inflammatory skin disease characterized by erythema, swelling and vesicles in the acute phase. If exposure continues it may develop into a chronic condition with scaling and painful fissures of the skin. Allergic contact dermatitis to fragrance ingredients is most often caused by cosmetic products and usually involves the face and/or hands. It may affect fitness for work and the quality of life of the individual. Fragrance allergy has long been recognized as a frequent and potentially disabling problem. Prevention is possible as it is an environmental disease and if the environment is modified (e.g. by reduced use concentrations of allergens), the disease frequency and severity will decrease. Fragrance contact allergy is mostly non-occupational and related to the personal use of cosmetic products. Allergic contact dermatitis can be severe and widespread, with a significant impairment of quality of life and potential consequences for fitness for work. Thus, prevention of contact sensitization to fragrances, both in terms of primary prevention (avoiding sensitization) and secondary prevention (avoiding re-exposure of allergic contact dermatitis to those already sensitized), is an important objective of public health risk management measures.</p> <p>Hands: Contact sensitization may be the primary cause of hand eczema, or may be a complication of irritant or atopic hand eczema. The number of positive patch tests has been reported to correlate with the duration of hand eczema, indicating that long-standing hand eczema may often be complicated by sensitization. Fragrance allergy may be a relevant problem in patients with hand eczema; perfumes are present in consumer products to which their hands are exposed. A significant relationship between hand eczema and fragrance contact allergy has been found in some studies based on patients investigated for contact allergy. However, hand eczema is a multi-factorial disease and the clinical significance of fragrance contact allergy in a severely chronic hand eczema may not be clear.</p> <p>Adverse Bilateral axillary underarm dermatitis may be caused by perfume in deodorants and, if the reaction is severe, it may spread down the arms and to other areas of the body. In individuals who consulted a dermatologist, a history of such first-time symptoms was significantly related to the later diagnosis of perfume allergy.</p> <p>Face/Facial eczema is an important manifestation of fragrance allergy from the use of cosmetic products (16). In men, after-shave products can cause an eczematous eruption of the beard area and the adjacent part of the neck and men using wet shaving as opposed to dry shaving have been shown to have an increased risk of having fragrance allergic.</p> <p>Irritant reactions (including contact urticaria): Irritant effects of some individual fragrance ingredients, e.g. citral are known. Irritant contact dermatitis from perfumes is believed to be common, but there are no existing investigations to substantiate this. Many more people complain about intolerance or rashes to perfumes/perfumed products than are shown to be allergic by testing. This may be due to irritant effects or inadequate diagnostic procedures. Fragrances may cause a dose-related contact urticaria of the non-immunological type (irritant contact urticaria). Cinnamal, cinnamic alcohol, and Myroxylon peroxide are well recognized causes of contact urticaria. But others, including menthyl, vanillin and benzaldehyde have also been reported. The reactions to Myroxylon peroxide may be due to cinnamates. A relationship to delayed contact hypersensitivity was suggested, but no significant difference was found between a fragrance-allergic group and a control group in the frequency of immediate reactions to fragrance ingredients in keeping with a nonimmunological basis for the reactions seen.</p> <p>Pigmentary anomalies: The term "pigmented cosmetic dermatitis" was introduced in 1973 for what had previously been known as melasma facie femine when the mechanism (type IV allergy) and causative allergens were clarified. It refers to increased pigmentation, usually on the face/neck, often following sub-clinical contact dermatitis. Many cosmetic ingredients were patch tested at non-irritant concentrations and statistical evaluation showed that a number of fragrance ingredients were associated: jasmine absolute, ylang-ylang oil, cananga oil, benzyl salicylate, hydroxyacetone, sandalwood oil, geraniol, geranium oil.</p> <p>Photo-reactions: Musk ambrette produced a considerable number of allergic photocontact reactions (in which UV-light is required) in the 1970s and was later banned from use in the EU. Nowadays, photoallergic contact dermatitis is uncommon. Furocoumarins (psoralens) in some plant-derived fragrance ingredients caused phototoxic reactions with erythema followed by hyperpigmentation resulting in Belouque disease. There are now limits for the amount of furocoumarins in fragrance products. Phototoxic reactions still occur but are rare.</p> <p>General respiratory: Fragrances are volatile and therefore, in addition to skin exposure, a perfume also exposes the eyes and nose-respiratory tract. It is estimated that 2-4% of the adult population is affected by respiratory or eye symptoms by such an exposure. It is known that exposure to fragrances may exacerbate pre-existing asthma. Asthma-like symptoms can be provoked by sensory mechanisms. In an epidemiological investigation, a significant association</p>	
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)		
<p>Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) & PARAFFIN WAX</p>	<p>Studies indicate that normal, branched and cyclic paraffins are absorbed from the mammalian gastrointestinal tract and that the absorption of n-paraffins is inversely proportional to the carbon chain length with little absorption above C30. With respect to the carbon chain lengths likely to be present in mineral oil, n-paraffins may be absorbed to a greater extent than iso- or cyclo-paraffins.</p> <p>The major classes of hydrocarbons have been shown to be well absorbed by the gastrointestinal tract in various species. In many cases, the hydrophobic hydrocarbons are ingested in association with dietary lipids. The dependence of hydrocarbon absorption on concomitant glyceride digestion and absorption is known as the "hydrocarbon continuum hypothesis", and asserts that a series of solubilizing phases in the intestinal lumen, created by dietary triglycerides and their digestion products, afford hydrocarbons a route to the lipid phase of the intestinal absorptive cell (reticuloendothelium). While some hydrocarbons may traverse the mucosal epithelium unmetabolised and appear as solutes in lipoprotein particles in intestinal lymph, there is evidence that most hydrocarbons partially separate from nutrient lipids and undergo metabolic transformation in the enterocyte. The enterocyte may play a major role in determining the proportion of an absorbed hydrocarbon that, by escaping initial biotransformation, becomes available for deposition in its unchanged form in peripheral tissues such as adipose tissue, or in the liver.</p>	
<p>Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) & PETROLEUM DISTILLATES HFP</p>	<p>for petroleum: This product contains benzene which is known to cause acute myeloid leukaemia and n-hexane which has been shown to metabolize to compounds which are neurotoxic.</p> <p>This product contains toluene. There are indications from animal studies that prolonged exposure to high concentrations of toluene may lead to hearing loss. This product contains ethyl benzene and naphthalene from which there is evidence of tumours in rodents.</p> <p>Carcinogenicity: Inhalation exposure to mice causes liver tumours, which are not considered relevant to humans; inhalation exposure to rats causes kidney tumours which are not considered relevant to humans.</p> <p>Mutagenicity: There is a large database of mutagenicity studies on gasoline and gasoline blending streams, which use a wide variety of endpoints and give predominantly negative results. All in vivo studies in animals and recent studies in exposed humans (e.g. petrol service station attendants) have shown negative results in mutagenicity assays.</p> <p>Reproductive Toxicity: Repeated exposure of pregnant rats to high concentrations of toluene (around or exceeding 1000 ppm) can cause developmental effects, such as lower birth weight and developmental neurotoxicity, on the foetus. However, in a two-generation reproductive study in rats exposed to gasoline vapour condensate, no adverse effects on the foetus were observed.</p> <p>Human Effects: Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis and may make the skin more susceptible to irritation and penetration by other materials.</p> <p>Lifetime exposure of rodents to gasoline produces carcinogenicity although the relevance to humans has been questioned. Gasoline induces kidney cancer in male rats as a consequence of accumulation of the alpha2-microglobulin protein in hyaline droplets in the male (but not female) rat kidney. Such abnormal accumulation results lysosomal overload and leads to chronic renal tubular cell degeneration, accumulation of cell debris, mineralisation of renal medullary tubules and necrosis. A sustained regenerative proliferation occurs in epithelial cells with subsequent neoplastic transformation with continued exposure. The alpha2-microglobulin is produced under the influence of hormonal controls in male rats but not in females and, more importantly, not in humans.</p> <p>For "kerosenes" Acute toxicity: Oral LD50s for three kerosenes (Jet A, CAS No. 8009-20-6 and CAS No. 64742-81-0) ranged from ~2 to >20 g/kg. The dermal LD50s of the same three kerosenes were all >2.0 g/kg. Inhalation LC50 values in Sprague-Dawley rats for straight run kerosene (CAS No. 8009-20-6) and hydrodesulfurized kerosene (CAS No. 64742-81-0) were reported to be > 5 and > 5.2 mg/l, respectively. No mortalities in rats were reported in rats when exposed for eight hours to saturated vapor of deodorized kerosene (probably a desulfurized kerosene). Six hour exposures of rats to the same material produced an LC50 of 6-4 mg/l.</p> <p>When tested in rabbits for skin irritation, straight run kerosene (CAS No. 8009-20-6) produced "moderate" to "severe" irritation. Six additional skin irritation studies on a range of kerosenes produced "mild" to "severe" irritation.</p> <p>An eye irritation in rabbits of straight run kerosene (CAS No. 8009-20-6) produced Draze scores of 0.7 and 2.0 (unwashed and washed eyes) at 1 hour. By 24 hours, the Draze scores had returned to zero. Eye irritation studies have also been reported for hydrodesulfurized kerosene and jet fuel. These materials produced more irritation in the unwashed eyes at 1 hour than had the straight run kerosene. The eye irritation persisted longer than that seen with straight run kerosene, but by day 7 had resolved.</p> <p>Straight run kerosene (CAS No. 8009-20-6), Jet A, and hydrodesulfurized kerosene (CAS No. 64742-81-0) have not produced sensitisation when tested in guinea pigs.</p> <p>Repeat-dose toxicity: Multiple repeat-dose toxicity studies have been reported on a variety of kerosenes or jet fuels. When applied dermally, kerosenes and jet fuels have been shown to produce dermal and systemic effects.</p> <p>Dose levels of 200, 1000 and 2000 mg/kg of a straight run kerosene (CAS No. 8009-20-6) were applied undiluted to the skin of male and female New Zealand white rabbits. The test material was applied 3x/week for 26 days. One male and one female in the 2000 mg/kg dose group found dead on days 10 and 24 respectively were thought to be treatment-related. Clinical signs that were considered to be treatment-related included: thinness; nasal discharge; urinary soiled and anal discharge; wheezing. The high dose group appeared to have a treatment related mean body weight loss when compared to controls. Dose-related skin irritation was observed, ranging from "slight" to "moderate" in the low and high dose groups, respectively. Other treatment-related dermal findings included cracked, itchy and/or leathery skin, crusts and/or hair loss. Reductions in RBC, haemoglobin and haematocrit were seen in the male dose groups. There were no treatment related effects on a variety of clinical chemistry values. Absolute and relative weights for a number of organs were normal, with the following exceptions that were judged to be treatment-related:</p> <ul style="list-style-type: none"> - increased relative heart weights for the mid- and high- dose males and females, - increased absolute and relative spleen weights in treated females, and - differences in absolute and relative adrenal weights in both male and female treated animals (considered to be stress-related and therefore, indirectly related to treatment). <p>Gross necropsy findings were confined largely to the skin. Enlarged spleens were seen in the female groups. Microscopic examination of tissues taken at necropsy found proliferative inflammatory changes in the treated skin of all male and female animals in the high dose group. These changes were, in the majority of animals, accompanied by an increase in granulocytes of the bone marrow. Four of six high dose males had testicular changes (multifocal or diffuse tubular hypoplasia) that were considered by the study authors to be secondary to the skin and/or weight changes.</p> <p>In a different study, hydrodesulfurized kerosene was tested in a thirteen-week dermal study using Sprague-Dawley rats. Test material was applied 5x/week to the skin of male and female rats at dose levels of 165, 330 and 495 mg/kg. Aside from skin irritation at the site of application, there were no treatment-related clinical signs during the study. Spraying of an animal using a fan-finisher (FFD) did not result in any substance-related effects.</p> <p>Ophthalmological examination of all animals also found no treatment-related effects. There were no treatment-related effects on growth rates, hematological or clinical chemistry values, or absolute or relative organ weights. Microscopic examination of tissues from animals surviving to termination found no treatment-related changes, with the exception of a minimal degree of a proliferative and inflammatory changes in the skin.</p> <p>A hydrodesulfurized mid-range distillate (CAS No. 64742-09-0) has also been tested in a four week irritation study. In this study, Sprague-Dawley rats were exposed to a nominal concentration of 25mg/m³ kerosene. Exposures were for approximately 6 h/day, five days each week for four consecutive weeks. There were no treatment-related effects on clinical condition, growth rate, absolute or relative organ weights, or any of the hematological or clinical chemistry determinations. Microscopic examination found no treatment-related changes observed in any tissues.</p> <p>Carcinogenicity: In addition to the repeated-dose studies discussed above, a number of dermal carcinogenicity studies have been performed on kerosenes or jet fuels. Following the discovery that hydrodesulfurized (HDS) kerosene caused skin tumors in lifetime mouse skin painting studies, the role of dermal irritation in tumor formation was extensively studied. HDS kerosene proved to be a mouse skin tumor promoter rather than initiator, and this promotion required prolonged dermal irritation. If the equivalent dose of kerosene was applied to the skin in a manner that did not cause significant skin irritation (eg. dilution with a mineral oil), skin tumors occurred. Dermal bioavailability studies in mice confirmed that the reduced irritation seen with samples in mineral oil was not due to decreased skin penetration. The effect of chronic acanthosis on the dermal tumorigenicity of a hydrodesulfurized kerosene was studied and the author concluded that hyperplasia was essential for tumor promotion. However, the author also concluded that subacute inflammation did not appear to be a significant factor.</p> <p>A sample of a hydrodesulfurized kerosene has been tested in an initiation-promotion assay in male CD-1 mice. Animal survival were not affected by exposure to the kerosene. The study's authors concluded that the kerosene was not an initiator but it did show tumor promoting activity.</p> <p>In-Vitro (Genotoxicity): The potential in vitro genotoxicity of kerosene and jet fuel have been evaluated in a variety of studies. Standard Ames assays on two kerosene samples and a sample of Jet A produced negative results with/without activation. Modified Ames assays on four kerosenes also produced negative results (with/without activation) except for one positive assay that occurred with activation. The testing of five kerosene and jet fuel samples in mouse lymphoma assays produced a mixture of negative and positive results. Hydrodesulfurized kerosene tested in a sister chromatid exchange assay produced negative results.</p>	
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Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)		
<p>Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) & BETA-PHENENE & ALPHA-PHENENE</p>	<p>Four 50% solutions of paraffin in petroleum were each instilled into the eyes of six albino rabbits with no rinse. Eyes were observed for irritation for three days. Two of the samples caused inflammation in one rabbit on day 1, the other samples were not irritating.</p> <p>In a long-term feeding study with Sprague-Dawley rats, no wax-related effects were observed. In a series of 180-day feeding studies in rats that were performed over a period of approximately 15 years (beginning in 1956) on chewing-gum bases containing hydrocarbon wax in proportions varying from 2% to 57% of the gum base, no compound-related effects were observed.</p> <p>Long-term toxicity studies indicated that petroleum-derived paraffin and microcrystalline waxes are non-toxic and non-carcinogenic.</p> <p>Eight slack waxes and eight aromatic hydrocarbon extracts derived from the slack waxes were tested for carcinogenicity after applying these to the skin of mice. The slack waxes showed only a low order of carcinogenicity at 250 days. However by 450 days every sample of slack wax had elicited papillomas and for 5 of them cancers as well. The aromatic extracts on the other hand exhibited a greater potency. At 250 days all but one sample had produced papillomas and 5 samples had produced cancers. At 450 days all but one sample had elicited cancers and all had elicited papillomas. The authors concluded that the carcinogenicity of slack wax can be attributed to the aromatic compounds found in the oils from which the waxes were pressed and which are retained on the waxes as impurities, and is not due to paraffins.</p> <p>Five petroleum waxes were negative for local and systemic carcinogenicity or toxicity in skin-painting studies in mice and rabbits. However, wax disk implants, but not ground wax implants, were associated with the development of fibrosarcomas at the implantation site in rats.</p> <p>A description of the accumulation of long-chain alkanes (C29, C31, and C33) in a patient who had died of heart disease led the author to conclude that these hydrocarbons were of dietary (plant) origin as judged by the tissue distribution of the alkanes.</p> <p>The EU Scientific Committee for Food (SCF) reviewed the available information on mineral hydrocarbons, which included the petroleum waxes. Their opinion was published in 1995. The SCF reached the following conclusion:</p> <p>There are sufficient data to allow a S&G Group ADI (Average daily intake) of 0-20 mg/kg bw for waxes conforming to the following specification: - Highly refined waxes derived from petroleum based or synthetic hydrocarbon feedstocks, with viscosity not less than 11 mPa.s (cSt) at 100 deg C. Carbon number not less than 25 at the 5% boiling point. Average molecular weight not less than 500.</p> <p>The materials included in the Lubricating Base Oils category are related from both process and physical-chemical perspectives:</p> <p>The potential toxicity of a specific distillate base oil is inversely related to the severity or extent of processing the oil has undergone, since:</p> <ul style="list-style-type: none"> • The adverse effects of these materials are associated with undesirable components, and • The levels of the undesirable components are inversely related to the degree of processing; • Distillate base oils receiving the same degree or extent of processing will have similar toxicities; • The potential toxicity of residual base oils is independent of the degree of processing the oil receives. <p>The reproductive and developmental toxicity of the distillate base oils is inversely related to the degree of processing.</p> <p>Unrefined & mildly refined distillate base oils contain the highest levels of undesirable components; have the largest variation of hydrocarbon molecules and have shown the highest potential carcinogenic and mutagenic activities. Highly and severely refined distillate base oils are produced from unrefined and mildly refined oils by removing or transforming undesirable components. In comparison to unrefined and mildly refined base oils, the highly and severely refined distillate base oils have a smaller range of hydrocarbon molecules and have demonstrated very low mammalian toxicity. Mutagenicity and carcinogenicity testing of residual oils has been negative, supporting the belief that these materials lack biologically active components or the components are largely non-bioavailable due to their molecular size.</p> <p>Toxicity testing has consistently shown that lubricating base oils have low acute toxicities. Numerous tests have shown that a lubricating base oil's mutagenic and carcinogenic potential correlates with its 3-7 ring polycyclic aromatic compound (PAC) content, and the level of DMSO extractables (e.g. IP346 assay), both characteristics that are directly related to the degree/conditions of processing.</p> <p>Highly and Severely Refined Distillate Base Oils</p> <p>Acute toxicity: Multiple studies of the acute toxicity of highly & severely refined base oils have been reported, irrespective of the crude source or the method or extent of processing, the oral LD50s have been observed to be >5 g/kg (bw) and the dermal LD50s have ranged from >10 to >5g/kg (bw). The LC50 for inhalation toxicity ranged from 2.18 mg/l to 4 mg/l.</p> <p>When tested for skin and eye irritation, the materials have been reported as "non-irritating" to "moderately irritating".</p> <p>Testing in guinea pigs for sensitization has been negative.</p> <p>Repeat dose toxicity: Several studies have been conducted with these oils. The weight of evidence from all available data on highly & severely refined base oils support the presumption that a distillate base oil's toxicity is inversely related to the degree of processing it receives. Adverse effects have been reported with even the most severely refined white oils - these appear to depend on animal species and/or the peculiarities of the study.</p> <ul style="list-style-type: none"> • The granulomatous lesions induced by the oral administration of white oils are essentially foreign body responses. The lesions occur only in rats, of which the Fischer 344 strain is particularly sensitive, • The testicular effects seen in rabbits after dermal administration of a highly to severely refined base oil were unique to a single study and may have been related to stress induced by skin irritation, and • The accumulation of foamy macrophages in the alveolar spaces of rats exposed repeatedly via inhalation to high levels of highly to severely refined base oils is not unique to these oils, but would be seen after exposure to many water insoluble materials. <p>Reproductive and developmental toxicity: A highly refined base oil was used as the vehicle control in a one-generation reproduction study. The study was conducted according to the OECD Test Guideline 421. There was no effect on fertility and mating indices in either males or females. At necropsy, there were no consistent findings and organ weights and histopathology were considered normal by the study's authors.</p> <p>A single generation study in which a white mineral oil (a food/drug grade severely refined base oil) was used as a vehicle control is reported. Two separate groups of pregnant rats were administered 5 mg/kg (bw)/day of the base oil via gavage, on days 6 through 19 of gestation. In one of the two base oil dose groups, three malformed fetuses were found among three litters. The study authors considered these malformations to be minor and within the normal ranges for the strain of rat.</p> <p>Genotoxicity</p> <p>In vitro (mutagenicity): Several studies have reported the results of testing different base oils for mutagenicity using a modified Ames assay. Base oils with no or low concentrations of 3-7 ring PACs had low mutagenicity indices.</p> <p>In vivo (chromosomal aberrations): A total of seven base oils were tested in male and female Sprague-Dawley rats using a bone marrow cytogenetics assay. The test materials were administered via gavage at dose levels ranging from 500 to 5000 mg/kg (bw). Dosing occurred for either a single day or for five consecutive days. None of the base oils produced a significant increase in aberrant cells.</p> <p>Carcinogenicity: Highly & severely refined base oils are not carcinogens, when given either orally or dermally.</p> <p>Tumorigenic in rats</p> <p>The following information refers to contact allergens as a group and may not be specific to this product.</p> <p>Contact allergens quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's edema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune responses. The significance of the contact allergen is not simply determined by its sensitisation potential; the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.</p>	
<p>Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) & DISTILLATES, PETROLEUM, LIGHT, HYDROTREATED & PARAFFIN AND HYDROCARBON WAXES, OXIDISED, LITHIUM SALTS</p>	<p>No significant acute toxicological data identified in literature search.</p>	
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Chemwatch: 4804-47 Version No: 11.11.1		Page 10 of 21 Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)	Issue Date: 03/07/2014 Print Date: 23/08/2016
paraffin wax	Oral (rat) LD50: >17000 mg/kg ^[2]		
	TOXICITY		IRRITATION
	dermal (rat) LD50: >2000 mg/kg ^[1]		Eye (rabbit): 100 mg/24 hr-mild
	dermal (rat) LD50: >2000 mg/kg ^[1]		Skin (rabbit): 500 mg/24 hr-mild
	Oral (rat) LD50: >4500 mg/kg ^[1]		
	Oral (rat) LD50: >4500 mg/kg ^[1]		
Legend:	1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2. Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances		
Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)	<p>Goltergens: Goltergens are substances that suppress the function of the thyroid gland by interfering with iodine uptake, which can, as a result, cause an enlargement of the thyroid, i.e., a goitre</p> <p>Goltergens include:</p> <ul style="list-style-type: none"> Vitamin A, flavonoid, which inhibits thyroid peroxidase thus contributing to goiter. Ions such as thiocyanate and perchlorate which decrease iodide uptake by competitive inhibition; as a consequence of reduced thyroxine and triiodothyronine secretion by the gland, at low doses, this causes an increased release of thyrotropin (by reduced negative feedback), which then stimulates the gland. Lithium which inhibits thyroid hormone release. Certain foods, such as soy and millet (containing vitamins) and vegetables in the genus Brassica (e.g. broccoli, brussels sprouts, cabbage, horseradish). Caffeine in coffee, tea, cola, chocolate which acts on thyroid function as a suppressant. <p>d-Limonene is readily absorbed by inhalation and ingestion. Dermal absorption is reported to be lower than by the inhalation route. d-Limonene is rapidly distributed to different tissues in the body, readily metabolised and eliminated primarily through the urine.</p> <p>Limonene exhibits low acute toxicity by all three routes in animals. Limonene is a skin irritant in both experimental animals and humans. Limited data are available on the potential to cause eye and respiratory irritation. Autooxidised products of d-limonene have the potential to be skin sensitizers. Limited data are available in humans on the potential to cause respiratory sensitisation. Autooxidation of limonene occurs readily in the presence of light and air forming a variety of oxygenated monocyclic terpenes. Risk of skin sensitisation is high in situations where contact with oxidation products of limonene occurs.</p> <p>Renal tumours induced by limonene in male rats is thought to be sex- and species-specific and are not considered relevant to humans. Repeated exposure affects the amount and activity of liver enzymes, liver weight, blood cholesterol levels and bile flow in animals. Increase in liver weight is considered a physiological adaptation as no toxic effects on the liver have been reported. From available data it is not possible to identify an NOAEL for these effects. Limonene is neither genotoxic or teratogenic nor toxic to the reproductive system.</p>		
	PETROLEUM DISTILLATES HFP	data for CAS 64742-89-7 i.e. CCINPO record 1441735	
ALPHA-PINENE	<p>The material may produce severe skin irritation after prolonged or repeated exposure, and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterized by skin redness (erythema) thickening of the epidermis.</p> <p>Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis. Prolonged contact is unlikely, given the severity of response, but repeated exposures may produce severe ulceration.</p> <p>For siloxanes: Effects which based on the reviewed literature do not seem to be problematic are acute toxicity, irritant effects, sensitization and genotoxicity. Some studies indicate that some of the siloxanes may have endocrine disrupting properties, and reproductive effects have caused concern about the possible effects of the siloxanes on humans and the environment.</p> <p>Only four siloxanes are described in the literature with regard to health effects, and it is therefore not possible to make broad conclusions and comparisons of the toxicity related to short-chained linear and cyclic siloxanes based on the present evaluation. Data are primarily found on the cyclic siloxanes D4 (octamethylcyclotetrasiloxane) and D5 (decamethylcyclopentasiloxane) and the short-linear HMDS (hexamethyldisiloxane).</p> <p>These three siloxanes have a relatively low order of acute toxicity by oral, dermal and inhalatory routes and do not require classification for this effect. They are not found to be irritating to skin or eyes and are also not found sensitizing by skin contact. Data on respiratory sensitization have not been identified. Subacute and subchronic toxicity studies show that the liver is the main target organ for D4 which also induces liver cell enzymes. This enzyme induction contributes to the elimination of the substance from the tissues. Primary target organ for D5 exposure by inhalation is the lung. D5 has an enzyme induction profile similar to that of D4. Subacute and subchronic irritation of HMDS effect in particular the lungs and kidneys in rats.</p> <p>None of the investigated siloxanes show any signs of genotoxic effects in vitro or in vivo. Preliminary results indicate that D5 has a potential carcinogenic effect.</p> <p>D4 is considered to impair fertility in rats by inhalation and is classified as a substance toxic to reproduction in category 3 with the risk phrase R62 (Possible risk of impaired fertility).</p> <p>The results of a study to screen for oestrogen activity indicate that D4 has very weak oestrogenic and anti-oestrogenic activity and is a partial agonist (enhances the effect of the estrogen). It is not uncommon for compounds that are weakly oestrogenic to also have anti-oestrogenic properties. Comparison of the oestrogenic potency of D4 relative to ethinyloestradiol (steroid hormone) indicates that D4 is 585,000 times less potent than ethinyloestradiol in the rat strain Sprague-Dawley and 3.7 million times less potent than ethinyloestradiol in the Fisher-344 rat strain. Because of the lack of effects on other endpoints designated to assess oestrogenicity, the oestrogenicity as mode of action for the D4 reproductive effects has been questioned. An indirect mode of action causing a delay of the LH (luteinising hormone) surge necessary for optimal timing of ovulation has been suggested as the mechanism.</p> <p>Based on the reviewed information, the critical effects of the siloxanes are impaired fertility (D4) and potential carcinogenic effects (uterine tumours in females). Furthermore there seem to be some effects on various organs following repeated exposures, the liver (D4), kidney (HMDS) and lung (D5 and HMDS) being the target organs.</p> <p>A possible oestrogenic effect contributing to the reproductive toxicity of D4 is debated. There seems however to be some indication that this toxicity may be caused by another mechanism than oestrogen activity.</p> <p>The material may be irritating to the eyes, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. No toxic response noted during 90 day subchronic inhalation studies. The no observable effect level is 450 mg/m³. Non-irritating and non-sensitising in human patch test. [Xerox]</p> <p>"Hydrocarbon wax" describes a group of solid C20 to C36 paraffinic hydrocarbons which are not absorbed in the gastro-intestinal tract and in small quantity will pass through undigested.</p> <p>The widespread use in cosmetics and in cosmetic surgery over many years demonstrates the low toxicity of refined waxes and many guidelines exist for their safe use. Notwithstanding this, there are occasional reports of adverse effects when referred to as paraffinoma, have been described frequently following injection of these materials under the skin but these are not normally associated with other progressive changes.</p> <p>Paraffin wax and microcrystalline were each administered orally as a solution in arachis oil to groups of 5 male and 5 female rats at dose levels of 1000 and 5000 µg/bw. Produced no clinical signs of toxicity during the seven day observation period and growth rates were normal. There were no mortalities and no macroscopic changes were observed at autopsy.</p> <p>Three samples of 50% paraffin in petrolatum were tested in repeated, open patch applications to 6 rabbits. Two samples produced erythema in four animals that lasted three days, and one produced erythema in one rabbit that lasted two days. A microcrystalline wax was slightly irritating, to rabbit skin, in a 24 hour occluded patch test.</p>		
POLYDIMETHYLSILOXANE	<p>D4 is considered to impair fertility in rats by inhalation and is classified as a substance toxic to reproduction in category 3 with the risk phrase R62 (Possible risk of impaired fertility).</p> <p>The results of a study to screen for oestrogen activity indicate that D4 has very weak oestrogenic and anti-oestrogenic activity and is a partial agonist (enhances the effect of the estrogen). It is not uncommon for compounds that are weakly oestrogenic to also have anti-oestrogenic properties. Comparison of the oestrogenic potency of D4 relative to ethinyloestradiol (steroid hormone) indicates that D4 is 585,000 times less potent than ethinyloestradiol in the rat strain Sprague-Dawley and 3.7 million times less potent than ethinyloestradiol in the Fisher-344 rat strain. Because of the lack of effects on other endpoints designated to assess oestrogenicity, the oestrogenicity as mode of action for the D4 reproductive effects has been questioned. An indirect mode of action causing a delay of the LH (luteinising hormone) surge necessary for optimal timing of ovulation has been suggested as the mechanism.</p> <p>Based on the reviewed information, the critical effects of the siloxanes are impaired fertility (D4) and potential carcinogenic effects (uterine tumours in females). Furthermore there seem to be some effects on various organs following repeated exposures, the liver (D4), kidney (HMDS) and lung (D5 and HMDS) being the target organs.</p> <p>A possible oestrogenic effect contributing to the reproductive toxicity of D4 is debated. There seems however to be some indication that this toxicity may be caused by another mechanism than oestrogen activity.</p> <p>The material may be irritating to the eyes, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. No toxic response noted during 90 day subchronic inhalation studies. The no observable effect level is 450 mg/m³. Non-irritating and non-sensitising in human patch test. [Xerox]</p> <p>"Hydrocarbon wax" describes a group of solid C20 to C36 paraffinic hydrocarbons which are not absorbed in the gastro-intestinal tract and in small quantity will pass through undigested.</p> <p>The widespread use in cosmetics and in cosmetic surgery over many years demonstrates the low toxicity of refined waxes and many guidelines exist for their safe use. Notwithstanding this, there are occasional reports of adverse effects when referred to as paraffinoma, have been described frequently following injection of these materials under the skin but these are not normally associated with other progressive changes.</p> <p>Paraffin wax and microcrystalline were each administered orally as a solution in arachis oil to groups of 5 male and 5 female rats at dose levels of 1000 and 5000 µg/bw. Produced no clinical signs of toxicity during the seven day observation period and growth rates were normal. There were no mortalities and no macroscopic changes were observed at autopsy.</p> <p>Three samples of 50% paraffin in petrolatum were tested in repeated, open patch applications to 6 rabbits. Two samples produced erythema in four animals that lasted three days, and one produced erythema in one rabbit that lasted two days. A microcrystalline wax was slightly irritating, to rabbit skin, in a 24 hour occluded patch test.</p>		
PARAFFIN WAX	<p>Three samples of 50% paraffin in petrolatum were tested in repeated, open patch applications to 6 rabbits. Two samples produced erythema in four animals that lasted three days, and one produced erythema in one rabbit that lasted two days. A microcrystalline wax was slightly irritating, to rabbit skin, in a 24 hour occluded patch test.</p>		
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		<p>Petroleum hydrocarbons may produce pain after direct contact with the eyes. Slight, but transient disturbances of the corneal epithelium may also result. The aromatic fraction may produce irritation and lachrymation.</p> <p>Practical experience shows that skin contact with the material is capable either of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals.</p> <p>Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following.</p> <p>On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects; in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment.</p> <p>Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organ or biochemical systems. Neuro-muscular effects result from chronic over-exposure to lithium compounds. These may include tremor, ataxia, cramps and hyperactive reflexes. Some animal studies have shown that exposure during pregnancy may produce birth defects. Other studies with rats, rabbits and monkeys have not shown teratogenic effects. Human data are ambiguous; it is well established that lithium can cross the human placenta. Of 225 registered pregnancies in which the mothers had received lithium (as a tranquilliser) there were 25 instances of congenital malformation. Although pharmacological doses of lithium cannot be unequivocally designated as a human teratogen, lithium therapy is contraindicated in women of childbearing potential.</p> <p>Prolonged exposure may produce anorexia, weight loss and emaciation. The kidneys, behavioural/central nervous system and peripheral nervous system may also show adverse effects.</p> <p>Various types of dermatitis (psoriasis, alopecia, cutaneous ulcers, acne, follicular papules, xerosis cutis, exfoliative) may also result from chronic skin exposure.</p> <p>Lithium ion can be an effective treatment for manic depression. It is thought to bind the enzyme IMPase (inositol monophosphatase) and thereby mediates its influence in producing a response to calcium-induced production of neurotransmitters and hormones thought to be responsible for the clinical picture.</p> <p>In subchronic studies, rats were exposed to 3 milliequivalent L/kg/day (equivalent to 1450 mg for a 70 kg person) but did not accumulate Li until on a high sodium diet. However when sodium was restricted, fetal kidney toxicity developed. Dogs survived daily dose of 50 mg LiCl/kg for 150 days to the termination of the experiment on a normal sodium intake, whereas the same dose was lethal in 12 to 18 days on a low sodium diet: 20 mg LiCl/kg/day resulted in death in 18 to 30 days.</p> <p>Repeated or prolonged exposure to mixed hydrocarbons may produce necrosis with discoloration, weakness, irritability, concentration and/or memory loss, tremor in the fingers and tongue, vertigo, olfactory disorders, constriction of visual field, paraesthesiae of the extremities, weight loss and anaemia and degenerative changes in the liver and kidney. Chronic exposure by petroleum workers, to the lighter hydrocarbons, has been associated with visual disturbances, damage to the central nervous system, peripheral neuropathies (including numbness and paraesthesiae), psychological and neurophysiological effects, bone marrow toxicities (including hypoplasia possibly due to benzene) and hepatic and renal involvement. Chronic dermal exposure to petroleum hydrocarbons may result in defolting which produces localised dermatoses. Surface cracking and erosion may also increase susceptibility to infection by microorganisms. One epidemiological study of petroleum refinery workers has reported elevations in standard mortality ratios for skin cancer, along with a dose-response relationship indicating an association between routine workplace exposure to petroleum or one of its constituents and skin cancer, particularly melanoma. Other studies have been unable to confirm this finding.</p> <p>Essential oils and isolates derived from the Pinaceae family, including Pinus and Abies genera, should only be used when the level of peroxide is kept to the lowest practicable level, for instance by adding antioxidants at the time of production. Such products should have a peroxide value of less than 10 millimoles peroxide per liter. Based on the published literature mentioning sensitising properties when containing peroxides (Food and Chemical Toxicology 11,1053(1973); 16,943(1978); 16,953(1978)).</p> <p>In the presence of air, a number of common flavour and fragrance chemicals can form peroxides surprisingly fast. Antioxidants can in most cases minimise the oxidation.</p> <p>Fragrance terpenes are generally easily oxidised in air. Non-oxidised limonene, linalool and caryophyllene turned out to be very weak sensitizers, however after oxidation limonene hydroperoxide and linalool hydroperoxide are strong sensitizers. Of the patients tested 2.6% showed positive reaction to oxidised limonene, 1.3% to oxidised linalool, 1.1% to linalool hydroperoxide, 0.5% to oxidised caryophyllene, while testing with caryophyllene oxide and oxidised myrcene resulted in few positive patch tests. 2/3 of the patients reacting positive to oxidised terpenes had fragrance related contact allergy and/or positive history for adverse reactions to fragrances.</p> <p>As well as the hydroperoxides produced by linalol, limonene and delta-3-carene other oxidation and reformation effects progressively causes other fairly major changes in essential oil quality over time. Autooxidation of fragrance terpenes contributes greatly to fragrance allergy, which emphasizes the need of testing with compounds that patients are actually exposed to and not only with the ingredients originally applied in commercial formulations.</p> <p>Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS]</p>	
Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)	TOXICITY		IRRITATION
	Not Available		Not Available
distillates, petroleum, light, hydroreated	TOXICITY		IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[1]		Not Available
	Oral (rat) LD50: >5000 mg/kg ^[1]		
petroleum distillates HFP	TOXICITY		IRRITATION
	Dermal (rabbit) LD50: >1900 mg/kg ^[1]		[Shell - Canada]
	dermal (rat) LD50: 2800 mg/kg ^[2]		
	Oral (rat) LD50: >19650 mg/kg ^[1]		
	Oral (rat) LD50: >4500 mg/kg ^[1]		
paraffin and hydrocarbon waxes, oxidised, lithium salts	TOXICITY		IRRITATION
	Not Available		Not Available
beta-pineno	TOXICITY		IRRITATION
	Oral (rabbit) LD50: 4700 mg/kg ^[2]		Skin (rabbit): 500 mg/24h - moderate
alpha-pineno	TOXICITY		IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[1]		Skin (man): 100% - SEVERE
	Oral (rat) LD50: 3700 mg/kg ^[2]		Skin (rabbit): 500 mg/24h - mod
polydimethylsiloxane	TOXICITY		IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[2]		Eye (rabbit): 100 mg/1h - mild
			Continued...

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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	<p>following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evolved to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, mainly derived from the vascular system.</p> <p>Inhalation hazard is increased at higher temperatures.</p> <p>High inhaled concentrations of mixed hydrocarbons may produce narcosis characterised by nausea, vomiting and lightheadedness. Inhalation of aerosols may produce severe pulmonary oedema, pneumonitis and pulmonary haemorrhage. Inhalation of petroleum hydrocarbons consisting substantially of low molecular weight species (typically C2-C12) may produce irritation of mucous membranes, incoordination, giddiness, nausea, vertigo, confusion, headache, appetite loss, drowsiness, tremors and anaesthetic stupor. Massive exposures may produce central nervous system depression, sudden collapse and deep coma. Facilities have been recorded. Irritation of the brain and/or apnoea may produce convulsions. Although recovery following overexposure is generally complete, cerebral micro-haemorrhage of focal post-inflammatory scarring may produce epileptiform seizures some months after the exposure. Pulmonary episodes may include chemical pneumonitis with oedema and haemorrhage. The lighter hydrocarbons may produce kidney and neurotoxic effects. Pulmonary irritation increases with carbon chain length for paraffins and olefins. Alkenes produce pulmonary oedema at high concentrations. Liquid paraffins may produce anaesthesia and depressant actions leading to weakness, dizziness, slow and shallow respiration, unconsciousness, convulsions and death. C5-7 paraffins may also produce polyneuropathy. Aromatic hydrocarbons accumulate in lipid rich tissues (typically the brain, spinal cord and peripheral nerves) and may produce functional impairment manifested by nonspecific symptoms such as nausea, weakness, fatigue and vertigo; severe exposures may produce inhibition or unconsciousness. Many of the petroleum hydrocarbons are cardiac sensitizers and may cause ventricular fibrillations.</p> <p>Central nervous system (CNS) depression may include nonspecific discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisonings may result in respiratory depression and may be fatal. Inhalation of essential oil volatiles may produce dizziness, rapid, shallow breathing, tachycardia, bronchial irritation and unconsciousness or convulsions. Complications include anuria, pulmonary oedema and bronchial pneumonia.</p> <p>Acute effects from inhalation of high concentrations of vapour are pulmonary irritation, including coughing, with nausea; central nervous system depression characterised by headache and dizziness, increased reaction time, fatigue and loss of co-ordination.</p>	
	<p>Swallowing of the liquid may cause aspiration of vomit into the lungs with the risk of haemorrhaging, pulmonary oedema, progressing to chemical pneumonitis; serious consequences may result.</p> <p>Signs and symptoms of chemical (aspiration) pneumonitis may include coughing, gasping, choking, burning of the mouth, difficult breathing, and bluish coloured skin (cyanosis).</p> <p>Accidental ingestion of the material may be damaging to the health of the individual.</p> <p>Large doses of lithium ion have caused dizziness and prostration and can cause kidney damage if sodium intake is limited. Dehydration, weight-loss, dermatological effects and thyroid disturbances have been reported. Central nervous system effects that include slurred speech, blurred vision, sensory loss, impaired concentration, irritability, lethargy, confusion, disorientation, drowsiness, anxiety, spasticity, tremor, stupor, ataxia (loss of muscle coordination), sedation, and gross tremor, giddiness, twitching and convulsions may occur. Diarrhoea, vomiting and neuromuscular effects such as tremor, clonus (rapid contraction and relaxation of muscles) and hyperactive reflexes may occur as a result of repeated exposure to lithium.</p> <p>Acute severe overexposure may affect the kidneys, resulting in renal dysfunction, albuminuria, oliguria and degenerative changes. Cardiovascular effects may also result in cardiac arrhythmias and hypotension.</p> <p>The primary target organ for lithium toxicity is the central nervous system. Lithium is therefore used therapeutically on membrane transport proteins in the central nervous system when treating manic-depression. Lithium is moderately toxic with lethal dose of LiCl in rats of 526-840 mg/kg body weight. After chronic exposure to 1 mg/kg decreased brain weight was observed in male offspring. Chemically, lithium resembles sodium, but is more toxic; in humans 5 g LiCl can result in fatal poisoning. In therapeutic doses, damages on the central nervous system and the kidneys have been reported.</p> <p>Terpenes and their oxygen-containing counterparts, the terpenoids, produce a variety of physiological effects. Pine oils monoterpenes, for example, produce a haemorrhagic gastritis characterised by stomach pain and bleeding and vomiting. Systemic effects of pine oils include weakness and central nervous depression, excitement, loss of balance, headache, with hypohemia and respiratory failure.</p> <p>Ingestion of petroleum hydrocarbons may produce irritation of the pharynx, oesophagus, stomach and small intestine with oedema and mucosal ulceration resulting; symptoms include a burning sensation in the mouth and throat. Large amounts may produce narcosis with nausea and vomiting, weakness or dizziness, slow and shallow respiration, swelling of the abdomen, unconsciousness and convulsions. Myocardial injury may produce arrhythmias, ventricular fibrillation and electrocardiographic changes. Central nervous system depression may also occur. Light aromatic hydrocarbons produce a warm, sharp, tingling sensation on contact with taste buds and may anaesthetise the tongue. Aspiration into the lungs may produce coughing, gagging and a chemical pneumonitis with pulmonary oedema and haemorrhage.</p> <p>Taken internally the essential oils exert a mild irritant effect on the mucous membranes of the mouth and digestive tract which induces a feeling of warmth and increases salivation.</p> <p>Taken by mouth, many essential oils can be dangerous in high concentrations. Typical effects begin with a burning feeling, followed by salivation. In the stomach, the effect is carminative (relieve flatulence), relaxing the gastric sphincter and encouraging eructation (belching). Further down the gut, the effect typically is antispasmodic.</p> <p>Excessive oral doses irritate the gastro-intestinal tract and may cause nausea, vomiting and diarrhoea. Occasional irritation of the urinary tract and aggravation of pre-existing inflammatory conditions have been reported. Other effects include dysuria, haematuria, unconsciousness and shallow respiration. Complications arising from ingestion of volatile oils include anuria, pulmonary oedema, and bronchial pneumonia.</p> <p>Central nervous system depression may lead to stupor and possible respiratory failure whilst central system stimulation may lead to excitement and convulsions. Pathologic findings include renal degeneration and intense congestion and oedema in the lungs, brain and gastric mucosa. Excretion takes place through the lungs, skin and kidneys.</p> <p>Most essential oils are reported to be ecotoxic (inducing contractions of the uterus leading to expulsion of a fetus), but abortions cannot be induced at safe doses.</p> <p>Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis</p>	
Ingestion	<p>Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant irritation when applied to the healthy intact skin of animals; for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.</p> <p>The material may accentuate any pre-existing dermatitis condition</p> <p>Repeated exposure may cause skin cracking, flaking or drying following normal handling and use.</p> <p>Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.</p> <p>Open cuts, abraded or irritated skin should not be exposed to this material</p> <p>It is likely that odor pine oils become irritants from the build up of peroxides of delta-3-carene and limonene etc.</p> <p>Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.</p> <p>50 (local)</p> <p>Aromatic hydrocarbons may produce skin irritation, vasodilation with erythema and changes in endothelial cell permeability. Systemic intoxication, resulting from contact with the light aromatics, is unlikely due to the slow rate of permeation. Branching of the side chain appears to increase percutaneous absorption.</p>	
Skin Contact	<p>Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after instillation into the eye(s) of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis); temporary impairment of vision and/or other transient eye damage/irritation may occur.</p>	
Eye		

Continued...

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	<p>Eye wash unit.</p> <p>Thermal hazards Not Available</p>																																																													
	<p>Respiratory protection</p> <p>Type A-P Filter of sufficient capacity (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)</p> <p>Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.</p> <table border="1"> <thead> <tr> <th>Required Minimum Protection Factor</th> <th>Half-Face Respirator</th> <th>Full-Face Respirator</th> <th>Powered Air Respirator</th> </tr> </thead> <tbody> <tr> <td>up to 10 x ES</td> <td>A-AUS P2</td> <td>-</td> <td>A-PAPRALUS / Class 1 P2</td> </tr> <tr> <td>up to 50 x ES</td> <td>-</td> <td>A-AUS / Class 1 P2</td> <td>-</td> </tr> <tr> <td>up to 100 x ES</td> <td>-</td> <td>A-2 P2</td> <td>A-PAPR-2 P2⁺</td> </tr> </tbody> </table> <p>⁺ - Full-face</p> <p>A(AI classes) = Organic vapours, B AUS or B1 = Acid gases, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds below 65 degC</p> <p>Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.</p>	Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator	up to 10 x ES	A-AUS P2	-	A-PAPRALUS / Class 1 P2	up to 50 x ES	-	A-AUS / Class 1 P2	-	up to 100 x ES	-	A-2 P2	A-PAPR-2 P2 ⁺																																													
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Chemwatch: 4804-97 Version No: 11.11.1	Page 6 of 21 Regular's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)	Issue Date: 03/07/2014 Print Date: 23/08/2016																				
<p>CEL TWA: 300 ppm, 300 mg/m³ (CEL = Chemwatch Exposure Limit)</p> <p>for petroleum distillates CEL TWA: 500 ppm, 2000 mg/m³ (compare GSHA TWA) (CEL = Chemwatch Exposure Limit)</p> <p>NOTE M: The classification as a carcinogen need not apply if it can be shown that the substance contains less than 0.005% w/w benz[a]pyrene (EINECS No 200-028-5). This note applies only to certain complex oil-derived substances in Annex IV. European Union (EU) List of harmonised classification and labelling hazardous substances, Table 3.1., Annex VI, Regulation (EC) No 1272/2008 (CLP) - up to the latest ATP.</p> <p>NOTE P: The classification as a carcinogen need not apply if it can be shown that the substance contains less than 0.01% w/w benzene (EINECS No 200-753-7). Note E shall also apply when the substance is classified as a carcinogen. This note applies only to certain complex oil-derived substances in Annex VI. European Union (EU) List of harmonised classification and labelling hazardous substances, Table 3.1., Annex VI, Regulation (EC) No 1272/2008 (CLP) - up to the latest ATP.</p>																						
<p>Exposure controls</p> <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are:</p> <p>Process controls which involve changing the way a job activity or process is done to reduce the risk.</p> <p>Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "draws" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.</p> <p>Employers may need to use multiple types of controls to prevent employee overexposure.</p> <p>Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Contact fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection.</p> <p>An approved self contained breathing apparatus (SCBA) may be required in some situations.</p> <p>Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.</p> <table border="1"> <thead> <tr> <th>Type of Contaminant:</th> <th>Air Speed:</th> </tr> </thead> <tbody> <tr> <td>solvent, vapours, degreasing, etc., evaporating from tank (in still air)</td> <td>0.25-0.5 m/s (50-100 ft/min.)</td> </tr> <tr> <td>aerosols, fumes from pouring operations, intermittent container filling, low speed conveyor transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)</td> <td>0.5-1 m/s (100-200 ft/min.)</td> </tr> <tr> <td>direct spray spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td> <td>1-2.5 m/s (200-500 ft/min.)</td> </tr> <tr> <td>grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion)</td> <td>2.5-10 m/s (500-2000 ft/min.)</td> </tr> </tbody> </table> <p>Within each range the appropriate value depends on:</p> <table border="1"> <thead> <tr> <th>Lower end of the range</th> <th>Upper end of the range</th> </tr> </thead> <tbody> <tr> <td>1. 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Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.</p>			Type of Contaminant:	Air Speed:	solvent, vapours, degreasing, etc., evaporating from tank (in still air)	0.25-0.5 m/s (50-100 ft/min.)	aerosols, fumes from pouring operations, intermittent container filling, low speed conveyor transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 ft/min.)	direct spray spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 ft/min.)	grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion)	2.5-10 m/s (500-2000 ft/min.)	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<p>Eye and face protection</p> <ul style="list-style-type: none"> Safety glasses with side shields. Chemical goggles. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adoption by the classes of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59] [ANSI Z87.1-2003 or national equivalent] 																						
<p>Skin protection</p> <p>See Hand protection below</p> <ul style="list-style-type: none"> Wear chemical protective gloves, e.g. PVC. Wear safety footwear or safety gumboots, e.g. Rubber <p>NOTE:</p> <ul style="list-style-type: none"> The material may produce skin sensitisation in predisposed individuals. Care must be taken, when removing gloves and other protective equipment, to avoid all possible skin contact. Contaminated leather items, such as shoes, belts and watch-bands should be removed and destroyed. 																						
<p>Hands/feet protection</p> <p>See Other protection below</p> <ul style="list-style-type: none"> Overalls. PVC apron. Barrier cream. Skin cleansing cream. 																						
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<p>Other Information</p> <ul style="list-style-type: none"> Observe manufacturer's storage and handling recommendations contained within this SDS. Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained. Store in original containers. Keep containers securely sealed. Store in a cool, dry, well-ventilated area. Store away from incompatible materials and foodstuff containers. Protect containers against physical damage and check regularly for leaks. Observe manufacturer's storage and handling recommendations contained within this SDS. 																																																																																										
<p>Conditions for safe storage, including any incompatibilities</p> <p>Suitable container</p> <ul style="list-style-type: none"> Metal can or drum Packaging as recommended by manufacturer. Check all containers are clearly labelled and free from leaks. <p>Storage incompatibility</p> <p>Traces of benzene, a carcinogen, may form when sticones are heated in air above 230 degrees C. Concentrated acids and bases cause degradation of polymer. Boiling water may soften and weaken material.</p> <p>HAZARD:</p> <ul style="list-style-type: none"> Although anti-oxidants may be present, in the original formulation, these may deplete over time as they come into contact with air. Rags wet / soaked with unsaturated hydrocarbons / drying oils may auto-oxidise; generate heat and, in time, smoulder and ignite. This is especially the case where oil-soaked materials are folded, bunched, compressed, or piled together - this allows the heat to accumulate or even accelerate the reaction. Oil-cleaning rags should be collected regularly and immersed in water, or spread to dry in safe-place away from direct sunlight or stored, immersed, in solvents in suitably closed containers. Avoid reaction with oxidising agents 																																																																																										
<p>SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION</p>																																																																																										
<p>Control parameters</p> <p>OCCUPATIONAL EXPOSURE LIMITS (OEL)</p> <p>INGREDIENT DATA</p> <table border="1"> <thead> <tr> <th>Source</th> <th>Ingredient</th> <th>Material name</th> <th>TWA</th> <th>STEL</th> <th>Peak</th> <th>Notes</th> </tr> </thead> <tbody> <tr> <td>Australia Exposure Standards</td> <td>distillates, petroleum, light, hydro-treated</td> <td>Oil mist, refined mineral</td> <td>5 mg/m³</td> <td>Not Available</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>Australia Exposure Standards</td> <td>petroleum distillates HFP</td> <td>Oil mist, refined mineral</td> <td>5 mg/m³</td> <td>Not Available</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>Australia Exposure Standards</td> <td>paraffin wax</td> <td>Paraffin wax (fume)</td> <td>2 mg/m³</td> <td>Not Available</td> <td>Not Available</td> <td>Not Available</td> </tr> </tbody> </table> <p>EMERGENCY LIMITS</p> <table border="1"> <thead> <tr> <th>Ingredient</th> <th>Material name</th> <th>TEEL-1</th> <th>TEEL-2</th> <th>TEEL-3</th> </tr> </thead> <tbody> <tr> <td>petroleum distillates HFP</td> <td>Naphtha, hydro-treated heavy; (Isopar L-rev 2)</td> <td>171 ppm</td> <td>171 ppm</td> <td>570 ppm</td> </tr> <tr> <td>petroleum distillates HFP</td> <td>Solvent naphtha, petroleum, medium aliphatic; (Mineral spirits, naphtha)</td> <td>0.32 mg/m³</td> <td>3.6 mg/m³</td> <td>21 mg/m³</td> </tr> <tr> <td>alpha-pinene</td> <td>Trimethylsilyloxy-1,1,2-hept-2-ene, 2,6,6-; (alpha-Pinene)</td> <td>22 ppm</td> <td>22 ppm</td> <td>130 ppm</td> </tr> <tr> <td>polydimethylsiloxane</td> <td>Dimethyl siloxane; (Dimethylpolydimethylsiloxane; Sylthem XLT; Sylthem 800; Silicone 360)</td> <td>1.5 mg/m³</td> <td>16 mg/m³</td> <td>980 mg/m³</td> </tr> <tr> <td>paraffin wax</td> <td>Paraffin, n-</td> <td>4.9 mg/m³</td> <td>4.9 mg/m³</td> <td>29 mg/m³</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th>Ingredient</th> <th>Original IDLH</th> <th>Revised IDLH</th> </tr> </thead> <tbody> <tr> <td>distillates, petroleum, light, hydro-treated</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>petroleum distillates HFP</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>conditioners, trade secret</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>paraffin and hydrocarbon waxes, oxidised, lithium salts</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>beta-pinene</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>alpha-pinene</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>polydimethylsiloxane</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>paraffin wax</td> <td>Not Available</td> <td>Not Available</td> </tr> <tr> <td>other terpenes</td> <td>Not Available</td> <td>Not Available</td> </tr> </tbody> </table> <p>MATERIAL DATA</p> <p>For kaolin: Kaolin dust appears to have fibrogenic potential even in the absence of crystalline silica. Kaolinosis can exist as simple and complicated forms with the latter often associated with respiratory symptoms. Crystalline silica enhances the severity of the pneumoconiosis.</p> <p>For paraffin waxes and hydrocarbon waxes a complex combination of hydrocarbons obtained from petroleum fractions by solvent crystallisation: TLV TWA: 2 mg/m³ Animals exposed by inhalation to 10 mg/m³ titanium dioxide show no significant fibrosis, possibly reversible tissue reaction. The architecture of lung air spaces remains intact.</p> <p>Odour threshold: 0.25 ppm.</p> <p>The TLV-TWA is protective against ocular and upper respiratory tract irritation and is recommended for bulk handling of gasoline based on calculations of hydrocarbon content of gasoline vapour. A STEL is recommended to prevent mucous membrane and ocular irritation and prevention of acute depression of the central nervous system. Because of the wide variation in molecular weights of its components, the conversion of ppm to mg/m³ is approximate. Sweden recommends hexane type limits of 100 ppm and heptane and octane type limits of 300 ppm. Germany does not assign a value because of the widely differing compositions and resultant differences in toxic properties.</p> <p>Odour Safety Factor (OSF) OSF=0.042 (gasoline) for kerosene CAS 8008-20-6 TLV TWA: 100 mg/m³ as total hydrocarbon vapour Sidh A3 OEL TWA: 14 ppm, 100 mg/m³ [NIOSH, 1985] REL TWA: 150 ppm [Shell]</p>			Source	Ingredient	Material name	TWA	STEL	Peak	Notes	Australia Exposure Standards	distillates, petroleum, light, hydro-treated	Oil mist, refined mineral	5 mg/m ³	Not Available	Not Available	Not Available	Australia Exposure Standards	petroleum distillates HFP	Oil mist, refined mineral	5 mg/m ³	Not Available	Not Available	Not Available	Australia Exposure Standards	paraffin wax	Paraffin wax (fume)	2 mg/m ³	Not Available	Not Available	Not Available	Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3	petroleum distillates HFP	Naphtha, hydro-treated heavy; (Isopar L-rev 2)	171 ppm	171 ppm	570 ppm	petroleum distillates HFP	Solvent naphtha, petroleum, medium aliphatic; (Mineral spirits, naphtha)	0.32 mg/m ³	3.6 mg/m ³	21 mg/m ³	alpha-pinene	Trimethylsilyloxy-1,1,2-hept-2-ene, 2,6,6-; (alpha-Pinene)	22 ppm	22 ppm	130 ppm	polydimethylsiloxane	Dimethyl siloxane; (Dimethylpolydimethylsiloxane; Sylthem XLT; Sylthem 800; Silicone 360)	1.5 mg/m ³	16 mg/m ³	980 mg/m ³	paraffin wax	Paraffin, n-	4.9 mg/m ³	4.9 mg/m ³	29 mg/m ³	Ingredient	Original IDLH	Revised IDLH	distillates, petroleum, light, hydro-treated	Not Available	Not Available	petroleum distillates HFP	Not Available	Not Available	conditioners, trade secret	Not Available	Not Available	paraffin and hydrocarbon waxes, oxidised, lithium salts	Not Available	Not Available	beta-pinene	Not Available	Not Available	alpha-pinene	Not Available	Not Available	polydimethylsiloxane	Not Available	Not Available	paraffin wax	Not Available	Not Available	other terpenes	Not Available	Not Available
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Initial Environmental Examination Report

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SC Auto (Myanmar) Co., Ltd.

Chemwatch: 4894-67
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Meguia's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)

Issue Date: 03/07/2014
Print Date: 23/08/2016

H227	Combustible liquid
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H336	May cause drowsiness or dizziness.
H304	May be fatal if swallowed and enters airways.
H411	Toxic to aquatic life with long lasting effects.
ALN066	Repeated exposure may cause skin dryness and cracking

Precautionary statement(s) Prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P271	Use in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P261	Avoid breathing mist/vapours/spray.
P273	Avoid release to the environment.
P272	Contaminated work clothing should not be allowed out of the workplace.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331	Do NOT induce vomiting.
P302	Take off contaminated clothing and wash before reuse.
P303	Wash contaminated clothing before reuse.
P370+P378	In case of fire: Use alcohol resistant foam or normal protein foam for extinction.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P391	Collect spillage.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Precautionary statement(s) Storage

P403+P233	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
------	---

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances
See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
64742-47-8	10-30	distillates, petroleum light, hydrocracked
64742-48-9	10-30	petroleum distillates HFP
Not Available	<20	conditioners, trade secret
68649-48-9	7-13	paraffin and hydrocarbon waxes, oxidised, lithium salts
19902-08-0	5-10	beta-pinene
80-56-8	5-10	alpha-pinene
63149-62-9	5-10	polydimethylsiloxane
8002-74-2	5-10	paraffin wax
Not Available	1-5	other terpenes

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> Wash out immediately with fresh running water. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. Seek medical attention without delay; if pain persists or recurs seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
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Continued...

Chemwatch

Meguia's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)

Motor Active

Chemwatch: 4894-67
Version No: 11.1.1.1
Safety Data Sheet according to WHS and ADG requirements

Issue Date: 03/07/2014
Print Date: 23/08/2016
L.GHS.AUS.EN

Chemwatch Hazard Alert Code: 2

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Meguia's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)
Synonyme	Not Available
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains beta-pinene and alpha-pinene)
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Use according to manufacturer's directions. Release agent.
--------------------------	---

Details of the supplier of the safety data sheet

Registered company name	Motor Active	Meguia's
Address	35 Skugh Business Park, Halker Street Silverwater NSW 2126 Australia	17991 Mitchell South Irvine CA 92714 United States
Telephone	+61 2 9737 9422/1800 350 822	+1 949 752 8000 +1 800 347 5700
Fax	+61 2 9737 9414	+1 949 752 5784
Website	www.motoractive.com.au	https://www.meguia.com/
Email	andrew.spra@motoractive.com.au	Not Available

Emergency telephone number

Association / Organisation	MotorActive	Not Available
Emergency telephone numbers	+61 2 9737 9422 (For General Information Monday to Friday 8:30am to 5 pm)	Not Available
Other emergency telephone numbers	13 11 28 (In Case of Emergency contact, Poison Information Hotline)	Not Available

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL, DANGEROUS GOODS, According to the WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

	Min	Max
Flammability	1	2
Toxicity	1	2
Body Contact	2	3
Reactivity	1	2
Chronic	2	3

0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule Not Applicable

Classification [1] Flammable Liquid Category 4, Skin Corrosion/Irritation Category 2, Skin Sensitizer Category 1, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Aspiration Hazard Category 1, Acute Aquatic Hazard Category 2, Chronic Aquatic Hazard Category 2

Legend: 1. Classified by Chemwatch, 2. Classification drawn from HSIS, 3. Classification drawn from EC Directive 1273/2008 - Annex VI

Label elements

GHS label elements	
SIGNAL WORD	DANGER

Hazard statement(s)

Continued...

Initial Environmental Examination Report

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SC Auto (Myanmar) Co., Ltd.

SAFETY DATA SHEET




its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.

Attention in medical use: Avoid medical use accompanying permanent implant in human body.

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Hazchem Code
SS 598:Part 1: 2014: 3YE

EmS
IMDG: F-E,S-E

Packaging group
SS 598:Part 1: 2014; IMDG: ICAO/IATA: II

Environmental hazards
SS 598:Part 1: 2014; IMDG: ICAO/IATA: none

Marine pollutant
IMDG: no

Special precautions for user
please see section 6 - 8

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
Deliveries shall only be made based on appropriate packaging and in compliance with traffic laws.

Section 15. Regulatory information
Safety, health and environmental regulations/legislation specific for the substance or mixture

Fire Safety (Petroleum and Flammable Materials) Regulations acetone
Fire Safety (Petroleum and Flammable Materials) Regulations xylene
Fire Safety (Petroleum and Flammable Materials) Regulations ethylbenzene
Fire Safety (Petroleum and Flammable Materials) Regulations butanone
Fire Safety (Petroleum and Flammable Materials) Regulations toluene

Restricted to professional users.

Chemical Safety Assessment
No safety checks were carried out on the mixture.

Section 16. Other information
Revision Note

Version	Changes
1.1	7

Revision Date: 2015-09-15
B12628728

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of

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Bioaccumulative potential
No information available.

Mobility in soil
No information available.

Section 13. Disposal considerations

Waste treatment methods
Dispose of in accordance with local regulations.

Product
Recommendation:
A disposal process that converts the waste into energy is recommended. If this is not possible the hazardous waste must be disposed of by incineration.

Uncleaned packaging
Recommendation:
Properly emptied containers are to be scrap processed or reconditioned.

Section 14. Transport information
Transport only in accordance with the requirements of the Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labeling), ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport.

UN number
SS 586:Part 1: 2014; IMDG; ICAO/IATA: 1263


UN proper shipping name
SS 586:Part 1: 2014; IMDG; ICAO/IATA: PAINT

Transport hazard class(es)

Hazard class
SS 586:Part 1: 2014; IMDG; ICAO/IATA: 3

Subsidiary hazard class
SS 586:Part 1: 2014; IMDG; ICAO/IATA: Not applicable.

Labels



Special Provisions
SS 586:Part 1: 2014: 640D

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CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
		mouse	LD50		= 730 mg/kg	

irritant effects
The liquid splashed in the eyes may cause irritation and reversible damage.

Sensitisation
Contains: bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate; methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate; isobutyl methacrylate. May produce an allergic reaction.

Section 12. Ecological information
There are no data available on the product itself. The product should not be allowed to enter drains or watercourses. The data in this section is consistent with data from chemical safety reports available at the date of revision.

Toxicity

Aquatic toxicity

Acute toxicity aquatic invertebrates

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
41556-26-7	bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	Daphnia	EC50	24 h	20 mg/l	
82919-37-7	methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate	Daphnia	EC50	24 h	20 mg/l	
97-86-9	isobutyl methacrylate	Daphnia	EC50	48 h	23 mg/l	

Acute and extended toxicity of fishes

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
41556-26-7	bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	Lepomis macrochirus (Bluegill sunfish)	LC50	96 h	0.97 mg/l	
82919-37-7	methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate	Lepomis macrochirus (Bluegill sunfish)	LC50	96 h	0.97 mg/l	
82919-37-7	methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate	Oncorhynchus mykiss (rainbow trout)	LC50	96 h	7.9 mg/l	
97-86-9	isobutyl methacrylate	Carassius auratus (goldfish)	EC50	72 h	124 mg/l	

Toxicity with aquatic plants

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
97-86-9	isobutyl methacrylate	Algae	EC50	96 h	1 mg/kg	

Persistence and degradability
No information available.


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Chemical stability						
The product is chemically stable.						
Possibility of hazardous reactions						
No dangerous reaction known under conditions of normal use.						
Conditions to avoid						
Stable under recommended storage and handling conditions (see section 7).						
Incompatible materials to avoid						
not required under normal use						
Hazardous decomposition products						
None known.						
Section 11. Toxicological information						
Information on toxicological effects						
General observations						
There is no data available on the product. See sections 2 and 3 for details.						
Practical experience						
Swallowing may cause nausea, diarrhoea, vomiting, gastro-intestinal irritation and chemical pneumonia. Exposure to component solvents vapours concentration in excess of the stated occupational exposure limit may result in adverse health effect such as mucous membrane and respiratory system irritation and adverse effect on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Solvents may cause some of the above effects by absorption through the skin. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non allergic contact dermatitis and absorption through the skin.						
Acute toxicity						
Acute inhalation toxicity						
CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
1330-20-7	xylene	rat	LC50	4 h	5,000 ppm	
110-43-0	heptan-2-one	rat	LC50	4 h	2,000 ppm	
108-10-1	4-methylpentan-2-one	rat	LC50	4 h	=> ppm	
100-41-4	ethylbenzene	rat	LC50	4 h	4,000 ppm	
108-88-3	toluene	mouse	LC50		5,300 ppm	
Acute dermal toxicity						
CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
1330-20-7	xylene	rabbit	LD50		> 1,700 mg/kg	
Acute oral toxicity						
CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
110-43-0	heptan-2-one	rat	LD50		1,600 mg/kg	
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Skin and body protection		
Wear suitable protective clothing. Personnel should wear antistatic clothings made of natural fiber or of high temperature resistant synthetic fiber.		
Hygiene measures		
Wash skin thoroughly with soap and water or use recognized skin cleanser. Do not use organic solvents!		
Environmental exposure controls		
Do not let product enter drains. For ecological information refer to section 12.		
Section 9. Physical and chemical properties		
Information on basic physical and chemical properties		
Appearance		
Form: liquid Colour: clear Odour: Characteristic Paint Odor		
Important health, safety and environmental information		
Property	Value	Method
pH	no data available	
Melting point/freezing point	Not applicable.	
Boiling point/boiling range	114 °C	
Flash point	-20 °C	DIN 53213/ISO 1523
Evaporation rate	Slower than Ether.	
Flammability (solid, gas)	not relevant as product is liquid	
Lower explosion limit	1 vol-% based on organic solvent content	
Upper explosion limit	12.8 vol-% based on organic solvent content	
Vapour pressure	71.8 hPa	
Vapour density	no data available	
Relative density	0,91 g/cm ³	20 °C: DIN 53217/ISO 2811
Solubility(ies)		
Water solubility	appreciable	
Solubility in other solvents	miscible with most organic solvents Listed in: Section 3, Composition information on ingredients	
Partition coefficient: n-octanol/water	This product is a mixture. For ingredient details see section 12	
Auto-ignition temperature	393 °C	DIN 51794 based on organic solvent content
Decomposition temperature	This product is a mixture. For further information see section 10.	
Viscosity (23 °C)	Not applicable.	ISO 2431 - 1993
Explosive properties	Not explosive	
Oxidizing properties	not oxidizing	
Other data		
Solvent separation test	< 3%	ADR/RID
Content of volatile components (including water)	84.4 %	Basis Vapour pressure >= 0.01 kPa
organic solvent content	84.4 %	Basis Vapour pressure >= 0.01 kPa
European VOC	84.3 %	Basis Vapour pressure >= 0.1 hPa
Section 10. Stability and reactivity		
Reactivity		
Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.		
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SAFETY DATA SHEET						
						
CAS-No.	Chemical Name	Source	Time	Type	Value	Note
				STEL	125 ppm	
78-93-3	butanone	ACGIH	15 min	STEL	300 ppm	
			8 hr	TWA	200 ppm	
		Singapore		TWA	200 ppm	
				STEL	885 mg/m ³	
				TWA	590 mg/m ³	
108-88-3	toluene	ACGIH	8 hr	TWA	20 ppm	
			Singapore		TWA	50 ppm
				TWA	188 mg/m ³	
				TWA	188 mg/m ³	
			TWA	188 mg/m ³		

Exposure controls

Additional technical information on the plant

Provide adequate ventilation. This should be achieved by a good general extraction and -if practically feasible- by the use of a local exhaust ventilation. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn. Mask with gas filter, type A (EN 141).

Protective equipment

Personal protective equipment should be worn to prevent contact with eyes, skin or clothing.

Respiratory protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators.

Hand protection

The breakthrough time of gloves is unknown for the product itself. The glove material given is recommended on basis of the substances in the preparation.

Chemical Name	Glove material	Glove thickness	Break through time
xylylene	Nitrile rubber	0.33 mm	30 min
butanone	Viton (R) [®]	0.7 mm	480 min
	Viton (R) [®]	0.7 mm	10 min


The protective glove should be checked in each case for their work specific suitability (e.g., mechanical stability, product compatibility, and anti-static properties). When the intended use is for spray application a nitrile glove of the chemical resistance group 3 (e.g. Dermatrix [®] glove) is to be used. After contamination, the glove has to be changed. If immersing the hands into the product is not avoidable (e.g., maintenance work) a butyl or fluorocarbon rubber glove should be used. When skin exposure may occur to materials specified in section 3 of this SDS, advice should be sought from the glove supplier as to appropriate type to use with this product and the permeation breakthrough times. Care should be taken when working with sharp edged articles as these can easily damage the gloves and make them ineffective. The instructions and information provided by the glove supplier on use, storage, maintenance and replacement must be followed. Damaged gloves or those showing signs of wear should be replaced immediately.

Eye protection

Wear protective eyewear for protection against solvent spatter.

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Do not store together with explosives, gases, oxidizing solids, products which form flammable gases in contact with water, oxidizing products, infectious products and radioactive products.						
Section 8. Exposure controls/personal protection						
Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.						
Control parameters						
National occupational exposure limits						
Singapore. OELs (Workplace Safety and Health (General Provisions) Regulations 2006 (S 134/2006), First Schedule: Permissible Exposure Limits of Toxic Substances, Feb. 28, 2006)						
CAS No.	Chemical Name	Source	Time	Type	Value	Note
67-64-1	acetone	ACGIH	15 min	STEL	750 ppm	
			8 hr	TWA	500 ppm	
		Singapore		TWA	750 ppm	
				STEL	2,380 mg/m ³	
				TWA	1,780 mg/m ³	
	STEL	1,000 ppm				
1330-20-7	xylene	ACGIH	15 min	STEL	150 ppm	
			8 hr	TWA	100 ppm	
		Singapore		TWA	100 ppm	
				STEL	651 mg/m ³	
				TWA	434 mg/m ³	
	STEL	150 ppm				
110-43-0	heptan-2-one	ACGIH	8 hr	TWA	50 ppm	
			Singapore		TWA	50 ppm
				TWA	233 mg/m ³	
				TWA	233 mg/m ³	
		108-10-1	4-methylpentan-2-one	ACGIH	15 min	STEL
8 hr	TWA				20 ppm	
Singapore				TWA	50 ppm	
				STEL	307 mg/m ³	
				TWA	205 mg/m ³	
	STEL	75 ppm				
100-41-4	ethylbenzene	ACGIH	8 hr	TWA	20 ppm	
			Singapore		TWA	100 ppm
				STEL	543 mg/m ³	
				TWA	434 mg/m ³	
			TWA	434 mg/m ³		


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Advice for firefighters	
Fire and Explosion Hazards	
Flammable liquid. Vapours may form explosive mixtures with air. Remove all sources of ignition. Solvent vapours are heavier than air and may spread along floors.	
Special Protective Equipment and Fire Fighting Procedures	
Wear as appropriate: Full protective flameproof clothing. Wear self contained breathing apparatus for fire fighting if necessary. In the event of fire, cool tanks with water spray. Do not allow run-off from fire fighting to enter drains or water courses.	
Section 6. Accidental release measures	
Personal precautions, protective equipment and emergency procedures	
Keep in a well-ventilated place. Keep away from sources of ignition. Do not inhale vapours.	
Environmental precautions	
Do not let product enter drains. Notify the respective authorities in accordance with local law in the case of contamination of rivers, lakes or waste water systems. Please avoid any emission of volatile organic compounds as possible.	
Methods and materials for containment and cleaning up	
Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations. Clean preferably with a detergent; avoid use of solvents.	
Reference to other sections	
Comply with safety directives (see chapters 7 and 8).	
Section 7. Handling and storage	
Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.	
Precautions for safe handling	
Safe handling advice	
Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Preparation may charge electrostatically; always use grounded leads when transferring from one container to another. Operators should wear antistatic footwear and clothing. No sparking tools should be used. Avoid skin and eye contact. Do not breathe vapours or spray mist. Smoking, eating and drinking should be prohibited in the application area. For personal protection see section 5. Comply with the health and safety at work laws. If material is a coating, do not sand, flame cut, braze or weld dry coating without an appropriate respirator or appropriate ventilation, and gloves.	
Advice on protection against fire and explosion	
Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Never use pressure to empty container: container is not a pressure vessel. Always keep in containers of same material as the original one.	
Conditions for safe storage, including any incompatibilities	
Requirements for storage areas and containers	
Observe label precautions. Refer to Technical Data Sheet (TDS) for further information about storage temperature. Store in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. No smoking. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage.	
Advice on common storage	
Store separately from oxidizing agents and strongly alkaline and strongly acidic materials.	
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SAFETY DATA SHEET	
Skin contact	
Do NOT use solvents or thinners. Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. If skin irritation persists, call a physician.	
Inhalation	
Avoid inhalation of vapour or mist. Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.	
Ingestion	
If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting. Keep at rest.	
Most Important Symptoms/effects, acute and delayed	
Inhalation	
May cause nose and throat irritation. May cause nervous system depression characterized by the following progressive steps: headache, dizziness, nausea, staggering gait, confusion, unconsciousness. Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. If this product mixed with an isocyanate activator/hardener (see MSDS for the activator), the following health effects may apply: Exposure to isocyanates may cause respiratory sensitization. This effect may be permanent. Symptoms include an asthma-like reaction with shortness of breath, wheezing, cough or permanent lung sensitization. This effect may be delayed for several hours after exposure. Repeated overexposure to isocyanates may cause a decrease in lung function, which may be permanent. Individuals with lung or breathing problems or prior reactions to isocyanates must not be exposed to vapors or spray mist of this product.	
Ingestion	
May result in gastrointestinal distress.	
Skin or eye contact	
May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis. If this product is mixed with an isocyanate, skin contact may cause sensitization.	
Protection of first-aiders	
No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.	
Notes to physician	
No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.	
Section 5. Firefighting measures	
Extinguishing media	
Suitable extinguishing media	
Universal aqueous film-forming foam, Carbon dioxide (CO2), Dry chemical, Water spray.	
Extinguishing media which shall not be used for safety reasons	
High volume water jet	
Special hazards arising from the substance or mixture	
Hazardous combustion products	
Fire will produce dense black smoke containing hazardous combustion products. Exposure to decomposition products may be a hazard to health.	
Hazardous decomposition products	
When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, oxides of nitrogen.	
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IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
 IF ON SKIN: Wash with plenty of soap and water.
 If skin irritation occurs: Get medical advice/ attention.
 Specific treatment (see supplemental first aid instructions on this label).
 Take off contaminated clothing and wash before reuse.
 Store in a well-ventilated place. Keep container tightly closed.
 Store locked up.
 Dispose of contents/container in accordance with local regulations.

Other hazards which do not result in classification

Contains: bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate; methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate; isobutyl methacrylate. May produce an allergic reaction.

Section 3. Composition/information on ingredients

Chemical nature

Mixture of synthetic resins and solvents

Hazardous components

CAS No.	Chemical Name	Concentration	GHS Hazardous
67-64-1	acetone	20 - 30%	✓
1330-20-7	xylene	10 - 20%	✓
110-43-0	heptan 2 one	5 - 10%	✓
108-10-1	4-methylpentan-2-one	5 - 10%	✓
100-41-4	ethylbenzene	3 - 5%	✓
78-93-3	butanone	3 - 5%	✓
108-88-3	toluene	1 - 3%	✓
41558-26-7	bis(1,2,2,6,6-pentamethyl-4-piperidyl) sebacate	0.3 - 1.0%	✓
82919-37-7	methyl 1,2,2,6,6-pentamethyl-4-piperidyl sebacate	0.1 - 0.3%	✓
97-86-9	isobutyl methacrylate	0.1 - 0.3%	✓

Non-regulated ingredients 30 - 40%


Section 4. First aid measures

Eye contact

Remove contact lenses. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Seek medical advice.

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SAFETY DATA SHEET

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name 37490120 A4LT PERMAFAST TURBO 2K CLEARCT
Product code 9314042010332

Relevant identified uses of the substance or mixture and uses advised against

Coating for professional use

Details of the supplier of the safety data sheet

Company/Undertaking Identification

Producer/Supplier Axalta Coating Systems Singapore Holding Pte Ltd.
Street/Box 1 Robinson Road, #15-02 AIA Tower, Singapore 048542

Emergency telephone

Emergency telephone number of manufacturer + (65) 65429595

For further information, please also consult our Internet site

<http://www.spieshecker.com>

Section 2. Hazards identification

This preparation is hazardous per the following GHS criteria

GHS-Classification

Flammable liquids	Category 2
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2A
Target Organ Systemic Toxicant - Single exposure	Category 3

Endpoints which are “not classified”, “cannot classified” and “not applicable” are not shown

GHS-Labeling

Hazard symbols	
Signal word	Danger
Hazard statements	Highly flammable liquid and vapour. Causes skin irritation. Causes serious eye irritation. May cause drowsiness or dizziness.
Precautionary statements	Ground/bond container and receiving equipment. Keep away from heat/sparks/open flames/hot surfaces. - No smoking. Take precautionary measures against static discharge. Use explosion-proof electrical/ventilating/lighting equipment. Use only non-sparking tools. Use only outdoors or in a well ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Avoid breathing dust/ vapours/ spray. IF exposed or if you feel unwell: Call a POISON CENTER or doctor/ physician. IF INHALED: Remove person to fresh air and keep comfortable for breathing. If eye irritation persists: Get medical advice/ attention.


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Marine pollutant

IMDG: yes [dibenzoyl peroxide]

Special precautions for user

please see section 6 - 8

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Deliveries shall only be made based on appropriate packaging and in compliance with traffic laws.

Section 15. Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

Restricted to professional users.

Chemical Safety Assessment

No safety checks were carried out on the mixture.

Section 16. Other information

Revision Note

Version	Changes
5.0	2, 9


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B12803577

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.

Attention in medical use: Avoid medical use accompanying permanent implant in human body.

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Uncleaned packaging

Recommendation:
Properly emptied containers are to be scrap processed or reconditioned.

Section 14. Transport information

Transport only in accordance with the requirements of the Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labeling), ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport.

UN number

SS 586:Part 1: 2014; IMDG; ICAO/IATA: 3108

UN proper shipping name

SS 586:Part 1: 2014; IMDG; ICAO/IATA: ORGANIC PEROXIDE TYPE E, SOLID

Transport hazard class(es)


Hazard class

SS 586:Part 1: 2014; IMDG; ICAO/IATA: 5.2

Subsidiary hazard class

SS 586:Part 1: 2014; IMDG; ICAO/IATA: Not applicable.

Labels



Special Provisions

SS 586:Part 1: 2014: no data available

Hazchem Code

SS 586:Part 1: 2014: 1W

Ems


IMDG: F-J,S-R

Packaging group

SS 586:Part 1: 2014; IMDG; ICAO/IATA:

Environmental hazards

SS 586:Part 1: 2014; IMDG; ICAO/IATA: yes




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Section 11. Toxicological information

Information on toxicological effects

General observations

There is no data available on the product. See sections 2 and 3 for details.

Practical experience

Swallowing may cause nausea, diarrhoea, vomiting, gastro-intestinal irritation and chemical pneumonia. Exposure to component solvents vapours concentration in excess of the stated occupational exposure limit may result in adverse health effect such as mucous membrane and respiratory system irritation and adverse effect on kidney, liver and central nervous system. Symptoms and signs include headache, dizziness, fatigue, muscular weakness, drowsiness and in extreme cases, loss of consciousness. Solvents may cause some of the above effects by absorption through the skin. Repeated or prolonged contact with the preparation may cause removal of natural fat from the skin resulting in non-allergic contact dermatitis and absorption through the skin.

Acute toxicity

Acute oral toxicity

CAS #	Chemical Name	Species	Type	Exposure time	Value	Method
107-21-1	ethanediol	rat	LD50		> 2,000 mg/kg	

Sensitisation

Contains: dibenzoyl peroxide. May produce an allergic reaction.

Section 12. Ecological information

There are no data available on the product itself. The product should not be allowed to enter drains or watercourses. The data in this section is consistent with data from chemical safety reports available at the date of revision.

Toxicity

No information available.

Persistence and degradability

No information available.

Bioaccumulative potential

No information available.

Mobility in soil

No information available.

Section 13. Disposal considerations

Waste treatment methods


Dispose of in accordance with local regulations.

Product

Recommendation:
A disposal process that converts the waste into energy is recommended. Can be landfilled or incinerated, when in compliance with local regulations.

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Appearance

Form: solid; Colour: ; Odour: Odour is not perceptible.;

Important health, safety and environmental information

Property	Value	Method
pH	not applicable	
Melting point/freezing point	Not applicable.	
Boiling point/boiling range	Not applicable.	
Flash point	Not applicable.	DIN 53213/ISO 1523
Evaporation rate	not applicable	
Flammability (solid, gas)	no data available	
Lower explosion limit	no data available	
Upper explosion limit	no data available	
Vapour pressure	Not applicable.	
Vapour density	no data available	
Relative density	1,3 g/cm ³	20 °C - DIN 53217/ISO 2811
Solubility(ies)		
Water solubility	immiscible	
Solubility in other solvents	no data available	
Partition coefficient: n-octanol/water	This product is a mixture. For ingredient details see section 12	
Decomposition temperature	This product is a mixture. For further information see section 10.	
Viscosity (23 °C)	>=100 s	ISO 2431 - 1993 6 mm
Explosive properties	Not explosive	
Oxidizing properties	oxidizing [See sections 2 and 3 for details. R-phrases(s)]	

Other data

Self-Accelerating decomposition temperature (SADT)	50 °C	Regulation EC 440/2008 A16
Content of volatile components (including water)	10,7 %	Basis Vapour pressure >= 0,01 kPa

Section 10. Stability and reactivity

Reactivity

Keep away from oxidising agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.

Chemical stability

The product is chemically stable.

Possibility of hazardous reactions

No dangerous reaction known under conditions of normal use.

Conditions to avoid

Stable under recommended storage and handling conditions (see section 7).

Incompatible materials to avoid

not required under normal use

Hazardous decomposition products

None known.


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CAS-No.	Chemical Name	Source	Time	Type	Value	Note
				STEL	50 ppm	

Exposure controls

Additional technical information on the plant

Do not breathe dust. Provide adequate ventilation. This should be achieved by a good general extraction and -if practically feasible- by the use of a local exhaust ventilation. If these are not sufficient to maintain exposure to dusts below the OEL, suitable respiratory protection must be worn.

Protective equipment

Personal protective equipment should be worn to prevent contact with eyes, skin or clothing.

Respiratory protection

If dust formation exceeds the air concentration limits, then a respiratory protection device approved for this purpose must be worn.

Hand protection

The breakthrough time of gloves is unknown for the product itself. The glove material given is recommended on basis of the substances in the preparation.

Glove material	Glove thickness	Break through time
Nitrile rubber	0.33 mm	> 240 min

The protective glove should be checked in each case for their work specific suitability (e.g. mechanical stability, product compatibility, and anti-static properties). When the intended use is for spray application a nitrile glove of the chemical resistance group 3 (e.g. Dermitril® glove) is to be used. After contamination, the glove has to be changed. If immersing the hands into the product is not avoidable (e.g. maintenance work) a butyl or fluorocarbon rubber glove should be used. When skin exposure may occur to materials specified in section 3 of this SDS, advice should be sought from the glove supplier as to appropriate type to use with this product and the permeation breakthrough times. Care should be taken when working with sharp edged articles as those can easily damage the gloves and make them ineffective. The instructions and information provided by the glove supplier on use, storage, maintenance and replacement must be followed. Damaged gloves or those showing signs of wear should be replaced immediately.

Eye protection

Eye protection (to EN 166/170) designed to protect against exposure to dusts should be worn when there is a likelihood of exposure.

Skin and body protection

Wear suitable protective clothing. Care should be taken in the selection of protective clothing. Avoid contact with the powder on throat and wrists due to possible inflammation and irritation of the skin.

Hygiene measures

Wash skin thoroughly with soap and water or use recognized skin cleanser. Do not use organic solvents!

Environmental exposure controls


Do not let product enter drains. For ecological information refer to section 12.

Section 9. Physical and chemical properties

Information on basic physical and chemical properties

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Methods and materials for containment and cleaning up

Contain and collect spillage with a electrically protected vacuum cleaner or by wet brushing and place in container for disposal according to local regulations. Do not use a dry brush as dust clouds or static can be created! Use a suitable vacuum cleaner.

Reference to other sections

Comply with safety directives (see chapters 7 and 8).

Section 7. Handling and storage

Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. It is recommended that advice is taken from a competent occupational health practitioner on the assessment of employees with skin or respiratory complaints before the individual is exposed to the uncured product.

Precautions for safe handling

Safe handling advice

Precautions should be taken to prevent the formation of dusts in concentrations above flammable, explosive or occupational exposure limits. Preparation may charge electrostatically: always use grounded leads when transferring from one container to another. Operators should wear antistatic footwear and clothing. Keep away from open flames, hot surfaces and sources of ignition. Smoking, eating and drinking should be prohibited in the application area. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. For personal protection see section 8. Comply with the health and safety at work laws. If material is a coating, do not sand, flame cut, braze or weld dry coating without an appropriate respirator or appropriate ventilation, and gloves.

Advice on protection against fire and explosion

Never use pressure to empty container; container is not a pressure vessel. Always keep in containers of same material as the original one.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers

Observe label precautions. Refer to Technical Data Sheet (TDS) for further information about storage temperature. Store in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. No smoking. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Advice on common storage

Store away from combustibles. Do not store together with explosives, compressed, liquefied and pressurised gases, aerosols, flammable liquids, oxidizing products, non combustible toxic products and infectious products.

Section 8. Exposure controls/personal protection

Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

Control parameters

National occupational exposure limits

Singapore. OELs (Workplace Safety and Health (General Provisions) Regulations 2006 (S 134/2006), First Schedule: Permissible Exposure Limits of Toxic Substances, Feb. 28, 2006)

CAS-No.	Chemical Name	Source	Time	Type	Value	Note
94-36-0	dibenzoyl peroxide	Singapore		TWA	5 mg/m3	
107-21-1	ethanedial			ACGIH CEIL	100 mg/m3	Aerosol
		Singapore		STEL	127 mg/m3	


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to the respiratory tract.

Ingestion
May result in gastrointestinal distress.

Skin or eye contact
Dust generated from this product may cause irritation of the eyes. Repeated or prolonged contact may cause skin irritation with discomfort and dermatitis.

Protection of first-aiders
No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.

Notes to physician
No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media
Water spray/Dry chemical

Extinguishing media which shall not be used for safety reasons
High volume water jet

Special hazards arising from the substance or mixture

Hazardous combustion products
Fire will produce dense black smoke containing hazardous combustion products. Exposure to decomposition products may be a hazard to health.

Hazardous decomposition products
When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, benzoic acid, benzene, diphenyl, phenylbenzoate; for cyclohexanone peroxides, hexane carboxylic acid, lauric carbonic acid, cyclohexane.

Advice for firefighters

Fire and Explosion Hazards
The product is not flammable.

Special Protective Equipment and Fire Fighting Procedures
Wear as appropriate: Full protective flameproof clothing. Wear self contained breathing apparatus for fire fighting if necessary. Do not allow run-off from fire fighting to enter drains or water courses.


Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep away from sources of ignition. Air out the room. Do not breathe dust.

Environmental precautions
Do not let product enter drains. Notify the respective authorities in accordance with local law in the case of contamination of rivers, lakes or waste water systems. Please avoid any emission of volatile organic compounds as possible.

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IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Specific treatment (see supplemental first aid instructions on this label).
If skin irritation or rash occurs: Get medical advice/ attention.
If eye irritation persists: Get medical advice/ attention.
Wash contaminated clothing before reuse.
Collect spillage.
Dispose of contents/container in accordance with local regulations.

Other hazards which do not result in classification
None known.

Section 3. Composition/information on ingredients

Chemical nature
Mixture of synthetic resins and solvents

Hazardous components

CAS-No.	Chemical Name	Concentration	GHS Hazardous
94-36-0	dibenzoyl peroxide	40 - 60%	✓
107-21-1	ethanediol	5 - 10%	✓
27138-31-4	Oxydiethyl dibenzoate	1 - 3%	✓

Non-regulated ingredients 30 - 40%

Section 4. First aid measures

Eye contact
Remove contact lenses. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Seek medical advice.

Skin contact
Do NOT use solvents or thinners. Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. If skin irritation persists, call a physician.

Inhalation
Avoid breathing dust. Inhalation of dust may cause shortness of breath, tightness of the chest, a sore throat and cough. Move to fresh air. If breathing is irregular or stopped, administer artificial respiration. If symptoms persist, call a physician.

Ingestion
If swallowed, seek medical advice immediately and show this safety data sheet (SDS) or product label.

Most Important Symptoms/effects, acute and delayed

Inhalation
May cause nose and throat irritation. May cause nervous system depression characterized by the following progressive steps: headache, dizziness, nausea, staggering gait, confusion, unconsciousness. Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. Dust generated from this product may be irritating.


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Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name RADERAL
HARDENER 0909 RED

Product code 4025331234890

Relevant identified uses of the substance or mixture and uses advised against

Hardener for professional use

Details of the supplier of the safety data sheet

Company/Undertaking Identification

Producer/Supplier Axalta Coating Systems Germany GmbH & Co. KG
Street/Box Horbeller Str. 15
Nat. Code/Postal code/City DE 50858 Köln
Telephone +49(0) 2234 6019-01
Importer Axalta Coating Systems Singapore Holding Pte Ltd.
Street/Box 1 Robinson Road, #15-02 AIA Tower, Singapore 049542
Nat. Code/Postal code/City

Information on SDS

Responsible Department Regulatory Affairs
Telephone +49 (0)202 529-2385
Telefax +49 (0)202 529-2804
E-mail address sds-service@axaltaacs.com

Emergency telephone

Emergency telephone number of manufacturer +(65) 65429595

For further information, please also consult our Internet site

Section 2. Hazards identification

The substance is hazardous per the following GHS criteria.

GHS-Classification

Serious eye damage/eye irritation	Category 2A
Skin sensitisation	Category 1
Acute aquatic toxicity	Category 1


Endpoints which are “not classified”, “cannot classified” and “not applicable” are not shown.

GHS-Labeling

Hazard symbols	
Signal word	Warning
Hazard statements	May cause an allergic skin reaction. Causes serious eye irritation. Very toxic to aquatic life.
Precautionary statements	Avoid breathing dust/ vapours/ spray. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.

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Chemical safety assessment

No safety checks were carried out on the mixture.

Section 16. Other information

Revision Note

Version	Changes
3.3	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

Revision Date: 2016 08 01
B11755575

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The above information relates only to the specific material(s) designated herein and may not be valid for such material(s) used in combination with any other materials or in any process or if the material is altered or processed, unless specified in the text.

Attention in medical use: Avoid medical use accompanying permanent implant in human body.




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Hazard class	SS 586:Part 1: 2014; IMDG; ICAO/IATA:	9	
Subsidiary hazard class	SS 586:Part 1: 2014; IMDG; ICAO/IATA:	Not applicable.	
Labels			
Special Provisions	SS 586:Part 1: 2014:	No data available	
Hazchem Code	SS 586:Part 1: 2014:	8Z	
Ems	IMDG:	F-A,S-F	
Packaging group	SS 586:Part 1: 2014; IMDG; ICAO/IATA:	III	
Environmental hazards	SS 586:Part 1: 2014; IMDG; ICAO/IATA:	yes	
Marine pollutant	IMDG:	yes [trizinc bis(orthophosphate)]	
Special precautions for user	please see section 6 - 8		
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Deliveries shall only be made based on appropriate packaging and in compliance with traffic laws.		
Section 15. Regulatory information	Safety, health and environmental regulations/legislation specific for the substance or mixture Restricted to professional users.		
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Acute and extended toxicity of fishes			
CAS #	Chemical name	Species	Type Exposure time Value Method
7779-90-0	trizinc bis(orthophosphate)	Oncorhynchus mykiss (rainbow trout)	LC50 96 h 1 mg/l
Toxicity with aquatic plants			
CAS #	Chemical name	Species	Type Exposure time Value Method
7779-90-0	trizinc bis(orthophosphate)	Algae	EC50 72 h 0.3 mg/l
Persistence and degradability No information available.			
Bioaccumulative potential No information available.			
Mobility in soil No information available.			
Section 13. Disposal considerations			
Waste treatment methods Dispose of in accordance with local regulations.			
Product Recommendation: A disposal process that converts the waste into energy is recommended. If this is not possible the hazardous waste must be disposed of by incineration.			
Uncleaned packaging Recommendation: Properly emptied containers are to be scrap processed or reconditioned.			
Section 14. Transport information			
Transport only in accordance with the requirements of the Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labeling), ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport.			
UN number	SS 586:Part 1: 2014; IMDG; ICAO/IATA:	3082	
UN proper shipping name	SS 586:Part 1: 2014; IMDG; ICAO/IATA: SS 586:Part 1: 2014; IMDG; ICAO/IATA:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. [trizinc bis(orthophosphate)]	
Transport hazard class(es)			
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Possibility of hazardous reactions
 No dangerous reaction known under conditions of normal use.

Conditions to avoid
 Stable under recommended storage and handling conditions (see section 7).

Incompatible materials to avoid
 not required under normal use

Hazardous decomposition products
 None known.

Section 11. Toxicological information

Information on toxicological effects

General observations
 There is no data available on the product. See sections 2 and 3 for details.

Practical experience
 Swallowing may cause nausea, diarrhoea and vomiting.

Acute toxicity

Acute dermal toxicity

CAS #	Chemical name	Species	Type	Exposure time	Value	Method
111-76-2	2-butoxyethanol	Rabbit	LD50		1,500 mg/kg	

Acute oral toxicity

CAS #	Chemical name	Species	Type	Exposure time	Value	Method
111-76-2	2-butoxyethanol	Rat	LD50		1,746 mg/kg	

Subacute toxicity
 2-butoxyethanol and its acetate are readily absorbed through the skin and will cause harmful effects on the blood.

Section 12. Ecological information

There are no data available on the product itself. The product should not be allowed to enter drains or watercourses. The data in this section is consistent with data from chemical safety reports available at the date of revision.

Toxicity


Aquatic toxicity

Acute toxicity aquatic invertebrates

CAS #	Chemical name	Species	Type	Exposure time	Value	Method
7779-90-0	Trizinc bis(orthophosphate)	Daphnia	EC50	48 h	1 mg/l	

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Environmental exposure controls
 Do not let product enter drains.
 For ecological information refer to section 12.

Section 9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance
Form: liquid; **Colour:** black; **Odour:** Odour is not perceptible.

Important health, safety and environmental information

Property	Value	Method
pH	7.5 - 8.5	
Melting point/freezing point	Not applicable.	
Boiling point/boiling range	100 °C	
Flash point	Not applicable.	ISO 3679
Evaporation rate	Slower than Ether	
Flammability (solid, gas)	not relevant as product is liquid	
Lower explosion limit	No data available	
Upper explosion limit	No data available	
Vapour pressure	1.6 hPa	
Vapour density	No data available	
Relative density	1.36 g/cm ³	20 °C - DIN 53217/ISO 2811
Solubility(ies)		
Water solubility	appreciable	
Solubility in other solvents	No data available	
Partition coefficient: n-octanol/water	This product is a mixture. For ingredient details see section 12	
Auto-ignition temperature	224 °C	DIN 51794 based on organic solvent content
Decomposition temperature	This product is a mixture. For further information see section 10.	
Viscosity (23 °C)	100 s	ISO 2431 - 1993 6 mm
Explosive properties	Not explosive	
Oxidizing properties	not oxidizing	

Other data

Solvent separation test	< 3%	ADR/RID
Content of volatile components (including water)	34.3 %	Basis Vapour pressure >= 0.01 kPa
organic solvent content	5.0 %	Basis Vapour pressure >= 0.01 kPa
European VOC	5.0 %	Basis Vapour pressure >= 0.1 hPa

Section 10. Stability and reactivity

Reactivity
 Keep away from oxidizing agents, strongly alkaline and strongly acid materials in order to avoid exothermic reactions.

Chemical stability
 The product is chemically stable.

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CAS-No.	Chemical name	Source	Time	Type	Value	Note
1332-58-7	Kaolin	ACGIH	8 hr	TWA	2 mg/m ³	Respirable Dust
		Singapore		TWA	2 mg/m ³	
14808-60-7	Quartz (SiO ₂)	ACGIH	8 hr	TWA	25 ug/m ³	Respirable Dust
		Singapore		TWA	0.1 mg/m ³	
111 76 2	2-butoxyethanol	ACGIH	8 hr	TWA	20 ppm	
		Singapore		TWA	25 ppm	
		Singapore		TWA	121 mg/m ³	
14807-96-6	Talc (Mg ₃ H ₂ (SiO ₃) ₄)	ACGIH	8 hr	TWA	2 mg/m ³	Respirable Dust
		Singapore		TWA	2 mg/m ³	

Exposure controls

Additional technical information on the plant

Provide adequate ventilation. This should be achieved by a good general extraction and -if practically feasible- by the use of a local exhaust ventilation. If these are not sufficient to maintain concentrations of particulates and solvent vapour below the OEL, suitable respiratory protection must be worn. Mask with gas filter, type A (EN 141)

Protective equipment

Personal protective equipment should be worn to prevent contact with eyes, skin or clothing.

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment.

Hand protection

The breakthrough time of gloves is unknown for the product itself. The glove material given is recommended on basis of the substances in the preparation.

Chemical name	Glove material	Glove thickness	Break through time
2-butoxyethanol	Viton (R)®	0.7 mm	480 MIN
	Nitrile rubber	0.33 mm	480 MIN

The protective glove should be checked in each case for their work specific suitability (e.g. mechanical stability, product compatibility, and anti-static properties). When the intended use is for spray application a nitrile glove of the chemical resistance group 3 (e.g. Dermatrix® glove) is to be used. After contamination, the glove has to be changed. If immersing the hands into the product is not avoidable (e.g. maintenance work) a butyl or fluorocarbon rubber glove should be used. When skin exposure may occur to materials specified in section 3 of this SDS, advice should be sought from the glove supplier as to appropriate type to use with this product and the permeation breakthrough times. Care should be taken when working with sharp edged articles as these can easily damage the gloves and make them ineffective. The instructions and information provided by the glove supplier on use, storage, maintenance and replacement must be followed. Damaged gloves or those showing signs of wear should be replaced immediately.

Eye protection

Use safety eyewear designed to protect against splash of products.

Skin and body protection

Wear suitable protective clothing. Personnel should wear antistatic clothings made of natural fiber or of high temperature resistant synthetic fiber.

Hygiene measures

Wash skin thoroughly with soap and water or use recognized skin cleanser. Do not use organic solvents!

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Environmental precautions

Do not let product enter drains. Notify the respective authorities in accordance with local law in the case of contamination of rivers, lakes or waste water systems. Please avoid any emission of volatile organic compounds as possible.

Methods and materials for containment and cleaning up

Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations. Clean preferably with a detergent; avoid use of solvents.

Reference to other sections

Comply with safety directives (see chapters 7 and 8).

Section 7. Handling and storage

Precautions for safe handling

Safe handling advice

Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded.

Operators should wear antistatic footwear and clothing. No sparking tools should be used. Avoid skin and eye contact. Do not breathe vapours or spray mist. Smoking, eating and drinking should be prohibited in the application area.

For personal protection see section 8. Comply with the health and safety at work laws. If material is a coating, do not sand, flame cut, braze or weld dry coating without an appropriate respirator or appropriate ventilation, and gloves.

Advice on protection against fire and explosion

Solvent vapours are heavier than air and may spread along floors. Vapours may form explosive mixtures with air. Never use pressure to empty container; container is not a pressure vessel. Always keep in containers of same material as the original one.

Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers

Observe label precautions. Refer to Technical Data Sheet (TDS) for further information about storage temperature. Store in a dry, well ventilated place away from sources of heat, ignition and direct sunlight. No smoking. Prevent unauthorized access. Containers which are opened must be carefully resealed and kept upright to prevent leakage.

Advice on common storage

Store separately from oxidizing agents and strongly alkaline and strongly acidic materials. Do not store together with explosives, compressed, liquefied and pressurised gases, aerosols, flammable liquids, oxidizing products, non-combustible toxic products and infectious products.

Section 8. Exposure controls/personal protection

Control parameters

National occupational exposure limits

Singapore. OELs (Workplace Safety and Health (General Provisions) Regulations 2006 (S 134/2006), First Schedule: Permissible Exposure Limits of Toxic Substances, Feb. 28, 2006)

CAS-No.	Chemical name	Source	Time	Type	Value	Note
7779-90-0	trizinc bis(orthophosphate)	Singapore		TWA	10 mg/m ³	

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Ingestion

May result in gastrointestinal distress.

Skin or eye contact

May cause irritation or burning of the eyes. Repeated or prolonged liquid contact may cause skin irritation with discomfort and dermatitis.

Protection of first-aiders

No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.

Notes to physician

No data available on the product. See section 3 and 11 for hazardous ingredients found in the product.

Section 5. Firefighting measures

Extinguishing media

Suitable extinguishing media

Water spray, Dry chemical, Foam

Extinguishing media which shall not be used for safety reasons

High volume water jet

Special hazards arising from the substance or mixture

Hazardous combustion products

Fire will produce dense black smoke containing hazardous combustion products. Exposure to decomposition products may be a hazard to health.

Hazardous decomposition products

When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, oxides of nitrogen.

Advice for firefighters

Fire and Explosion Hazards

The product is not flammable.

Special Protective Equipment and Fire Fighting Procedures

Wear as appropriate: Full protective flameproof clothing. Wear self-contained breathing apparatus for firefighting if necessary. In the event of fire, cool tanks with water spray. Do not allow run-off from fire fighting to enter drains or water courses.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

Keep in a well-ventilated place. Keep away from sources of ignition. Do not inhale vapours.

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Dispose of contents/container in accordance with local regulations.

Other hazards which do not result in classification

None known.

Section 3. Composition/information on ingredients

Chemical nature

Mixture of synthetic resins and solvents as well as water

Hazardous components

CAS-No.	Chemical name	Concentration	GHS Hazardous
7779-90-0	trizinc bis(orthophosphate)	10 - 20%	√
1332-58-7	Kaolin	5 - 10%	
14808 60 7	Quartz (SiO ₂)	5 - 10%	√
111-76-2	2-butoxyethanol	3 - 5%	√
14807 96 6	Talc (Mg ₃ H ₂ (SiO ₃) ₄)	3 - 5%	

Non-regulated ingredients 60 - 70%

Section 4. First aid measures

Eye contact

Remove contact lenses. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Seek medical advice.

Skin contact

Do NOT use solvents or thinners. Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. If skin irritation persists, call a physician.

Inhalation

Avoid inhalation of vapour or mist. Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

Ingestion

If swallowed, seek medical advice immediately and show this safety data sheet (SDS) or product label. Do NOT induce vomiting. Keep at rest.

Most Important Symptoms/effects, acute and delayed

Inhalation

May cause nose and throat irritation.

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Product name: PERMAHYD STEINSCHLAG ELASTIC SCHWARZ/BLACK
Product code: 4025331222620
Print Date: 2016-08-01 v3.3 Revision Date: 2016-08-01 SG/en Page 1 - 10

Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier

Product name PERMAHYD
STEINSCHLAG ELASTIC
SCHWARZ/BLACK

Product code 4025331222620

Relevant identified uses of the substance or mixture and uses advised against

Coating for professional use

Details of the supplier of the safety data sheet

Company/Undertaking identification

Producer/Supplier Axalta Coating Systems Germany GmbH & Co. KG
Street/Box Horbeller Str. 15
Nat. Code/Postal code/City DE 50858 Köln
Telephone +49(0) 2234 6019-01
Importer Axalta Coating Systems Singapore Holding Pte Ltd.
Street/Box 1 Robinson Road, #15-02 AIA Tower, Singapore 048542
Nat. Code/Postal code/City

Information on SDS

Responsible Department Regulatory Affairs
Telephone +49 (0)202 529-2385
Telefax +49 (0)202 529-2804
E-mail address sds-service@axaltars.com

Emergency telephone

Emergency telephone number of manufacturer +(65) 65429595

Section 2. Hazards identification

This preparation is hazardous per the following GHS criteria

GHS-Classification

Chronic aquatic toxicity Category 2

Endpoints which are “not classified”, “cannot classified” and “not applicable” are not shown.

GHS-Labeling

Hazard symbols



Signal word: Not classified according to GHS criteria

Hazard statements

Toxic to aquatic life with long lasting effects.

Precautionary statements

Avoid release to the environment.
Collect spillage.

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Glossary

SU	Sector of use
PC	Product category
PROC	Process category
ERC	Environmental release category
AC	Article category
spERC	Sector specific environmental release category (for ACEA uses)
ACEA	European automobile manufacturers association
AIRC	Federation of vehicle repair organisations
CEPE	European council of producers and importers of paints, printing inks and artists' colours
OC	Operational condition
DOA	Duration of activity
LEV	Local exhaust ventilation
TRV	Technical room ventilation
RMM	Risk Management Measures
RPE	Respiratory protection equipment
DPE	Dermal protection equipment
WWTP	Waste water treatment plant (on site)
STP	Sewage treatment plant (municipal)
SVHC	Substance of very high concern
LSI	Load substance indicator
M(spvc)	Maximum volume of lead substance which can be used safely under conditions described by CEPE spERC
DNEL	Derived No Effect Level
DNEL	Derived minimum effect level
PNEC	Predicted No Effect Concentration
ECETOC TRA	Targeted risk assessment as proposed by European center for ecotoxicology and toxicology of chemicals
RCR	Risk characterisation ratio

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Additional explanation

Use by private end consumers (SU 21) not considered as product is assigned for professional use only
Wide dispersive use (ERC 8a-8f) not assessed as professional use in paintshops is considered as non dispersive (point source)
No relevant substance transfer expected to marine water, sediment, or soil due to use in dedicated installations.
Environmental assessment only relevant in case of substance transfer into a waste water stream
Environmental assessment based on ACEA sector specific ERC approach (SpERC factors for solids and volatiles)
The spERC approach is only applicable to demonstrate safe use of a substance for environmental aspects under REACH.
It is not suitable to demonstrate compliance with applicable local waste water regulations.
Ingestion (oral route) not assessed as not considered to occur in case of industrial / professional use
Hazards due to particle shape negligible due to inclusion into polymer matrix (silicogenic or similar compounds)
Worker exposure assessment based on DNELs is only applicable to demonstrate safe use of substances under REACH.
It is not suitable to demonstrate compliance with applicable occupational exposure limits (as displayed in section 8 of SDS).
Occupational exposure limits may apply for residual monomers (e.g. formaldehyde, monomeric isocyanates) which are not assessed under REACH.
Exposure assessment is performed for coating material as supplied.
Adaptation may be required for ready for use mixture depending on selection of specific hardener and diluent
Exposure assessment is performed for application of coating material at ambient temperature.
Adaptation may be required for application at elevated temperature (e.g. hot spraying).
Loss during service life negligible, in any case less than 1 %
Waste stage not assessed as incineration / biological treatment of waste and safe deposition of inert residues is assumed
Use for coating of toys, articles designed for prolonged skin contact or indirect food contact needs further assessment
No SVHC above declaration threshold contained unless disclosed in section 3 of SDS

Good practice advice


Following advice shall be pursued as long as exposure assessment in part 3 does not contain sufficient information

Recommendation to use technical room ventilation.
Advice to wear skin/eye protection as standard RMM due to risk of splashes/droplets.
Advice on respiratory protection equipment for PROC 7, 11 is based on Axalta expert judgement
Advice to use spray-booth or efficient exhaust ventilation
Advice to wear respiratory protection equipment as standard RMM due to aerosol formation, even in ventilated booth.
Advice to use integrated dust evacuation, in case of air recirculation in accordance to EN 60335.
Recommendation to use respiratory protection equipment when sanding, even in combination with integrated dust evacuation.
Advice to use local exhaust ventilation according to EN 15012 for welding of coated substrates.
Advice to provide spill retention system according to applicable regulation.
Recommendation to avoid contact with water.

Standardised use descriptors according European Chemical Agency (ECHA) Guidance on information requirements and chemical safety assessment, chapter R.12

SU 3	Industrial uses: Uses of substances as such or in preparations at industrial sites
SU 22	Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
PC9a	Coatings and paints, thinners, paint removers
PC9b	Fillers, putties, plasters, modelling clay
PROC2	Use in closed, continuous process with occasional controlled exposure
PROC3	Use in closed batch process (synthesis or formulation)
PROC4	Use in batch and other process (synthesis) where opportunity for exposure arises
PROC5	Mixing or blending in batch processes for formulation of preparations and articles (multi-stage and/ or significant contact)
PROC7	Industrial spraying
PROC8a	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at non-dedicated facilities
PROC8b	Transfer of substance or preparation (charging/ discharging) from/ to vessels/ large containers at dedicated facilities
PROC11	Non industrial spraying
PROC24	High (mechanical) energy work-up of substances bound in materials and/ or articles
ERC4	Industrial use of processing aids in processes and products, not becoming part of articles
ERC5	Industrial use resulting in inclusion into or onto a matrix
ERC12a	Industrial processing of articles with abrasive techniques (low release)
ERC6d	Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers

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3.1. Environmental assessment

No relevant ecotoxicological impact expected; specific description and assessment of environmental exposure obsolete.

3.2. Worker assessment

No relevant toxicological impact expected; specific description and assessment of worker exposure obsolete.

Further specification:

Above exposure assessment is performed for dry content of coating material as supplied. Exposure assessment requires adaptation to ready for use mixture (including reacted compounds where appropriate)

4. Guidance to downstream user to evaluate whether he works inside the boundaries set by the exposure scenario

By variation of operational conditions and risk management measures (scaling), a downstream user can check whether he works inside the exposure scenario boundaries.
Standard scaling can be based on exposure modifying factors as used by ECETOC TRA which are listed below.
RCR(o) = RCR(s) * EMF(s)/EMF(o)
RCR(s) shall be < 1
RCR(s) = scaled risk characterisation ratio: RCR(o) = original risk characterisation ratio (in part 3)
EMF(s) = exposure modifying factor selected for scaling; EMF(o) = original exposure modifying factor (in part 3)
Scaling may be used consecutively for multiple determinants.
Example: No technical room ventilation for mixing of tints (EMF(o) = 0.3), duration of activity restricted to 1 h/d (EMF(s) = 0.2)

Specific scaling may be based on measured values at the individual site.

Content % range	Content Factor	DOA h	DOA Factor	Respiratory protection equipment	Factor	
> 25	1	> 4	1			
5 - 25	0.6	1 - 4	0.6	No RPE	1	
1 - 5	0.2	0.25 - 1	0.2	Filter mask	0,1	Level 1
< 1	0.1	< 0,25	0,1	Air-fed mask	0,05	Level 2

Respiratory protection equipment	Factor	
No gloves	1	
Suitable gloves	0,2	Level 1
Resistant gloves, training	0,1	Level 2
Resistant gloves, specific training	0,05	Level 3

PROC	Factor for TRV	Factor for LEV Industrial setting	Factor for LEV Professional setting	Factor for LEV Dermal impact
2	0,3	0,1	0,2	0,1
3	0,3	0,1	0,2	0,1
4	0,3	0,1	0,2	0,1
5	0,3	0,1	0,2	0,005
7		0,05	n.a.	0,05
8a	0,3	0,1	0,2	0,01
8b	0,3	Sol 0,05	Sol 0,2	0,1
8b	0,3	Vol 0,03	Vol 0,1	0,1
11		n.a.	0,2	0,02
24		0,2	0,25	0,1

PROC	Factor	PROC	Adjusted factor Professional	Adjusted factor Industrial
4 (high volatility)	1	2 (high volatility)	0,2	0,5
5 (high volatility)	1	3 (high volatility)	0,2	0,4
8a (high volatility)	1	8b (high volatility)	0,5	0,6
4 (medium volatility)	1	2 (medium volatility)	0,4	0,5
5 (medium volatility)	1	3 (medium volatility)	0,25	0,5
8a (medium volatility)	1	8b (medium volatility)	0,5	1
4 (low volatility)	1	2 (low volatility)	0,5	0,2
5 (low volatility)	1	3 (low volatility)	0,3	0,6
8a (low volatility)	1	8b (low volatility)	0,4	0,5

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4. Guidance to downstream user to evaluate whether he works inside the boundaries set by the exposure scenario

Part 4 is common and is available at the end of the Annex.

1. Consolidated exposure assessment (type 3) for sanding

Free short title:
Industrial or professional sanding of cured coating (professional use in close to industrial setting)

Systematic title based on use descriptors:

Sector of use	SU 22, SU 3
Product category	PC3a, PC9b
Process category	PROC24
Environmental release category	ERC12a

Activities covered:
Sanding of cured coating

Contributing scenarios:

spERC x4	Wet sanding/wet dust collection in serial production
spERC x5	Wet sanding/wet dust collection in refinishing process
PROC24	Applicable for: Sanding, grinding, chipping or polishing of cured coating film

2. Operational conditions and risk management measures

2.1. Contributing environmental scenario

Sanding of cured coating

Process conditions:
Potential transfer to process waste water stream when applying wet sanding techniques or wet dust collection

	M(sperc)	Transfer to process waste water	Release after on-site WWTP	Municipal STP
spERC x4 (solids)	Solids in dry film	2%	10%	yes
spERC x5 (solids)	Solids in dry film	2%	100%	yes

2.2. Contributing worker scenarios

Sanding of cured coating

	PROC	DOA	LEV/TRV	RPE	DPE
Sanding	24	> 4 h	LEV	no	yes level 2

Further specification:
Above parameters represent standard (default) assumptions according to CEPE mapping of operational conditions. Valid information on risk management measures for specific formulation is provided in part 3. Deviation options are explained in part 4 (scaling).

3. Exposure estimation and reference to its source

Exposure assessment bases on initial scenarios for the used chemicals in this preparation as provided by manufacturers and importers. Identification of a lead substance indicator per route is based on the DPD+ methodology, taking into account content, dustiness and hazard characteristics. Use of the mixture is considered safe when conditions for safe use of the lead substance indicator are respected. Risk assessment is not applicable as long as no initial exposure scenarios are available.

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	PROC	Route	LSI	LSI range	% DOA	LEV TRV	/	RPE	DPE	DNEL	RCR
Non-industrial spraying	11	Skin	dipentone	>1-5	> 4hr	-	-	-	Resistant gloves, training	-	-
		Inhalation	n-butyl acetate	>25	> 4hr	Local exhaust ventilation	-	-	Filter mask (90% efficient)	100	0.10
Curing	4 (covering 2)	Skin	dipentene	>1-5	> 4hr	-	-	-	Resistant gloves, training	-	-
		Inhalation	n-butyl acetate	>25	> 4hr	Technical room ventilation	-	-	none	100	0.15
		Skin	dipentene	>1-5	> 4hr	-	-	-	Resistant gloves, training	-	-

Preparing, transferring/loading, application by spraying, drying and curing of coating material - industrial setting

	PROC	Route	LSI	LSI range	% DOA	LEV TRV	/	RPE	DPE	DNEL	RCR
Mixing	5 (covering 3)	Inhalation	n-butyl acetate	>25	> 4hr	Technical room ventilation	-	-	none	100	0.30
		Skin	dipentene	>1-5	> 4hr	-	-	-	Resistant gloves, training	-	-
Transferring	8a (covering 8b)	Inhalation	n-butyl acetate	>25	> 4hr	Technical room ventilation	-	-	none	100	0.30
		Skin	dipentene	>1-5	> 4hr	-	-	-	Resistant gloves, training	-	-
Industrial spraying	7	Inhalation	n-butyl acetate	>25	> 4hr	Local exhaust ventilation	-	-	Air-fed mask (95% efficient)	100	-
		Skin	dipentene	>1-5	> 4hr	-	-	-	Resistant gloves, training	-	-
Curing	4 (covering 2)	Inhalation	n-butyl acetate	>25	> 4hr	Technical room ventilation	-	-	none	100	0.15
		Skin	dipentene	>1-5	> 4hr	-	-	-	Resistant gloves, training	-	-

Further specification:
Above exposure assessment is performed for coating material as supplied. Exposure assessment requires adaptation to ready for use mixture (review hardener and/or diluent)

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Exposure limit for the pure substance | <http://osha.europa.eu/OSHA>

Training advice
Directive 79/769/EC
Directive 99/24/EC

Further information
The information of this SDS is based on the present state of our knowledge and meets the requirements of EU and national laws. The user's working conditions however, are beyond our knowledge and control. The product is not to be used for purposes other than those specified under section 1 without a written permission. It remains the responsibility of the user to ensure that the necessary steps are taken to meet the laws and regulations. Handling of the product may only be done by people above 18 years of age, who are satisfactorily informed of how to do the work, the hazardous properties and necessary safety precautions. The information given in this SDS is to describe the product only in terms of health and safety requirements and should not, therefore, be construed as guaranteeing specific properties.

Report version


Version	Changes
19.2	3

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15.2. Chemical Safety Assessment
No safety checks were carried out on the mixture.

Section 16. Other information
Full text of R phrases with no. appearing in section 3

R10	Flammable.
R11	Highly flammable.
R20	Harmful by inhalation.
R20/21	Harmful by inhalation and in contact with skin.
R20/21/22	Harmful by inhalation, in contact with skin and if swallowed.
R22	Harmful if swallowed.
R37/38	Irritating to respiratory system and skin.
R38	Irritating to skin.
R41	Risk of serious damage to eyes.
R43	May cause sensitisation by skin contact.
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
R65	Harmful; may cause lung damage if swallowed.
R66	Repeated exposure may cause skin dryness or cracking.
R67	Vapours may cause drowsiness and dizziness.

Full text of H phrases with no. appearing in section 3

H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H302	Harmful if swallowed.
H304	May be fatal if swallowed and enters airways.
H312	Harmful in contact with skin.
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Information taken from reference works and the literature.

Substance No.	CAS no: www.cas.org/EO/regsys.html EC no: http://ecb.jrc.it/esis/index.php?PGM=ein
Substances presenting a health or environmental hazard within the meaning of Directive 67/548/EEC.	http://ecb.jrc.it/existing-chemicals/ http://ecb.jrc.it/classification-labelling/ http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?HSDB http://www.cdc.gov/niosh/ipcs/start.html
Other directives, limitations and prohibitory regulations	Directive 76/769/EC Directive 98/24/EC Directive 90/394/EC Directive 79/3/EC Directive 1999/45/EC Directive 2006/6/EC EUR-Lex: http://europa.eu.int/eur-lex/lex

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Tunnel restriction code		
ADR/RID:	D/E	
Special Provisions		
ADR/RID:	640E	
Kemler Code		
ADR/RID:	30	
Hazchem Code		
ADR/RID:	3Y	
EmS		
IMDG:	F E S E	
14.4. Packaging group		
ADR/RID; IMDG; ICAO/IATA:	III	
14.5. Environmental hazards		
ADR/RID; IMDG; ICAO/IATA:	yes	
Marine pollutant		
IMDG:	yes [dipentone]	
14.6. Special precautions for user		
please see section 6 - 8		
14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code		
Deliveries shall only be made based on appropriate packaging and in compliance with traffic laws.		
Section 15. Regulatory information		
15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture		
National legislation		
This safety datasheet has been prepared according to British legislation.		
The product is labeled according to the Chemicals (Hazard Information and Packaging for Supply) Regulations 2002 as amended (CHIP Regulations). The risk associated with the use of this product must be assessed in accordance with the Control of Substances Hazardous to Health (COSHH) Regulations and the Dangerous Substances and Explosive Atmospheres Regulations.		
Restricted to professional users.		
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12.6. Other adverse effects		
The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and is classified for eco-toxicological properties accordingly. See sections 2 and 3 for details.		
Adsorbed organic bound halogens (AOX)		
The product contains an organic linked halogen. It may contribute to the AOX-value.		
Section 13. Disposal considerations		
13.1. Waste treatment methods		
Dispose of in accordance with local regulations.		
Product		
Recommendation: A disposal process that converts the waste into energy is recommended. If this is not possible the hazardous waste must be disposed of by incineration.		
Waste Key Number	Description	
08 01 11	waste paint and varnish containing organic solvents or other dangerous substances	
Uncleaned packaging		
Recommendation: Properly emptied containers are to be scrap processed or reconditioned. Improperly emptied containers are considered hazardous waste (waste key number 150110). Waste, including emptied containers, is controlled waste. Do not allow into drains or watercourses or dispose of where ground or surface waters may be affected. If fully drained containers are compacted they can be regarded as Controlled Waste and disposed of in accordance with the requirements of the Control of Pollution Act 1974 and the Environmental Protection Act 1990 (SEA), the Pollution Control and Local Government (NI) Order 1978 (NI) or of the EC (Waste) Regulations 1979 and the EC (Toxic & Dangerous Waste) Regulations 1982 (IRL).		
Section 14. Transport information		
Transport only in accordance with the requirements of the Carriage of Dangerous Goods by Road and Rail (Classification, Packaging and Labeling), ADR for road, RID for rail, IMDG for sea and ICAO/IATA for air transport.		
14.1. UN number		
ADR/RID; IMDG; ICAO/IATA:	1263	
14.2. UN proper shipping name		
ADR/RID; IMDG; ICAO/IATA:	PAINT	
14.3. Transport hazard class(es)		
Hazard class		
ADR/RID; IMDG; ICAO/IATA:	3	
Subsidiary hazard class		
ADR/RID; IMDG; ICAO/IATA:	Not applicable.	
Labels		
		
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Section 5. Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media
Universal aqueous film-forming foam, Carbon dioxide (CO₂), Dry chemical, Water spray.

Extinguishing media which shall not be used for safety reasons
High volume water jet

5.2. Special hazards arising from the substance or mixture

Hazardous combustion products
Fire will produce dense black smoke containing hazardous combustion products. Exposure to decomposition products may be a hazard to health.

Hazardous decomposition products
When exposed to high temperatures may produce hazardous decomposition products such as carbon monoxide and dioxide, smoke, oxides of nitrogen.

5.3. Advice for firefighters

Fire and Explosion Hazards
Flammable liquid. Vapours may form explosive mixtures with air. Remove all sources of ignition. Solvent vapours are heavier than air and may spread along floors.

Special Protective Equipment and Fire Fighting Procedures
Wear as appropriate: Full protective flameproof clothing. Wear self contained breathing apparatus for fire fighting if necessary. In the event of fire, cool tanks with water spray. Do not allow run-off from fire fighting to enter drains or water courses.

Section 6. Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Keep in a well-ventilated place. Keep away from sources of ignition. Do not inhale vapours.

6.2. Environmental precautions

Do not let product enter drains. Notify the respective authorities in accordance with local law in the case of contamination of rivers, lakes or waste water systems. Please avoid any emission of volatile organic compounds as possible.

6.3. Methods and materials for containment and cleaning up

Contain and collect spillage with non-combustible absorbent materials, e.g. sand, earth, vermiculite, diatomaceous earth and place in container for disposal according to local regulations. Clean thoroughly with a detergent; avoid use of solvents.

6.4. Reference to other sections

Comply with safety directives (see chapters 7 and 8).

Section 7. Handling and storage

Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.


7.1. Precautions for safe handling

Safe handling advice
Prevent the creation of flammable or explosive concentrations of vapour in air and avoid vapour concentration higher than the occupational exposure limits. The product should only be used in areas from which all naked lights and other sources of ignition have been excluded. Preparation may charge electrostatically; always use grounded leads when transferring from one container to another. Operators should wear antistatic footwear and clothing. No sparking tools should be used. Avoid skin and eye contact. Do not breathe vapours or spray mist. Smoking, eating and drinking should be prohibited in the application area. For

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SAFETY DATA SHEET
according to 1907/2006/EC as amended by 453/2010/EC

CAS 1330 20 7	xylene	
EC 215-535-7	REACH 01-2119488218-32	3.00 - < 5.00 %
Classification	Flam. Liq. 3, H226; Acute Tox. 4, H312; Skin Irrit. 2, H315; Acute Tox. 4, H332;	
CAS 138-86-3	dipentene	
EC 205-341-0	REACH no registration number available	3.00 - < 5.00 %
Classification	Flam. Liq. 3, H226; Asp. Tox. 1, H304; Skin Irrit. 2, H315; Skin Sens. 1, H317; Aquatic Acute 1, H400; Aquatic Chronic 1, H410; Note C;	
CAS 112 07 2	2 butoxyethyl acetate	
EC 203-933-3	REACH 01-2119475112-47	3.00 - < 5.00 %
Classification	Acute Tox. 4, H302; Acute Tox. 4, H312; Acute Tox. 4, H332;	
CAS -	naphtha. (petroleum), hydrodesulfurized heavy (white spirit) (<0,1% benzene)	
EC 928-136-4	REACH 01-2119484809-19	1.00 - < 2.00 %
Classification	Flam. Liq. 3, H226; Asp. Tox. 1, H304; STOT SE 3, H336; Aquatic Chronic 2, H411; EUH066; Note H (Table 3.1); Note P;	
CAS 100-41-4	ethylbenzene	
EC 202-348-4	REACH 01-2119489370-35	1.00 - < 2.00 %
Classification	Flam. Liq. 2, H225; Acute Tox. 4, H332;	

Up to the given revision date of this safety data sheet only the above mentioned REACH registration numbers are assigned to the chemical substances used in this mixture.

Additional advice
To avoid misinterpretation in any case of risk assessment it is not allowed to accumulate the above mentioned percentages. See full text of R-phrases in chapter 16.
See full text of H-phrases in chapter 16.

Section 4. First aid measures

4.1. Description of first aid measures

General advice
When symptoms persist or in all cases of doubt seek medical advice. Never give anything by mouth to an unconscious person.

Inhalation
Avoid inhalation of vapour or mist. Move to fresh air in case of accidental inhalation of vapours. If breathing is irregular or stopped, administer artificial respiration. If unconscious place in recovery position and seek medical advice. If symptoms persist, call a physician.

Skin contact
Do NOT use solvents or thinners. Take off all contaminated clothing immediately. Wash skin thoroughly with soap and water or use recognized skin cleanser. If skin irritation persists, call a physician.

Eye contact
Remove contact lenses. Irrigate copiously with clean, fresh water for at least 15 minutes, holding the eyelids apart. Seek medical advice.

Ingestion
If swallowed, seek medical advice immediately and show this container or label. Do NOT induce vomiting. Keep at rest.

4.2. Most important symptoms and effects, both acute and delayed

Please see practical experience in section 11.

4.3. Indication of any immediate medical attention and special treatment needed

If unconscious place in recovery position and seek medical advice.

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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



SAFETY DATA SHEET
according to 1907/2006/EC as amended by 453/2010/EC

Section 1. Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name	Permacron Mixing Colour Series 293 (N), (X)
Product code	4025331903161

1.2. Relevant identified uses of the substance or mixture and uses advised against

Identified uses

based on use descriptor system given by guideline of the European Chemical Agency

Sector of use	SU 3, SU 22
Product category	PC9a, PC9b

Further information see chapter Exposure scenario
The product is only for industrial and/or professional use, not for any private consumer use.

1.3. Details of the supplier of the safety data sheet

Company/Undertaking identification

Producer/Supplier	Axalta Coating Systems Germany GmbH
Street/Box	Horbeller Str. 15
Nat. Code/Postal code/City	DE 50858 Köln
Telephone	+49(0) 2234 6019-01

Information on SDS

Responsible Department	Regulatory Affairs
Telephone	+49 (0)202 529-2385
Telefax	+49 (0)202 529-2604

1.4. Emergency telephone

Emergency telephone number of manufacturer	+44 (0)845 600-6640
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For further information, please also consult our Internet site

<http://www.spieshecker.com>

Section 2. Hazards identification

The product is classified as dangerous in accordance with Directive 1999/45/EC.
The product is classified as dangerous in accordance with Regulation (EC) No. 1272/2008.

2.1. Classification of the substance or mixture

Classification of the mixture

According to European Directive 1999/45/EC as amended.
Classification : Irritant, Sensitising, dangerous for the environment, Flammable;
[R10] Flammable, [R36] Irritating to eyes, [R43] May cause sensitisation by skin contact, [R68] Repeated exposure may cause skin dryness or cracking, [R67] Vapours may cause drowsiness and dizziness, [R51/53] Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

According to Regulation (EC) No 1272/2008
Flam. Liq. 3, H226; Skin Irrit. 2, H315; Skin Sens. 1, H317; Eye Dam. 1, H318; STOT SE 3, H336; Aquatic Chronic 2, H411; EUH066;

2.2. Label elements

Labelling according to European Directive 1999/45/EC.

Symbol and indication of hazard.

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Safety Data Sheet (SDS)


Date Prepared/Revised: 10/1/18 Version no.: 02 Supersedes: (12/2/2014)

To the best of our knowledge, the information contained herein is believed to be accurate. However, the above data does not imply any guarantee or warranty of any kind, expressed or implied. The final determination of the suitability of any material is the sole responsibility of the user. All materials made present un-known hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee these are the only hazards existing.

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Number		Class	Group	Pollutant	Provisions
UN1950	Aerosols	2.1	Not Applicable	Not Applicable	Reference 49 CFR 172.101

IMDG

UN Number	Proper Shipping Name	Hazard Class	Packing Group	Marine Pollutant	Special Provisions
UN1950	Aerosols	2.1	Not Applicable	Not Applicable	Reference IMDG code part 3

IATA:

UN Number	Proper Shipping Name	Hazard Class	Packing Group	Marine Pollutant	Special Provisions
UN1950	Aerosols, Flammable	2.1	Not Applicable	Not Applicable	Reference IATA Dangerous Goods Regulation

15. Regulatory Information

Workplace classification:
This product is considered hazardous under the OSHA Hazard Communication Standard (29 CFR 1910.1200). The Occupational Safety and Health Administration's interpretation of the product's hazard to workers.

SARA Title 3:
Section 311/312 Categorizations (40 CFR 372): This product is a hazardous chemical under 29 CFR 1910.1200, and is categorized as an immediate and delayed health, and flammability physical hazard. Superfund Amendment and Reauthorization Act (SARA) category. SARA requires reporting any spill of any hazardous substance.

TSCA status: All chemicals in this product are listed, or are exempt from listing, on the TSCA Inventory.


WHMIS: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the (M)SDS contains all of the information required by the CPR.

PROP 65 (CA): WARNING: Cancer and Reproductive Harm – www.P65Warnings.ca.gov.

16. Other Information

This SDS has been completed in accordance with GHS Rev04 (2011): U.S OSHA, CMA, ANSL Canadian WHMIS standards, and European Directives.

Date of Preparation/Revision: 10/1/18
Supersedes: (12/2/2014)



Safety Data Sheet (SDS)

Date Prepared/Revised: 10/1/18 Version no.: 02 Supersedes: (12/2/2014)

Skin irritation/sensitization/absorption data: N/A/V
Reproductive toxicity data: N/A/V

Mutagenicity data: Muta. 1B

Symptoms associated with physical contact: N/A/V

Acute/chronic effects from short/long term exposure: Irritating to skin. Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis. Not expected to be a skin sensitizer.

Known reportable carcinogens via the following agencies:

NTP: N/A/V
IARC: N/A/V
OSHA: N/A/V

* Petroleum distillates may contain chemical carcinogens in limited quantities (<0.01%). These quantities are determined by the supplier/fraction/purity of the distillate during the manufacturing process. Chemicals that may be present within distillates are listed on California's prop 65 list such as ETHYLBENZENE, BENZENE, and TOLUENE.

12. Ecological Information

Ecotoxicity: **No Data Available**
Persistence and degradability: **No Data Available**
Bioaccumulative potential: **No Data Available**
Mobility in soil: **No Data Available**
Results of PBT and vPvB assessment: **No Data Available**
Other adverse effects: **No Data Available**

13. Disposal Considerations

Waste Disposal: Dispose of material in accordance with BU, national and local requirements. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permitted under applicable rules, regulations and/or laws governing your location.
Product / Packaging disposal: Dispose of packaging in accordance with federal, state and local requirements, regulations and/or laws governing your location.


14. Transportation Information

US DOT					
UN	Proper Shipping Name	Hazard	Packing	Marine	Special

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				(TWA)	
Isopropanol	67-63-0	200ppm	400ppm	400ppm	N/AV
Hydrocarbon Propellant	68476-86-8	N/AV	N/AV	N/AV	N/AV

***Values are based on the 2014 Guide to Occupational Exposure Values by ACGIH**

9. Information on Basic Physical and Chemical Properties

Appearance: Clear, transparent liquid	Clear	Odor: Alcohol odor
Odor Threshold: N/AV		pH: Not Applicable (solvent Base)
Melting Point: N/AV		Freezing Point: N/AV
Initial Boiling Point: N/AV		Boiling Point Range: N/AV
Flash Point: <0° F (-18° C)		Evaporation Rate: Faster than n-Butyl Acetate
Flammability Solid/Gas: Flammable gas		LEL: 1.4% UEL: 11%
Vapor Pressure: N/AV		Vapor Density: Heavier Than Air
Relative Density: N/AV		Solubility: Negligible
Partition Coefficient: n-octano/ water: N/AV		Auto-ignition Temperature: N/AV
Decomposition Temperature: N/AV		Viscosity: N/AV
Explosive Properties: N/AV		Oxidizing Properties: N/AV

10. Stability & Reactivity

Possibility of hazardous reactions: Hazardous polymerization will not occur under normal conditions
 Chemical stability: Stable under normal conditions
 Conditions to avoid: Heat and ignition sources
 Incompatible materials: Strong Oxidizing Agents
 Hazardous decomposition products: Will not occur


11. Toxicological Information

Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. Repeated overexposure can also damage kidneys, lungs, liver, heart and blood

Routes of exposure: Eyes, skin, ingestion, and/or inhalation

Acute toxicological data: N/AV

Eye irritation data: N/AV



Safety Data Sheet (SDS)

Date Prepared/Revised: 10/1/18 Version no.: 02 Supersedes: (12/2/2014)

PERSONAL PRECAUTIONARY MEASURES:

- 1.) Follow personal protective equipment recommendations found in section 8.
- 2.) Maintain adequate ventilation.

SPILL CLEAN-UP PROCEDURES:

- 1.) Evacuate unprotected personnel from the area.
- 2.) Remove sources of ignition if safe to do so.
- 3.) Pickup spilled materials using non-sparking tools and place in an appropriate container for disposal.
- 4.) Contain spill to prevent material from entering sewage or ground water systems.
- 5.) Always dispose of waste materials in accordance with all EU, National and Local Regulations.

7. Handling and Storage

Handling:

Flammable Aerosol, use in a well ventilated area.
 Do not use near sources of ignition.
 Do not to eat, drink and smoke while working with this material.
 Wash hands after use.

Conditions for safe storage, including any incompatibilities:

Store out of direct sunlight.
 Storage Temperature: 32° to 120°F (0° to 49°C).
 No known incompatibilities.

8. Exposure Controls / Personal Protection

Appropriate engineering controls:

Ensure adequate ventilation. A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits.
 Keep away from sources of ignition.
 Take precautionary measures against static discharge.

Personal Protection:

Eye & face protection devices such as safety glasses, safety goggles or face shield are recommended.

Skin protection

Wear the appropriate protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection:

Use only in an adequately ventilated area. For unknown vapor concentrations use a positive-pressure, pressure-demand, self-contained breathing apparatus (SCBA).

Hazardous Ingredient	CAS Number	ACGIH TLV (TWA)	ACGIH TLV (STEL)	OSHA PEL	OSHA PEL (STEL)

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SC Auto (Myanmar) Co., Ltd.

AERVOE Safety Data Sheet (SDS)

Date Prepared/Revised: 10/1/18 Version no.: 02 Supersedes: (12/2/2014)

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Other Product Information

Chemical Identity: Mixture

4.) First Aid Measures

General Advice: If symptoms persist, always call a doctor.

Inhalation First Aid: Remove victim to fresh air and provide oxygen if breathing is difficult. If not breathing, give artificial respiration, preferably mouth to mouth. Get medical attention immediately.

Skin Contact First Aid: Wash with soap and water. Remove contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse.

Eye Contact First Aid: If contact with eyes, immediately flush eyes with plenty of water for at least 15 minutes, while holding eyelids open. Get medical attention immediately.

Ingestion First Aid: If swallowed, wash out mouth with water provided the person is conscious. Do not induce vomiting. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Most Important Symptoms/Effects: Exposure may cause slight irritation to the skin, eyes, and respiratory tract. Excessive exposure may cause central nervous system effects.

5. Fire Fighting Measures

Flammable Properties: Aerosol

Auto Ignition Temperature: Not Available

Suitable extinguishing media: Carbon dioxide, dry chemical, water spray.

Unsuitable extinguishing media: None known

Special hazards arising from the substance or mixture: None known

Hazardous combustion products: Carbon dioxide, Carbon monoxide

Fire & Explosion Hazards: Closed Containers may rupture due to the buildup of pressure from extreme temperatures.

Precautions for fire-fighters: Use water spray to cool containers exposed to heat or fire to prevent pressure build up. In the event of a fire, wear full protective clothing and NIOSH- approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode.

6. Accidental Release Measures


AERVOE Safety Data Sheet (SDS)

Date Prepared/Revised: 10/1/18 Version no.: 02 Supersedes: (12/2/2014)

H336 – May cause drowsiness or dizziness.
H340 – May cause genetic defects
H350 – May cause cancer

Precautionary Statements: P101 - If medical advice is needed, have product container or label at hand
P102 - Keep out of reach of children
P103 - Read label before use
P210 - Keep away from heat/sparks/open flames/hot surfaces - no smoking
P211 - Do not spray on an open flame or other ignition source
P251 - Pressurized container: Do not pierce or burn, even after use
P261 - Avoid breathing dust/fume/gas/mist/vapours/spray
P262 - Do not get in eyes, on skin, or on clothing
P264 - Wash ... thoroughly after handling
P280 - Wear protective gloves/eye protection/face protection

P303+P361+P353 - If on skin or hair, remove/takeoff immediately all contaminated clothing. Rinse skin with water/shower.
P410+P412 - Protect from sunlight. Do not expose to temperatures exceeding 50°C/122°F
P501 - Dispose of contents/container in accordance with local/regional/national/international regulation
P251 - Pressurized container: Do not pierce or burn, even after use

Symbols/Pictograms: 

3. Composition / Information on Ingredients


Composition

Chemical	Synonyms	CAS Number	FINESCS Number	Weight Percent	Hazard Category	HL-Code
Isopropanol	Isopropyl Alcohol	67-63-0	200-661-7	60-100%	Flam. Liq. 2 Eye Irrit. 2 STOT SE 3	H225 H319 H336
Hydrocarbon Propellant	LPG	68476-86-8	270-705-8	10-30%	Press. Gas Flam. Gas 1	H220 H229

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Safety Data Sheet (SDS)

Date Prepared/Revised: 10/1/18 Version no.: 02 Supersedes: (12/2/2014)

1.) Identification of the Mixture and of the Company

Product identifier: **Crown Fault-Finder Cleaner Group 1 - Aerosol**
Product name:
1071 Fault-Finder Cleaner Group 1

Relevant identified uses of the substance: Use to clean metals, glass and plastic before applying penetrant.
Uses advised against: Poorly ventilated areas

CAS No: **Not Applicable (mixture)**
EC No: **Not Applicable (mixture)**
Index No: **Not Applicable (mixture)**
Manufacturer/Supplier: **AerVOE Industries Incorporated**
Street address/P.O. Box: **1100 Mark Circle**
Country ID/Postcode/Place: **Gardnerville, Nevada 89410**
Telephone number: **1-775-782-0100**
e-mail: **mailbox@aerVOE.com**
National contact: **AerVOE industries Incorporated**
For Product Information: **1-800-227-0196**
Emergency telephone number: **1-800-424-9300 (CHEMTREC – 24 hrs)**

2. Hazards identification

Classifications

Physical Hazards: Aerosol - Category 1
Press. Gas
Flam. Gas. 1
Flam. Liquid 2


Health Hazards: Carc. 1B
Muta. 1B
Eye Irrit. 2
STOT SE 3

Environmental Hazards: N/AV

Labeling

Signal Word: Danger

Hazard Statements: H220 – Extremely flammable gas.
H222 – Extremely Flammable Aerosol
H225 – Highly flammable liquid and vapour.
H229 – Pressurized container: may burst if heated
H319 – Causes serious eye irritation.



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NFPA 704 Rating			HMIS Rating		
Health	Flammability	Reactivity	Health	Flammability	Reactivity
3	2	2	3	2	2


Disclaimer: The information contained herein is considered accurate. However, no warranty is expressed or implied regarding the accuracy of the data, the results to be obtained by the use thereof, or that any such use will not infringe any patent. Before using, user shall determine the suitability of the product for the intended use and user assumes all risk and liability whatsoever in connection therewith.

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Initial Environmental Examination Report


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Corrosive (C)



Oxidising (O)

Section 16 – Other Information

Relevant hazard statements

Chemical Name	Hazard Statements (GHS Classification)
Methyl ethyl ketone peroxide	H242 Heating may cause a fire H302 Harmful if swallowed H312 Harmful in contact with skin H314 Causes severe skin burns and eye damage H331 Toxic if inhaled
Diethylene glycol Methyl ethyl ketone	H302 Harmful if swallowed H225 Highly flammable liquid and vapour H319 Causes serious eye irritation H336 May cause drowsiness or dizziness
Hydrogen peroxide	H271 May cause fire or explosion; strong oxidizer H302 Harmful if swallowed H314 Causes severe skin burns and eye damage H332 Harmful if inhaled


R-pharse information

Chemical name	Risk phrase EU Classification
Dimethyl phthalate	none
Methyl ethyl ketone peroxide	R07 May cause fire R22 Harmful if swallowed R34 Causes burn
Diethylene glycol Methyl ethyl ketone	R22 Harmful if swallowed R11 Highly flammable R36 Irritating to eyes R66 Repeated exposure may cause skin dryness or cracking
Hydrogen Peroxide	R67 Vapours may cause drowsiness and dizziness R05 Heating may cause an explosion R08 Contact with combustible material may cause fire R20/22 Harmful by inhalation and if swallowed R35 Causes severe burns

**NFPA 432
Organic Peroxide Classification
Class III**

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For further advice contact manufacturer.

Section 14 – Transportation Information

Land transport (ADR/ RID) and / or DOT
Class 5.2
Classification Code P1
RID class 5.2
TREM-Card or ERG Number CEFIC TEC(R)- 52GP1-L
UN number 3105
Proper Shipping Name Organic peroxide type d, liquid; (Methyl ethyl ketone peroxide.)
Sea transport (IMDG-code/ IMO)
Class 5.2
Packing group II
UN number 3105
EMS F+, S-R
Marine pollutant no
Proper Shipping Name Organic peroxide type d, liquid; (Methyl ethyl ketone peroxide.)
Air transport (ICAO-TI/ IATA-DGR)
UN number 3105
Class 5.2
Proper Shipping Name Organic peroxide type d, liquid; (Methyl ethyl ketone peroxide.)

Section 15 – Regulatory Information

Chemical description
Methyl ethyl ketone peroxide in solvent mixture

Labelling according to EC directives
EC-number
not applicable

R(isk) phrase(s)
Code Description
R07. May cause fire.
R20/21/22. Harmful by inhalation, in contact with skin and if swallowed.
R34. Causes burns.
R43. May cause sensitization by skin contact.

S(afety) phrase(s)
Code Description
S03/07. Keep container tightly closed in a cool place.
S14B. Keep away from reducing agents (e.g. amines), acids, alkalies and heavy metal compounds (e.g. accelerators, driers, metal soaps).
S26. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37/39. Wear suitable protective clothing, gloves and eye/face protection.
S45. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
S50D. Do not mix with peroxide-accelerators or reducing agents.

Classification according to 67/548/EC as ammended

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Irritation

Skin Mildly : irritating
Eye Minimally : irritating

Diacetone alcohol

Acute toxicity

Oral LD50 : rat: 4000 mg/kg
Dermal LD50 : rabbit 13.500 mg/kg
Inhalation LC50 : mouse 500-1900 mg/m³

Irritation

Skin Mildly : irritating
Eye Severely : irritating

Genotoxicity Ames test: Not mutagenic

Section 12 – Ecological Information

No experimental ecological data are available on the substance as such. The following data are applicable to the ingredient(s) listed below.

Methyl ethyl ketone peroxide, 40 % in Dimethyl phthalate

Ecotoxicity

fish : Acute toxicity, 96h-LC50 = 44.2 mg/l. (*Poecilia reticulata*.)
bacteria : Activated sludge respiration inhibition test EC50 = 48.0 mg/l.

Fate

Degradation Biotic : Readily biodegradable (Closed bottle test).

tert-Butyl hydroperoxide, 70% solution in water

Ecotoxicity

fish : Acute toxicity, 96h-LC50 = 57 mg/l. (*Brachydanionerio*.)
bacteria : Activated sludge respiration inhibition test EC50 =17 mg/l.

Fate

Degradation Biotic : Not readily biodegradable (Closed bottle test).

Dimethyl phthalate

Ecotoxicity

fish : *Lepomis macrochirus*: 96h-LC50: 420 ppm
algae : *Selenastrum capricornutum*: 39.8 mg/l (96h-IC50)

Fate

Degradation Biotic : Readily biodegradable.
Other information : Bio Concentration Factor (BCF) fish 5.4 (24 hours)

Diacetone alcohol

Ecotoxicity

fish : *Lepomis macrochirus*: 96h-LC50: 420 ppm
bacteria : Activated sludge respiration inhibition test EC50 =17 mg/l.

Fate

Degradation Biotic : Biodegradable.
Other information : Bio Concentration Factor (BCF) = 0.5

Section 13 – Disposal Considerations

Product

Waste disposal in accordance with regulations (most probably controlled incineration).

Contaminated packaging

According to local regulations.

Other information

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Section 10 – Chemical Stability & Reactivity Information

Stability

SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the following temperature: 60 °C. Contact with incompatible substances can cause decomposition at or below the SADT 60 °C.

Conditions to avoid

To maintain quality store in original closed container below: 25 °C.
Avoid shock and friction. Confinement must be avoided.

Incompatibilities

Avoid contact with rust, iron and copper. Contact with incompatible materials such as acids, alkalis, heavy metals and reducing agents will result in hazardous decomposition. Do not mix with peroxide accelerators. Use only Stainless steel 316, PVC, polyethylene or glass-lined equipment.

Decomposition

Acetic acid, Formic acid, Propanoic acid, Methyl ethyl ketone

Other information

Emergency procedures will vary depending on conditions. The customer must have an emergency response plan in place.

Section 11 – Toxicological Information

No experimental toxicological data on the preparation as such available. The following data are applicable to the ingredient(s) listed below.

Methyl ethyl ketone peroxide, 40 % in Dimethyl phthalate

Acute toxicity

Oral LD50 : rat:1017 mg/kg
Dermal LD50 : rat:4000 mg/kg
Inhalation LC50 : rat:17 mg/l ; 4 hours exposure time

Irritation

Skin : Corrosive
Eye : Corrosive
Sensitization : Not sensitizing
Genotoxicity Ames test: Not mutagenic

tert-Butyl hydroperoxide, 70% solution in water

Acute toxicity

Oral LD50 : rat: 810 mg/kg
Dermal LD50 : rabbit: approx. 790 mg/kg
Inhalation LC50 : rat: 1.85 mg/l; 4 hours max. attainable concentration (as 100 % tert-Butyl hydroperoxide)

Irritation

Skin : Severely irritating
Eye : Severely irritating
Sensitization : May cause sensitization by skin contact.

Dimethyl phthalate

Acute toxicity

Oral LD50 : rat: >2400 mg/kg
Dermal LD50 : rabbit: >10.000 mg/kg
Inhalation LC50 : 9300 mg/m³ (6.5 hours)

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Section 8 – Exposure Controls / Personal Protection

Engineering controls

Ensure good ventilation and local exhaust of the working area. Explosion proof ventilation recommended.

Personal protection

Respiratory

Do not breathe vapour. Ensure good ventilation and local exhaust of the working area.

Hand

Wear suitable protective gloves of neoprene or synthetic rubber.

Eye

Wear eye/face protection. A face shield is preferred over goggles.

Skin and body

Wear suitable protective clothing and gloves. Take off contaminated clothing immediately.

Other information

Launder clothes before reuse.

Methyl ethyl ketone peroxide

Agency OES-STEL 1,500 mg/m³

Dimethyl phthalate

Agency OES-STEL 5,000 ppm

Diacetone alcohol

Agency OES-STEL 75,000 mg/m³

Section 9 – Physical & Chemical Properties

Appearance and Odour	:	liquid colourless
odour	:	faint
Boiling point/range	:	not relevant
Melting point/range	:	Solidifies at or below -10°C / 14°F
Flash point	:	42°C / 108°F (closed cup) >63°C / >145°F (open cup)
Flammability	:	61 °C (ISO 3679)
Explosive properties	:	no
Oxidizing properties	:	not applicable
Vapour pressure	:	not applicable
Density	:	1130 kg/m ³
Bulk density	:	not relevant
Solubility in water	:	Partly miscible with water at 20°C / 68°F
Solubility in other solvents	:	Miscible with phthalates at 20°C / 68°F
pH value	:	slightly acidic character
Partition coefficient n-octanol/water	:	not determined
Relative vapour density (air=1)	:	not determined
Viscosity	:	not determined
Active oxygen content	:	9.8 - 10.0 %
Peroxide content	:	36-50 %
Autoignition temperature Test method	:	not applicable. (See Section 7)
SADT 60 °C.	:	See also Section 10.
Explosion limits	:	not applicable
Specific conductivity	:	not determined

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Section 5 - Fire Fighting Measures

Rinse immediately and as long as possible with plenty of water. Eyelids should be held away from the eyeball to ensure thorough rinsing. Always seek medical advice.

Ingestion

Only when conscious, rinse mouth, give plenty of water to drink. DO NOT induce vomiting. Seek medical advice.

Advice to physician

Symptomatic treatment is advised.

Extinguishing media

Carbon dioxide, dry chemical powder, water, foam.

Unsuitable extinguishing media

halones.

Hazardous decomposition/

combustion products

Carbon dioxide, Acetic acid, Formic acid, Propanoic acid, Methyl ethyl ketone

Protective equipment

Wear suitable protective clothing. Wear self contained breathing apparatus.

Other information

Extinguish a small fire with powder or carbon dioxide then apply water to prevent re-ignition. Cool closed containers with water.

Section 6 – Accidental Release Measures

Personal precautions

Avoid contact with skin and eyes. For personal protection see Section 8.

Environmental precautions

Collect as much as possible in a clean container for (preferable) reuse or disposal. Do not empty into drains.

Methods for cleaning up

The waste should NOT be confined. Absorb the remainder with e.g. vermiculite. Keep contents moist.

Other information

For personal protection see Section 8.

Section 7 – Handling and Storage

Handling

Never weigh out in the storage room. When using do not eat, drink or smoke. Do not pipet by mouth. Do not breathe fumes/vapour. Handle in well ventilated areas. Apply effective local ventilation. Keep away from reducing agents (e.g. amines), acids, alkalis and heavy metal compounds (e.g. accelerators, driers, metal soaps). Keep product and emptied container away from heat and sources of ignition. Confinement must be avoided. Avoid shock and friction. Avoid contact with skin and eyes.

Storage requirements

Store in accordance with local/national regulations. Keep away from food, drink and animal feeding stuffs.

Store in a dry well ventilated place away from sources of heat and direct sunlight. Keep only in the original container.

Keep container upright to prevent leakage.

Storage

For maximum quality store below: 25 °C.

Other information


It is recommended to use electrical equipment of temperature group T3. However, autoignition can never be excluded. Wash hands thoroughly after handling or contact. Keep working clothing separately and do not take them home.

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Number	REACH Registration Number	EC- Number	Classification according to 1272/2-8 as amended		Classification according to 67/548/EEC as amended
1	01-21194 205-011-6 37229-36		GHS classification	none	none
2	01-21195 215-661-2 14691-43		Organic peroxide	Type D	H242 H302 H312 H314 H331
			Acute toxicity (inhalation)	category 3	
			Acute toxicity (oral)	category 4	
			Acute toxicity (dermal)	category 4	
			Eye irritation	category 1	
			Skin corrosion/ irritation	category 1B	
3	01-21194 203-872-2 57857-21		Acute toxicity (oral)	category 4	H302
4		201-159-0	Flammable liquid	category 2	H225 H319 H336
			7		F Xi R11 R36 R66 R6
			Eye irritation	category 2	
			Target organ, single exposure	category 3	
5		231-765-0	Oxidizing liquid	category 1	H271 H302 H314 H332
			R35		C O R05 R08 R20/R22
			Acute toxicity (inhalation)	category 4	
			Acute toxicity (oral)	category 4	
			irritation	category 1	
			Skin corrosion/ irritation	category 1A	

Other information
Balance: non-hazardous ingredients.

Section 4 - First Aid Measures

Symptoms and effects
Harmful by inhalation, in contact with skin and if swallowed. Causes burns. May cause sensitization by skin contact. Causes injury to the cornea and eyelids. Risk of serious damage to eyes.

First aid
Call a physician immediately.


Inhalation
Move to fresh air, rest, half upright position, loosen clothing. Oxygen or artificial respiration if there is difficulty in breathing. Remove contaminated clothing. Always seek medical attention.

Skin
Remove all contaminated clothing immediately. Wash off with plenty of soap and water. Always seek medical advice. Launder clothes before reuse.

Eye

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Precautionary statement(s) (GHS)

Code	Description
P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
P220d.	Keep away from dirt, rust, chemicals in particular
P233.	Keep container tightly closed.
P234.	Keep only in original container.
P240.	Ground/bond container and receiving equipment.
P241a.	Use explosion-proof equipment.
P242.	Use only non-sparking tools.
P243.	Take precautionary measures against static discharge.
P260e.	Do not breathe vapours.
P264a.	Wash hands and contaminated skin thoroughly after handling
P270.	Do not eat, drink or smoke when using this product
P271.	Use only outdoors or in a well-ventilated area.
P280d.	Wear protective gloves, eye/face protection and protective clothing.
P301+P330+P331.	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303+P361+P353.	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304+P340.	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P305+P351+P338.	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310.	Immediately call a POISON CENTER or doctor/physician.
P378d.	Use waterspray, foam, sand, dry chemical powder or CO2 for extinction.
P403+P233.	Store in a well-ventilated place. Keep container tightly closed.
P410.	Protect from sunlight.
P501a	Dispose of contents and container according to local regulation.

Section 3 - Composition / Information on Ingredients

Information on hazardous ingredients
Mixture of methyl ethyl ketone peroxide in solvent mixture

Composition / information on ingredients			
Number	% w/w	CAS-number	Chemical name
1	35.00 - 45.00	001338-23-4	Methyl ethyl ketone peroxide
2	1.00-5.00	007722-84-1	Hydrogen peroxide
3	7.00-13.00	000111-46-6	Diethylene glycol
4	30.00-50.00	000131-11-3	Dimethyl phthalate
5	3.00-7.00	000078-93-3	Methyl ethyl ketone

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SAFETY DATA SHEET : METHYL ETHYL KETONE PEROXIDE

Date of Revision : 25 Jan 2017

Section 1 - Product and Company Identification

Product Name(s) : Methyl Ethyl Ketone peroxide Esterox Series

Supplier : WEE TEE TONG CHEMICALS PTE LTD
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Section 2 - Hazards Identification

May cause fire.
Harmful by inhalation, in contact with skin and if swallowed
Causes burns.
May cause sensitization by skin contact.

GHS classification


Description	Applicable
Flammable Liquid	Category 3
Organic peroxide	Type D
Acute toxicity (inhalation)	Category 4
Acute toxicity (oral)	Category 4
Eye irritation	Category 1
Skin corrosion/irritation	Category 1A

Pictogram(s) (GHS)


Signal word: DANGER
H226.
H242.
H302.
H314.
H332.


Flammable liquid and vapour.
Heating may cause a fire.
Harmful if swallowed.
Causes severe skin burns and eye damage. Harmful if inhaled.

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Shipping Name: Not regulated Not regulated Not regulated

Hazard Class: None None None

UN Number: None None None

Packing Group: None None None

Section 15 – Regulatory Information

Classification and Labeling (EEC):
This product is not hazardous according to European Directives 99/45/EC, 67/548/EEC and their latest amendment.

Symbol(s): None

R-phrases(s): None

S-phrases(s): S22 - Do not breathe dust.

Component Analysis – Inventory

Component CAS # TSCA EINECS
Glass, Oxides (Fiber Glass Continuous Filament) 65997-17-3 Yes 266-046-0

Section 16 – Other Information

Key/Legend
TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NTP = National Toxicology Program; WHO = World Health Organization; IATA = International Air Transport Association; RID = European Rail Transport; ADR = European Road Transport; IMO = International Maritime Organization; MEL = Maximum Exposure Limits; TWA = Time Weighted Average; STEL = Short-term Exposure Limit Ref. IOM Study. Source: NAIMA 1997. Unpublished letter. Rat inhalation studies with E-Glass micro-fibers at Institute of Medicine, Scotland. January 30, 1997. Letter to USEPA TSCA 8(e) coordinator.

This Product Safety Data Sheet has been prepared in conformity with EU Directive 91/155/EEC; 99/45/EC and 67/548/EEC and their latest amendments.
It is the responsibility of the person in receipt of this product safety data sheet to ensure that the information contained herein is properly understood by all people who may use, handle or dispose of the product or in any way come in contact with the product.
The information provided in this product safety data sheet is based on current state of scientific and technical knowledge at the date indicated on the present document.

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Section 10 – Chemical Stability & Reactivity Information

Reactivity: This is a stable material.

Conditions to Avoid: None expected.

Incompatible Materials: None expected.

Hazardous Decomposition Products: None. In case of fire see Section 5.

Hazardous Polymerization: Will not occur, all binders are fully polymerized.

Section 11 – Toxicological Information

Carcinogenicity:

Fiber Glass Continuous Filament: According to the E.U. Directives the continuous filament glass fibers in these products are not classified as carcinogenic. Continuous filament glass fibers are not within the scope of Directive 67/548/EEC per amendment 97/69/EC, since they are not “fibres with random orientation.”

The International Agency for Research on Cancer (IARC) in June 1987, categorized fiberglass continuous filament as not classifiable with respect to human carcinogenicity (Group 3). The evidence from human as well as animal studies was evaluated by IARC as insufficient to classify fiberglass continuous filament as a possible, probable, or confirmed cancer causing material.

The American Conference of Governmental Industrial Hygienists (ACGIH) has established an A4 classification, not classifiable as a human carcinogen, for respirable continuous filament glass fibers. This was based on inadequate evidences in terms of its carcinogenicity in humans and/or animals.

The continuous filament glass fibers in these products are “non-respirable.” Products that are chopped, crushed or severely mechanically processed during manufacture or use contain small amounts of respirable glass “fiber-like” fragments (WHO Criteria > 5 microns in length; < 3 microns in diameter and an aspect ratio > 3:1 (length to width ratio). Available exposure monitoring data indicates that airborne exposure concentrations of respirable glass “fiber-like” fragments are expected to be extremely low or non-detectable.

Section 12 – Ecological Information

Ecotoxicity:

A: General Product Information

No data are available for this product. This material is not expected to cause harm to animals, plants or fish.

B: Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available.

Environmental Fate:

No data are available for this product. This product is not expected to be biodegradable.

Section 13 – Disposal Considerations

Disposal Instructions:

Consult appropriate authorities before disposing waste material. Dispose, recycle or re-use waste material according to local and national requirements.

Section 14 – Transportation Information

International Transport: IATA RID/ADR IMO

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Germany Alveolar dust: 6 Respirable Fibres: 0,25

Ireland Inhalable dust: 5 Respirable Fibres: 2

Italy Dust : 10 Fibres: 1

Netherlands Respirable dust: 5 Respirable fibres: 2 General dust: 10

Norway Inert respirable dust: 5 Fibres: 1 Total inert dust: 10

Portugal Fibrous dust: 1 None --Total dust 4

Spain Dust : 10 Fibres: 1

Sweden Respirable dust: 5 Fibres: 1 Total dust 10

Switzerland Dust : 6 Respirable fibres 0,5

U.K. Respirable dust : 5 Respirable fibres: 2 Total dust : 10

Refer to local legislation for exposure limits in other countries.

Ventilation: General ventilation and/or local exhaust ventilation should be provided as necessary to maintain exposures below regulatory limits.

PERSONAL PROTECTION

Personal Breathing Protection:

Under normal circumstances, breathing protection is not necessary. To avoid irritation a properly fitted P2 disposable filtermask should be used. In extreme circumstances (exposure exceeding the established exposure limit) the use of a properly fitted half-mask respirator with a P2 filter should be used. Use respiratory protection in accordance with your company's respiratory protection program and applicable regulations.

Loose fitting long sleeved shirts that cover to the base of the neck, long trousers and gloves should be worn. Skin irritation is known to occur chiefly at pressure points such as at the base of the neck, wrist, waist and between the fingers. Be careful not to rub or scratch irritated areas. Rubbing or scratching may force fibres into the skin. In extreme circumstances, a disposable overall and gloves are recommended.

Eyes/Face Protective Equipment:

To avoid irritation of the eyes, safety glasses with side shields or goggles are recommended.

Work and Hygienic Practices:

Avoid unnecessary exposure to dust and handle with care. Remove material from clothing using a vacuum cleaner. Never use compressed air. Keep the work area clean of dust and fibres by using an industrial vacuum cleaner with a high efficiency filter. Avoid dry sweeping or the use compressed air. Have access to an eye wash station and shower. Clothing should be washed separately from other clothing. Wipe out washer/sink to prevent loose glass fibres from getting on other articles.

Section 9 – Physical & Chemical Properties

Vapor Pressure (mm HG @ 20 C): Not applicable

Vapor Density (Air=1): Not applicable

Specific Gravity (Water=1): 2,60

Boiling Point: Not applicable

Solubility in Water: Insoluble

Viscosity: Not applicable

Appearance: Solid nonwoven mat

Physical State: Solid

Flash Point: Not applicable

Freezing Point: Not applicable

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remove fibers. To avoid further irritation, do not rub or scratch affected areas. Rubbing or scratching may force fibers into the skin. Remove polluted clothing. If irritation persists, get medical attention.

Ingestion:

Accidental ingestion of this material is unlikely. If it does occur, watch the person for several days to make sure that intestinal blockage does not occur. Rinse the mouth with water and drink water to remove fibres from the throat. If irritation persists, get medical attention.

Section 5 - Fire Fighting Measures

Flammability: This product will burn poorly.

Extinguishing Media: Dry chemical, foam, carbon dioxide, water fog.

Unusual Fire & Explosion Hazards: Toxic fumes can be released during a fire.

Hazardous Combustion Products: Primary combustion products are carbon monoxide, carbon dioxide and water. Formaldehyde, nitrogen oxides, amines and other undetermined compounds could be released in small quantities.

Section 6 – Accidental Release Measures

Land Spill: Scoop up material and put into suitable container for disposal as a non-hazardous waste.

Water Spill: This material will sink and disperse along the bottom of waterways and ponds. It can not easily be removed after it is waterborne; however, the material is non-hazardous in water.

Air Release: This material will settle out of the air. If concentrated on land it can then be scooped up for disposal as a non-hazardous waste.

Section 7 – Handling and Storage

Storage Temperature: Not Applicable.

Storage Pressure: Not Applicable.

General: No special storage or handling procedures are required for this material.

Section 8 – Exposure Controls / Personal Protection

Country Particulate (8 hr TWA) mg/m³

Man Made Vitreous Fibres: (8 hr TWA) Fibres / ml

Austria Fine dust: (yearly avg) 6 Fibres: 0,5(monthly average) 12

Belgium Dust 10 None --

Denmark Inert respirable dust: 5 Fibres: 1 Total inert dust: 10

Finland Inert Organic Dust 10 Fibres: 1

France Total Dust: 10 Respirable fibres: 1

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SAFETY DATA SHEET : FIBREGLASS ROVING, CHOPPED STRAND, CHOPPED STRAND MAT, WOVEN ROVING, MILLED FIBRE, GLASS FLAKE, YARN, FIBREGLASS CLOTH, SURFACE TISSUE, C VEIL, BOAT TAPE, GLASS TAPE, BIAXIAL MAT, UNIDIRECTIONAL FABRIC, QUADRIAXIAL FABRIC.

Date of Revision : 16 Jan 2020

Section 1 - Product and Company Identification

Product Name(s): Fibreglass Roving, Chopped Strand, Chopped strand Mat, Woven Roving, Milled Fibre, Glass Flake, Yarn, Fibreglass Cloth, Surface Tissue, C Veil, Boat Tape, Glass Tape, Biaxial Mat, Triaxial, Vitrocore, Unidirectional Fabric, Quadriaxial Fabric

Section 2 - Hazards Identification

The product is not classified as hazardous according to Regulation (EC) 1272/2008

Label Elements

Signal Word : No signal word
Hazard Statements : No critical hazards

Section 3 – Composition / Information on Ingredients

Ingredient(s)	% by weight	Classification	Identifiers
Fibrous glass	98-100%	Not Classified	CAS 65997-17-3
Polymeric Organic Binder	0-2%	Not Classified	Not available

No hazardous ingredient in the meaning of European Directive 67/548/EEC and 99/45/EC and their latest amendments.

Section 4 - First Aid Measures

Inhalation:

Immediately move the affected person to fresh air. If symptoms persist, get medical attention.

Eye Contact:

Immediately flush eyes with plenty of water for at least 15 minutes. Do not rub or scratch eyes. Rubbing or scratching may cause mechanical damage. If irritation persists get medical attention.

Skin Contact:

For skin contact, wash immediately with soap and cold water. Do not wash with warm water because this will open up the pores of the skin, which will cause further penetration of the fibres. Use a washcloth to help

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SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Method Used)	Not Combustible
Flammable Limits	Nor Applicable
Extinguishing Media	Use media appropriate for surrounding fire
Special Fire Fighting Procedures	None required
Unusual Fire and Explosion Hazards	None

SECTION V - HEALTH HAZARD DATA

Threshold Limit Value	SiO ₂ : LD ₅₀ (ori-rat) 3.160 mg/Kg
Effects of Overexposure	Non irritation to skin
Emergency and First Aid Procedures	
Eyes	Immediately flush with water.
Skin	Wash and apply a moisturising skin cream.

SECTION VI - REACTIVITY DATA

Stability	Stable; No conditions to avoid
Incompatibility (Materials to avoid)	None
Hazardous Decomposition Products	Not Applicable
Hazardous Polymerization	Will not occur; No conditions to avoid

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be taken in case material is released or spilled
Any feasible mechanical means, such as broom, brush, scoop or vacuum.

Waste Disposal Method
All material should be package labelled, transported and disposed or reclaimed in conformance with all applicable local, state and federal regulation.

SECTION VIII - SPECIAL PROTECTION INFORMATION

Respiratory protection (Specific type)	
NIOSH - approved dust respirators if airborne dust concentration exceeds the TLV.	
Ventilation	Sufficient to minimise to vapour.
Protective Gloves	To prevent drying effect on the skin
Eye Protection	Safety glasses with sideshields or goggles
Other Protective Equipment	None

SECTION IX - SPECIAL PRECAUTIONS

No special precautions are needed.

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MATERIAL SAFETY DATA SHEET

SECTION I

Chemical Name and Synonyms	Silicon Dioxide (Amorphous Silica)
Trade Name and Synonyms	Reolosil (Amorphous Fumed Silica)
CAS No.	112945-52-5
Chemical Family	Non-metal
Formula	SiO ₂

SECTION II - HAZARDOUS INGREDIENTS

Paints, Preservatives & Solvents	% TLV (Unit)
Pigments	None
Catalyst	None
Vehicle	None
Solvent	None
Additives	None
Others	None

Alloys and Metallic Coating	
Base Metal	None
Alloys	None
Metallic Coatings	None
Filler metal plus coating or core flux	None
Others	None

Hazardous Mixtures of other liquids, solids or gases
None

SECTION III - PHYSICAL DATA

Appearance	White Powder
Odour	Odourless
Boiling Point (at 760mmHg)	2,230 deg C (SiO ₂)
Vapour Pressure	Not applicable
Specific Gravity	2.0
Oxirane Oxygen	None
Evaporation rate	Not applicable
Fluidity Point	~ 1,713 deg C (SiO ₂)

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paraffin wax: 8002-74-2, 12704-91-5, 105054-93-1, 105945-09-7, 115251-23-5, 115251-24-6, 12704-92-6, 12796-75-4, 160936-34-5, 37220-23-8, 37339-80-3, 39355-23-1, 39373-78-9, 51331-35-2, 54892-42-1, 57672-43-7, 57608-84-1, 56697-11-7, 64742-43-4, 64742-51-4, 68607-08-9, 68649-50-3, 70431-26-4, 72993-89-5, 72993-89-6, 72993-90-9, 8035-62-9, 8044-02-8, 8044-79-9, 9063-41-4, 92045-74-4

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at: www.chemwatch.net

The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations
 PC - TWA: Permissible Concentration-Time Weighted Average
 PC - STEL: Permissible Concentration-Short Term Exposure Limit
 IARC: International Agency for Research on Cancer
 ACGIH: American Conference of Governmental Industrial Hygienists
 STEL: Short Term Exposure Limit
 TEEL: Temporary Emergency Exposure Limit
 IDLH: Immediately Dangerous to Life or Health Concentrations
 OSHF: Odour Safety Factor
 NOAEL: No Observed Adverse Effect Level
 LOAEL: Lowest Observed Adverse Effect Level
 TLV: Threshold Limit Value
 LOD: Limit of Detection
 OTV: Odour Threshold Value
 BCF: BioConcentration Factors
 BEI: Biological Exposure Index

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end of SDS

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UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains beta-pinene and alpha-pinene)	
Transport hazard class(es)	IMDG Class	9
	IMDG Subrisk	Not Applicable
Packing group	III	
Environmental hazard	Marine Pollutant	
Special precautions for user	EMS Number	F-A, S-F
	Special provisions	274, 335, 369
	Limited Quantities	5 L

Transport in bulk according to Annex II of MARPOL and the IBC code
Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

DISTILLATES, PETROLEUM, LIGHT, HYDROTREATED(64742-47-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS
 Australia Exposure Standards Australia Inventory of Chemical Substances (AICS)
 Australia Hazardous Substances Information System - Consolidated Lists International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

PETROLEUM DISTILLATES HFP(64742-48-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS
 Australia Exposure Standards Australia Inventory of Chemical Substances (AICS)
 Australia Hazardous Substances Information System - Consolidated Lists International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs

PARAFFIN AND HYDROCARBON WAXES, OXIDISED, LITHIUM SALTS(68649-48-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS
 Australia Inventory of Chemical Substances (AICS)

BETA-PINENE(19902-69-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS
 Australia Inventory of Chemical Substances (AICS)

ALPHA-PINENE(80-56-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS
 Australia Inventory of Chemical Substances (AICS)

POLYDIMETHYLSILOXANE(63148-62-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS
 Australia Inventory of Chemical Substances (AICS)

PARAFFIN WAX(8092-74-2) IS FOUND ON THE FOLLOWING REGULATORY LISTS
 Australia Exposure Standards Australia Inventory of Chemical Substances (AICS)
 Australia Hazardous Substances Information System - Consolidated Lists

National Inventory	Status
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (petroleum distillates HFP; polydimethylsiloxane; paraffin and hydrocarbon waxes, oxidised, lithium salts; beta-pinene; distillates, petroleum, light, hydrotreated; paraffin wax)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (polydimethylsiloxane)
Japan - ENCS	N (petroleum distillates HFP; polydimethylsiloxane; paraffin wax)
Korea - KECI	Y
New Zealand - NZIoC	N (paraffin and hydrocarbon waxes, oxidised, lithium salts)
Philippines - PICCS	Y
USA - TSCA	Y

Legend:
 Y = All ingredients are on the inventory
 N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing (see specific ingredients in brackets)

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
petroleum distillates HFP	64742-48-9, 64742-69-7
beta-pinene	19902-69-0, 18172-67-3, 127-91-3
alpha-pinene	80-56-8, 1330-16-1, 2437-95-8, 7785-70-8, 7785-26-4

Continued...

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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Waste treatment methods

Containers may still present a chemical hazard danger when empty.

- Return to supplier for reuse/recycling if possible.

Otherwise:

- If container can not be cleaned sufficiently well to ensure that residues do not remain or if the container cannot be used to store the same product, then puncture containers, to prevent re-use, and bury at an authorized landfill.
- When possible retain label warnings and SDS and observe all notes pertaining to the product.
- DO NOT allow wash water from cleaning or process equipment to enter drains.**
- It may be necessary to collect all wash water for treatment before disposal.
- In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first.
- Where in doubt contact the responsible authority.
- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Authority for disposal.
- Bury or incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorized landfill.

Product / Packaging disposal

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant

HAZCHEM -12

Land transport (ADG)

UN number	3082
UN proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (contains beta-pinene and alpha-pinene)
Transport hazard classes	Class 9 Subrisk Not Applicable
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions 274 331 335 375 AUI1 Limited quantity 5 L

Environmentally Hazardous Substances meeting the descriptions of UN 3077 or UN 3082 are not subject to this Code when transported by road or rail:

- packaging;
- IBC; or
- any other receptacle not exceeding 500 kg(L).

- Australian Special Provisions (SP AUI1) - ADG Code 7th Ed.

Air transport (ICAO-IATA / DGR)

UN number	3082
UN proper shipping name	Environmentally hazardous substance, liquid, n.o.s. * (contains beta-pinene and alpha-pinene)
Transport hazard classes	ICAO/IATA Class 9 ICAO / IATA Subrisk Not Applicable ERG Code 9L
Packing group	III
Environmental hazard	Not Applicable
Special precautions for user	Special provisions A57 A158 A159 Cargo Only Packing Instructions 664 Cargo Only Maximum Qty / Pack 450 L Passenger and Cargo Packing Instructions 664 Passenger and Cargo Maximum Qty / Pack 420 L Passenger and Cargo Limited Quantity Packing Instructions 7064 Passenger and Cargo Limited Maximum Qty / Pack 30 kg G

Sea transport (IMDG-Code / GGVSee)

UN number	3082
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Continued...

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Photocopier toner, printed paper, styrene polymers
Environmental tobacco smoke
Soiled clothing, fabrics, bedding
Soiled particle filters
Verification dusts and dust liners
"Urban grime"
Perfumes, colognes, essential oils (e.g. lavender, eucalyptus, tea tree)
Overall home emissions

Styrene
Styrene, acrolein, nicotine
Squalene, unsaturated sterols, oleic acid and other saturated fatty acids
Unsaturated fatty acids from plant waxes, leaf litter, and other vegetative debris; soil; diesel particles
Unsaturated fatty acids and esters; unsaturated alcohols
Polycyclic aromatic hydrocarbons
Limonene, alpha-pinene, linalool, linalyl acetate, terpinene-4-ol, gamma-terpinene
Limonene, alpha-pinene, styrene

Formaldehyde, benzaldehyde
Formaldehyde, benzaldehyde, hexanal, glyoxal, N-methylformamide, nicotinaldehyde, colidine
Acetone, geranyl acetone, 6MHO, 4OPA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid
Formaldehyde, nonanal, and other aldehydes; azelaic acid; nonanoic acid; 9-oxo-nonanoic acid and other oxo-acids; compounds with mixed functional groups (-CO-, -OH, and -COOH)
C5 to C10 aldehydes
Oxidized polycyclic aromatic hydrocarbons
Formaldehyde, 4-AMC, acetone, 4-hydroxy-4-methyl-5-hexan-1-ol, 5-ethyl-2-thio-5-methyl-2-thi-4-furanone, SOAs including ultrafine particles
Formaldehyde, 4-AMC, pinonaldehyde, acetone, pinic acid, pinonic acid, fomic acid, benzaldehyde, SOAs including ultrafine particles

Abbreviations: 4-AMC, 4-acetyl-1-methylcyclohexane; 6MHO, 6-methyl-5-heptene-2-one; 4OPA, 4-oxopentanal; SOA, Secondary Organic Aerosols
Reference: Charles J Wascher; Environmental Health Perspectives, Vol 114, October 2006

Environmental fate:
Ecotoxicity studies conducted with a wide range of products have shown little potential for toxicity to aquatic organisms under expected conditions of use or in the event of an accidental release. Not all alpha olefins are readily biodegradable; however, they will ultimately biodegrade. While the octanol/water partition coefficients of alpha olefins suggest a potential for bioaccumulation of these materials in aquatic organisms, the volatility of these materials (especially for the liquid alpha olefins) and the low-water solubility (indicative of limited bioavailability), would indicate that bioaccumulation will not occur. Under most environmental scenarios, extensive evaporation and subsequent degradation in the atmosphere would preclude bioaccumulation. Therefore, alpha olefins are not expected to be toxic to aquatic organisms, and will not bioaccumulate.

The potential for exposure of aquatic organisms to members of the higher olefins will be influenced by their physico-chemical properties. The predicted or measured water solubilities of these olefins range from 50 mg/L at 20 C for hexene to 0.00015 mg/L at 25 C for 1-octadecene, and to 6.33 [E-23] mg/L at 25 C for C54 alpha olefin, which suggests there is a lower potential for the larger olefins to be bioavailable to aquatic organisms due to their low solubilities. Their vapor pressures range from 230.6 hPa at 25 C for hexene to 0.00009 hPa at 25 C for 1-octadecene, and to 1.15 [E-16] hPa at 25 C for C54 alpha olefin, which suggests the shorter chain olefins will tend to partition to the air at a significant rate and not remain in the other environmental compartments for long periods of time; while the longer chain olefins will tend to partition primarily to water, soil or sediment, depending on water solubility and sorption behavior. The predicted soil adsorption coefficients (Koc) range from 149 for C6 to 230,800 for C18 and to 1.0 [E10] for C54. Indicating increasing partitioning to soil/sediment with increasing carbon number. Level I fugacity modelling predicts that the C6-13 olefins would partition primarily to air, while the C16 and longer chain olefins would partition primarily to soil. Results of Level III fugacity modelling suggest that the C6-8 olefins will partition primarily to the water compartment, and, as the chain length increases beyond C10, soil and sediment become the primary compartments. These chemicals have a very low potential to hydrolyse and do not photodegrade directly. However, in the air, all members of the category are subject to atmospheric oxidation from hydroxyl radical attack, with calculated degradation half-lives of 1.9 to 4.8 hours. C6-30 olefins have been shown to degrade to an extent of approximately 9-92% in at least 28 day biodegradation tests. These results were not clearly correlated with carbon number or any other identifiable parameter; however, the weight of evidence shows that the members of the higher olefins have potential for degradation in the environment. Volatilisation from water is predicted to occur rapidly (hours to days), with Henry's Law Constants (bond method) ranging from 0.423 (C6) to 10.7 (C18), and to 2.09 [E5] (C54) atm-m³/mol. Consideration of these degradation processes supports the assessment that these substances will degrade relatively rapidly in the environment and not persist. Based on calculated bioconcentration factors, the C6, C7, and C16 and longer chain length category members are not expected to bioaccumulate (BCF: C6 = 44-46, C7 = 256, C16 = 71-92 and >= C18 = 3.3-4.6). Although the C6-15 olefins have BCF's ranging from 213 to 2030, and Kow values ranging from 4.13 to 7.49, and thus are considered to have the potential for bioaccumulation, their physico-chemical properties and fate indicate that these would be limited environmental exposure because of volatility, biodegradability and limited solubility.

Ecotoxicity:
Data indicate that acute aquatic toxicity can be observed for C6 through the C10 olefins (C6: ECA C50 range of 1-10 mg/L; C7-C10: ECLC50 range of 0.1-1.0 mg/L), and that toxicity increases with increasing carbon number within that range, which is consistent with increasing Kow values (3.07-5.12). Above a chain length of 10, toxicity is not observed within the limits of solubility. However, data indicate that chronic aquatic toxicity can be observed in the C10 olefins (EC10 = 20.0 ug/L, EC50 = 29.1 ug/L, NOEC = 19.04 ug/L). Data also suggest that aquatic toxicity does not differ with bond location or presence of branching.

For lithium (anion):
Environmental fate:
Experiments with experimental animals have shown that lithium can have reproductive effects, and increasing consumption might therefore result in adverse effects on health and environment. Lithium has significant bioavailability only when administered as a partially soluble salt such as lithium carbonate. Lithium is not a dietary mineral for plants but it does stimulate plant growth.

Ecotoxicity:
Fish LC50 (28, 35 days) rainbow trout 9.28, 1.4 mg/L (salt)
Fish LC50 (96 h) fathead minnow 41 mg/L, NOEC 13 mg/L (salt)
Daphnia magna EC50 (48 h) 24 mg/L, NOEC 11 mg/L
Lithium is not expected to bioaccumulate in mammals and its human and environmental toxicity are low. Lithium does accumulate in several species of fish, molluscs and crustaceans where it stored in the digestive tract and exoskeleton.
Methanogenesis of granular anaerobic sludge (initial COD 6750 mg/L O2, pH 7.2) was stimulated at lithium ion concentration 10-20 mg/L, slightly inhibited at lithium ion concentration 350 mg/L and seriously inhibited at lithium ion concentration > 500 mg/L.
Microinjection of lithium chloride into prospective ventral blastomeres of a 32-cell Xenopus laevis embryo gives rise to duplication of dorsoventral structures such as the notochord, neural tube and eyes.

DO NOT discharge into sewer or wastewater.

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
beta-pinene	HIGH	HIGH
alpha-pinene	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
distillates, petroleum, light, hydrocarbon	LOW (BCF = 159)
beta-pinene	MEDIUM (LogKOW = 4.16)
alpha-pinene	MEDIUM (LogKOW = 4.44)

Mobility in soil

Ingredient	Mobility
beta-pinene	LOW (KOC = 1204)
alpha-pinene	LOW (KOC = 1204)

SECTION 13 DISPOSAL CONSIDERATIONS

Continued...

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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<p>Stability in Water: Chemicals that have a potential to hydrolyze include alkyl halides, amides, carbamates, carboxylic acid esters and lactones, epoxides, phosphate esters, and sulfonic acid esters. Because lubricating base oils do not contain significant levels of these functional groups, materials in the lubricating base oils category are not subject to hydrolysis.</p> <p>Chemical Transport and Distribution in the Environment: Based on the physical-chemical characteristics of petroleum hydrocarbons in lubricating base oils, the lower molecular weight components are expected to have the highest vapour pressures and water solubilities, and the lowest partition coefficients. These factors enhance the potential for widespread distribution in the environment. To gain an understanding of the potential transport and distribution of lubricating base oil components, the EOC (Equilibrium Criterion) model was used to characterize the environmental distribution of fifteen C15 compounds representing different structures found in lube oils (e.g., paraffins, naphthenes, and aromatics). The modeling found partitioning to soil or air is the ultimate fate of these C15 compounds. Aromatic compounds partition primarily to soil. These paraffins partition mostly to soil, while branched appears to allow greater distribution to air. Naphthenes distribute to both soil and air, with increasing proportions in soil for components with the greater number of ring structures. Because the modeling does not take into account degradation factors, levels modeled in the atmosphere are likely overestimated in light of the tendency for indirect photodegradation to occur.</p> <p>Biodegradability: The extent of biodegradation of a particular lubricating oil is dependent not only on the procedure used but also on how the sample is presented in the biodegradation test. Lubricating base oils typically are not readily biodegradable in standard 28-day tests. However, since the oils consist primarily of hydrocarbons that are ultimately assimilated by microorganisms, and therefore inherently biodegradable. Twenty-eight biodegradability studies have been reported for a variety of lubricating base oils. Based on the results of ultimate biodegradability tests (monometric respirometry testing) the base oils are expected to be, for the most part, inherently biodegradable. Biodegradation rates found using the modified Sturm procedure ranged from 1.6 to 25%. Results from the monometric respirometry tests on similar materials showed biodegradation rates from 31 to 50%. Biodegradation rates measured in 21-day CEC tests for similar materials ranged from 13 to 79%.</p> <p>Ecotoxicity: Numerous acute studies covering fish, invertebrates, and algae have been conducted to assess the ecotoxicity of various lubricating base oils. None of these studies have shown evidence of acute toxicity to aquatic organisms. Eight 7-day exposure studies using rainbow trout failed to demonstrate toxicity when treated up to the maximum concentration of 1000 mg/L applied as dispersions. Three 96-hour tests with rainbow trout also failed to show any dry effects; trout when treated up to 1000 mg/L applied as dispersions. Similarly, three 96-hour tests with fathead minnow at a maximum test concentration of 100 mg/L water accommodated fractions (WAF) showed no adverse effects. Two species of aquatic invertebrates (<i>Daphnia magna</i> and <i>Chironomus sp.</i>) were exposed to WAF solutions up to 10,000 mg/L for 48 and 96-hours, respectively, with no adverse effects being observed. Four-day exposures of the freshwater green alga (<i>Scenedesmus subspicatus</i>) to 500 mg/L WAF solutions failed to show adverse effects on growth rate and algal cell densities in four studies.</p> <p>Multiple chronic toxicity studies have shown no adverse effects to diploid survival or reproduction. In 10 of 11 chronic studies, daphnids were exposed for 21 days to WAF preparations of lubricating base oils with no effects on survival or reproduction at the maximum concentration of 1000 mg/L. One test detected a reduction in reproduction at 1000 mg/L. Additional data support findings of no chronic toxicity to aquatic invertebrates and fish. No observed effect levels ranged from 550 to 5,000 mg/L when tested as other dispersions or WAFs.</p> <p>The data described above are supported by studies on a homologous series of alkanes. The author concluded that the water solubility of carbon chains C10 is too limited to elicit acute toxicity. This also was shown for alkybenzenes having carbon numbers C15. Since base oils consist of carbon compounds of C15 to C50, component hydrocarbons that are of acute toxicological concern are, for the most part, absent in these materials. Similarly, due to their low solubility, the alkylated two to three ring polycyclic aromatic compounds in base oils are not expected to cause acute or chronic toxicity. The lack of toxicity to benthic life in the results of the reported studies.</p> <p>The effects of crude and refined oils on organisms in fresh and sea water have been extensively reviewed.</p> <p>sea water. Where spillages occur the non-mobile species suffer the greatest mortality, whereas fish species can often escape from the affected region. The extent of the initial mortality depends on the chemical nature of the oil, the location, and the physical conditions, particularly the temperature and wind velocity. Most affected freshwater and marine communities recover from the effects of an oil spill within a year. The occurrence of biogenic hydrocarbons in the world's oceans is well recorded. They have the characteristic isoprenoid structure, and measurements made in water columns indicate a background concentration of 1.0 to 10 µg/L. The high molecular weight materials are dispersed as particles, with the highest concentrations of about 0.8 µg/L occurring in the top 3 mm layer of water.</p> <p>A wide variation in the response of organisms to oil exposures has been noted. The larvae of fish and crustaceans appear to be most susceptible to the water-soluble fraction of crude oil. Exposures of plankton and algae have indicated that certain species of diatoms and green algae are intolerant, whereas microflagellates are not.</p> <p>For the most part, molluscs and most intertidal worm species appear to be tolerant of oil contamination.</p> <p>For biocyclic monoterpenes:</p> <p>Photodegradability: The calculated photodegradation half-lives for the structurally defined materials in this group are in the range from 1 to 14 to 94 hours. These calculations are based on measured OH rate constants for alpha-pinene, beta-pinene, camphene and trans-pinane, measured ozone and HO3 rate constants with the exception of trans-pinane.</p> <p>Stability in Water: No hydrolysis is possible for any of the materials in this group. All are expected to be very stable in soil horizons.</p> <p>Biodegradability: Studies evaluating biodegradability are available for this group of substances using standard OECD/Guideline protocols. Additional studies in soil horizons obtained from coniferous and deciduous forests provide a broader perspective on the biodegradation of biocyclic terpene hydrocarbons in the environment. Four studies on alpha-pinene showed limited biodegradability. The first, evaluated inherent biodegradability, and reported 37% biodegradation at 31 days; the second, evaluated ready biodegradability, and reported 38% biodegradation at 28 days; and a third evaluated ready biodegradability using a mixture of alpha and beta-pinene in a closed bottle test, reported very limited biodegradability. In the fourth experiment, a mixture of 62.9% alpha-pinene and 36.9% beta-pinene was concluded to be inherently biodegradable based on the results of a closed bottle Sturm test. The mixture was 52% biodegraded within 28 days, but there was no indication that biodegradation had ceased.</p> <p>Very limited biodegradability was also reported for 3-carene and for camphene (less than 20%). In studies showing limited biodegradability, the authors concluded that the high vapour pressure and low water solubility of these substances led to volatilization of the test substance in the upper parts of the test vessel, thereby limiting aerobic biodegradation.</p> <p>Additional studies in extracts and slurries prepared from soils of coniferous and deciduous forests indicate rapid and complete biodegradation of alpha-pinene in a closed bottle test. Soil extracts from coniferous and hardwood watersheds were added to sealed flasks containing oxygen-saturated media that were precolonized with alpha-pinene for 24 hours. alpha-pinene undergoes 100% biodegradation after approximately 8 days in acclimated media and after day 15 in non-acclimated media. The authors concluded the pinene is completely degradable in extracts prepared from watershed soils of coniferous or deciduous forests.</p> <p>Ecotoxicity:</p> <p>Fish LC50 (96 h): fathead minnow 0.28 mg/l (alpha-pinene); 0.5 mg/l (beta-pinene); Brachydanio rerio 0.72 mg/l (camphene) (closed system flow through).</p> <p>The calculated values for camphene, alpha-pinene, dicyclopentadiene, and alpha-pinene are 0.82, 0.83, 0.63 and 0.28 mg/l, respectively. These values indicate that all of these materials and mixtures that are made up primarily of these substances, should have acute fish toxicities on the order of 0.5 mg/L.</p> <p>Daphnia magna LC50 (48 h): 1.44 mg/l (alpha-pinene); 1.256 mg/l (beta-pinene)</p> <p>The calculated values for camphene, alpha-pinene, dicyclopentadiene, and alpha-pinene are 0.79, 0.8, 0.8 and 0.22 mg/L, respectively, indicates that all of these materials and mixtures that primarily are made up of these substances, should all have acute aquatic plant toxicity on the order of 0.5 mg/L.</p> <p>Terpenes such as limonene and isoprene contribute to aerosol and photochemical smog formation. Emissions of biogenic hydrocarbons, such as the terpenes, to the atmosphere may either decrease ozone concentrations when oxides of nitrogen are low, or form oxides (as well as other reactive species) when concentrations of nitrogen oxides, leads to an increase in ozone concentrations. Lower terpenoids can react with unstable reactive gases and may act as precursors of photochemical smog therefore indirectly influencing community and ecosystem properties. Complex chlorinated terpenes such as toluene (a persistent, mobile and toxic insecticide) and its degradation products, were produced by photoinitiated reactions in an aqueous system, imitating certain limonene and other monoterpenes, simulating pulp-bleach conditions.</p> <p>The reactions of ozone with highly unsaturated compounds, such as the terpenes can give rise to oxygenated species with low vapour pressures that subsequently condense to form secondary organic aerosol.</p> <p>Substances containing unsaturated carbon are ubiquitous in indoor environments. They result from many sources (see below). Most are reactive with environmental ozone and many produce stable products which are thought to adversely affect human health. The potential for surfaces in an enclosed space to facilitate reactions should be considered.</p> <p>Source of unsaturated substances (Reactive Emissions)</p> <table border="1"> <tr> <td>Unsaturated substances (Reactive Emissions)</td> <td>Major Stable Products produced following reaction with ozone</td> </tr> <tr> <td>Isoprene, nitric oxide, squarone, unsaturated sterols, oleic acid and other unsaturated fatty acids, unsaturated oxidized products</td> <td>Methacrolein, methyl vinyl ketone, nitrogen dioxide, acetone, (OH)2, geranyl acetone, C6PA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid</td> </tr> <tr> <td>Soft woods, wood flooring, building cypress, cedar and silver fir, indoors, houseplants</td> <td>Formaldehyde, 4-AMC, pinonaldehyde, pinic acid, pinonic acid, formic acid, methacrolein, methyl vinyl ketone, SOAs including uranine products</td> </tr> <tr> <td>Carpets and carpet backing</td> <td>Formaldehyde, acetaldehyde, benzaldehyde, hexanal, nonanal, 2-nonenal</td> </tr> <tr> <td>Limonene and pinene/pinenes containing linseed oil</td> <td>Propanal, hexanal, nonanal, 2-hexenal, 2-nonenal, 2-decenal, 1-pentene-3-one, propionic acid, n-butyric acid</td> </tr> <tr> <td>Latex paint</td> <td>Formaldehyde</td> </tr> <tr> <td>Certain cleaning products, polishes, waxes, all fresheners</td> <td>Formaldehyde, acetaldehyde, glyoxaldehyde, formic acid, acetic acid, hydrogen and organic</td> </tr> <tr> <td>Natural rubber adhesive</td> <td>2-(3H)-Auranone, 4-AMC, SOAs including uranine products</td> </tr> <tr> <td></td> <td>Formaldehyde, methacrolein, methyl vinyl ketone</td> </tr> </table>			Unsaturated substances (Reactive Emissions)	Major Stable Products produced following reaction with ozone	Isoprene, nitric oxide, squarone, unsaturated sterols, oleic acid and other unsaturated fatty acids, unsaturated oxidized products	Methacrolein, methyl vinyl ketone, nitrogen dioxide, acetone, (OH)2, geranyl acetone, C6PA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid	Soft woods, wood flooring, building cypress, cedar and silver fir, indoors, houseplants	Formaldehyde, 4-AMC, pinonaldehyde, pinic acid, pinonic acid, formic acid, methacrolein, methyl vinyl ketone, SOAs including uranine products	Carpets and carpet backing	Formaldehyde, acetaldehyde, benzaldehyde, hexanal, nonanal, 2-nonenal	Limonene and pinene/pinenes containing linseed oil	Propanal, hexanal, nonanal, 2-hexenal, 2-nonenal, 2-decenal, 1-pentene-3-one, propionic acid, n-butyric acid	Latex paint	Formaldehyde	Certain cleaning products, polishes, waxes, all fresheners	Formaldehyde, acetaldehyde, glyoxaldehyde, formic acid, acetic acid, hydrogen and organic	Natural rubber adhesive	2-(3H)-Auranone, 4-AMC, SOAs including uranine products		Formaldehyde, methacrolein, methyl vinyl ketone
Unsaturated substances (Reactive Emissions)	Major Stable Products produced following reaction with ozone																			
Isoprene, nitric oxide, squarone, unsaturated sterols, oleic acid and other unsaturated fatty acids, unsaturated oxidized products	Methacrolein, methyl vinyl ketone, nitrogen dioxide, acetone, (OH)2, geranyl acetone, C6PA, formaldehyde, nonanal, decanal, 9-oxo-nonanoic acid, azelaic acid, nonanoic acid																			
Soft woods, wood flooring, building cypress, cedar and silver fir, indoors, houseplants	Formaldehyde, 4-AMC, pinonaldehyde, pinic acid, pinonic acid, formic acid, methacrolein, methyl vinyl ketone, SOAs including uranine products																			
Carpets and carpet backing	Formaldehyde, acetaldehyde, benzaldehyde, hexanal, nonanal, 2-nonenal																			
Limonene and pinene/pinenes containing linseed oil	Propanal, hexanal, nonanal, 2-hexenal, 2-nonenal, 2-decenal, 1-pentene-3-one, propionic acid, n-butyric acid																			
Latex paint	Formaldehyde																			
Certain cleaning products, polishes, waxes, all fresheners	Formaldehyde, acetaldehyde, glyoxaldehyde, formic acid, acetic acid, hydrogen and organic																			
Natural rubber adhesive	2-(3H)-Auranone, 4-AMC, SOAs including uranine products																			
	Formaldehyde, methacrolein, methyl vinyl ketone																			
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<p>oil may significantly attenuate the rate of this process.</p> <p>Aquatic Fate: If released to water, kerosene is expected to biodegrade under both aerobic and anaerobic conditions. Bioconcentration factors for components of kerosene were estimated to be 1990 to 5800 (based on estimated log octanol/water partition coefficients of 3.3 to 5.25) indicating that some components of kerosene may significantly bioaccumulate in fish and aquatic organisms. Soil adsorption coefficients for kerosene range from 1500 to 17,000 indicating that it may strongly adsorb to sediment and suspended organic matter. The estimated half-life for degradation of kerosene from a motor/aver 1 m deep flowing at 1 m/sec with a wind speed of 3 m/sec which does not take into account adoptive processes is 3-6 hrs. The estimated half-life for volatilization of kerosene from a moat lake, which accounts for adoptive processes, is >130 days.</p> <p>Atmospheric Fate: Released to the atmosphere, kerosene may undergo oxidation by a gas phase reaction with photochemically produced hydroxyl radicals. Estimated rate constants for the oxidation of these representative classes of compounds ranging from 1.2x10⁻¹¹ to 1x10⁻¹⁰ cm³/mole-sec at 25 deg C translate to an atmospheric half-life for kerosene of 2-3.4 days using an average atmospheric hydroxyl radical concentration of 6x10⁶ molecules/cm³.</p> <p>The stability of kerosene in soils as affected by volatilization was determined in a laboratory column experiment by following the losses in the total concentration and the change in composition of the residue in a dune sand, a loamy sand, and a silt loam soil during a 50 day period. Seven major compounds ranging between C9 and C15 were selected from a large variety of hydrocarbons forming kerosene and their presence in the remaining petroleum product was determined. The change in composition of kerosene during the experimental period was determined by gas chromatography and related to the seven major compounds selected. The experimental conditions air-dry soil and no subsequent addition of water excluded both biodegradability and leaching losses. The losses of kerosene in air-dried soil columns during the 50-day experimental period and the changes in the composition of the remaining residues due to volatilization are reported. The volatilization of all the components determined was greater from the dune sand and loamy sand soils than from the silt loam soil. It was assumed that the reason for this behavior was that the dune sand and the loamy sand soils contain a greater proportion of large pores (> 4 µm) than the silt loam soil, even though the total porosity of the loamy sand and the silt loam is similar. In all the soils in the experiment, the composition of the residue formed the main fraction of the kerosene residues after 50 days of incubation. Volatilization in the air phase and saturated mass flow of kerosene in the three sands (fine, medium and coarse) were studied in the laboratory under controlled conditions. Volatilization was the major physico-chemical process affecting the fate of kerosene in the inert porous medium. During volatilization the liquid kerosene changed its composition by gradually losing its light components (C9-C15), and the viscosity of the remaining liquid kerosene increased. The increase in viscosity led to a decrease in the infiltration rate, for example, by about 20% when the viscosity increased.</p> <p>Ecotoxicity:</p> <p>Data for various kerosene streams is available. Kerosenes and JET fuels are moderately to acutely toxic to aquatic organisms. All studies used exposures to water accommodated fractions (WAF) of the process streams. Each of the different streams exhibited similar toxicity to rainbow trout (<i>Oncorhynchus mykiss</i>): 96-hour LC 50 values of 1.6–25 mg/L. However, toxicity to the alga <i>Skeletonema costatum</i> with 96-hour growth rate EC50 values of 0.6–6.2 mg/L, and biomass inhibition EC50 values of 5.9–11 mg/L, did not vary greatly among the streams. There was considerable variation in the measured toxicity of the category member (CAS No. 64742-91-0) to daphnia (<i>Daphnia magna</i>) when evaluated in different tests. In the test using daily renewal of freshly prepared WAF, the 48-hr EC50 was estimated at 1.4 mg/L, while in the test where solution was not renewed it was estimated at between 40 and 60 mg/L. In spite of daily renewal, a sample of sweetened kerosene (CAS No. 91770-15-9) exhibited consistently less toxicity than the hydrocarbon-fortified and hydrocracked materials tested in the same laboratory, indicating the difference in that measurement is due to the nature of the sample rather than variations in the testing approach.</p> <p>For siloxanes:</p> <p>Environmental fate:</p> <p>It is well accepted that polydimethylsiloxane fluids become permanent residents of sediment but should not exert adverse environmental effects. Siloxane fluids are very surface active because the flexible siloxane linkages permit alignment of the hydrophilic methyl substituents towards the non-polar phase, and of the polysiloxane backbone towards the polar phase. The polar media is generally water, and a polar media to which polydimethylsiloxanes become attached may be ledges, sewage sludge, hull, algae, sediment etc. In aqueous environments, polydimethylsiloxanes are adsorbed onto sediment particles. Also, in the presence of trace ions, which exist at various concentrations in the environment, short chain siloxanes are photodegraded to the level of silicic acid within days.</p> <p>The stability of the siloxanes, desirable from a technical point of view, makes the siloxanes very persistent, and once released to the environment the siloxanes remain for many years.</p> <p>The main source of releases to the environment is from volatile siloxanes used in cosmetics, wax, polishes, and to a minor extent in several other applications. The volatile siloxanes may account for a significant part of the siloxanes used for cosmetics.</p> <p>Non-volatile siloxane fluids used in cosmetics, wax, polishes, cleaning products and for textile applications (softeners) will to a large extent end up in wastewater and be directed to wastewater treatment plants.</p> <p>The cyclic siloxanes and small-chain linear siloxanes are bioconcentrated (bioconcentration factors for long-chain siloxanes have not been assessed). The estimated bioconcentration factors (BCF) of the small siloxanes range from 340 for HMDX to 40,000 for a phenylated trisiloxane (phenyl trimethicone). The small phenylated siloxanes seem to have very high BCF, and model organisms indicate that these substances are the most toxic to aquatic organisms.</p> <p>PBT profiler screening</p> <p>In order to make a first comparison between the substances as to persistence, bioaccumulation and toxicity, the substances were screened using the PBT profiler developed by U.S. EPA (U.S. EPA 2003). The profiler uses a procedure to predict persistence, bioaccumulation, and toxicity of organic chemicals on the basis of the chemical structure and physical parameters of the substances combined with experimental parameters for substance with a similar structure, using a QSAR approach.</p> <p>The results for six members of the siloxane family predict the highest bioconcentration factors for the two phenyl siloxanes, one order of magnitude higher than the values for the cyclic siloxanes and two orders of magnitude higher than the values for the small linear methyl siloxanes. The predicted toxicity is also significantly higher (lower CV values) for the phenyl siloxanes. The predicted half-life is nearly the same for all substances.</p> <p>Using U.S. EPA's criteria, the screening indicates that all substances are of high concern as to environmental toxicity, and that the phenyl siloxanes are considered very bioaccumulative.</p> <p>Ecotoxicity:</p> <p>The environmental fate and effects of volatile methylsiloxanes (mainly cyclosiloxanes) and polydimethylsiloxane (PDMS) have been reported:</p> <p>For octamethylcyclotrisiloxane:</p> <p>Fish acute LC50 (14 day): rainbow trout 10 µg/l; sheephead mackerel 6-3 µg/l</p> <p>Daphnia magna acute EC50 (48 h): >15 µg/l; NOEC 15 µg/l</p> <p>Myxid shrimp acute LC50 (96 h): >1 µg/l; NOEC 91 µg/l</p> <p>For PDMS</p> <p>Daphnia magna NOEC 672 mg/lg</p> <p>Physical effects such as surface enlargement have been observed when testing aquatic invertebrates in clean laboratory water, but similar effects are not expected in natural environments where a large variety of other surfaces provide opportunities for deposition</p> <p>For lubricating oil base stocks:</p> <p>Vapor Pressure Vapor pressures of lubricating base oils are reported to be negligible. In one study, the experimentally measured vapour pressure of a solvent-deaerated heavy paraffinic distillate base oil was 1.7 x 10⁻⁶ Pa. Since base oils are mixtures of C15 to C50 paraffinic, naphthenic, and aromatic hydrocarbon isomers, representative components of those structures were selected to calculate a range of vapor pressures. The estimated vapor pressure values for these selected components of base oils ranged from 4.5 x 10⁻⁶ Pa to 2 x 10⁻⁶ Pa based on Dalton's Law the expected total vapor pressure for base oils would fall well below minimum levels (10⁻⁶ Pa) of recommended experimental procedures.</p> <p>Partition Coefficient (log <i>K</i>_{ow}) in materials such as the base oils, the percent distribution of the hydrocarbon groups (i.e., paraffin, naphthenes, and aromatics) and the carbon chain lengths determines in-part the partitioning characteristics of the mixture. Generally, hydrocarbon chains with fewer carbon atoms tend to have lower partition coefficients than those with higher carbon numbers. However, due to their complex composition, UNEQUAL determination of the log <i>K</i>_{ow} of these hydrocarbon mixtures cannot be made. Rather, partition coefficients of selected C15 chain-length hydrocarbon structures representing paraffinic, naphthenic, and aromatic constituents in base oil lubricants were modeled. Results showed typical log <i>K</i>_{ow} values from 4.9 to 7.7, which were consistent with values of 4-8 for lubricating oil basestocks.</p> <p>Water Solubility When released to water, base oils will float and spread at a rate that is viscosity dependent. While water solubility of base oils is typically very low, individual hydrocarbons exhibit a wide range of solubility depending on molecular weight and degree of unsaturation. Decreasing molecular weight (i.e., carbon number) and increasing levels of unsaturation increases the water solubility of these materials. As noted for partition coefficient, the water solubility of lubricating base oils cannot be determined due to their complex mixture characteristics. Therefore, the water solubility of individual C15 hydrocarbons representing the different groups making up base oils (i.e., linear and branched paraffins, naphthenes, and aromatics) was modeled. Based on water solubility modeling of those groups, aqueous solubilities are typically much less than 1 ppm. (0.003-0.63 mg/l)</p> <p>Environmental Fate:</p> <p>Photodegradation: Chemicals having potential to photolyse have UV/visible absorption maxima in the range of 290 to 800 nm. Some chemicals have absorption maxima significantly below 290 nm and consequently cannot undergo direct photolysis in sunlight (e.g. chemicals such as alkanes, alkenes, alkyenes, saturated alcohols, and saturated acids). Most hydrocarbon constituents of the materials in this category are not expected to photolyse since they do not absorb absorbance within the 290-800 nm range. However, photodegradation of polyaromatic hydrocarbons (PAHs) can occur and may be a significant degradation pathway for these constituents of lubricating base oils. The degree and rate at which PAHs may photodegrade depend upon whether conditions allow penetration of light with sufficient energy to effect a change. For example, polycyclic aromatic compounds (PAC) compounds bound to sediments may persist due to a lack of sufficient light penetration.</p> <p>Atmospheric gas-phase reactions can occur between organic chemicals and reactive molecules such as photochemically produced hydroxyl radicals, ozone and nitrogen oxides. Atmospheric oxidation as a result of radical attack is not direct photochemical degradation, but indirect degradation. In general, lubricating base oils have low vapour pressures and volatilization is not expected to be a significant removal mechanism for the majority of the hydrocarbon components. However, some components (e.g., C15 branched paraffins and naphthenes) appear to have the potential to volatilise. Atmospheric half-lives of 0.10 to 0.66 days have been calculated for representative C15 hydrocarbon components of lubricating base oils.</p>		
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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bicyclic terpenes would exhibit a significant genotoxic potential in vivo.					
A member or analogue of a group of aliphatic and aromatic terpene hydrocarbons generally considered as safe (GRAS) based, in part, on their self-limiting properties as flavouring substances in food: their rapid absorption, metabolic detoxication, and excretion in humans and other animals; their low level of flavour use; the wide margin of safety between the conservative estimates of intake and the no-observed-adverse effect levels determined from subchronic and chronic studies; and the lack of significant genotoxic potential. Consumers are exposed to aliphatic and terpene hydrocarbons from a variety of ingested and environmental sources. Quantitative natural occurrence data for 17 aliphatic terpene hydrocarbons in the group demonstrate that their consumption occurs predominantly as natural components of traditional food. Oral LD50 values have been reported for 16 of the 17 substances in this group. LD50 values range from 1930 to greater than 8000 mg/kg bw in rats, and 2000 to greater than 13,300 mg/kg bw in mice. These values indicate that aliphatic and aromatic hydrocarbons exhibit low acute oral toxicity. Although members of this group have been shown to exhibit renal carcinogenic potential in the male F344/N rat, the mechanism leading to these findings is known and strongly indicates that the nephropathy associated with monoterpenic hydrocarbons has no significance for human risk: Flavor and Extracts Manufacturers Association (FEMA)					
Acute Toxicity		Carcinogenicity			
Skin Irritation/Corrosion		Reproductive			
Serious Eye Damage/Irritation		STOT - Single Exposure			
Respiratory or Skin Sensitisation		STOT - Repeated Exposure			
Mutagenicity		Aspiration Hazard			
Legend: ✗ - Data available but does not fill the criteria for classification ✗ - Data required to make classification available ○ - Data Not Available to make classification					
SECTION 12 ECOLOGICAL INFORMATION					
Toxicity					
Ingredient	Endpoint	Test Duration (hr)	Species	Value	Source
distillates, petroleum, light, hydrodistilled	LC50	96	Fish	2.2mg/L	4
distillates, petroleum, light, hydrodistilled	NOEC	3072	Fish	=1mg/L	1
petroleum distillates HFP	EC50	96	Algae or other aquatic plants	64mg/L	2
petroleum distillates HFP	EC50	48	Crustacea	>100mg/L	1
petroleum distillates HFP	EC50	96	Algae or other aquatic plants	=450mg/L	1
beta-pinene	EC50	384	Crustacea	0.113mg/L	3
beta-pinene	EC50	96	Algae or other aquatic plants	0.563mg/L	3
beta-pinene	LC50	96	Fish	0.445mg/L	3
alpha-pinene	NOEC	96	Crustacea	=0.181mg/L	1
alpha-pinene	EC50	384	Crustacea	0.129mg/L	3
alpha-pinene	EC50	96	Algae or other aquatic plants	0.663mg/L	3
alpha-pinene	LC50	96	Fish	0.28mg/L	2
polydimethylsiloxane	LC50	96	Fish	3.16mg/L	4
Legend: Extracted from 1. IUCLD Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPMN Suite V8.12 - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. NITE (Japan) - Bioconcentration Data 8. Vendor Data					
Toxic to aquatic organisms; may cause long-term adverse effects in the aquatic environment. Do NOT allow product to come in contact with surface waters or to intertidal areas below the mean high water mark. Do not contaminate water when cleaning equipment or disposing of equipment washwaters. Wastes resulting from use of the product must be disposed of on site or at approved waste sites. When spilled this product may act as a typical oil, causing a film, sheen, emulsion or sludge at or beneath the surface of the body of water. The oil film on water surface may physically affect the aquatic organisms, due to the interruption of the oxygen transfer between the air and the water. Oils of any kind can cause: <ul style="list-style-type: none"> - drowning of waterfowl due to lack of buoyancy, loss of insulating capacity of feathers, starvation and vulnerability to predators due to lack of mobility - vital effects on fish by coating gill surfaces, preventing respiration - asphyxiation of benthic life forms when floating masses become engaged with surface debris and settle on the bottom and - adverse aesthetic effects of fouled shoreline and beaches In case of accidental releases on the soil, a thin film is formed on the soil, which prevents the plant respiration process and the soil particle saturation. It may cause deep water infiltration. For kerosene: For kerosene range refinery streams ("kerosene"): Kerosene is the name for the lighter end of a group of petroleum streams known as the middle distillates. Kerosene may be obtained either from the distillation of crude oil under atmospheric pressure (straight-run kerosene) or from catalytic, thermal or steam cracking of heavier petroleum streams (cracked kerosene). The kerosenes, are further treated by a variety of processes (including hydrogenation) to remove or reduce the level of sulfur, nitrogen or olefinic materials. The precise composition of any particular kerosene will depend on the crude oil from which it was derived and on the refinery processes used for its production. The streams are complex mixtures of ethyl-, isopentyl-, naphthyl-, and aromatic hydrocarbons ranging in carbon number from C5-25 (mainly C9-16) and boil in the range 140 to 300 C. Olefins constitute less than 5% of the midures, by volume, and polycyclic aromatic hydrocarbons (PAHs) (3-7 fused rings content is typically very low. Jet fuels (e.g., Jet A, JP-8, etc.) are included because they are composed almost entirely of two of these streams straight run kerosene (CAS No. 8000-20-9) or hydrosulfurized kerosene (CAS No. 64742-81-0). Environmental Fate Terrestrial fate: If released to soil, kerosene is expected to biodegrade under both aerobic and anaerobic conditions. Kerosene is a mixture of petroleum hydrocarbons, chiefly C10-C16 alkanes, and a typical analysis includes the identification of: fluorenes, alkyl benzene derivatives, naphthalene, and tetrahydronaphthalene. Soil adsorption coefficients for these representative classes of compounds ranging from 1500 to 17,000, obtained from estimated log octanol/water partition coefficients of 3.3 to 5.25 indicate that some components of kerosene may display low mobility and some will be essentially immobile in soil. The vapour pressure of kerosene, 0.48 mm Hg indicates that it may rapidly volatilise from dry soil to the atmosphere although its expected strong adsorption to					
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was found between respiratory complaints related to fragrances and contact allergy to fragrance ingredients, in addition to hand eczema, which were independent risk factors in a multivariate analysis.					
Fragrance allergens act as haptens, i.e. low molecular weight chemicals that are immunogenic only when attached to a carrier protein. However, not all sensitising fragrance chemicals are directly reactive, but require previous activation. A prohapten is a chemical that itself is non- or low-sensitising, but that is transformed into a hapten outside the skin by simple chemical transformation (air oxidation, photoactivation) and without the requirement of specific enzymatic systems. In the case of prohaptenes, it is possible to prevent activation outside the body to a certain extent by different measures, e.g. prevention of air exposure during handling and storage of the ingredients and the final product, and by the addition of suitable antioxidants. When antioxidants are used, care should be taken that they will not be oxidised themselves and thereby form prohaptenes. Prohaptenes Most terpenes with oxidisable allylic positions can be expected to autoxidise on air exposure due to their inherent properties. Depending on the stability of the oxidation products that are formed, a difference in the sensitisation potency of the oxidised terpenes can be seen. Autoxidation is a free radical chain reaction in which hydrogen atom abstraction in combination with addition of oxygen forms peroxy radicals. The reaction shows selectivity for positions where stable radicals can be formed. So far, all fragrance substances that have been investigated with regard to the influence of autoxidation on the allergenic potential, including identification of formed oxidation products, have oxidisable allylic positions that are able to form hydroperoxides and/or hydrogen peroxide as primary oxidation products upon air exposure. Once the hydroperoxides have been formed outside the skin they form specific antigens and act as skin sensitisers. Secondary oxidation products such as aldehydes and epoxides can also be allergenic, thus further increasing the sensitisation potency of the autoxidation mixture. The process of photoactivation may also play a role, but further research is required to establish whether this activation route is currently underestimated in importance due to insufficient knowledge of the true haptens in this context. It should be noted that activation of substances via air oxidation results in various haptens that might be the same or cross-reacting with other haptens (allergens). The main allergens after air oxidation of linoleol and linally acetate are the hydroperoxides. If linally acetate is chemically hydrolysed outside the skin it can thereafter be oxidised to the same haptens as seen for linoleol. A corresponding example is chromanol and chromanol acetate. In clinical studies, concomitant reactions to oxidised linoleol and oxidised linally acetate have been observed. Whether these reactions depend on cross-reactivity or are due to exposure to both fragrance substances cannot be elucidated as both have an allergenic effect themselves. Linoleol and linally acetate are the main components of lavender oil. They also occur on air exposure also when present in the essential oil, and form the same oxidation products found in previous studies of the pure synthetic terpenes. Experimental sensitisation studies showed that air exposure of lavender oil increased the sensitisation potency. Patch test results in dermatitis patients showed a connection between positive reactions to oxidised linoleol, linally acetate and lavender oil. Prohaptenes Compounds that are bioactivated in the skin and thereby form haptens are referred to as prohaptenes. In the case of prohaptenes, the possibility to become activated is inherent to the molecule and activation cannot be avoided by extrinsic measures. Activation processes increase the risk for cross-reactivity between fragrance substances. Cross-reactivity has been shown for certain alcohols and their corresponding aldehydes, i.e. between geraniol and geranyl citral and between citriol and citral. The human skin expresses enzyme systems that are able to metabolise xenobiotics, modifying their chemical structure to increase hydrophilicity and allow elimination from the body. Xenobiotic metabolism can be divided into two phases: phase I and phase II. Phase I transformations are known as activation or functionalisation reactions, which normally introduce or unmask hydrophilic functional groups. If the metabolites are sufficiently polar at this point they will be eliminated. However, many phase I products have to undergo subsequent phase II transformations, i.e. conjugation to make them sufficiently water soluble to be eliminated. Although the purpose of xenobiotic metabolism is detoxification, it can also convert relatively harmless compounds into reactive species. Cutaneous enzymes that catalyse phase I transformations include the cytochrome P450 mixed-function oxidase system, alcohol and aldehyde dehydrogenases, monoamine oxidases, flavin-containing monooxygenases and hydrolytic enzymes. Acyltransferases, glutathione S-transferases, UDP-glucuronosyltransferases and sulfotransferases are examples of phase II enzymes that have been shown to be present in human skin. These enzymes are known to catalyse both activating and deactivating biotransformations, but the influence of the reactions on the allergenic activity of skin sensitisers has not been studied in detail. Skin sensitising prohaptenes can be recognised and grouped into chemical classes based on knowledge of xenobiotic bioactivation reactions, clinical observations and/or in vivo and in vitro studies of sensitisation potential and chemical reactivity. QSAR prediction: The relationships between molecular structure and reactivity that form the basis for structural alerts are based on well established principles of mechanistic organic chemistry. Examples of structural alerts are aliphatic aldehydes (alerting to the possibility of sensitisation via a Schiff base reaction with protein amino groups), and alpha,beta-unsaturated carbonyl groups, C=C=O (alerting to the possibility of sensitisation via Michael addition of protein thiol groups). Prediction of the sensitisation potential of compounds that can act via abiotic or metabolic activation (pro- or prohaptenes) is more complex compared to that of compounds that act as direct haptens without any activation. The activation patterns can differ due to differences in the stability of the intermediates formed, e.g. it has been shown that autoxidation of the structural isomers linoleol and geranyl results in different major haptens/allergens. Moreover, the complexity of the prediction increases further for those compounds that can act both as pro- and prohaptenes. In such cases, the impact on the sensitisation potency depends on the degree of abiotic activation (e.g. autooxidation) in relation to the metabolic activation. For bicyclic terpenes: Acute toxicity: The literature abounds with clinical reports of accidental and intentional acute poisoning with pinene-based turpentine. Rat oral LD50 values are available for alpha-pinene, beta-pinene, camphene and turpentine oil and indicate these materials to be very low in oral acute toxicity with LD50 values in the range from 3380 mg/kg to greater than 5000 mg/kg. Rabbit dermal LD50 values similarly indicate very low toxicities with values greater than the limit doses of 2000 or 5000 mg/kg. Acute irritation toxicity: has been measured in different animal species. The acute LC50 was reported to be 13,500 mg/m ³ in rats, 13,500 mg/m ³ in guinea pigs, and 8000 mg/m ³ in mice. The acute irritation LC50 of commercial grade turpentine in Wistar rats is reported to be in the range of 12,000-20,000 mg/m ³ for 1 to 6 hour exposures and the LC50 for a 2-hour exposure in Swiss-Webster mice is 29,000 mg/m ³ . Based on these results the acute oral, dermal, and irritation toxicities of bicyclic terpene hydrocarbons is concluded to be low. Repeat dose toxicity: A 28-day repeat dose study has been performed with camphene according to an OECD Guideline 407 in both sexes of Wistar rats. Animals of both sexes at the 1000 mg/kg bodyweight dose exhibited vocalization of hepatocytes and increase liver weights. Male rats also exhibited alpha-2-microglobulin-type nephropathy at all dose levels. Subsequent investigations have shown that the alpha-2-microglobulin nephropathy found in the F344/N male rat does not develop in mammals that do not express the hepatic form of alpha-2-microglobulin (e.g. other strains of rats, mice, dogs, humans). Therefore, the nephropathy observed in the camphene study in male F344 rats is not relevant to the human health risk assessment. Based on liver toxicity the NOAEL for this study is concluded to be 250 mg/kg bodyweight. Reproductive toxicity: In the a-rodent species study, no reproductive effects were observed when dose levels of up to 250 to 600 mg/kg bw of an essential oil predominantly composed of bicyclic terpene hydrocarbons (alpha-pinene, beta-pinene, and sabinene) was administered daily to mice, rats, or hamsters during gestation. When this data is combined with the fact that no adverse effects were observed to the reproductive organs in a 28-day study with camphene at dose levels up to 250 mg/kg bodyweight, it is concluded that bicyclic terpene hydrocarbons including alpha-pinene and beta-pinene are not reproductive toxicants. Two in vivo irritation studies have been performed for alpha-pinene in which a full complement of male and female sex organs and tissues were subjected to histopathological examination. Both studies reported no microscopic changes that could be associated with exposure to the test substance. Taking into account the lack of any effects to females in a earlier teratology study, the absence of any maternal or developmental effects in a reproductive/developmental study of a pinene-based oil and for a structurally related monoterpene hydrocarbon, myrcene, it can be concluded that the members of this category show no significant reproductive or developmental toxicity. Developmental toxicity: Based on the NOAELs for maternal and developmental toxicity in studies with camphene (250 and 1000 mg/kg bodyweight) and a terpene hydrocarbon mixture containing alpha- and beta-pinene and camphene (688 mg/kg bodyweight), and the lack of any signs of maternal or developmental toxicity in mice, rats, or hamsters given 250 to 600 mg/kg bodyweight of a mixture composed primarily (~80%) of alpha- and beta-pinene and sabinene, it is concluded that bicyclic terpene hydrocarbons are not maternal or developmental toxicants. Genotoxicity: In vitro: In vivo genotoxicity assays available for alpha-pinene, beta-pinene and camphene demonstrate that these substances have a little, if any, genotoxic potential. In standard Ames assays of alpha-pinene, beta-pinene and camphene, <i>Sahneobacterium typhimurium</i> strains TA97, TA98, TA100, TA1535, TA1537, and TA1538 provided no evidence of mutagenicity at any dose tested. In vivo: Based on the lack of any evidence of genotoxicity in numerous in vivo assays with and without metabolic activation, it is unlikely that any of these					
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	<p>Four 50% solutions of paraffin in petrolatum were each instilled into the eyes of six albino rabbits with no rise. Eyes were observed for irritation for three days. Two of the samples caused mild irritation in one rabbit on day 1; the other samples were not irritating.</p> <p>In a long term feeding study with Sprague-Dawley rats, no vasorelaxant effects were observed. In a series of 180-day feeding studies in rats that were performed over a period of approximately 15 years (beginning in 1955) on chewing-gum bases containing hydrocarbon wax in proportions varying from 2% to 57% of the gum base, no compound-related effects were observed.</p> <p>Long-term toxicity studies indicated that petroleum-derived paraffin and microcrystalline waxes are non-toxic and non-carcinogenic.</p> <p>Eight slack waxes and eight aromatic hydrocarbon extracts derived from the slack waxes were tested for carcinogenicity after applying these to the skin of mice. The slack waxes showed only a low order of carcinogenicity at 250 days. However by 450 days every sample of slack wax had elicited papillomas and 5 of them cancers as well. The aromatic extracts on the other hand exhibited a greater potency. At 250 days all but one sample had produced papillomas and 5 samples had produced cancers. At 450 days all but one sample had elicited cancers and all had elicited papillomas. The authors concluded that the carcinogenicity of slack wax can be attributed to the aromatic compounds found in the oils from which the waxes were pressed and which are retained on the waxes as impurities, and is not due to paraffin.</p> <p>Five petrolatum waxes were negative for local and systemic carcinogenicity or toxicity in skin-painting studies in mice and rabbits. However, wax disk implants, but not ground wax implants, were associated with the development of fibrosarcomas at the implantation site in rats.</p> <p>A description of the accumulation of long-chain alkanes (C29, C31, and C33) in a patient who had died of heart disease led the author to conclude that these hydrocarbons were of dietary (plant) origin as judged by the tissue distribution of the alkanes.</p> <p>The EU Scientific Committee for Food (SCF) reviewed the available information on mineral hydrocarbons, which included the petroleum waxes. Their opinion was published in 1995. The SCF reached the following conclusion:</p> <p>There are sufficient data to allow a full Group ADI (Average daily intake) of 0.20 mg/kg bw for waxes conforming to the following specifications:</p> <ul style="list-style-type: none"> Highly refined waxes derived from petroleum based or synthetic hydrocarbon feedstocks, with viscosity not less than 11 mPa.s (cSt) at 100 °C Carbon number not less than 25 at the 5% boiling point Average molecular weight not less than 500 <p>The materials included in the Lubricating Base Oils category are related from both process and physical-chemical perspectives. The potential toxicity of a specific distillate base oil is inversely related to the severity or extent of processing that it has undergone, since:</p> <ul style="list-style-type: none"> The adverse effects of these materials are associated with undesirable components, and The levels of the undesirable components are inversely related to the degree of processing; Distillate base oils receiving the same degree or extent of processing will have similar toxicities; The potential toxicity of residual base oils is independent of the degree of processing of the oil receives. <p>The reproductive and developmental toxicity of the distillate base oils is inversely related to the degree of processing.</p> <p>Unrefined and mildly refined distillate base oils contain the highest levels of undesirable components, have the largest variation of hydrocarbon molecules and have shown the highest potential carcinogenic and mutagenic activities. Highly and severely refined distillate base oils are produced from unrefined and mildly refined distillate base oils by removing or transforming undesirable components. In comparison to unrefined and mildly refined base oils, the highly and severely refined distillate base oils have a smaller range of hydrocarbon molecules and have demonstrated very low mammalian toxicity. Mutagenicity and carcinogenicity testing of residual oils has been negative, supporting the belief that these materials lack biologically active components or the components are largely non-bioavailable due to their molecular size.</p> <p>Toxicity testing has consistently shown that lubricating base oils have low acute toxicities. Numerous tests have shown that a lubricating base oil is mutagenic and carcinogenic potential correlates with its 3,7 ring polycyclic aromatic compound (PAC) content, and the level of DBSD extractables (e.g. #P46 assay), both characteristics that are directly related to the degree/conditions of processing.</p> <p>Highly and Severely Refined Distillate Base Oils</p> <p>Acute toxicity: Multiple studies of the acute toxicity of highly & severely refined base oils have been reported. Irrespective of the crude source or the method or extent of processing, the oral LD50s have been observed to be >5 g/kg (bw) and the dermal LD50s have ranged from >2 to >5g/kg (bw). The LC50 for inhalation toxicity ranged from 2.18 mg/l to 4 mg/l.</p> <p>When tested for skin and eye irritation, the materials have been reported as "non-irritating" to "moderately irritating".</p> <p>Testing in guinea pigs for sensitization has been negative.</p> <p>Repeat dose toxicity: Several studies have been conducted with these oils. The weight of evidence from all available data on highly & severely refined base oils support the presumption that a distillate base oil's toxicity is inversely related to the degree of processing it receives. Adverse effects have been reported with even the most severely refined white oils - these appear to depend on animal species and/or the peculiarities of the study.</p> <ul style="list-style-type: none"> The granulomatous lesions induced by the oral administration of white oils are essentially foreign body responses. The lesions occur only in rats, of which the Fisher 344 strain is particularly sensitive. The testicular effects seen in rabbits after dermal administration of a highly to severely refined base oil were unique to a single study and may have been related to stress induced by skin irritation, and The accumulation of foamy macrophages in the alveolar spaces of rats exposed repeatedly via inhalation to high levels of highly to severely refined base oils is not unique to these oils, but would be seen after exposure to many water insoluble materials. <p>Reproductive and developmental toxicity: A highly refined base oil was used as the vehicle control in a one-generation reproduction study. The study was conducted according to the OECD test Guideline 421. There was no effect on fertility and mating indices in either males or females. At necropsy, there were no consistent findings and organ weights and histopathology were considered normal by the study's authors.</p> <p>A single generation study in which a white mineral oil (a food/drug grade severely refined base oil) was used as a vehicle control is reported. Two separate groups of pregnant rats were administered 5 mg/kg (body wt) of the base oil via gavage, on days 0 through 19 of gestation. In one of the two base oil dose groups, there were no malformations found among three litters. The study authors considered these malformations to be minor and within the normal ranges for the strain of rat.</p> <p>Genotoxicity</p> <p>In vitro (mutagenicity): Several studies have reported the results of testing different base oils for mutagenicity using a modified Ames assay. Base oils with no or low concentrations of 3-7 ring PACs had low mutagenicity indices.</p> <p>In vivo (chromosomal aberrations): A total of seven base stocks were tested in male and female Sprague-Dawley rats using a bone marrow cytogenetics assay. The test materials were administered via gavage at dose levels ranging from 500 to 5000 mg/kg (bw). Dosing occurred for either a single day or for five consecutive days. None of the base oils produced a significant increase in aberrant cells.</p> <p>Carcinogenicity: Highly & severely refined base oils are not carcinogens, when given either orally or dermally.</p> <p>Tumorigenic in rats</p> <p>The following information refers to contact allergens as a group and may not be specific to this product.</p> <p>Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocyte) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitization potential; the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.</p> <p>Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) & DISTILLATES, PETROLEUM, LIGHT, HYDROTRATED & PARAFFIN AND HYDROCARBON WAXES, OXIDISED, LITHIUM SALTS</p> <p>No significant acute toxicological data identified in literature search.</p>	
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	<p>Oral (rat) LD50: >17000 mg/kg^[2]</p> <table border="1"> <thead> <tr> <th>TOXICITY</th> <th>IRRITATION</th> </tr> </thead> <tbody> <tr> <td>dermal (rat) LD50: >2000 mg/kg^[1]</td> <td>Eye (rabbit): 100 mg/24 hr-mild</td> </tr> <tr> <td>dermal (rat) LD50: >2000 mg/kg^[1]</td> <td>Skin (rabbit): 500 mg/24 hr-mild</td> </tr> <tr> <td>Oral (rat) LD50: >4500 mg/kg^[1]</td> <td></td> </tr> <tr> <td>Oral (rat) LD50: >4500 mg/kg^[1]</td> <td></td> </tr> </tbody> </table> <p>Legend: 1. Value obtained from Europe ECHA Registered Substances - Acute Toxicity 2. Value obtained from manufacturer's SDS. Linkages otherwise specified date extracted from RTECS - Register of Toxic Effect of Chemical Substances</p> <p>Gastrointestinal: Guttores are substances that suppress the function of the thyroid gland by interfering with iodine uptake, which can, as a result, cause an enlargement of the thyroid, i.e., a goitre.</p> <p>Guttores include:</p> <ul style="list-style-type: none"> Vitexin, a flavonoid, which inhibits thyroid peroxidase thus contributing to goiter. Ions such as thiocyanate and perchlorate which decrease iodine uptake by competitive inhibition; as a consequence of reduced thyroxine and triiodothyronine secretion by the gland, at low doses, this causes an increased release of thyrotropin (by reduced negative feedback), which then stimulates the gland. Lithium which inhibits thyroid hormone release. Certain foods, such as soy and millet (containing vitamins) and vegetables in the genus Brassica (e.g. broccoli, brussels sprouts, cabbage, horseradish). Caffeine (in coffee, tea, cola, chocolate) which acts on thyroid function as a suppressant. <p>Limonene is readily absorbed by inhalation and ingestion. Dermal absorption is reported to be lower than by the inhalation route. d-Limonene is rapidly distributed to different tissues in the body, readily metabolised and eliminated primarily through the urine.</p> <p>Limonene exhibits low acute toxicity by all three routes in animals. Limonene is a skin irritant in both experimental animals and humans. Limited data are available on the potential to cause eye and respiratory irritation. Autooxidised products of limonene have the potential to be skin sensitizers. Limited data are available in humans on the potential to cause respiratory sensitisation. Autooxidation of limonene occurs readily in the presence of light and air forming a variety of oxygenated monocyclic terpenes. Risk of skin sensitisation is high in situations where contact with oxidation products of limonene occur.</p> <p>Benign tumours induced by limonene in male rats is thought to be sex and species specific and are not considered relevant to humans. Repeated exposure affects the amount and activity of liver enzymes, liver weight, blood cholesterol levels and bile flow in animals. Increases in liver weight is considered a physiological adaptation as no toxic effects on the liver have been reported. From available data it is not possible to identify an NOAEL for these effects. Limonene is neither genotoxic or teratogenic nor toxic to the reproductive system.</p> <p>PETROLEUM DISTILLATES HFP</p> <p>data for CAS 64742-88-7 i.e. C10-19 record 1441735</p> <p>ALPHA-PINENE</p> <p>The material may produce severe skin irritation after prolonged or repeated exposure, and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) thickening of the epidermis.</p> <p>Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis. Prolonged contact is unlikely given the severity of response, but repeated exposures may produce severe ulceration.</p> <p>For siloxanes:</p> <p>Effects which based on the reviewed literature do not seem to be problematic are acute toxicity, irritant effects, sensitization and genotoxicity.</p> <p>Some studies indicate that some of the siloxanes may have endocrine disrupting properties, and reproductive effects have caused concern about the possible effects of the siloxanes on humans and the environment.</p> <p>Only few siloxanes are described in the literature with regard to health effects, and it is therefore not possible to make broad conclusions and comparisons of the toxicity related to short-chained linear and cyclic siloxanes based on the present evaluation. Data are primarily found on the cyclic siloxanes D4 (octamethylcyclotetrasiloxane) and D5 (decamethylcyclopentasiloxane) and the short-linear HMDS (hexamethyldisiloxane).</p> <p>These three siloxanes have a relatively low order of acute toxicity by oral, dermal and inhalatory routes and do not require classification for this effect. They are not found to be irritating to skin or eyes and are also not found sensitizing by skin contact. Data on respiratory sensitization have not been identified. Subacute and subchronic toxicity studies show that the liver is the main target organ for D4 which also induces liver cell enzymes. This enzyme induction contributes to the elimination of the substance from the tissues. Primary target organ for D5 exposure by inhalation is the lung. D5 has an enzyme induction profile similar to that of D4. Subacute and subchronic irritation of HMDS effect in particular the lungs and kidneys in rats.</p> <p>None of the investigated siloxanes show any signs of genotoxic effects in vitro or in vivo. Preliminary results indicate that D5 has a potential carcinogenic effect.</p> <p>D4 is considered to impair fertility in rats by inhalation and is classified as a substance toxic to reproduction in category 3 with the risk phrase R62 ("Possible risk of impaired fertility").</p> <p>The results of a study to screen for oestrogen activity indicate that D4 has very weak oestrogenic and anti-oestrogenic activity and is a partial agonist (enhances the effect of the estrogen). It is not uncommon for compounds that are weakly oestrogenic to also have anti-oestrogenic properties. Comparison of the oestrogenic potency of D4 relative to ethinylestradiol (steroid hormone) indicates that D4 is 585,000 times less potent than ethinylestradiol in the rat strain Sprague-Dawley and 3.7 million times less potent than ethinylestradiol in the Fisher-344 rat strain. Because of the lack of effects on other endpoints designated to assess oestrogenicity, the oestrogenicity as mode of action for the D4 reproductive effects has been questioned. An indirect mode of action causing a delay of the LH (luteinising hormone) surge necessary for optimal timing of ovulation has been suggested as the mechanism.</p> <p>Based on the reviewed information, the critical effects of the siloxanes are impaired fertility (D4) and potential carcinogenic effects (uterine tumours in females). Furthermore there seem to be some effects on various organs following repeated exposures, the liver (D4), kidney (HMDS) and lung (D5 and HMDS) being the target organs.</p> <p>A possible oestrogenic effect contributing to the reproductive toxicity of D4 is debated. There seems however to be some indication that this toxicity may be caused by another mechanism than oestrogen activity.</p> <p>The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to trifluoromethylsiloxanes may produce conjunctivitis. No toxic response noted during 90 day subchronic inhalation toxicity studies. The no observable effect level is 400 mg/m3. Non-irritating and non-sensitising in human patch test. [Eroxy]</p> <p>PARAFFIN WAX</p> <p>"Hydrocarbon wax" describes a group of solid C26 to C36 paraffinic hydrocarbons which are not absorbed in the gastrointestinal tract and in small quantity will pass through undigested.</p> <p>The widespread use in cosmetic and in cosmetic surgery over many years demonstrates the low toxicity of refined waxes and many guidelines exist for their safe use. Notwithstanding this, there are occasional reports of adverse effects with these products. Subcutaneous deposits often referred to as paraffinoma, have been described frequently following injection of these materials under the skin but these are not normally associated with other progressive changes.</p> <p>Paraffin wax and microcrystalline waxes were each administered orally as a solution in waxes of 5 male and 5 female rats at dose levels of 1000 and 5000 mg/kg bw. produced no clinical signs of toxicity during the seven day observation period and growth rates were normal. There were no mortalities and no macroscopic changes were observed at autopsy.</p> <p>Three samples of 50% paraffin in petrolatum were tested in repeated, open patch applications to 6 rabbits. Two samples produced erythema in four animals that lasted three days, and one produced erythema in one rabbit that lasted two days. A microcrystalline wax was slightly irritating, to rabbit skin, in a 24 hour occluded patch test.</p>	TOXICITY	IRRITATION	dermal (rat) LD50: >2000 mg/kg ^[1]	Eye (rabbit): 100 mg/24 hr-mild	dermal (rat) LD50: >2000 mg/kg ^[1]	Skin (rabbit): 500 mg/24 hr-mild	Oral (rat) LD50: >4500 mg/kg ^[1]		Oral (rat) LD50: >4500 mg/kg ^[1]		
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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Version No: 11.L1.1 Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) Print Date: 23/08/2016

Petroleum hydrocarbons may produce pain after direct contact with the eyes. Slight, but transient disturbances of the corneal epithelium may also result. The aromatic fraction may produce irritation and lachrymation.

Practical experience shows that skin contact with the material is capable of inducing a sensitisation reaction in a substantial number of individuals, and/or of producing a positive response in experimental animals.

Prolonged or repeated skin contact may cause drying with cracking, irritation and possible dermatitis following.

On the basis, primarily, of animal experiments, concern has been expressed by at least one classification body that the material may produce carcinogenic or mutagenic effects, in respect of the available information, however, there presently exists inadequate data for making a satisfactory assessment.

Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems. Neuro-muscular effects result from chronic over-exposure to lithium compounds. These may include tremor, ataxia, clonus and hypervariable reflexes. Some animal studies have shown that exposure during pregnancy may produce limb defects. Other studies with rats, rabbits and monkeys have not shown teratogenic effects. Human data are ambiguous. It is well established that lithium can cross the human placenta of 25 registered pregnancies in which the mothers had received lithium (as a tranquiliser) there were 25 instances of congenital malformation. Although pharmacological doses of lithium cannot be unequivocally designated as a human teratogen, lithium therapy is contraindicated in women of childbearing potential.

Prolonged exposure may produce anorexia, weight loss and emaciation. The kidneys, behavioural/central nervous system and peripheral nervous system may also show adverse effects.

Various types of dermatitis (psoriasis, alopecia, cutaneous ulcers, acne, follicular papules, xerosis, etc., exfoliative) may also result from chronic skin exposure.

Lithium ion can be an effective treatment for manic depression. It is thought to bind the enzyme IPase (inositol monophosphatase) and thereby mediates its influence in producing a response to calcium-induced production of neurotransmitters and hormones thought to be responsible for the clinical picture.

In subchronic studies, rats were exposed to 3 milliequivalents Li/kg/day (equivalent to 1450 mg for a 70 kg person) but did not accumulate Li whilst on a high sodium diet. However when sodium was restricted, fetal kidney toxicity developed. Dogs survived daily dose of 50 mg Li/kg for 100 days to the termination of the experiment on a normal sodium intake, whereas the same dose was lethal in 12 to 18 days on a low sodium diet. 20 mg Li/kg/day resulted in death in 18 to 30 days.

Repeated or prolonged exposure to mixed hydrocarbons may produce narcosis with dizziness, weakness, inability concentration and/or memory loss, tremor in the fingers and tongue, vertigo, olfactory disorders, constriction of visual field, paraesthesiae of the extremities, weight loss and anaemia and degenerative changes in the liver and kidney. Chronic exposure by petroleum workers, to the lighter hydrocarbons, has been associated with visual disturbances, damage to the central nervous system, peripheral neuropathies (including numbness and paraesthesiae), psychological and neurophysiological deficits, bone marrow toxicities (including hypoplasia possibly due to benzene) and hepatic and renal involvement. Chronic dermal exposure to petroleum hydrocarbons may result in defolting which produces localised dermatoses. Surface cracking and erosion may also increase susceptibility to infection by microorganisms. One epidemiological study of petroleum refinery workers has reported elevations in standard mortality ratios for skin cancer along with a dose-response relationship indicating an association between routine workplace exposure to petroleum or one of its constituents and skin cancer, particularly melanoma. Other studies have been unable to confirm this finding.

Essential oils and isolates derived from the Pinaceae family, including Pinus and Abies genera, should only be used when the level of peroxide is kept to the lowest practicable level, for instance by adding antioxidants at the time of production. Such products should have a peroxide value of less than 10 millimoles peroxide per liter. Based on the published literature monitoring sensitizing properties when containing terpenes (Food and Chemical Toxicology 11, 1053(1973); 16, 843(1978); 16, 853(1978)).

In the presence of air, a number of common flavour and fragrance chemicals can form peroxides surprisingly fast. Antioxidants can in most cases minimize the oxidant.

Fragrance terpenes are generally easily oxidised in air. Non-oxidised limonene, linalool and caryophyllene turned out to be very weak sensitizers, however after oxidation limonene hydroperoxide and linalool hydroperoxide are strong sensitizers. Of the patients tested 2.8% showed positive reaction to oxidised limonene, 1.3% to oxidised linalool, 1.1% to linalool hydroperoxide, 0.5% to oxidised caryophyllene, while testing with caryophyllene oxide and oxidised myrcene resulted in few positive patch tests. 2/3 of the patients reacting positive to oxidised terpenes had fragrance related contact allergy and/or positive history for adverse reactions to fragrances.

As well as the hydroperoxides produced by linalol, limonene and delta-3-carene other oxidation and resinification effects progressively causes other fairly major changes in essential oil quality over time. Autooxidation of fragrance terpenes contributes greatly to fragrance allergy, which emphasizes the need of testing with compounds that patients are actually exposed to and not only with the ingredients originally applied in commercial formulations. Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. (PACTYS)

Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)	TOXICITY	IRRITATION
	Not Available	Not Available
distillates, petroleum, light, hydrorefined	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[1] Oral (rat) LD50: >5000 mg/kg ^[1]	Not Available
petroleum distillates HFP	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >1900 mg/kg ^[1] Dermal (rat) LD50: 28000 mg/kg ^[2] Oral (rat) LD50: 19650 mg/kg ^[2] Oral (rat) LD50: >4500 mg/kg ^[1]	[Shell - Canada]
paraffin and hydrocarbon waxes, oxidised, lithium salts	TOXICITY	IRRITATION
	Not Available	Not Available
beta-pinene	TOXICITY	IRRITATION
	Oral (rabbit) LD50: 4700 mg/kg ^[2]	Skin (rabbit): 500 mg/24h - moderate
alpha-pinene	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[1] Oral (rat) LD50: 3700 mg/kg ^[2]	Skin (man): 100% - SEVERE Skin (rabbit): 500 mg/24h - mod
polydimethylsiloxane	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg ^[2]	Eye (rabbit): 100 mg/1h - mild

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following inhalation. In contrast to most organs, the lung is able to respond to a chemical insult by first removing or neutralising the irritant and then repairing the damage. The repair process, which initially evoked to protect mammalian lungs from foreign matter and antigens, may however, produce further lung damage resulting in the impairment of gas exchange, the primary function of the lungs. Respiratory tract irritation often results in an inflammatory response involving the recruitment and activation of many cell types, many derived from the vascular system.

High inhaled concentrations of mixed hydrocarbons may produce narcosis characterised by nausea, vomiting and lightheadedness. Inhalation of aerosols may produce severe pulmonary oedema, pneumonitis and pulmonary haemorrhage. Inhalation of petroleum hydrocarbons consisting substantially of low molecular weight species (typical C2-C12) may produce irritation of mucous membranes, inconducation, giddiness, nausea, vertigo, confusion, headache, appetite loss, drowsiness, tremor and anaesthetic stupor. Massive exposures may produce central nervous system depression with sudden collapse and deep coma. Fatalities have been recorded. Irritation of the brain and/or apnoeic anoxia may produce convulsions. Although recovery following overexposure is generally complete, cerebral micro-haemorrhage of focal post-inflammatory scarring may produce epileptiform seizures some months after the exposure. Pulmonary exposures may include chemical pneumonitis with oedema and haemorrhage. The lighter hydrocarbons may produce kidney and neurotoxic effects. Pulmonary irritation increases with carbon chain length for paraffins and olefins. Alkenes produce pulmonary oedema at high concentrations. Liquid paraffins may produce anaesthesia and depressant actions leading to weakness, dizziness, slow and shallow respiration, unconsciousness, convulsions and death. C5-7 paraffins may also produce polyneuropathy. Aromatic hydrocarbons accumulate in lipid rich tissues (typically the brain, spinal cord and peripheral nerves) and may produce functional impairment manifested by nonspecific symptoms such as nausea, weakness, fatigue and vertigo. Severe exposures may produce irritation or unconsciousness. Many of the petroleum hydrocarbons are cardiac sensitizers and may cause ventricular fibrillations. Central nervous system (CNS) depression may include nonspecific discomfort, symptoms of giddiness, headache, dizziness, nausea, anaesthetic effects, slowed reaction time, slurred speech and may progress to unconsciousness. Serious poisoning may result in respiratory depression and may be fatal. Inhalation of essential oil volatiles may produce dizziness, rapid, shallow breathing, tachycardia, bronchial irritation and unconsciousness or convulsions. Complications include anuria, pulmonary oedema and bronchial pneumonia.

Acute effects from inhalation of high concentrations of vapour are pulmonary irritation, including coughing, with nausea; central nervous system depression - characterised by headache and dizziness, increased reaction time, fatigue and loss of co-ordination.

Swallowing of the liquid may cause aspiration of vomit into the lungs with the risk of haemorrhaging, pulmonary oedema, progressing to chemical pneumonitis; serious consequences may result.

Signs and symptoms of chemical (aspiration) pneumonitis may include coughing, gasping, choking, burning of the mouth, difficult breathing, and bluish coloured skin (cyanosis).

Accidental ingestion of the material may be damaging to the health of the individual.

Large doses of lithium ion have caused dizziness and prostration and can cause kidney damage if sodium intake is limited. Dehydration, weight loss, oedematous effects and thyroid disturbances have been reported. Central nervous system effects that include slurred speech, blurred vision, sensory loss, impaired concentration, inability, lethargy, confusion, disorientation, drowsiness, anxiety, spasticity, delirium, stupor, ataxia (loss of muscle coordination), sedation, fine and gross tremor, giddiness, vomiting and convulsions may occur. Diarrhoea, vomiting and convulsions such as tremor, clonus (rapid contraction and relaxation of muscles) and hyperactive reflexes may occur as a result of repeated exposure to lithium.

Acute severe overexposure may affect the kidneys, resulting in renal dysfunction, albuminuria, oliguria and degenerative changes. Cardiovascular effects may also result in cardiac arrhythmias and hypotension.

The primary target organ for lithium toxicity is the central nervous system. Lithium is therefore used therapeutically on membrane transport proteins in the central nervous system when treating manic-depression. Lithium is moderately toxic with lethal dose of LC10 in rats of 520-560 mg/kg body weight. After chronic exposure to 1 mg/dl, decreased brain weight was observed in male offspring. Chemically, lithium resembles sodium, but is more toxic. In humans 5 g/LiCl can result in fatal poisoning. In therapeutic doses, damages on the central nervous system and the kidneys have been reported.

Terpenes and their oxygen-containing counterparts, the terpenoids, produce a variety of physiological effects. Pure oil monoterpenes, for example, produce a haemorrhagic gastritis characterised by stomach pain and bleeding and vomiting. Systemic effects of pure oils include weakness and central nervous depression, excitement, loss of balance, headache, with hypothermia and respiratory failure.

Ingestion of petroleum hydrocarbons may produce irritation of the pharynx, oesophagus, stomach and small intestine with oedema and mucosal ulceration resulting. Symptoms include a burning sensation in the mouth and throat. Large amounts may produce narcosis with nausea and vomiting, weakness or dizziness, slow and shallow respiration, swelling of the abdomen, unconsciousness and convulsions. Myocardial injury may produce arrhythmias, ventricular fibrillation and electrocardiographic changes. Central nervous system depression may also occur. Light aromatic hydrocarbons produce a warm, sharp, itching sensation on contact with taste buds and may anaesthetise the tongue. Aspiration into the lungs may produce coughing, gagging and a chemical pneumonitis with pulmonary oedema and haemorrhage.

Taken internally the essential oils exert a mild irritant effect on the mucous membranes of the mouth and digestive tract which induces a feeling of warmth and increases salivation.

Taken by mouth, many essential oils can be dangerous in high concentrations. Typical effects begin with a burning feeling, followed by salivation. In the stomach, the effect is cramp-like (relieve flatulence), relaxing the gastric sphincter and encouraging eructation (belching). Further down the gut, the effect typically is antispasmodic.

Excessive oral doses irritate the gastro-intestinal tract and may cause nausea, vomiting and diarrhoea. Occasional irritation of the urinary tract and aggravation of pre-existing inflammatory conditions have been reported. Other effects include dysuria, haematuria, unconsciousness and shallow respiration. Complications arising from ingestion of volatile oils include anuria, pulmonary oedema, and bronchial pneumonia.

Central nervous system depression may lead to stupor and possible respiratory failure whilst central system stimulation may lead to excitement and convulsions. Pathologic findings include renal degeneration and intense congestion and oedema in the lungs, brain and gastric mucosa. Excretion takes place through the lungs, skin and kidneys.

Mild essential oils are reported to be abortifacients (inducing contractions of the uterus leading to expulsion of a fetus), but abortions cannot be induced at safe doses.

Considered an unlikely route of entry in commercial/industrial environments. The liquid may produce gastrointestinal discomfort and may be harmful if swallowed. Ingestion may result in nausea, pain and vomiting. Vomit entering the lungs by aspiration may cause potentially lethal chemical pneumonitis.

Evidence exists, or practical experience predicts, that the material either produces inflammation of the skin in a substantial number of individuals following direct contact, and/or produces significant inflammation when applied to the healthy intact skin of animals, for up to four hours, such inflammation being present twenty-four hours or more after the end of the exposure period. Skin irritation may also be present after prolonged or repeated exposure; this may result in a form of contact dermatitis (nonallergic). The dermatitis is often characterised by skin redness (erythema) and swelling (oedema) which may progress to blistering (vesiculation), scaling and thickening of the epidermis. At the microscopic level there may be intercellular oedema of the spongy layer of the skin (spongiosis) and intracellular oedema of the epidermis.

The material may accentuate any pre-existing dermatitis condition.

Repeated exposure may cause skin cracking, flaking or drying following normal handling and use.

Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.

Open cuts, abrasion or irritated skin should not be exposed to this material.

It is likely that odoriferous oils become irritants from the build up of peroxides of delta-3-carene and limonene etc.

Entry into the blood-stream through, for example, cuts, abrasions, puncture wounds or lesions, may produce systemic injury with harmful effects. Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.

ES105556

Aromatic hydrocarbons may produce skin irritation, vasodilatation with erythema and changes in endothelial cell permeability. Systemic intoxication, resulting from contact with the light aromatics, is unlikely due to the slow rate of permeation. Branching of the side chain appears to increase percutaneous absorption.

Limited evidence exists, or practical experience suggests, that the material may cause eye irritation in a substantial number of individuals and/or is expected to produce significant ocular lesions which are present twenty-four hours or more after installation into the eyes of experimental animals. Repeated or prolonged eye contact may cause inflammation characterised by temporary redness (similar to windburn) of the conjunctiva (conjunctivitis), temporary impairment of vision and/or other transient eye damage/ocular injury may occur.

Continued...


Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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Version No: 11.1.1.1		Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)		Print Date: 23/08/2016																																																													
<p>Thermal hazards</p> <ul style="list-style-type: none"> Eye wash unit. <p>Not Available</p>																																																																	
<p>Respiratory protection</p> <p>Type A-P Filter of sufficient capacity (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)</p> <p>Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the "Exposure Standard" (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.</p> <table border="1"> <thead> <tr> <th>Required Minimum Protection Factor</th> <th>Half-Face Respirator</th> <th>Full-Face Respirator</th> <th>Powered Air Respirator</th> </tr> </thead> <tbody> <tr> <td>up to 10 x ES</td> <td>A-AUS P2</td> <td>-</td> <td>A-PAPR-AUS / Class 1 P2</td> </tr> <tr> <td>up to 50 x ES</td> <td>-</td> <td>A-AUS / Class 1 P2</td> <td>-</td> </tr> <tr> <td>up to 100 x ES</td> <td>-</td> <td>A-2 P2</td> <td>A-PAPR-2 P2*</td> </tr> </tbody> </table> <p>* - Full-face A(AI classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO₂), G = Agricultural chemicals, K = Ammonia(NH₃), hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AL = Low boiling point organic compounds(below 65 degC)</p> <p>Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content. The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.</p>						Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator	up to 10 x ES	A-AUS P2	-	A-PAPR-AUS / Class 1 P2	up to 50 x ES	-	A-AUS / Class 1 P2	-	up to 100 x ES	-	A-2 P2	A-PAPR-2 P2*																																												
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<p>CEL TWA: 300 ppm, 900 mg/m³ (CEL = Chemwatch Exposure Limit)</p> <p>for petroleum distillates: CEL TWA: 600 ppm, 2000 mg/m³ (compare OSHA TWA) (CEL = Chemwatch Exposure Limit)</p> <p>NOTE M: The classification as a carcinogen need not apply if it can be shown that the substance contains less than 0.05% w/w benz[a]pyrene (ENECs No 200-C28-5). This note applies only to certain complex oil-derived substances in Annex IV. European Union (EU) List of harmonised classification and labelling hazardous substances, Table 3.1, Annex VI, Regulation (EC) No 1272/2008 (CLP) - up to the latest ATP. NOTE F: This classification as a carcinogen need not apply if it can be shown that the substance contains less than 0.01% w/w benzene (ENECs No 200-783-7). Note E shall also apply when the substance is classified as a carcinogen. This note applies only to certain complex oil-derived substances in Annex VI. European Union (EU) List of harmonised classification and labelling hazardous substances, Table 3.1, Annex VI, Regulation (EC) No 1272/2008 (CLP) - up to the latest ATP.</p>																									
<p>Exposure controls</p> <p>Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection. The basic types of engineering controls are: Process controls which involve changing the way a job activity or process is done to reduce the risk. Enclosure and/or isolation of emission source which keeps a selected hazard "physically" away from the worker and ventilation that strategically "adds" and "removes" air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use. Employers may need to use multiple types of controls to prevent employee overexposure.</p> <p>Local exhaust ventilation usually required. If risk of overexposure exists, wear approved respirator. Correct fit is essential to obtain adequate protection. Supplied-air type respirator may be required in special circumstances. Correct fit is essential to ensure adequate protection. An approved self contained breathing apparatus (SCBA) may be required in some situations. Provide adequate ventilation in warehouse or closed storage area. Air contaminants generated in the workplace possess varying "escape" velocities which, in turn, determine the "capture velocities" of fresh circulating air required to effectively remove the contaminant.</p> <table border="1"> <thead> <tr> <th>Type of Contaminant:</th> <th>Air Speed:</th> </tr> </thead> <tbody> <tr> <td>solvent, vapours, degreasing etc.: evaporating from tank (in still air)</td> <td>0.25-0.5 m/s (50-100 ft/min.)</td> </tr> <tr> <td>arcwelds, fumes from pouring operations, intermittent container filling, low speed conveyor transfers, welding, spray diff. plating acid fumes, pickling (released at low velocity into zone of active generation)</td> <td>0.5-1 m/s (100-200 ft/min.)</td> </tr> <tr> <td>direct spray spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)</td> <td>1-2.5 m/s (200-500 ft/min.)</td> </tr> <tr> <td>grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion)</td> <td>2.5-10 m/s (500-2000 ft/min.)</td> </tr> </tbody> </table> <p>Within each range the appropriate value depends on:</p> <table border="1"> <thead> <tr> <th>Lower end of the range</th> <th>Upper end of the range</th> </tr> </thead> <tbody> <tr> <td>1: Room air currents minimal or favourable to capture</td> <td>1: Disturbing room air currents</td> </tr> <tr> <td>2: Contaminants of low toxicity or of nuisance value only</td> <td>2: Contaminants of high toxicity</td> </tr> <tr> <td>3: Intermittent, low production</td> <td>3: High production, heavy use</td> </tr> <tr> <td>4: Large hood or large air mass in motion</td> <td>4: Small hood-local control only</td> </tr> </tbody> </table> <p>Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 ft/min) for extraction of solvents generated in a tank 2 metres distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.</p>						Type of Contaminant:	Air Speed:	solvent, vapours, degreasing etc.: evaporating from tank (in still air)	0.25-0.5 m/s (50-100 ft/min.)	arcwelds, fumes from pouring operations, intermittent container filling, low speed conveyor transfers, welding, spray diff. plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 ft/min.)	direct spray spray painting in shallow booths, drum filling, conveyor loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 ft/min.)	grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion)	2.5-10 m/s (500-2000 ft/min.)	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<p>Personal protection</p> 																									
<p>Eye and face protection</p> <ul style="list-style-type: none"> Safety glasses with side shields. Chemical goggles. Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each ventilator or tank. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [G09 NIOSH Current Intelligence Bulletin 92] [ANSI Z87.1-2003 or national equivalent] 																									
<p>Skin protection</p> <p>See Hand protection below</p> <ul style="list-style-type: none"> Wear chemical protective gloves, e.g. PVC. Wear safety footwear or safety gumboots, e.g. Rubber. 																									
<p>Hands/feet protection</p> <p>NOTE:</p> <ul style="list-style-type: none"> The material may produce skin sensitisation in predisposed individuals. Care must be taken when removing gloves and other protective equipment, to avoid all possible skin contact. Contaminated leather items, such as shoes, belts and watch bands should be removed and destroyed. 																									
<p>Body protection</p> <p>See Other protection below</p>																									
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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

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Other information

- Observe manufacturer's storage and handling recommendations contained within this SDS.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions are maintained.
- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container

- Metal can or drum
- Packaging as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

Storage incompatibility

Trace of benzene, a carcinogen, may form when silicones are heated in air above 230 degrees C. Concentrated acids and bases cause degradation of polymer. Boiling water may soften and weaken material.

HAZARD:

- Although anti-oxidants may be present, in the original formulation, these may deplete over time as they come into contact with air.
- Rags wet / soaked with unsaturated hydrocarbons / drying oils may auto-oxidize: generate heat and, in time, smoulder and ignite. This is especially the case where oil-soaked materials are folded, bunched, compressed, or piled together - this allows the heat to accumulate or even accelerate the reaction
- Only cleaning rags should be collected regularly and immersed in water, or spread to dry in safe-place away from direct sunlight or stored, immersed, in solvents in suitably closed containers.
- Avoid reaction with oxidizing agents

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
Australia Exposure Standards	distillates, petroleum, light, hydrotreated	Oil mist, refined mineral	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	petroleum distillates HFP	Oil mist, refined mineral	5 mg/m3	Not Available	Not Available	Not Available
Australia Exposure Standards	paraffin wax	Paraffin wax (dume)	2 mg/m3	Not Available	Not Available	Not Available

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
petroleum distillates HFP	Naphtha, hydrotreated heavy; (Isopar L-rev 2)	171 ppm	171 ppm	570 ppm
petroleum distillates HFP	Solvent naphtha, petroleum, medium aliphatic; (Mineral spirits, naphtha)	0.32 mg/m3	3.5 mg/m3	21 mg/m3
alpha-pinene	Trimethylcyclo(3,1,1)-2-hept-2-ene, 2,6,6; (alpha-Phinene)	22 ppm	22 ppm	130 ppm
polydimethylsiloxane	Dimethyl siloxane; (Dimethylpoly siloxane; Sylthem XLT; Sylthem 800; Silicone 360)	1.5 mg/m3	16 mg/m3	950 mg/m3
paraffin wax	Paraffin, n	4.9 mg/m3	4.9 mg/m3	29 mg/m3

Ingredient	Original IDLH	Revised IDLH
distillates, petroleum, light, hydrotreated	Not Available	Not Available
petroleum distillates HFP	Not Available	Not Available
conditioners, trade secret	Not Available	Not Available
paraffin and hydrocarbon waxes, oxidized, lithium salts	Not Available	Not Available
beta-pinene	Not Available	Not Available
alpha-pinene	Not Available	Not Available
polydimethylsiloxane	Not Available	Not Available
paraffin wax	Not Available	Not Available
other terpenes	Not Available	Not Available

MATERIAL DATA

For kaolin:
Kaolin dust appears to have fibrogenic potential even in the absence of crystalline silica. Kaolinists can exist as simple and complicated forms with the latter often associated with respiratory symptoms. Crystalline silica enhances the severity of the pneumoconiosis.

For paraffin waxes and hydrocarbon waxes a complex combination of hydrocarbons obtained from petroleum fractions by solvent crystallisation:
TLV TWA: 2 mg/m3
Animals exposed by inhalation to 10 mg/m3 titanium dioxide show no significant fibrosis, possibly reversible tissue reaction. The architecture of lung air spaces remains intact.

Odour threshold: 0.25 ppm.
The TLV/TWA is protective against ocular and upper respiratory tract irritation and is recommended for bulk handling of gasoline based on calculations of hydrocarbon content of gasoline vapour. A STEL is recommended to prevent mucous membrane and ocular irritation and prevention of acute depression of the central nervous system. Because of the wide variation in molecular weights of its components, the conversion of ppm to mg/m3 is approximate. Sweden recommends hexane type limits of 100 ppm and heptane and octane type limits of 300 ppm. Germany does not assign a value because of the widely differing compositions and resultant differences in toxic properties.

Odour Safety Factor (OSF)
OSF=0.042 (gasoline)
for kerosene CAS 8008-20-6
TLV TWA: 100 mg/m3 as total hydrocarbon vapour S13 A3
OEL TWA: 14 ppm, 100 mg/m3 (NIOSH, 1985)
REL TWA: 150 ppm [S16a]

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Fire incompatibility

- Avoid contamination with oxidizing agents (i.e. nitrates, oxidizing acids, chlorine bleaches, pool chlorine etc. as ignition may result)

Advice for firefighters

Fire Fighting

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use water delivered as a fine spray to control fire and cool adjacent area.
- DO NOT approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.
- Equipment should be thoroughly decontaminated after use.

Fire/Explosion Hazard

- Combustible.
- Slight fire hazard when exposed to heat or flame.
- Heating may cause expansion or decomposition leading to violent rupture of containers.
- On combustion, may emit toxic fumes of carbon monoxide (CO).
- May emit acid smoke.
- Mists containing combustible materials may be explosive.

Combustion products include: carbon monoxide (CO) carbon dioxide (CO2) silicon dioxide (SiO2) other pyrolysis products typical of burning organic material
CARE: Water in contact with hot liquid may cause foaming and a steam explosion with wide scattering of hot oil and possible severe burns. Foaming may cause overflow of containers and may result in possible fire.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills

Environmental hazard - contain spillage.

- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Wear impervious gloves and safety goggles.
- Traverse spillage up.
- Place spilled material in clean, dry sealed container.
- Flush spill area with water.

Major Spills

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Stop leak if safe to do so.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Neutralise/decontaminate residue (see Section 13 for specific agent).
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

Environmental hazard - contain spillage.
CARE: Absorbent materials wetted with occluded oil must be moistened with water as they may auto-oxidize, become self heating and ignite. Some oils slowly oxidize when spread in a film and oil on cloths, mops, absorbents may autoxidize and generate heat, smoulder, ignite and burn. In the workplace oily rags should be collected and immersed in water.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

- Containers, even those that have been emptied, may contain explosive vapours.
- Do NOT cut, drill, grind, weld or perform similar operations on or near containers.
- Electrostatic discharge may be generated during pumping - this may result in fire.
- Ensure electrical continuity by bonding and grounding (earthing) all equipment.
- Restrict line velocity during pumping in order to avoid generation of electrostatic discharge (<=1 m/sec until fill pipe submerged to twice its diameter, then <= 7 m/sec).
- Avoid splash filling.
- Do NOT use compressed air for filling discharge or handling operations.
- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- DO NOT allow materials to contact humans, exposed food or food utensils.
- Avoid contact with incompatible materials.
- When handling, DO NOT eat, drink or smoke.
- Keep containers securely sealed when not in use.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Wash clothes should be laundered separately. Launder contaminated clothing before re-use.
- Use good occupational work practice.

Continued...

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

Chemwatch: 4804-07 Page 3 of 21 Issue Date: 03/07/2014
Version No: 11.1.1.1 Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A) Print Date: 23/08/2016

Skin Contact

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

For thermal burns:

- Decontaminate area around burn.
- Consider the use of cold packs and topical antibiotics.

For first-degree burns (affecting top layer of skin)

- Hold burned skin under cool (not cold) running water or immerse in cool water until pain subsides.
- Use compresses if running water is not available.
- Cover with sterile non-adhesive bandage or clean cloth.
- Do NOT apply butter or ointments; this may cause infection.
- Give over-the-counter pain relievers if pain increases or swelling, redness, fever occur.

For second-degree burns (affecting top two layers of skin)

- Cool the burn by immersing in cold running water for 10-15 minutes.
- Use compresses if running water is not available.
- Do NOT apply ice as this may lower body temperature and cause further damage.
- Do NOT break blisters or apply butter or ointments; this may cause infection.
- Protect burn by covering loosely with sterile, nonstick bandage and secure in place with gauze or tape.

To prevent shock: (unless the person has a head, neck, or leg injury, or it would cause discomfort):

- Leg the person flat.
- Elevate feet about 12 inches.
- Elevate burn area above heart level, if possible.
- Cover the person with cool or blanket.
- Seek medical assistance.

For third-degree burns

- Seek immediate medical or emergency assistance.

In the mean time

- Protect burn area cover loosely with sterile, nonstick bandage or, for large areas, a sheet or other material that will not leave lint in wound.
- Separate burned toes and fingers with dry, sterile dressings.
- Do not soak burn in water or apply ointments or butter; this may cause infection.
- To prevent shock see above.
- For an airway burn, do not place pillow under the person's head when the person is lying down. This can close the airway.
- Have a person with a facial burn sit up.
- Check pulse and breathing to monitor for shock until emergency help arrives.

Inhalation

- If fumes, aerosols or combustion products are inhaled remove from contaminated area.
- Other measures are usually unnecessary.

If swallowed do NOT induce vomiting.

- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
- Observe the patient carefully.

Ingestion

- Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious.
- Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink.
- Seek medical advice.
- Avoid giving milk or oils.
- Avoid giving alcohol.

Indication of any immediate medical attention and special treatment needed

For acute or short term repeated exposures to petroleum distillates or related hydrocarbons:

- Primary threat to life, from pure petroleum distillate ingestion and/or inhalation, is respiratory failure.
- Patients should be quickly evaluated for signs of respiratory distress (e.g. cyanosis, tachypnoea, intercostal retraction, obtundation) and given oxygen. Patients with inadequate tidal volumes or poor arterial blood gases (pO2 50 mm Hg) should be intubated.
- Anty/arrhythmias complicate some hydrocarbon ingestion and/or inhalation and electrocardiographic evidence of myocardial injury has been reported; intravenous lines and cardiac monitors should be established in obviously symptomatic patients. The lungs excrete inhaled solvents, so that hyper-ventilation improves clearance.
- A chest x-ray should be taken immediately after stabilisation of breathing and circulation to document aspiration and detect the presence of pneumothorax.
- Ephedrine (adrenaline) is not recommended for treatment of bronchospasm because of potential myocardial sensitisation to catecholamines. Inhaled cardioselective bronchodilators (e.g. Alupent, Salbutamol) are the preferred agents, with aminophylline a second choice.
- Levage is indicated in patients who require decontamination; ensure use of cuffed endotracheal tube in adult patients. [Elienhorn and Barceloux: Medical Toxicology]

Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically. Mechanical means should be used if it is considered necessary to evacuate the stomach contents; these include gastric lavage after endotracheal intubation. If spontaneous vomiting has occurred after ingestion, the patient should be monitored for efficient breathing, as adverse effects of aspiration into the lungs may be delayed up to 48 hours.

Clinical effects of lithium intoxication appear to relate to duration of exposure as well as to level.

- Lithium produces a generalised slowing of the electroencephalogram; the aion gap may increase in severe cases.
- Emesis or lavage (if the patient is obtunded or comatose) is indicated for ingestions exceeding 40 mg (Li)/kg.
- Overdose may delay absorption; decontamination measures may be more effective several hours after cathartics.
- Charcoal is not useful. No clinical data are available to guide the administration of cathartics.
- Haemodialysis significantly increases lithium clearance. Indications for haemodialysis include patients with serum levels above 4 meq/L.
- There are no antidotes.

[Elienhorn and Barceloux: Medical Toxicology]

In acute poisonings by essential oils the stomach should be emptied by aspiration and lavage. Give a saline purgative such as sodium sulfate (30 g in 250 ml water) unless cathartics is already present. Demulcent drinks may also be given. Large volumes of fluid should be given provided renal function is adequate. [MARTINDALE: The Extra Pharmacopoeia, 28th Ed.]

SECTION 5 FIREFIGHTING MEASURES

Extinguishing media

- Water spray or fog.
- Alcohol stable foam.
- Dry chemical powder.
- Carbon dioxide.

Special hazards arising from the substrate or mixture

Continued...

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H227	Combustible liquid
H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H336	May cause drowsiness or dizziness.
H304	May be fatal if swallowed and enters airways.
H411	Toxic to aquatic life with long lasting effects.
ALH066	Repeated exposure may cause skin dryness and cracking

Precautionary statement(s) Prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P271	Use in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301	Avoid breathing mist/sprays/aerosol.
P273	Avoid release to the environment.
P272	Contaminated work clothing should not be allowed out of the workplace.

Precautionary statement(s) Response

P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331	Do NOT induce vomiting.
P362	Take off contaminated clothing and wash before reuse.
P363	Wash contaminated clothing before reuse.
P370+P378	In case of fire: Use alcohol resistant foam or normal protein foam for extinction.
P302+P352	IF ON SKIN: Wash with plenty of soap and water.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
P333+P313	If skin irritation or rash occurs: Get medical advice/attention.
P391	Collect spillage.
P304+P340	IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Precautionary statement(s) Storage

P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.
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SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures	CAS No	%(weight)	Name
	64742-47-9	10-30	<u>distillates, petroleum, light, hydro treated</u>
	64742-49-9	10-30	<u>petroleum distillates 1-EP</u>
	Not Available	<20	<u>conditioners, trade secret</u>
	66649-49-9	7-13	<u>paraffin and hydrocarbon waxes, oxidised, lithium salts</u>
	19902-09-0	5-10	<u>butylacetone</u>
	80-56-8	5-10	<u>alpha-cubene</u>
	63146-62-9	5-10	<u>polydimethylsiloxane</u>
	8002-74-2	5-10	<u>paraffin wax</u>
	Not Available	1-5	<u>other terpenes</u>

SECTION 4 FIRST AID MEASURES

Description of first aid measures

Eye Contact	<p>If this product comes in contact with the eyes:</p> <ul style="list-style-type: none"> Wash out immediately with fresh running water. Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids. Seek medical attention without delay; if pain persists or recurs seek medical attention. Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
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Continued...

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SC Auto (Myanmar) Co., Ltd.

Chemwatch

Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)

Motor Active Chemwatch Hazard Alert Code: 2

Chemwatch: 4804-67 Issue Date: 02/07/2014
Version No: 11.1.1.1 Print Date: 23/09/2016
Safety Data Sheet according to WHS and ADG requirements L.GHS.AUS.EN

SECTION 1 IDENTIFICATION OF THE SUBSTANCE / MIXTURE AND OF THE COMPANY / UNDERTAKING

Product Identifier

Product name	Meguiar's M08 - Mirror Glaze Maximum Mold Release Wax (23-135A)
Synonyms	Not Available
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID N.O.S. (contains beta-pinene and alpha-pinene)
Other means of identification	Not Available

Relevant identified uses of the substance or mixture and uses advised against

Relevant identified uses	Use according to manufacturer's directions. Release agent.
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Details of the supplier of the safety data sheet

Registered company name	Motor Active	Meguiars
Address	35 Slough Business Park, Hooker Street Silverwater NSW 2128 Australia	17691 Mitchell South Irvine CA 92714 United States
Telephone	+61 2 9737 9422/1800 350 522	+1 949 752 8000/+1 800 347 5700
Fax	+61 2 9737 9414	+1 949 752 5784
Website	www.motoractive.com.au	https://www.meguiars.com/
Email	andrew.apina@motoractive.com.au	N/A: Available

Emergency telephone number

Association / Organisation	MotorActive	Not Available
Emergency telephone numbers	+61 2 9737 9422 (For General Information Monday to Friday 9:30am to 5 pm)	Not Available
Other emergency telephone numbers	13 11 26 (In Case of Emergency contact, Poison Information hotline)	Not Available

SECTION 2 HAZARDS IDENTIFICATION

Classification of the substance or mixture

HAZARDOUS CHEMICAL, DANGEROUS GOODS, According to the WHS Regulations and the ADG Code.

CHEMWATCH HAZARD RATINGS

Flammability	1	Min	Max
Toxicity	1		
Body Contact	2		
Reactivity	1		
Chronic	2		


0 = Minimum
1 = Low
2 = Moderate
3 = High
4 = Extreme

Poisons Schedule Not Applicable

Classification (GHS) Flammable Liquid Category 4, Skin Corrosion/Irritation Category 2, Skin Sensitizer Category 1, Specific target organ toxicity - single exposure Category 3 (narcotic effects), Aspiration Hazard Category 1, Acute Aquatic Hazard Category 2, Chronic Aquatic Hazard Category 2

Legend: 1. Classified by Chemwatch; 2. Classification drawn from HSIS; 3. Classification drawn from EC Directive 1272/2008 - Annex VI


Label elements

GHS label elements 

SIGNAL WORD **DANGER**

Hazard statement(s)

Continued...


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Shipping Name: Not regulated Not regulated Not regulated

Hazard Class: None None None

UN Number: None None None

Packing Group: None None None

Section 15 – Regulatory Information

Classification and Labeling (EEC):
This product is not hazardous according to European Directives 69/45/EEC, 67/548/EEC and their latest amendment.

Symbol(s): None

R-phrase(s): None

S-phrase(s): S22 - Do not breathe dust.

Component Analysis – Inventory

Component CAS # TSCA EINECS
Glass, Oxides (Fiber Glass Continuous Filament) 65997-17-3 Yes 266-046-0

Section 16 – Other Information

Key/Legend
TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NTP = National Toxicology Program; WHO = World Health Organization; IATA = International Air Transport Association; RID = European Rail Transport; ADR = European Road Transport; IMO = International Maritime Organization; MEL = Maximum Exposure Limits; TWA = Time Weighted Average; STEL = Short-term Exposure Limit Ref: IOM Study; Source: NAIMA 1997. Unpublished letter. Rat inhalation studies with E-Glass micro-fibers at Institute of Medicine, Scotland, January 30, 1997. Letter to USEPA TSCA 8(e) coordinator.

This Product Safety Data Sheet has been prepared in conformity with EU Directive 91/155/EEC; 69/45/EEC and 67/548/EEC and their latest amendments. It is the responsibility of the person in receipt of this product safety data sheet to ensure that the information contained herein is properly understood by all people who may use, handle or dispose of the product or in any way come in contact with the product. The information provided in this product safety data sheet is based on current state of scientific and technical knowledge at the date indicated on the present document.

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Section 10 – Chemical Stability & Reactivity Information

Reactivity: This is a stable material.

Conditions to Avoid: None expected.

Incompatible Materials: None expected.

Hazardous Decomposition Products: None. In case of fire see Section 5.

Hazardous Polymerization: Will not occur, all binders are fully polymerized.

Section 11 – Toxicological Information

Carcinogenicity:

Fiber Glass Continuous Filament: According to the E.U. Directives the continuous filament glass fibers in these products are not classified as carcinogenic. Continuous filament glass fibers are not within the scope of Directive 67/548/EEC per amendment 97/69/EC, since they are not “fibres with random orientation.”

The International Agency for Research on Cancer (IARC) in June 1987, categorized fiberglass continuous filament as not classifiable with respect to human carcinogenicity (Group 3). The evidence from human as well as animal studies was evaluated by IARC as insufficient to classify fiberglass continuous filament as a possible, probable, or confirmed cancer causing material.

The American Conference of Governmental Industrial Hygienists (ACGIH) has established an A4 classification, not classifiable as a human carcinogen, for respirable continuous filament glass fibers. This was based on inadequate evidences in terms of its carcinogenicity in humans and/or animals.

The continuous filament glass fibers in these products are “non-respirable.” Products that are chopped, crushed or severely mechanically processed during manufacture or use contain small amounts of respirable glass “fiber-like” fragments (WHO Criteria > 5 microns in length; < 3 microns in diameter and an aspect ratio > 3:1 (length to width ratio). Available exposure monitoring data indicates that airborne exposure concentrations of respirable glass “fiber-like” fragments are expected to be extremely low or non-detectable.

Section 12 – Ecological Information

Ecotoxicity:

A: General Product Information

No data are available for this product. This material is not expected to cause harm to animals, plants or fish.

B: Ecotoxicity - Aquatic Toxicity

No ecotoxicity data are available.

Environmental Fate:

No data are available for this product. This product is not expected to be biodegradable.

Section 13 – Disposal Considerations

Disposal Instructions:

Consult appropriate authorities before disposing waste material. Dispose, recycle or re-use waste material according to local and national requirements.

Section 14 – Transportation Information

International Transport: IATA RID/ADR IMO

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Germany Alveolar dust: 6 Respirable Fibres: 0.25

Ireland Inhalable dust: 5 Respirable Fibres: 2

Italy Dust: 10 Fibres: 1

Netherlands Respirable dust: 5 Respirable fibres: 2 General dust: 10

Norway Inert respirable dust: 5 Fibres: 1 Total inert dust: 10

Portugal Fibrous dust: 1 None --Total dust 4

Spain Dust : 10 Fibres: 1

Sweden Respirable dust: 5 Fibres: 1 Total dust 10

Switzerland Dust : 6 Respirable fibres 0.5

U.K. Respirable dust : 5 Respirable fibres: 2 Total dust : 10

Refer to local legislation for exposure limits in other countries.

Ventilation: General ventilation and/or local exhaust ventilation should be provided as necessary to maintain exposures below regulatory limits.

PERSONAL PROTECTION

Personal Breathing Protection:

Under normal circumstances, breathing protection is not necessary. To avoid irritation a properly fitted P2 disposable filtermask should be used. In extreme circumstances (exposure exceeding the established exposure limit) the use of a properly fitted half-mask respirator with a P2 filter should be used. Use respiratory protection in accordance with your company's respiratory protection program and applicable regulations.

Loose fitting long sleeved shirts that cover to the base of the neck, long trousers and gloves should be worn. Skin irritation is known to occur chiefly at pressure points such as at the base of the neck, wrist, waist and between the fingers. Be careful not to rub or scratch irritated areas. Rubbing or scratching may force fibres into the skin. In extreme circumstances, a disposable overall and gloves are recommended.

Eyes/Face Protective Equipment:

To avoid irritation of the eyes, safety glasses with side shields or goggles are recommended.

Work and Hygienic Practices:

Avoid unnecessary exposure to dust and handle with care. Remove material from clothing using a vacuum cleaner. Never use compressed air. Keep the work area clean of dust and fibres by using an industrial vacuum cleaner with a high efficiency filter. Avoid dry sweeping or the use compressed air. Have access to an eye wash station and shower. Clothing should be washed separately from other clothing. Wipe out washer/sink to prevent loose glass fibres from getting on other articles.

Section 9 – Physical & Chemical Properties

Vapor Pressure (mm HG @ 20 C): Not applicable

Vapor Density (Air=1): Not applicable

Specific Gravity (Water=1): 2.60

Boiling Point: Not applicable

Solubility in Water: Insoluble

Viscosity: Not applicable

Appearance: Solid nonwovenmat

Physical State: Solid

Flash Point: Not applicable


Freezing Point: Not applicable

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remove fibers. To avoid further irritation, do not rub or scratch affected areas. Rubbing or scratching may force fibers into the skin. Remove polluted clothing. If irritation persists, get medical attention.

Ingestion:
Accidental ingestion of this material is unlikely. If it does occur, watch the person for several days to make sure that intestinal blockage does not occur. Rinse the mouth with water and drink water to remove fibres from the throat. If irritation persists, get medical attention.

Section 5 - Fire Fighting Measures

Flammability: This product will burn poorly.

Extinguishing Media: Dry chemical, foam, carbon dioxide, water fog.

Unusual Fire & Explosion Hazards: Toxic fumes can be released during a fire.

Hazardous Combustion Products: Primary combustion products are carbon monoxide, carbon dioxide and water. Formaldehyde, nitrogen oxides, amines and other undetermined compounds could be released in small quantities.

Section 6 – Accidental Release Measures

Land Spill: Scoop up material and put into suitable container for disposal as a non-hazardous waste.

Water Spill: This material will sink and disperse along the bottom of waterways and ponds. It can not easily be removed after it is waterborne; however, the material is non-hazardous in water.

Air Release: This material will settle out of the air. If concentrated on land it can then be scooped up for disposal as a non-hazardous waste.

Section 7 – Handling and Storage

Storage Temperature: Not Applicable.

Storage Pressure: Not Applicable.

General: No special storage or handling procedures are required for this material.


Section 8 – Exposure Controls / Personal Protection

Country Particulate (8 hr TWA) mg/m³

Man Made Vitreous Fibres: (8 hr TWA) Fibres / ml

Austria Fine dust: (yearly avg) 6 Fibres: 0,5(monthly average) 12
Belgium Dust 10 None –
Denmark Inert respirable dust: 5 Fibres: 1 Total inert dust: 10
Finland Inert Organic Dust 10 Fibres: 1
France Total Dust: 10 Respirable fibres: 1

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SAFETY DATA SHEET : FIBREGLASS ROVING, CHOPPED STRAND, CHOPPED STRAND MAT, WOVEN ROVING, MILLED FIBRE, GLASS FLAKE, YARN, FIBREGLASS CLOTH, SURFACE TISSUE, C VEIL, BOAT TAPE, GLASS TAPE, BIAXIAL MAT, UNIDIRECTIONAL FABRIC, QUADRIAXIAL FABRIC.

Date of Revision : 16 Jan 2018

Section 1 - Product and Company Identification

Product Name(s): Fibreglass Roving, Chopped Strand, Chopped strand Mat, Woven Roving, Milled Fibre, Glass Flake, Yarn, Fibreglass Cloth, Surface Tissue, C Veil, Boat Tape, Glass Tape, Biaxial Mat, Triaxial, Vitrocore, Unidirectional Fabric, Quadriaxial Fabric

Section 2 - Hazards Identification

The product is not classified as hazardous according to Regulation (EC) 1272/2008

Label Elements

Signal Word : No signal word
Hazard Statements : No critical hazards

Section 3 – Composition / Information on Ingredients

Ingredient(s)	% by weight	Classification	Identifiers
Fibrous glass	98-100%	Not Classified	CAS 65997-17-3
Polymeric Organic Binder	0-2%	Not Classified	Not available

No hazardous ingredient in the meaning of European Directive 67/548/EEC and 99/45/EC and their latest amendments.

Section 4 - First Aid Measures

Inhalation:
Immediately move the affected person to fresh air. If symptoms persist, get medical attention.

Eye Contact:
Immediately flush eyes with plenty of water for at least 15 minutes. Do not rub or scratch eyes. Rubbing or scratching may cause mechanical damage. If irritation persists get medical attention.


Skin Contact:
For skin contact, wash immediately with soap and cold water. Do not wash with warm water because this will open up the pores of the skin, which will cause further penetration of the fibres. Use a washcloth to help

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S 51 Use only in well ventilated areas.
S 53 Avoid exposure - obtain special instructions before use.

Special designation of certain preparations:
Contains epoxy combinations

National regulations
Technical guidance air: I - III: 0 %
Water risk class: 2
water pollutant (allocation)

Further regulations, limitations and legal requirements:
National regulations USA:
SARA Title III - Hazard Classes:
- Acute Health Hazard
- Chronic Health Hazard
NFPA Hazard Rating:
- Health = Not established
- Fire = 1 (slight)
- Reactivity = Not established
SARA Title III - Section 313 Supplier Notification: See chapter 2


16. Other information

Further remarks
Text for labelling: Contains epoxy combinations.
Follow manufacturer's directions.
see chapter 1, department responsible for information.

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.

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11. Toxicological information

Toxicological Tests
Additional information: Skin irritation: Rabbit, irritant
Eye Irritant: Rabbit, irritant
Sensitization: May cause sensitization by skin contact.

12. Ecological information

Ecotoxicological effects
Further details: Do not allow to enter ground water or storm drains.

13. Disposal considerations

Product
Recommendation: Incinerate as hazardous waste according to applicable local, state, and federal regulations.
Waste key number (D): 55508

Contaminated packaging
Recommendation: Dispose of waste according to applicable local, state, and federal regulations.

14. Transport information

Overland transport
ADR/GGVS (road): Not applicable
RID/GGVE (railway): Not applicable

Transport by sea
Remarks: Not applicable

Air transport
Remarks: Not applicable

Additional information
Not a hazardous material with respect to transportation regulations.

15. Regulatory information

Classification
Code letter and hazard symbol: Xn Harmful

R phrase(s):
R 36/38 Irritating to eyes and skin.
R 43 May cause sensitization by skin contact.
R 62 Possible risk of impaired fertility.
R 63 Possible risk of harm to the unborn child.

S phrase(s):
S 23 Do not breath gas/fumes/vapor/spray (to be specified by the manufacturer).
S 24 Avoid contact with skin.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 38 In case of insufficient ventilation, wear suitable respiratory equipment.

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8. Exposure controls / personal protection

Information on system design and engineering measures

Information for safe handling:

Use only explosion-proof equipment/instruments.
See also Information in chapter 7, section storage.

Components with workplace relevant concentration limits

CAS-Number Chemical name (acc. to EC) Type Value
84-74-2 Dibutylphthalate OSHA/NIOSH/ACGIH-TWA 5 mg/m³

Personal protection equipment

Respiratory protection:

Use respiratory protection whenever ventilation is inadequate.

Hand protection:

Protective gloves

Eye protection:

Tightly sealed safety glasses

Body protection:

Closed work clothing

General protection and hygiene measures:

Wash hands when done working with material; at breaks, lunch, shift changes, etc. Avoid contact with skin and eyes. When using do not eat, drink or smoke.

9. Physical and chemical properties

Appearance

Form: Paste

Odour: weakly aromatic

Safety relevant data

pH value: n.a.

Boiling temperature / boiling range: n.a.

Melting point / melting range: n.a.

Flash point: 101 °C

Ignition temperature: n.a.

Explosive properties: n.a.

Explosion limits: lower: 0.8 Vol%

Vapour pressure: at 20 °C: n.a.

Density: at 20 °C: 1.26 g/ml

Solubility in water: at 20 °C: insoluble

Viscosity: pasty

10. Stability and reactivity

Additional information

Condition to avoid (hazardous reactions):

Static discharges

Materials to avoid:

Avoid contact with strong acids, strong bases and strong oxidizing agents.

Hazardous decomposition products:

Hazardous decomposition byproducts such as carbon dioxide, carbon monoxide, smoke nitrogen oxides may develop with exposure to high temperature.

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5. Fire fighting measures

after swallowing:

Seek medical attention immediately. Keep affected person calm. Do not induce vomiting.

Suitable extinguishing media:

Alcohol resistant foam, carbon dioxide, extinguishing powder, water fog

Extinguisher unsuitable on safety grounds:

high power water jet

Particular hazards arising from the preparation itself, combustion products or resulting gases:

Exposure to fire produces thick, black smoke that is hazardous to health. Harmful by inhalation.

Particular protective equipment:

Wear self-contained breathing apparatus. Cool endangered containers with water spray.

Additional information:

USA: Flammability Class: NFPA1

6. Accidental release measures

Personal precautions:

Keep away from sources of ignition. Provide adequate ventilation. Do not inhale vapor.

Environmental precautions:

Do not empty into drains. If the product contaminates lakes, rivers or sewages, inform appropriate authorities in accordance with local regulations.

Additional information:

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents) and place in closed containers for disposal. Clean using cleansing agents. Do not use solvents.

7. Handling and storage

Handling

Information for safe handling:

Avoid formation of flammable and potentially explosive solvent vapors in the air. Avoid exceeding MAK threshold levels. Keep away from sources of ignition. Product may become electrostatically charged. When filling containers, use only grounded equipment with bonding leads. Anti-static clothing including shoes are recommended during use. Use only spark proof tools. Avoid contact with skin and eyes. Do not inhale vapor or fog. When using do not eat, drink or smoke. Precautions against fire and explosion: Vapors form potentially explosive mixtures with air, which are heavier than air. Air-Vapor mixture may travel great distances at floor level and lead to backflash when exposed to an ignition source.

Requirement for storerooms and containers:

Electrical equipment must be explosion proof according to standards. Floors must be electrically conductive. Keep container tightly closed. Do not use air pressure to deliver. Only trained personnel may be allowed to enter storage area. Carefully close containers, store upright to prevent any leaks. Keep only in the original container. Store in securely closed containers in cool dry, well-ventilated area at temperatures between 15° and 30°C. Protect from heat and direct sunlight. Keep away from sources of ignition. No smoking.

Information about storage in one common storage facility:


Keep away from strongly acidic and alkaline materials as well as oxidizers.

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SAFETY DATA SHEET : PIGMENT PASTE J SERIES

In accordance with Directives 91/155/EEC + 93/112/EEC and ISO 11014-1

Date of update: 10 / 01 / 17

Page: 1 of 6

1. Identification of the substance/preparation and of the company/undertaking

Identification of the substance or preparation
Commercial Product name: J-Series - Pigment Paste

Company/undertaking identification
Manufacturer / distributor: Wee Tee Tong Chemicals Pte Ltd
Street/POB-No.: No. 18 Sungei Kadut Street 3
State/city/postal code: Singapore 729149
Telephone: (65) 6366 4231

2. Hazard Identification

The product is not classified as hazardous according to Regulation (EC) 1272/2008

Label Elements

Signal Word : No signal word
Hazard Statements : No critical hazards

3. Composition/information on ingredients

Comprises of
Solvent free reactive resin system
Titanium Dioxide
Carbon Black
Proprietary Formulation

Polyester Colour Paste is a non-drying material.

4. First aid measures


General information:
Always seek medical attention if symptoms develop that are possibly due to exposure through skin or eye contact or through inhalation of fumes.

after inhalation:
Provide fresh air. Instruct person to keep calm and warm. If breathing becomes irregular or ceases, administer artificial respiration or oxygen immediately, as needed. If victim is at risk of losing consciousness, position and transport on their side. Seek medical attention.

after skin contact:
Take all contaminated clothing off immediately. After contact with skin, wash immediately with soap and plenty of water. Do not use solvents or thinners.

after eye contact:
Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist.

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NJ Department of Health PTK List		
STYRENE	00100-42-5	[present]
NJ Environmental Hazardous Substances List		
STYRENE	00100-42-5	[present]
NJ Special Hazardous Substances		
STYRENE	00100-42-5	(flammable – third degree)
Pennsylvania Right to Know List		
STYRENE	00100-42-5	environmental hazard
Rhode Island Hazardous Substance List		
STYRENE	00100-42-5	Toxic, Flammable
International Regulations		
Canada – NPRI (National Pollutant Release Inventory)		
STYRENE	00100-42-5	[present]
Inventory – Canada – Domestic Substances List		
STYRENE	00100-42-5	CaH ₆

Section 16. Other Information

Nil

Disclaimer


The health and safety information is available to SIU/SCL as of the date published and QPC makes no representation of the information's completeness or accuracy. Any data provided is based on either; reference sources, testing performed on a representative sample(s), or professional judgement. The physical data should not be construed as either representing specifications or guaranteed analysis. The material has been classified in accordance with the hazard criteria of the Controlled Products Regulation and the SDS contains information required by Controlled Products Regulation. QPC expects those persons who receive this SDS to exercise their independent judgement, or consult with a competent health/safety professional, to determine how to utilize this material. This includes, but is not exclusive to, the material's appropriateness for a specific use, the type of personal protection equipment necessary, and the use of engineering controls.

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Sea (IMO/MDG)
Shipping Name UP Resin
Class 3
Packing Group III
UN Number 1866

Air (ICAO/IATA)
Shipping Name UP Resin
Class 3
Subsidiary Class UN1866
Packing Group III

European Road/Rail (ADR/RID)
Shipping Name UP Resin
Class 3

15. Regulatory Information

U.S. Federal Regulations

CAA – 1990 Hazardous Air Pollutants
STYRENE 00100-42-5 [present]

CAA – HON Rule – Organic HAPs
STYRENE 00100-42-5 [present]

CAA – HON Rule – SOCM Chemicals
STYRENE 00100-42-5 [present]

CAA – Volatile Organic Compounds (VOCs) in SOCM
STYRENE 00100-42-5 [present]

TSCA – Sect. 5(s) – Substances Subject to Testing Consent Orders

Superfund Amendments & Reauthorization Act of 1986
CERCLA/SARA – Section 313 – Emission Reporting
STYRENE 00100-42-5 form R reporting required for 1.0% de minimus concentration

State Regulations

California – Directors List of Hazardous Substances (8 CCR 339)
STYRENE 00100-42-5 [present]

Florida Hazardous Substance List
STYRENE 00100-42-5 [present]


Massachusetts Right To Know List
STYRENE 00100-42-5 [present]

Michigan Critical Materials List
STYRENE 00100-42-5 [present]

Minnesota Hazardous Substance List
STYRENE 00100-42-5 [present]

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Repeated exposures to styrene vapor in animal studies have resulted in liver toxicity in mice at levels above 100 ppm. Also, nasal lesions were observed at 50 ppm or higher in rats and 20 ppm or higher in mice.

Some evidence of hearing loss was observed in rats exposed to 800 ppm styrene vapor, but not at 200 ppm. No significant hearing loss is expected to occur in humans occupationally exposed to styrene. In addition it has been reported that some workers, primarily those with mean exposure levels greater than 50 ppm., develop small decreases in the ability to discriminate between colors. These effect were very subtle and not likely to be noticed.

Styrene did not cause birth defects in laboratory animal studies, although other developmental effects have been reported. It should be noted that these developmental effect occurred at exposure levels that were maternally toxic. Human studies do not show any significant risk of reproductive toxicity or birth defects from styrene exposure.

Mixed results have been reported for styrene in vitro genotoxicity tests. However, there is no convincing evidence of cytogenic damage in laboratory animals exposed to styrene. Some cytogenetic studies on peripheral blood lymphocytes of workers exposed to styrene have reported increases in chromosomal damage, although there is no clear dose response relationship.

The International Agency for Research on Cancer(IARC) has evaluated styrene and has classified it as possibly carcinogenic to humans(Group 2B)

Section 12. Ecological Information

Environmental Fate
Information for this material, as described in the MSDS' Section II, is not available. However, limited ingredient data may be available. If such information is desired, please contact appropriate people using the phone numbers provided in the MSDS' Section I.

Section 13. Disposal consideration

Waste Management/Disposal
Dispose of the waste material in accordance with Local, State, and or Federal regulations.

Containers
Emptied containers retain vapour and residual material and therefore entail an explosion and toxic vapour hazard. All hazard precautions given in this data sheet must be observed until the container is cleaned, reconditioned, or destroyed.

Section 14. Transport Information

Land Transport (ADG)
Shipping Name UP Resin
Hazard Class 3
Identification Number UN1866
Packing Group III

International Information


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Vapor Pressure	Styrene	4.3 mmHg
Evaporation Rate	Styrene	3.10 (Butyl Acetate=1)
Vapor Density	Styrene	3.6 (Air=1)
Solubility in Water		immiscible
Percent Solids		50 ~ 80 %
Chemical Family		Unsaturated Polyester Solution

Section 10. Stability & Reactivity

Stability
The product has limited storage life at ambient temperatures due to the depletion of polymerization inhibitor. Use within six(6)months of delivery. Excessive heat will accelerate inhibitor depletion, and allow spontaneous polymerization to begin.

Materials to Avoid
Acids, Oxidizing Agents, Free Radical Initiators such as peroxides, and Metallic Halides and Soaps.

Conditions to Avoid
Prolonged storage above 75 Deg. F., Sunlight, Open Flame, and all forms of contaminants.

Hazardous Decomposition Products
Carbon Monoxide, Carbon Dioxide, and Low Molecular Weight Hydrocarbons may be released as a result of incomplete combustion.

Section 11. Toxicological Information

Acute toxicity data:Eye irritation
Testing not conducted. See other toxicity data.

Skin irritation
Testing not conducted. See other toxicity data.


Dermal LD50
Testing not conducted. See other toxicity data.

Oral LD50
Testing not conducted. See other toxicity data.

Inhalation LC50
Testing not conducted. See other toxicity data.

Other toxicity data
Epidemiology studies involving workers in the styrene, polystyrene, and reinforced plastics industries do not show increased cancer risk from occupational exposure to styrene. A recent, well-conducted chronic study show no incidence of cancer in rats from styrene exposure. In another recently, well-conducted chronic study, an increased of lung cancer was observed in mice. The relevance of the mouse lung cancers to humans is uncertain. Earlier studies in which rats and mice were exposed to styrene by inhalation or ingestion are considered inadequate for assessing human cancer risk because of deficiencies in design, conduct, or interpretation.

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Handling Procedures
As with all chemicals, good industrial hygiene practices should be followed when handling this material. When the container(s) is empty it may retain product residue including vapors which could accumulate. therefore, do not cut, drill, grind, or weld empty containers. Additionally, do not conduct such activity(ies) near full, partially full, or empty product containers without appropriate workplace safety authorization(s) or permit(s).

Storage Procedures
Protect container from physical abuse. Keep the container tightly closed. Keep this material in a cool, well-ventilated place. Eliminate all sources of ignition. Bond and ground containers when transferring material. Keep separate from incompatibles. Do not handle or store near an open flame heat or other sources of ignition. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition.

Section 8. Exposure Control / Personal Protection

Eye
Do not get in eyes. Wear chemical goggles or safety glasses with side shields

Skin
Avoid prolonged or repeated skin contact. Wear protective clothing and gloves.

Inhalation
Use with adequate ventilation. If ventilation is inadequate, use NIOSH certified respirator that will protect against organic vapor and dust/mist.

Engineering Controls
Control airborne concentrations below the exposure guidelines.

Exposure Guidelines		
Component	CAS#	
STYRENE	00100-42-5	OSHA PEL : 50 ppm (skin) (1989) ; 100
		OSHA STEL : ppm (skin) (1971)
		OSHA Ceiling : 100 ppm (skin) (1989) ; Not
		ACGIH TLV-TWA established (1971)
		: 200 ppm (skin) (1971)
ACGIH TLV-STEL 20 ppm		
: 40 ppm		

Section 9. Physical & Chemical Properties

Blue(or Pink, Yellowish, Green), viscous liquid with a sweet pungent odour typical of styrene.

AIHA – Odor Threshold Values


STYRENE	00100-42-5	geometric mean air odor threshold=50 ppm (detectable),75 ppm (recognizable)
Boiling Point	145°C	294 °F (Styrene)
Specific Gravity		1.06 ~ 1.19 (water=1)
Melting Point	-30.6°C	-23.1°F (Styrene)
Flash Point	32.0°C	

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Autoignition Temperature: 914°F (490 °C)

Flammability Classification: Flammable Liquid.

Extinguishing Media
Agents approved for Class B hazards (e.g., dry chemical, carbon dioxide, foam, steam) or water fog.

Unusual Fire and Explosion Hazards
Flammable liquid. Vapor may explode if ignited in enclosed area.

Fire-Fighting Equipment
Firefighters should wear full bunker gear, including a positive pressure self-contained breathing apparatus.

Precautions
Keep away from sources of ignition (e.g., heat and open flames). Keep container closed. Use with adequate ventilation.

Hazardous Combustion Products
Hazardous polymerization possible with catalyst and heat.

Section 6. Accidental Release, Spill, Leak Procedures

This product is a "Hazardous Waste" because of its inherent characteristics and ignitability. In the advent of any spill or leak of this material, Remove all sources of ignition. Ventilate the area. Prevent the spilt material from entering drains or waterways. Remove personnel from the area. Absorb the spill using Vermiculite, Dry Sand, or Earth.

Spill/Leak Procedures
Small Spill or Leak
Soak up the spill with absorbent material and place into drums for later disposal.


Large Spill or Leak
Dike area with sand and pump or scoop the spilt material into drums for later disposal. Treat the residual spilt material as for small spill or leak.

Waste Management/Disposal
Dispose of the waste material in accordance with Local, State, and or Federal regulations.

Containers
Emptied containers retain vapour and residual material and therefore entail an explosion and toxic vapour hazard. All hazard precautions given in this data sheet must be observed until the container is cleaned, reconditioned, or destroyed.

Section 7. Handling and Storage

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P301+P310 If swallowed, immediately call a doctor/physician/first aider
P321 Specific treatment (see advice on this label).
P331 Do NOT induce vomiting.
P370+P378 In case of fire: Use... to extinguish.
P305+P351 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a doctor/physician/first aider/if you feel unwell.
P337+P313 If eye irritation persists: Get medical advice/attention.

GHS Precautionary statement(s): Storage
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

GHS Precautionary statement(s): Disposal
P501 Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration

Section 3 – Composition / Information on Ingredients

Mixtures

CAS No %	[weight]	Name
Not Available	45-65	polyester resin
100-42-5	35-55	styrene
7631-86-9	0-1.5	silica amorphous
Not Available	0-1	metal naphthenates and/or octoates

Section 4 - First Aid Measures

Eye Contact
Immediately flush with plenty of fresh clean water for at least 15 minutes. Obtain prompt medical attention. Contact lenses should not be worn when working with this material.

Skin Contact
If on the skin, immediately wash off with plenty of soap and water. Remove contaminated clothing. Wash clothing before reuse.

Inhalation
Remove the exposed person(s) to fresh air. If not breathing apply artificial respiration and C.P.R. If breathing difficult, administer oxygen and call medical attention.

Ingestion
Do not induce vomiting. If patient is conscious give a glass of water. Transport to doctor or hospital immediately. Keep careful watch over patient until medical assistance is available.

Section 5. Fire Fighting Measures

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SAFETY DATA SHEET

Revision Date : 30 November 2016

Section 1 - Product and Company Identification

Product name: Flameguard 2597PT-FR-26

Proper shipping name RESIN SOLUTION, flammable
Chemical formula Not Applicable
Other means of identification Not Available
CAS number Not Applicable

Details of the supplier of the safety data sheet

Manufacturer / distributor: Wee Tee Tong Chemicals Pte Ltd
Street/POB-No.: No. 18 Sungei Kadut Street 3
State/city/postal code: Singapore 729149
Telephone: (65) 6366 4231

Section 2 - Hazards Identification

GHS Classification : Flammable Liquid Category 3, Acute Toxicity (Inhalation) Category 4, Skin Corrosion/Irritation Category 2, Eye Irritation Category 2, Aspiration Hazard

GHS label elements

Symbols : 

Signal words : Danger


GHS Hazard statements: Physical Hazards
H226 Flammable liquid and vapour
H332 Harmful if inhaled
H315 Causes skin irritation
H319 Causes serious eye irritation Continued...H304 May be fatal if swallowed and enters airways

GHS Precautionary statements: Prevention
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P271 Use only outdoors or in a well-ventilated area.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/intrinsically safe equipment.
P242 Use only non-sparking tools.
P243 Take precautionary measures against static discharge.

GHS Precautionary statement(s): Response

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15. Regulatory information

Classification
Code letter and hazard symbol: Xn Harmful

R phrase(s):
R 36/38 Irritating to eyes and skin.
R 43 May cause sensitization by skin contact.
R 62 Possible risk of impaired fertility.
R 63 Possible risk of harm to the unborn child.

S phrase(s):
S 23 Do not breath gas/fumes/vapor/spray (to be specified by the manufacturer).
S 24 Avoid contact with skin.
S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S 38 In case of insufficient ventilation, wear suitable respiratory equipment.
S 51 Use only in well ventilated areas.
S 53 Avoid exposure - obtain special instructions before use.

Special designation of certain preparations:
Contains epoxy combinations

National regulations
Technical guidance air: I - III: 0 %
Water risk class: 2
water pollutant (allocation) and legal requirements.

Further regulations, limitations and legal requirements:
National regulations USA:
SARA Title III - Hazard Classes:
- Acute Health Hazard
- Chronic Health Hazard
NFPA Hazard Rating:
- Health = Not established
- Fire = 1 (slight)
- Reactivity = Not established
SARA Title III - Section 313 Supplier Notification: See chapter 2

16. Other information

Further remarks
Text for labelling: Contains epoxy combinations
Follow manufacturer's directions.
see chapter 1, department responsible for information.

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. It does not represent a guarantee for the properties of the product described in terms of the legal warranty regulations.


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10. Stability and reactivity

Additional information
Condition to avoid (hazardous reactions):
Static discharges
Materials to avoid:
Avoid contact with strong acids, strong bases and strong oxidizing agents.
Hazardous decomposition products:
Hazardous decomposition byproducts such as carbon dioxide, carbon monoxide, smoke nitrogen oxides may develop with exposure to high temperature.

11. Toxicological information

Toxicological Tests
Additional information: Skin irritation: Rabbit, irritant
Eye Irritant: Rabbit, irritant
Sensitization: May cause sensitization by skin contact.

12. Ecological information

Ecotoxicological effects
Further details: Do not allow to enter ground water or storm drains.

13. Disposal considerations

Product
Recommendation: Incinerate as hazardous waste according to applicable local, state, and federal regulations.
Waste key number (D): 55508

Contaminated packaging
Recommendation: Dispose of waste according to applicable local, state, and federal regulations.

14. Transport information


Overland transport
Resin Solution, Class 3, UN 1866, PG III

Transport by sea
Resin Solution, Class 3, UN 1866, PG III

Air transport
Resin Solution, Class 3, UN 1866, PG III

Additional information
Nil

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Personal protection equipment
Respiratory protection: Use respiratory protection whenever ventilation is inadequate.
Hand protection: Protective gloves
Eye protection: Tightly sealed safety glasses
Body protection: Closed work clothing
General protection and hygiene measures: Wash hands when done working with material; at breaks, lunch, shift changes, etc. Avoid contact with skin and eyes. When using do not eat, drink or smoke.

9. Physical and chemical properties

Physical Data:


Boiling Point:	: 293.2 °F, 145-1 °C	* Based On Styrene
Vap. Press	: 7mmhg 20 °C, 68 °F	
Vap. Density	: 3.6	
Sol. Inwater	: Insoluble	
Sp. Gravity	: 1.0-1.2	
Appearance	: (UG-270) Pink, (UG-271) Black, (UG-272) Orange	
Odor	: Pungent Styrene Odor	

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high power water jet
Particular hazards arising from the preparation itself, combustion products or resulting gases:
Exposure to fire produces thick, black smoke that is hazardous to health. Harmful by inhalation.

Particular protective equipment:
Wear self-contained breathing apparatus. Cool endangered containers with water spray.

Additional information:
USA: Flammability Class: NFPA1

6. Accidental release measures

Personal precautions:
Keep away from sources of ignition. Provide adequate ventilation. Do not inhale vapor.

Environmental precautions:
Do not empty into drains. If the product contaminates lakes, rivers or sewages, inform appropriate authorities in accordance with local regulations.

Additional information:
Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents) and place in closed containers for disposal. Clean using cleansing agents. Do not use solvents.

7. Handling and storage

Handling
Information for safe handling:
Avoid formation of flammable and potentially explosive solvent vapors in the air. Avoid exceeding MAK threshold levels. Keep away from sources of ignition. Product may become electrostatically charged. When filling containers, use only grounded equipment with bonding leads. Anti-static clothing including shoes are recommended during use. Use only spark proof tools. Avoid contact with skin and eyes. Do not inhale vapor or fog. When using do not eat, drink or smoke. Precautions against fire and explosion: Vapors form potentially explosive mixtures with air, which are heavier than air. Air-Vapor mixture may travel great distances at floor level and lead to backflash when exposed to an ignition source.

Requirement for storerooms and containers:
Electrical equipment must be explosion proof according to standards. Floors must be electrically conductive. Keep container tightly closed. Do not use air pressure to deliver. Only trained personnel may be allowed to enter storage area. Carefully close containers, store upright to prevent any leaks. Keep only in the original container. Store in securely closed containers in cool dry, well-ventilated area at temperatures between 15° and 30°C. Protect from heat and direct sunlight. Keep away from sources of ignition. No smoking.


Information about storage in one common storage facility:
Keep away from strongly acidic and alkaline materials as well as oxidizers.

8. Exposure controls / personal protection

Information on system design and engineering measures
Information for safe handling:
Use only explosion-proof equipment/instruments.
See also Information in chapter 7, section storage.

Components with workplace relevant concentration limits
CAS-Number Chemical name (acc. to EC) Type Value
84-74-2 Dibutylphthalate OSHA/NIOSH/ACGIH-TWA 5 mg/m³

3
Wee Tee Tong Chemicals Pte Ltd
No. 18 Sungei Kadut Street 3 Singapore 729149
Tel : (65) 6366 4231 Fax : (65) 6366 4232
E-Mail : info@weeteetong.com Website : www.weeteetong.com


WEE TEE TONG
Chemicals

EXCELLENCE IN
COMPOSITE SOLUTIONS

P243 Take precautionary measures against static discharge.

GHS Precautionary statement(s): Response

P301+P310 If swallowed, immediately call a doctor/physician/first aider
P321 Specific treatment (see advice on this label).
P331 Do NOT induce vomiting.
P370+P378 In case of fire: Use... to extinguish.
P305+P351 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P312 Call a doctor/physician/first aider if you feel unwell.
P337+P313 If eye irritation persists: Get medical advice/attention.

GHS Precautionary statement(s): Storage
P403+P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

GHS Precautionary statement(s): Disposal
P501 Dispose of contents/container to authorised chemical landfill or if organic to high temperature incineration

3. Composition/information on ingredients

Mixtures

CAS No %	[weight]	Name
Not Available	45-65	Iso NPG resin
100-42-5	35-55	styrene
7631-86-9	0-1.5	silica amorphous
Not Available	0-1	metal naphthenates and/or octoates

4. First aid measures

General information:
Always seek medical attention if symptoms develop that are possibly due to exposure through skin or eye contact or through inhalation of fumes.

after inhalation: Provide fresh air. Instruct person to keep calm and warm. If breathing becomes irregular or ceases, administer artificial respiration or oxygen immediately, as needed. If victim is at risk of losing consciousness, position and transport on their side. Seek medical attention.

after skin contact: Take all contaminated clothing off immediately. After contact with skin, wash immediately with soap and plenty of water. Do not use solvents or thinners.

after eye contact: Immediately flush eyes with plenty of flowing water for 10 to 15 minutes holding eyelids apart. Subsequently consult an ophthalmologist.

after swallowing: Seek medical attention immediately. Keep affected person calm. Do not induce vomiting.

5. Fire fighting measures

Suitable extinguishing media:
Alcohol resistant foam, carbon dioxide, extinguishing powder, water fog
Extinguisher unsuitable on safety grounds:

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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.


WEE TEE TONG
Chemicals

EXCELLENCE IN
COMPOSITE SOLUTIONS
SAFETY DATA SHEET
in accordance with Directives 91/155/EEC + 93/112/EEC and ISO 11014-1

Gelcoat GH / GS 5200-8

Date of print: 02/01/15
Page: 1 of 6

1. Identification of the substance/preparation and of the company/undertaking

Identification of the substance or preparation
Commercial Product name: Gelcoat GH / GS 5200-8

Company/undertaking identification
Manufacturer / distributor: Wee Tee Tong Chemicals Pte Ltd
Street/POB-No.: No. 18 Sungei Kadut Street 3
State/city/postal code: Singapore 729149
Telephone: (65) 6366 4231

2. Hazard identification

GHS Classification : Flammable Liquid Category 3, Acute Toxicity (Inhalation) Category 4, Skin Corrosion/Irritation Category 2, Eye Irritation Category 2, Aspiration Hazard

GHS label elements




Symbols : 

Signal words : Danger

GHS Hazard statements:
Physical Hazards
H226 Flammable liquid and vapour
H332 Harmful if inhaled
H315 Causes skin irritation
H319 Causes serious eye irritation Continued...H304 May be fatal if swallowed and enters airways

GHS Precautionary statements: Prevention
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P271 Use only outdoors or in a well-ventilated area.
P240 Ground/bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting/intrinsically safe equipment.
P242 Use only non-sparking tools.

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ADHESIVE

Material Safety Data Sheet Product name: WB800

Protective Equipment:
Gloves.
Lab coat.
Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Wear appropriate respirator when ventilation is inadequate.
Splash goggles.

16. Other Information
References: Not available.
Other Special Considerations: Not available.
Created: 28/04/2008
Last Updated: 28/04/2008

The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if AMLAB has been advised of the possibility of such damages.

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ADHESIVE

Material Safety Data Sheet Product name: WB800

14. Transport Information

DOT Classification: CLASS 3: Flammable liquid.

Identification: Toluene UNNA: 1294 PG: II

Special Provisions for Transport: Not applicable.

15. Other Regulatory Information

Federal and State Regulations:

California prop. 65: This product contains the following ingredients for which the State of California has found to cause cancer, birth defects or other reproductive harm, which would require a warning under the statute: Toluene
California prop. 65 (no significant risk level): Toluene: 7 mg/day (value)
California prop. 65 (acceptable daily intake level): Toluene: 7 mg/day (value)
California prop. 65: This product contains the following ingredients for which the State of California has found to cause birth defects which would require a warning under the statute: Toluene
Connecticut hazardous material survey: Toluene
Illinois toxic substances disclosure to employee act: Toluene
California Director's List of Hazardous Substances.: Toluene
TSCA 8(b) inventory: Toluene
TSCA 8(d) H and S data reporting: Toluene: Effective date: 10/04/82; Sunset Date: 10/01/92
SARA 313 toxic chemical notification and release reporting: Toluene
CERCLA: Hazardous substances.: Toluene: 1000 lbs. (453.6 kg)

Other Regulations:

OSHA: Hazardous by definition of Hazard Communication Standard (29 CFR 1910.1200).
EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

Other Classifications:

WHMIS (Canada):

CLASS B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
CLASS D-2A: Material causing other toxic effects (VERY TOXIC).

DSCL (EEC):

R11- Highly flammable.
R20- Harmful by inhalation.
S16- Keep away from sources of ignition – No smoking.
S25- Avoid contact with eyes.
S29- Do not empty into drains.
S33- Take precautionary measures against static discharges.

HMS (U.S.A.):

Health Hazard: 2
Fire Hazard: 3
Reactivity: 0
Personal Protection: h

National Fire Protection Association (U.S.A.):

Health: 2
Flammability: 3
Reactivity: 0
Specific hazard:



ADHESIVE

Material Safety Data Sheet Product name: WB800

Chronic Effects on Humans: CARCINOGENIC EFFECTS: A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC.
May cause damage to the following organs: blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).

Other Toxic Effects on Humans: Hazardous in case of skin contact (irritant), of ingestion, of inhalation.
Slightly hazardous in case of skin contact (permeator).

Special Remarks on Toxicity to Animals: Lowest Published Lethal Dose:

LDL [Human] - Route: Oral; Dose: 50 mg/kg
LCL [Rabbit] - Route: Inhalation; Dose: 55000 ppm/40min

Special Remarks on Chronic Effects on Humans: Not available.

Special Remarks on other Toxic Effects on Humans:

Skin: Causes mild to moderate skin irritation. It can be absorbed to some extent through the skin.
Eyes: Causes mild to moderate eye irritation with a burning sensation. Splash contact with eyes also causes conjunctivitis, blepharospasm, corneal edema, corneal abrasions. This usually resolves in 2 days.
Inhalation: Inhalation of vapor may cause respiratory tract irritation causing coughing and wheezing, and nasal discharge. Inhalation of high concentrations may affect behavior and cause central nervous system effects characterized by nausea, headache, dizziness, tremors, restlessness, lightheadedness, exhilaration, memory loss, insomnia, impaired reaction time, drowsiness, ataxia, hallucinations, somnolence, muscle contraction or spasticity, unconsciousness and coma. Inhalation of high concentration of vapor may also affect the cardiovascular system (rapid heart beat, heart palpitations, increased or decreased blood pressure, dysrhythmia,), respiration (acute pulmonary edema, respiratory depression, apnea, asphyxia), cause vision disturbances and dilated pupils, and cause loss of appetite.
Ingestion: Aspiration hazard. Aspiration of Toluene into the lungs may cause chemical pneumonitis. May cause irritation of the digestive tract with nausea, vomiting, pain. May have effects similar to that of acute inhalation.
Chronic Potential Health Effects:
Inhalation and Ingestion: Prolonged or repeated exposure via inhalation may cause central nervous system and cardiovascular symptoms similar to that of acute inhalation and ingestion as well liver damage/failure, kidney damage/failure (with hematuria, proteinuria, oliguria, renal tubular acidosis), brain damage, weight loss, blood (pigmented or nucleated red blood cells, changes in white blood cell count), bone marrow changes, electrolyte imbalances (Hypokalemia, Hypophosphatemia), severe, muscle weakness and Rhabdomyolysis.
Skin: Repeated or prolonged skin contact may cause defatting dermatitis.

12. Ecological Information

Ecotoxicity: Ecotoxicity in water (LC50): 313 mg/l 48 hours [Daphnia (daphnia)]. 17 mg/l 24 hours [Fish (Blue Gill)]. 13 mg/l 96 hours [Fish (Blue Gill)]. 56 mg/l 24 hours [Fish (Fathead minnow)]. 34 mg/l 96 hours [Fish (Fathead minnow)]. 56.8 ppm any hours [Fish (Goldfish)].

BOD5 and COD: Not available.

Products of Biodegradation:

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

Toxicity of the Products of Biodegradation: The products of degradation of calcium sulfate are less toxic than the product itself.

Special Remarks on the Products of Biodegradation: Not available.

13. Disposal Considerations

Waste Disposal:

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

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Material Safety Data Sheet

Product name: WB800

Critical Temperature: Not available.

Specific Gravity: 0.929 (Water = 1)

Vapor Pressure: 3.8kPa (@25 deg C)

Vapor Density: 3.1 (Air=1).

Volatility: Not available.

Odor Threshold: Not available.

Water/Oil Dist. Coeff.: Not available.

Ioncity (in Water): Not available.

Dispersion Properties: Not available.

Solubility:

Soluble in diethyl ether, acetone.

Practically insoluble in cold water.

Soluble in ethanol, benzene, chloroform, glacial acetic acid, carbon disulfide.

10. Stability and Reactivity Data

Stability: The product is stable.

Instability Temperature: Not available.

Conditions of Instability: Heat, ignition sources (flames, sparks, static), incompatible materials

Incompatibility with various substances: Reactive with oxidizing agents.

Corrosivity: Non-corrosive in presence of glass.

Special Remarks on Reactivity:

Incompatible with strong oxidizers, silver perchlorate, sodium difluoride, Tetranitromethane, Uranium Hexafluoride.

Frozen Bromine Trifluoride reacts violently with Toluene at -80 deg C.

Reacts chemically with nitrogen oxides, or halogens to form nitrotoluene, nitrobenzene, and nitrophenol and halogenated products, respectively.

Special Remarks on Corrosivity: Not available.

Polymerization: Will not occur.

11. Toxicological Information

Routes of Entry: Absorbed through skin. Eye contact. Inhalation. Ingestion.

Toxicity to Animals:

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE.

Acute oral toxicity (LD50): 636 mg/kg [Rat].

Acute dermal toxicity (LD50): 14100 mg/kg [Rabbit].

Acute toxicity of the vapor (LC50): 440 24 hours [Mouse].



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Material Safety Data Sheet

Product name: WB800

Toxic flammable liquid, insoluble or very slightly soluble in water.

Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand or other non-combustible material. Do not get water inside container. Do not touch spilled material. Prevent entry into sewers, basements or confined areas; dike if needed. Call for assistance on disposal. Be careful that the product is not present at a concentration level above TLV. Check TLV on the MSDS and with local authorities.

7. Handling and Storage

Precautions: Keep away from heat. Keep away from sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas/fumes/vapor/spray. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as oxidizing agents.

Storage: Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).

8. Exposure Controls/Personal Protection

Engineering Controls:

Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapors below their respective threshold limit value. Ensure that eyewash stations and safety showers are proximal to the work-station location.

Personal Protection:

Splash goggles. Lab coat. Vapor respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Vapor respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

Exposure Limits:

TWA: 200 STEL: 500 CEIL: 300 (ppm) from OSHA (PEL) [United States]

TWA: 50 (ppm) from ACGIH (TLV) [United States] SKIN

TWA: 100 STEL: 150 from NIOSH [United States]

TWA: 375 STEL: 560 (mg/m³) from NIOSH [United States]

Consult local authorities for acceptable exposure limits.

9. Physical and Chemical Properties

Physical state and appearance: Yellow viscous liquid with mixed hydrocarbon odour.

Odor: Mixed hydrocarbon odour.

Taste: Not available.

Molecular Weight: Not available.

Color: Yellow

pH (1% soln/water): Not available.


Boiling Point: 70 deg C.

Melting Point: Not available.

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ADHESIVE

Material Safety Data Sheet

Product name: WB800

Serious Skin Contact:
Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek medical attention.

Inhalation:
If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Serious Inhalation:
Evacuate the victim to a safe area as soon as possible. Loosen tight clothing such as a collar, tie, belt or waistband. If breathing is difficult, administer oxygen. If the victim is not breathing, perform mouth-to-mouth resuscitation. **WARNING:** It may be hazardous to the person providing aid to give mouth-to-mouth resuscitation when the inhaled material is toxic, infectious or corrosive. Seek medical attention.

Ingestion:
Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

Serious Ingestion: Not available.

5. Fire and Explosion Data

Flammability of the Product: Flammable

Auto-Ignition Temperature: More than 200 deg C.

Flash Points: Less than 10 deg C.

Flammable Limits: Not available.

Products of Combustion: These products are carbon oxides (CO, CO₂).

Fire Hazards in Presence of Various Substances: Flammable in presence of open flames and sparks, of heat. Non-flammable in presence of shocks.

Explosion Hazards in Presence of Various Substances:
Risks of explosion of the product in presence of mechanical impact: Not available.
Risks of explosion of the product in presence of static discharge: Not available.

Fire Fighting Media and Instructions:
Flammable liquid, insoluble in water.
SMALL FIRE: Use DRY chemical powder.
LARGE FIRE: Use water spray or fog.


Special Remarks on Fire Hazards: Not available.

Special Remarks on Explosion Hazards: Toluene forms explosive reaction with 1,3-dichloro-5,5-dimethyl-2,4-imidazolidindione; dinitrogen tetroxide; concentrated nitric acid; sulfuric acid + nitric acid; N₂O₄; AgClO₄; BrF₃; Uranium hexafluoride; sulfur dichloride. Also forms an explosive mixture with tetranitromethane.

6. Accidental Release Measures

Small Spill:
Absorb with an inert material and put the spilled material in an appropriate waste disposal.

Large Spill:




ADHESIVE

Material Safety Data Sheet

Product name: WB800

Version No: 001 28-April-2008

1. Chemical Product and Company Identification

Trade Name: World Brand Adhesive No. 800	NFPA								
Company : Pin Trading Company Adhesive Manufacturer 10, Admiralty Street, #01-76, North Link Building, Singapore 757695									
Information Telephone Number: 65- 62696 542									
Emergency Contact: Drug & Poison Contact Center Emergency Telephone Number: 65-64239119									
UN Hazard Class: 3 IMO UN Number: 1294 Product Code: 5386	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="background-color: blue; color: white;">Health</td><td style="background-color: white; color: blue;">2</td></tr> <tr><td style="background-color: red; color: white;">Fire</td><td style="background-color: white; color: red;">3</td></tr> <tr><td style="background-color: yellow; color: black;">Reactivity</td><td style="background-color: white; color: black;">0</td></tr> <tr><td style="background-color: white; color: black;">Personal Protection</td><td style="background-color: white; color: black;">H</td></tr> </table>	Health	2	Fire	3	Reactivity	0	Personal Protection	H
Health	2								
Fire	3								
Reactivity	0								
Personal Protection	H								

2. Composition and Information on Ingredients

Composition	Cas #	% by weight
Zinc Oxide	1314-13-2	0.6%
Magnesium Oxide	1309-48-4	0.6%
Phenolic Resin	9003-35-4	5.6%
Polychloroprene	9010-98-8	16.0%
Ethyl Acetate	141-78-6	16.0%
SBP 80/100	N/A	16.0%
Hexane	64742-49-0	12.8%
Toluene	108-88-3	32.1%

Toxicological Data on Ingredients: Toluene: ORAL (LD50): Acute: 636 mg/kg [Rat]. DERMAL (LD50): Acute: 14100 mg/kg [Rabbit]. VAPOR (LC50): Acute: 49000 mg/m³ 4 hours [Rat]. 440 ppm 24 hours [Mouse]. Ethyl Acetate: ORAL (LD50): Acute: 5620 mg/kg [Rat]. Hexane: ORAL (LD50): Acute: 49 ml/kg [Rat].

3. Hazards Identification

Potential Acute Health Effects: Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

Potential Chronic Health Effects:
CARCINOGENIC EFFECTS: Not available.
MUTAGENIC EFFECTS: Not available.
TERATOGENIC EFFECTS: Not available.
DEVELOPMENTAL TOXICITY: Not available.
The substance may be toxic to blood, kidneys, the nervous system, liver, brain, central nervous system (CNS).
Repeated or prolonged exposure to the substance can produce target organs damage.

4. First Aid Measures

Eye Contact:
Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention.

Skin Contact:
In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

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SAFETY DATA SHEET		
Sika® Aktivator-100		
Version 0.0	SDS Number: 000000033123	Revision Date: 14.10.2018
Date format	: dd.mm.yyyy	
<p>The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any use and processing.</p>		
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SAFETY DATA SHEET		
Sika® Aktivator-100		
Version 0.0	SDS Number: 000000033123	Revision Date: 14.10.2018
14. TRANSPORT INFORMATION		
International Regulations		
UNRTDG		
UN number	:	UN 1866
Proper shipping name	:	RESIN SOLUTION
Class	:	3
Packing group	:	II
Labels	:	3
IATA-DGR		
UN/ID No.	:	UN 1866
Proper shipping name	:	Resin solution
Class	:	3
Packing group	:	II
Labels	:	Flammable Liquids
Packing instruction (cargo aircraft)	:	364
Packing instruction (passenger aircraft)	:	353
IMDG-Code		
UN number	:	UN 1866
Proper shipping name	:	RESIN SOLUTION (n-heptane)
Class	:	3
Packing group	:	II
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	yes
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code		
Not applicable for product as supplied.		
Special precautions for user		
The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.		
15. REGULATORY INFORMATION		
Safety, health and environmental regulations/legislation specific for the substance or mixture		
Workplace Safety and Health Act and Workplace Safety and Health (General Provisions) Regulations: This product is subjected to the SDS, labelling, PEL and other requirements in the Act/Regulations.		
Environmental Protection and Management Act and Environmental Protection and Management (Hazardous Substances) Regulations	:	Not applicable
16. OTHER INFORMATION		
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Initial Environmental Examination Report

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SAFETY DATA SHEET

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Version 0.0

SDS Number: 000000033123

Revision Date: 14.10.2018

Respiratory or skin sensitisation

Skin sensitisation: May cause an allergic skin reaction.
Respiratory sensitisation: Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

May cause drowsiness or dizziness.

STOT - repeated exposure

Not classified based on available information.

Aspiration toxicity

May be fatal if swallowed and enters airways.

12. ECOLOGICAL INFORMATION

Ecotoxicity

No data available

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

Other adverse effects

Product:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

13. DISPOSAL CONSIDERATIONS

Disposal methods

Waste from residues : The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.

Contaminated packaging

: Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.
Do not burn, or use a cutting torch on, the empty drum.

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SAFETY DATA SHEET

Sika® Aktivator-100



Version 0.0

SDS Number: 000000033123

Revision Date: 14.10.2018

Water solubility	: insoluble
Partition coefficient: n-octanol/water	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity	
Viscosity, dynamic	: No data available
Viscosity, kinematic	: < 20.5 mm ² /s (40 °C)
Explosive properties	: No data available
Molecular weight	: No data available

10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: The product is chemically stable.
Possibility of hazardous reactions	: Stable under recommended storage conditions. Vapours may form explosive mixture with air.
Conditions to avoid	: Heat, flames and sparks.
Incompatible materials	: No data available
Hazardous decomposition products	: methanol

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Components:

N-(3-(trimethoxysilyl)propyl)ethylenediamine:

Acute oral toxicity	: LD50 Oral (Rat): ca. 2,400 mg/kg
Acute inhalation toxicity	: LC50: 1.49 mg/l Exposure time: 4 h Test atmosphere: dust/mist
Acute dermal toxicity	: LD50 Dermal (Rat): > 2,000 mg/kg

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye irritation.

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SAFETY DATA SHEET

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Version 0.0 SDS Number: 000000033123 Revision Date: 14.10.2018



Hand protection

Eye protection

Skin and body protection

Hygiene measures

: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary.

: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.

: Handle in accordance with good industrial hygiene and safety practice.
When using do not eat or drink.
When using do not smoke.
Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Colour

Odour

Odour Threshold

pH

Melting point/range / Freezing point

Boiling point/boiling range

Flash point

Evaporation rate

Flammability

Upper explosion limit

Lower explosion limit

Vapour pressure

Relative vapour density

Density

Solubility(ies)

: liquid

: colourless

: hydrocarbon-like

: No data available

: No data available

: No data available

: ca. 78 °C (172 °F)

: ca. -4 °C (25 °F)
Method: closed cup

: No data available

: No data available

: 7 %(V)

: 0.6 %(V)

: 75.9935 hPa (57.000 mmHg)

: No data available


: ca. 0.727 g/cm3 (20 °C (68 °F) ())

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SAFETY DATA SHEET

Sika® Aktivator-100

Version 0.0 SDS Number: 000000033123 Revision Date: 14.10.2018



Conditions for safe storage

: Do not get in eyes, on skin, or on clothing.
For personal protection see section 8.
Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.
Smoking, eating and drinking should be prohibited in the application area.
Take precautionary measures against static discharge.
Open drum carefully as content may be under pressure.
Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours).
Follow standard hygiene measures when handling chemical products

: Store in original container.
Store in cool place.
Keep in a well-ventilated place.
Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Observe label precautions.
Store in accordance with local regulations.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
ethanol	64-17-5	PEL (long term)	1,000 ppm 1,880 mg/m3	SG OEL
		TWA	1,000 ppm	ACGIH
		STEL	1,000 ppm	ACGIH

Occupational exposure limits of decomposition products

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
methanol	67-56-1	PEL (long term)	200 ppm 262 mg/m3	SG OEL
		PEL (short term)	250 ppm 328 mg/m3	SG OEL
		TWA	200 ppm	ACGIH
		STEL	250 ppm	ACGIH

Personal protective equipment

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.

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“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

SAFETY DATA SHEET

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Notes to physician : Treat symptomatically.

5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : Water
High volume water jet
- Specific hazards during fire-fighting : Do not use a solid water stream as it may scatter and spread fire.
Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : No hazardous combustion products are known
- Specific extinguishing methods : Use water spray to cool unopened containers.
Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.
- Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

- Personal precautions, protective equipment and emergency procedures : Use personal protective equipment.
Remove all sources of ignition.
Deny access to unprotected persons.
- Environmental precautions : Prevent product from entering drains.
If the product contaminates rivers and lakes or drains inform respective authorities.
- Methods and materials for containment and cleaning up : Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).

7. HANDLING AND STORAGE

- Advice on protection against fire and explosion : Use explosion-proof equipment. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Take precautionary measures against electrostatic discharges.
- Advice on safe handling : Do not breathe vapours or spray mist.
Avoid exceeding the given occupational exposure limits (see section 8).

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SAFETY DATA SHEET

Sika® Aktivator-100



Version 0.0

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Hazardous components

Chemical name	CAS-No.	Concentration (%)
Naphtha (petroleum), hydrotreated light; Low boiling point hydrogen treated naphtha	64742-49-0	>= 70 - < 90
ethanol	64-17-5	>= 1 - < 10
tris(dodecylbenzenesulphonato-O)(propan-2-olato)titanium	61417-55-8	>= 1 - < 10
N-(3-(trimethoxysilyl)propyl)ethylenediamine	1760-24-3	>= 1 - < 3

4. FIRST AID MEASURES

- General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
- If inhaled : Move to fresh air.
Consult a physician after significant exposure.
- In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician.
- In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Clean mouth with water and drink afterwards plenty of water.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
Never give anything by mouth to an unconscious person.
Take victim immediately to hospital.
- Most important symptoms and effects, both acute and delayed : Risk of serious damage to the lungs (by aspiration).
irritant effects
sensitising effects
Aspiration may cause pulmonary oedema and pneumonitis.
Allergic reactions
Excessive lachrymation
Dermatitis
Loss of balance
Vertigo
See Section 11 for more detailed information on health effects and symptoms.
May be fatal if swallowed and enters airways.
Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye irritation.
May cause drowsiness or dizziness.

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H304 May be fatal if swallowed and enters airways.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H336 May cause drowsiness or dizziness.
 H411 Toxic to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**
 P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
 P233 Keep container tightly closed.
 P240 Ground/bond container and receiving equipment.
 P241 Use explosion-proof electrical/ ventilating/ lighting equipment.
 P242 Use only non-sparking tools.
 P243 Take precautionary measures against static discharge.
 P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 P264 Wash skin thoroughly after handling.
 P271 Use only outdoors or in a well-ventilated area.
 P272 Contaminated work clothing should not be allowed out of the workplace.
 P273 Avoid release to the environment.
 P280 Wear protective gloves/ eye protection/ face protection.

Response:
 P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER/doctor.
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
 P304 + P340 + P312 IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 P331 Do NOT induce vomiting.
 P333 + P313 If skin irritation or rash occurs: Get medical advice/ attention.
 P337 + P313 If eye irritation persists: Get medical advice/ attention.
 P362 + P364 Take off contaminated clothing and wash it before reuse.
 P370 + P378 In case of fire: Use dry sand, dry chemical or alcohol-resistant foam to extinguish.
 P391 Collect spillage.

Storage:
 P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
 P403 + P235 Store in a well-ventilated place. Keep cool.
 P405 Store locked up.

Disposal:
 P501 Dispose of contents/ container to an approved waste disposal plant.


Other hazards which do not result in classification
 None known.

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SAFETY DATA SHEET

Sika® Aktivator-100

Version 0.0



SDS Number: 000000033123

Revision Date: 14.10.2018

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Sika® Aktivator-100
 Product code : 000000033123
 Type of product : liquid


Recommended use of the chemical and restrictions on use
 Product use : Pretreatment agent

Manufacturer or supplier's details
 Company : SIKA (SINGAPORE) PTE LTD.
 66A Sungei Kadut Street 1
 Singapore 729368
 Telephone : +65 63680883
 Telefax : +65 6779 6200
 E-mail address : -
 Emergency telephone number : +65 63680883

2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 2
 Skin corrosion/irritation : Category 2
 Serious eye damage/eye irritation : Category 2
 Skin sensitisation : Category 1
 Specific target organ toxicity - single exposure : Category 3 (Central nervous system)
 Aspiration hazard : Category 1
 Long-term (chronic) aquatic hazard : Category 2

GHS label elements
 Hazard pictograms : 


Signal word : Danger
 Hazard statements : H225 Highly flammable liquid and vapour.


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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

SAFETY DATA SHEET		
Sika® Primer-206 G+P		
Version 1.0	SDS Number: 000000020203	Revision Date: 14.10.2018
Special precautions for user The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.		
15. REGULATORY INFORMATION		
Safety, health and environmental regulations/legislation specific for the substance or mixture		
Workplace Safety and Health Act and Workplace Safety and Health (General Provisions) Regulations: This product is subjected to the SDS, labelling, PEL and other requirements in the Act/Regulations.		
Environmental Protection and Management Act and	:	Isocyanates
Environmental Protection and Management (Hazardous Substances) Regulations	:	
16. OTHER INFORMATION		
Date format	:	dd.mm.yyyy
The information contained in this Safety Data Sheet corresponds to our level of knowledge at the time of publication. All warranties are excluded. Our most current General Sales Conditions shall apply. Please consult the product data sheet prior to any use and processing.		
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SAFETY DATA SHEET		
Sika® Primer-206 G+P		
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Other adverse effects		
Product: Additional ecological information	:	There is no data available for this product.
13. DISPOSAL CONSIDERATIONS		
Disposal methods		
Waste from residues	:	Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers. Do not burn, or use a cutting torch on, the empty drum.
14. TRANSPORT INFORMATION		
International Regulations		
UNRTDG		
UN number	:	UN 1866
Proper shipping name	:	RESIN SOLUTION
Class	:	3
Packing group	:	II
Labels	:	3
IATA-DGR		
UN/ID No.	:	UN 1866
Proper shipping name	:	Resin solution
Class	:	3
Packing group	:	II
Labels	:	Flammable Liquids
Packing instruction (cargo aircraft)	:	364
Packing instruction (passenger aircraft)	:	353
IMDG-Code		
UN number	:	UN 1866
Proper shipping name	:	RESIN SOLUTION
Class	:	3
Packing group	:	II
Labels	:	3
EmS Code	:	F-E, S-E
Marine pollutant	:	no
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable for product as supplied.		
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Serious eye damage/eye irritation

Causes serious eye irritation.

Respiratory or skin sensitisation

Skin sensitisation: May cause an allergic skin reaction.
Respiratory sensitisation: Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

May cause drowsiness or dizziness.

STOT - repeated exposure

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

Further information

Product:

Remarks: Toxicology data for the components
Information given is based on data on the components and the toxicology of similar products.
Based on available data, the classification criteria are not met.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Hexamethylene diisocyanate, oligomers:

Toxicity to fish : LC50 (Danio rerio (zebra fish)): > 100 mg/l
Exposure time: 96 h

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): > 100 mg/l
Exposure time: 48 h

n-butyl acetate:

Toxicity to algae : EC50 (Desmodesmus subspicatus (green algae)): 647.7 mg/l
Exposure time: 72 h

Persistence and degradability

No data available

Bioaccumulative potential

No data available

Mobility in soil

No data available

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Avoid moisture.

Incompatible materials : Strong acids and strong bases
Oxidizing agents
Peroxides

No decomposition if stored and applied as directed.

11. TOXICOLOGICAL INFORMATION

Acute toxicity

Not classified based on available information.

Components:

ethyl acetate:
Acute oral toxicity : LD50 Oral (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): ca. 1,600 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 Dermal (Rabbit): > 5,000 mg/kg

Hexamethylene diisocyanate, oligomers:

Acute oral toxicity : LD50 Oral (Rat): > 5,000 mg/kg

Acute inhalation toxicity : Acute toxicity estimate: 1.5 mg/l
Test atmosphere: dust/mist
Method: Expert judgement

tris(p-isocyanatophenyl) thiophosphate:

Acute oral toxicity : LD50 Oral (Rat): > 675 mg/kg
Remarks: see user defined free text

Acute inhalation toxicity : LC50 (Rat): 5.721 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

n-butyl acetate:

Acute oral toxicity : LD50 Oral (Rat): > 5,000 mg/kg

Acute inhalation toxicity : LC50 (Rat): 23.4 mg/l
Exposure time: 4 h
Test atmosphere: vapour

Acute dermal toxicity : LD50 Dermal (Rabbit): > 5,000 mg/kg

2-methoxy-1-methylethyl acetate:

Acute oral toxicity : LD50 Oral (Rat): > 5,000 mg/kg

Acute dermal toxicity : LD50 Dermal (Rabbit): > 5,000 mg/kg

Skin corrosion/irritation

Not classified based on available information.

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pH	: ca. 7
Melting point/range / Freezing point	: No data available
Boiling point/boiling range	: > 77 °C (> 171 °F)
Flash point	: -4 °C (25 °F) Method: closed cup
Evaporation rate	: No data available
Flammability	: No data available
Upper explosion limit	: 11.5 %(V)
Lower explosion limit	: 2.1 %(V)
Vapour pressure	: 99.9915 hPa (75.000 mmHg)
Relative vapour density	: No data available
Density	: ca. 1.02 g/cm ³ (20 °C (68 °F) (l))
Solubility(ies) Water solubility	: insoluble
Partition coefficient: n-octanol/water	: No data available
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Viscosity Viscosity, dynamic	: ca. 10 mPa.s (20 °C)
Viscosity, kinematic	: No data available
Explosive properties	: No data available
Molecular weight	: No data available

10. STABILITY AND REACTIVITY

Reactivity	: No dangerous reaction known under conditions of normal use.
Chemical stability	: The product is chemically stable.
Possibility of hazardous reactions	: Stable under recommended storage conditions. Vapours may form explosive mixture with air.
Conditions to avoid	: Heat, flames and sparks.

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Sika® Primer-206 G+P



Version 1.0

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Components with workplace control parameters

Components	CAS-No.	Value type (Form of exposure)	Control parameters / Permissible concentration	Basis
ethyl acetate	141-78-6	PEL (long term)	400 ppm 1,440 mg/m ³	SG OEL
		TWA	400 ppm	ACGIH
n-butyl acetate	123-86-4	PEL (long term)	150 ppm 713 mg/m ³	SG OEL
		PEL (short term)	200 ppm 950 mg/m ³	SG OEL
		TWA	50 ppm	ACGIH
		STEL	150 ppm	ACGIH

Personal protective equipment

Respiratory protection	: Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. The filter class for the respirator must be suitable for the maximum expected contaminant concentration (gas/vapour/aerosol/particulates) that may arise when handling the product. If this concentration is exceeded, self-contained breathing apparatus must be used.
Hand protection	: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
Eye protection	: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary.
Skin and body protection	: Choose body protection in relation to its type, to the concentration and amount of dangerous substances, and to the specific work-place.
Hygiene measures	: Handle in accordance with good industrial hygiene and safety practice. When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	: liquid
Colour	: black
Odour	: ester-like
Odour Threshold	: No data available

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Special protective equipment for firefighters	: In the event of fire, wear self-contained breathing apparatus.
6. ACCIDENTAL RELEASE MEASURES	
Personal precautions, protective equipment and emergency procedures	: Use personal protective equipment. Remove all sources of ignition. Deny access to unprotected persons.
Environmental precautions	: Prevent product from entering drains. If the product contaminates rivers and lakes or drains inform respective authorities.
Methods and materials for containment and cleaning up	: Contain spillage, and then collect with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations (see section 13).
7. HANDLING AND STORAGE	
Advice on protection against fire and explosion	: Use explosion-proof equipment. Keep away from heat/sparks/open flames/hot surfaces. No smoking. Take precautionary measures against electrostatic discharges.
Advice on safe handling	: Do not breathe vapours or spray mist. Avoid exceeding the given occupational exposure limits (see section 8). Do not get in eyes, on skin, or on clothing. For personal protection see section 8. Persons with a history of skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used. Smoking, eating and drinking should be prohibited in the application area. Take precautionary measures against static discharge. Open drum carefully as content may be under pressure. Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Follow standard hygiene measures when handling chemical products
Conditions for safe storage	: Store in original container. Store in cool place. Keep in a well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Observe label precautions. Store in accordance with local regulations.
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SAFETY DATA SHEET	
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4. FIRST AID MEASURES	
General advice	: Move out of dangerous area. Consult a physician. Show this safety data sheet to the doctor in attendance.
If inhaled	: Move to fresh air. Consult a physician after significant exposure.
In case of skin contact	: Take off contaminated clothing and shoes immediately. Wash off with soap and plenty of water. If symptoms persist, call a physician.
In case of eye contact	: Immediately flush eye(s) with plenty of water. Remove contact lenses. Keep eye wide open while rinsing. If eye irritation persists, consult a specialist.
If swallowed	: Clean mouth with water and drink afterwards plenty of water. Do not give milk or alcoholic beverages. Never give anything by mouth to an unconscious person. Obtain medical attention.
Most important symptoms and effects, both acute and delayed	: Irritant effects sensitising effects Allergic reactions Excessive lachrymation Loss of balance Vertigo See Section 11 for more detailed information on health effects and symptoms. May cause an allergic skin reaction. Causes serious eye irritation. May cause drowsiness or dizziness.
Notes to physician	: Treat symptomatically.
5. FIREFIGHTING MEASURES	
Suitable extinguishing media	: Alcohol-resistant foam Carbon dioxide (CO2) Dry chemical
Unsuitable extinguishing media	: Water High volume water jet
Specific hazards during fire-fighting	: Do not use a solid water stream as it may scatter and spread fire.
Hazardous combustion products	: No hazardous combustion products are known
Specific extinguishing methods	: Use water spray to cool unopened containers.
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P233 Keep container tightly closed.
 P240 Ground/bond container and receiving equipment.
 P241 Use explosion-proof electrical/ ventilating/ lighting equip-
 ment.
 P242 Use only non-sparking tools.
 P243 Take precautionary measures against static discharge.
 P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
 P264 Wash skin thoroughly after handling.
 P271 Use only outdoors or in a well-ventilated area.
 P272 Contaminated work clothing should not be allowed out of
 the workplace.
 P280 Wear protective gloves/ eye protection/ face protection.
Response:
 P303 + P361 + P353 IF ON SKIN (or hair): Take off immediat-
 ely all contaminated clothing. Rinse skin with water/shower.
 P304 + P340 + P312 IF INHALED: Remove person to fresh air
 and keep comfortable for breathing. Call a POISON
 CENTER/doctor if you feel unwell.
 P305 + P351 + P338 IF IN EYES: Rinse cautiously with water
 for several minutes. Remove contact lenses, if present and
 easy to do. Continue rinsing.
 P333 + P313 If skin irritation or rash occurs: Get medical ad-
 vice/ attention.
 P337 + P313 If eye irritation persists: Get medical advice/ at-
 tention.
 P362 + P364 Take off contaminated clothing and wash it before
 reuse.
 P370 + P378 In case of fire: Use dry sand, dry chemical or
 alcohol-resistant foam to extinguish.
Storage:
 P403 + P233 Store in a well-ventilated place. Keep container
 tightly closed.
 P403 + P235 Store in a well-ventilated place. Keep cool.
 P405 Store locked up.
Disposal:
 P501 Dispose of contents/ container to an approved waste
 disposal plant.

Other hazards which do not result in classification

None known.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture : Mixture

Chemical nature : Solvent

Hazardous components

Chemical name	CAS-No.	Concentration (%)
ethyl acetate	141-78-6	>= 50 - < 70
Hexamethylene diisocyanate, oligomers	28182-81-2	>= 1 - < 10
tris(p-isocyanatophenyl) thiophosphate	4151-51-3	>= 1 - < 10
Isophorondiisocyanate homopolymer	53880-05-0	>= 1 - < 10
n-butyl acetate	123-86-4	>= 1 - < 10
2-methoxy-1-methylethyl acetate	108-65-6	>= 1 - < 10

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SAFETY DATA SHEET

Sika® Primer-206 G+P



Version 1.0

SDS Number: 000000020203

Revision Date: 14.10.2018

1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Sika® Primer-206 G+P

Product code : 000000020203

Type of product : liquid

Recommended use of the chemical and restrictions on use

Product use : Pretreatment agent, Product is not intended for consumer use

Manufacturer or supplier's details

Company : SIKA (SINGAPORE) PTE LTD.

66A Sungei Kadut Street 1
 Singapore 729368

Telephone : +65 63680883

Telefax : +65 6779 6200

E-mail address : -

Emergency telephone num-
 ber : +65 63680883

2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquids : Category 2

Serious eye damage/eye irri-
 tation : Category 2

Skin sensitisation : Category 1

Specific target organ toxicity -
 single exposure : Category 3 (Central nervous system)

GHS label elements

Hazard pictograms



Signal word : Danger

Hazard statements : H225 Highly flammable liquid and vapour.
 H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H336 May cause drowsiness or dizziness.

Precautionary statements : **Prevention:**
 P210 Keep away from heat/sparks/open flames/hot surfaces.
 No smoking.

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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

MATERIAL SAFETY DATA SHEET

ABC Dry Chemical Powder

MSDS DATE: 01 JAN 2018

SECTION 11: TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION: Oral, rat, LD50

SODIUM BICARBONATE: 2840 mg/kg

EYE CONTACT: Irritating effect

SKIN CONTACT: Irritant to skin and mucous membranes

INGESTION: Practically non-harmful

INHALATION: Long term inhalation of dust may cause irritation to the mucous membranes

SECTION 12: ECOLOGICAL INFORMATION

Slightly hazardous for water. Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage. In the event of large spillage, advise appropriate authority.

SECTION 13: DISPOSAL CONSIDERATIONS

Dispose of surplus product or contaminated packaging according to local and national legislation. Do not dispose with household garbage. Do not allow product to reach sewage system.

SECTION 14: TRANSPORT INFORMATION

Not classified as hazardous for transport. DOT/ADR/IRD/AND/IATA/IMDF – Not regulated as dangerous goods.

SECTION 15: REGULATORY INFORMATION

UK REGULATIONS

Not classified under Chemicals (Hazard Information and Packaging for Supply) Regulations 1994 as hazardous. Refer to Health and Safety at Work Act and the Control of Substances Hazardous to Work Regulations. This material safety data sheet does not constitute the user's own assessment of workplace risk as required by the above regulations. The Manual Handling Operations Regulations may be applicable to certain pack sizes of this product.

Mandatory labelling not applicable (EEC directive 67/548/EEC).

SECTION 16: OTHER INFORMATION

The information in this safety data sheet is based on the present state of knowledge and current national legislation. It provides guidance on safety health and environmental aspects of the product and should not be construed as any guarantee of performance. The product should not be used for purposes other than fire-fighting without first referring to the supplier. The user is responsible for ensuring that requirements of relevant legislation are complied with. Further information may be obtained from the following Health and Safety Executive publications:

EH40 Occupational Exposure Limited (updated annually)

EH44 Dust: General principles of protection

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MATERIAL SAFETY DATA SHEET

ABC Dry Chemical Powder

MSDS DATE: 01 JAN 2018

Restrict access to area until completion of clean up. Ensure clean up is conducted by trained personnel only. Wear adequate personal protective equipment. Ventilate area.

SECTION 7: HANDLING AND STORAGE

HANDLING: When handling this product use suitable containment methods to avoid generation of dust and local exhaust ventilation to limit personal exposure.

STORAGE: Keep cool and dry in absence of vibration. Maintain housekeeping practice. Store away from water.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational exposure standards:

United Kingdom OES: 10mg/m³ total dust; 4mg/m³ respirable dust 8-hour time weighted averages. (Ref: EH40/98)

Personal Protection:

Wear suitable respiratory protection eg dust mask/respirator to reduce personal exposure to below OES. Overalls, gloves and eye protection recommended for regular handling and the normal hygiene measures adopted when using chemicals.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Fine, yellow powder

ODOR: Odourless

PHYSICAL STATE: Powder

pH AS SUPPLIED: NA

SOLUBILITY IN WATER: NA

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable

CONDITIONS TO AVOID (STABILITY): Moisture

INCOMPATIBILITY (MATERIAL TO AVOID): No dangerous reactions known

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: NA

HAZARDOUS POLYMERIZATION: Does not occur

CONDITIONS TO AVOID (POLYMERIZATION): -

SECTION 10 NOTES:

If powder becomes damp or hard it is not suitable for fire fighting purpose

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Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

MATERIAL SAFETY DATA SHEET

ABC Dry Chemical Powder

MSDS DATE: 01 JAN 2018

Talc ($Mg_3H_2(SiO_2)_4$)
Synonym: Talcum powder

Silicon Dioxide (CAS No. 7631-86-9)
Synonym: silica white

Poly(methylhydrosiloxane) (CAS No. 63148-57-2)
Synonym: silicon oil

SECTION 3: HAZARDS IDENTIFICATION

HAZARD DESCRIPTION: Xi Irritant

- Classification system:
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.

SECTION 4: FIRST AID MEASURES

EYES: Irrigate with fresh water for at least ten minutes holding eyelids apart
SKIN: Wash off with plenty of water
INGESTION: May cause abdominal pain, nausea, vomiting. Concentrated solutions (over 20%) may cause burns of mouth, bleeding stomach, incoordination, muscle spasms and kidney injury.
INHALATION: In case of unconsciousness place patient stably in side position for transportation.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS:
If other symptoms persist seek medical advice and treat symptomatically.

SECTION 5: FIRE-FIGHTING MEASURES

Not flammable product

SECTION 6: ACCIDENTAL RELEASE MEASURES

ACCIDENTAL RELEASE MEASURES:

MATERIAL SAFETY DATA SHEET

ABC Dry Chemical Powder

MSDS DATE: 01 JAN 2018

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

TRADE NAME: ABC Dry Chemical Powder
PRODUCT APPLICATION: Dry Chemical Powder for fire extinguisher (fire class A, B, C)
SUPPLIER ADDRESS: Fire Armour PTE LTD
14 Fan Yoong Road Singapore 629791
EMERGENCY PHONE: 65 6266 6788
FAX PHONE: 65 6266 3788
FURTHER INFORMATION OBTAINABLE FROM: Fire Armour PTE LTD

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

- Chemical Characterization
- Description :

Mixture of substances listed below with nonhazardous additions.
For the wording of the listed risk phrases refer to section 16.

- Dangerous components:

CAS: 7783-20-2 EINECS: 231-984-1	Ammonium sulphate	Xi: R 36/37/38	40.0%
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- Non-dangerous components:


CAS: 7722-76-1 EINECS: 231-764-5	Ammonium dihydrogenorthophosphate	40.0%
CAS: 14464-46-1 EUNECs: 238-455-4	Cristobalite	8.2%
CAS: 14807-96-6	TALC($Mg_3H_2(SiO_2)_4$)	5.0%
CAS: 12001-26-2	Mica	3.0%
CAS: 7631-86-9	Silicon dioxide, chemically prepared	2.6%
CAS: 63148-57-2	Poly(methylhydrosiloxane)	1.2%


- Remark:**
Ammonium dihydrogenorthophosphate (CAS No. 7722-76-1)
Synonym: mono ammonium phosphate

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Safety Data Sheet Rockwool stone wool Rev. 2013-11-26	
	
11. TOXICOLOGICAL INFORMATION	<p>Acute toxicity No acute toxicity whether for inhalation, swallowing or contact with skin or eyes during normal use of the products. Gases appearing during the first heating above 200°C may have a harmful effect.</p> <p>Local effects Coarse fibres can cause itching and rashes on the skin, irritation in eyes and the upper respiratory system. The itching and possible inflammation are mechanical reactions to coarse fibres (> 5 µm) and are not damaging in the way chemically irritants may be. They generally abate within a short time after the end of exposure.</p> <p>Longterm effects According to remark Q in directive KIFS 2005:5 from Kemikaleinspektionen stone wool fibres with high biosolubility are classified as not carcinogenic. Roxul stone wool fibres are tested according to the EU minutes ECB/TM 26:27 Rev. 7 1998 and the fibres comply with remark Q's requirement of biosolubility.</p>
12. ECOLOGICAL INFORMATION	Stone wool is a stable product with no known negative environmental impacts. The product can be reused.
13. DISPOSAL CONSIDERATIONS	Stone wool is not combustible but may be disposed of without special restrictions. The waste can also be granulated and reused as insulation. The wrapping consists of polyethylene plastic which can be recycled or burned. Pallets of wood are used and they can be recycled or burned.
14. TRANSPORT INFORMATION	No special precautions required.
15. REGULATORY INFORMATIONS	<p>EG-Regulation No 1272/2008 about classification, labeling and packaging (CLP) The fibres meet the claims in Note Q and are thus not classified as carcinogenic.</p> <p>Arbetsmiljöverket's regulations are valid when working with mineral wool: AFS 2004:1 "Synthetic Inorganic Fibres" AFS 2005:17 "Occupational exposure limit values and measures against air contaminants"</p> <p>Labeling of packages Rockwool products are labeled with information about personal protective equipment.</p>
16. OTHER INFORMATION	See trade association Swedisol's writing "God arbetsmiljö vid montering av mineralull" on www.rockwool.se .
Safety Data Sheet according to EG-Regulation 1907/2006, REACH 3(3)	

Safety Data Sheet Rockwool stone wool Rev. 2013-11-26															
															
7. HANDLING AND STORAGE	<p>Handling Unpack material at application site and cut with a special knife on a clean, solid and plane surface. Knives can be ordered from Rockwool AB. Waste is placed directly in collection bags. Ensure good general ventilation, particularly in narrow spaces and at demolition. Local exhaust should be used at extra dustable jobs. When cleaning up, avoid dry sweeping, large pieces are placed directly in refuse sacks, residue is sucked up by vacuum cleaner.</p> <p>Storage The products are stored in original packagings until they are used. They are protected against moisture and mechanical damages.</p>														
8. EXPOSURE CONTROLS/PERSONAL PROTECTION	<p>Exposure limit values In Sweden occupational exposure limits for respirable fibres in air-borne dust from mineral wool is 1 fibre /cm³. European limit is missing.</p> <p>Limitation of exposure Respiratory protection (dust filter P2) should be used if the limit might be exceeded despite of technical measures and if problems with respiratory organs appear, for example when handling old mineral wool in narrow spaces.</p> <p>At very dustable work suitable protective clothing, closing tightly around sensitive skin areas such as neck and forearms, should be used. Wear dust repelling protective gloves and clothing, without pockets or lapels. Wear eye protectors when working above eye level. Lens carriers should always wear eye protectors.</p> <p>During first heating above 150 – 200 °C, decomposition products of the binder may release hazardous gases. The duration of release is dependent upon the thickness of the isolation, binder content and the temperature applied. Therefore it is advised to ventilate the relevant area well during first heating period and only to access it with full face masks with fresh air supply. In general it is correct to observe a period of 96 hours for this, which needs to be extended if visible smoke and / or a strong and irritating smell is noticed in the room.</p> <p>Hygiene measures in general Take a shower and change clothes after the work. Work clothes should be stored and washed separately from other clothes.</p>														
9. PHYSICAL AND CHEMICAL PROPERTIES	<table border="1"> <tr> <td>Appearance</td> <td>The product is in solid form and has a grey-green colour.</td> </tr> <tr> <td>Smell</td> <td>The product is odourless</td> </tr> <tr> <td>Melting point</td> <td>> 1000°C</td> </tr> <tr> <td>Flammability</td> <td>Non-combustible material.</td> </tr> <tr> <td>Explosive properties</td> <td>Not applicable</td> </tr> <tr> <td>Density</td> <td>The glass i the fibres has a density of about 2,8 g/cm³. The products has a density of 25-300 kg/m³ depending on application.</td> </tr> <tr> <td>Solubility</td> <td>Insoluble in water with the exception of dust binding oil.</td> </tr> </table>	Appearance	The product is in solid form and has a grey-green colour.	Smell	The product is odourless	Melting point	> 1000°C	Flammability	Non-combustible material.	Explosive properties	Not applicable	Density	The glass i the fibres has a density of about 2,8 g/cm ³ . The products has a density of 25-300 kg/m ³ depending on application.	Solubility	Insoluble in water with the exception of dust binding oil.
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Solubility	Insoluble in water with the exception of dust binding oil.														
10. STABILITY AND REACTIVITY	The products are chemically stable and have no reactivity. At temperatures above 200°C the binder is broken down while smelling gases are leaving. The issue is of short duration. See to that there is a good ventilation until the odour has disappeared and avoid staying in unpleasant smoke. If necessary, use personal protective equipment. See paragraph 8.														
Safety Data Sheet according to EG-Regulation 1907/2006, REACH 2(3)															

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Safety Data Sheet		 ROCKWOOL FIRESAFE INSULATION						
Rockwool stone wool Rev. 2013-11-26								
1.	NAME OF PRODUCT AND COMPANY							
	Product Stone wool insulation based on Rockwool 1000 fibre. Principal application. Thermal, fire and soundproofing insulation.							
	Supplier Rockwool AB, Box 11505, 550 11 JÖNKÖPING, Telephone: 036- 570 52 00, Telefax: 036- 570 52 82, Org.nr: 556347-9152 www.rockwool.se , info@rockwool.com							
2.	HAZARD IDENTIFICATION							
	Biosoluble stone wool (Rockwool 1000 fibre) The product has no hazardous qualities but can cause occasional itching caused by the mechanical effect generated by the fibres in contact with skin.							
3.	COMPOSITION/INFORMATION ON INGREDIENTS							
	Rockwool stone wool contains mostly stone wool fibres which are of type synthetic inorganic glass similar silicate fibres. The stone wool fibres meet the claims in Note Q according to the European Classification Regulation No 1272/2008 about classification, labeling and packaging (CLP). To keep the stone wool fibres together a binder is added which by the curing process is transformed into heat-stable plastic (bakelite). A small quantity of oil is added to make the products water repellent and to reduce dusting. Some products have one or two surface layers of for example paper, alu-foil or glass fibres.							
	Included components <table border="0"> <tr> <td>Mineral wool</td> <td>95-98 %</td> </tr> <tr> <td>Bakelite (binder)</td> <td>1,5 – 4,5 %</td> </tr> <tr> <td>Oil (dust binding)</td> <td>0,5 %</td> </tr> </table>	Mineral wool	95-98 %	Bakelite (binder)	1,5 – 4,5 %	Oil (dust binding)	0,5 %	
Mineral wool	95-98 %							
Bakelite (binder)	1,5 – 4,5 %							
Oil (dust binding)	0,5 %							
	Classification Rockwool stone wool has no classification.							
4.	FIRST AID MEASURES							
	Inhalation Leave the dusty place and breathe fresh air at inconvenience.							
	Skin If skin irritation occurs, do not rub or scratch. Wash off under running water prior to washing with mild soap and water.							
	Eyes If eye irritation occurs, do not rub the eyes. Flush eyes with water and consult a physician if irritation persists.							
5.	FIRE-FIGHTING MEASURES							
	Stone wool products from Rockwool are non-combustible and do not pose a fire hazard. In case of fire binder disappears and finishes such as paper, cellulose and plastic layer are combustible. Use normal fire fighting methods.							
6.	ACCIDENTAL RELEASE MEASURES							
	Personal precautions Not applicable.							
	Environmental precautions Not applicable.							
	Decontamination methods Clean up normally. See paragraph 7, 8 and 13.							

Safety Data Sheet according to EG-Regulation 1907/2006, REACH 1(3)

<div style="text-align: center;">PU Foam B3</div>			
MAK(Germany) Dimethyläther	Time-weighted average exposure limits h	1000 ppm 1800 mg/m ³	
polyuretes MDI (isocyanate-Prekursor)	Time-weighted average exposure limits h	200 mg/m ³ [E]	Egemessen skilimitatione Prekursor (g.L.A.techn. M(S. 18-1)
Pipen	Time-weighted average exposure limits h	1000 ppm 1800 mg/m ³	
Butan (isobutane)	Time-weighted average exposure limits h	1000 ppm 2400 mg/m ³	
15.2 Chemical safety assessment: No chemical safety assessment has been conducted.			
SECTION 16: Other information			
Information based on classification according to CLP			
R11 Irritating to the eyes R20 Harmful by inhalation R22 Harmful to the water R36/37/38 Irritating to eyes, respiratory system and skin R40 Limited evidence of carcinogenic effect R42/43 May cause sensitization by inhalation and skin contact R45/20 Harmful to the environment through prolonged exposure through inhalation			
H220 Extremely flammable gas. H222 Flammable aerosol. H280 Contains gas under pressure; may explode if heated. H302 Harmful if swallowed. H313 Causes skin irritation. H317 May cause an allergic skin reaction. H319 Causes serious eye irritation. H332 Harmful if inhaled. H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled. H335 May cause respiratory irritation. H351 Suspected of causing cancer. H373 May cause damage to organs through prolonged or repeated exposure. H413 May cause damage to aquatic life through prolonged or repeated exposure if inhaled.			
P201+202 Obtain special advice before use. P203 Do not breathe dust/fume/gas/mist/vapors/spray. P210 Keep away from heat, open flames, sparks, hot surfaces and other sources of ignition. P223 Extremely flammable gas - do not breathe gas. P231+232 Do not breathe gas/aerosol/vapors/mist/spray. P233 Store in a cool, well-ventilated place. P240 Ventilate the work area. P241 Use only outdoors or in a well-ventilated area. P242 Avoid breathing dust/fume/gas/mist/vapors/spray. P243 Avoid contact with skin. P244 Wear eye protection. P246 Do not get inside clothing. P251 Avoid contact with eyes. P253 Wash hands thoroughly after handling. P261+273 Avoid breathing dust/fume/gas/mist/vapors/spray. P273 Do not release into the environment. P280 Wear protective gloves/eye protection/respirator. P281 Use respiratory protection. P282 In case of contact with eyes, rinse immediately with plenty of water. Seek medical attention in case of irritation. P283 In case of contact with skin, wash immediately with plenty of water. Seek medical attention in case of irritation. P284 Use respiratory protection. P286 In case of contact with liquid, remove contaminated clothing and wash immediately with plenty of water. P287 Avoid contact with liquid. P288 In case of contact with liquid, remove contaminated clothing and wash immediately with plenty of water. P289 Avoid contact with liquid. P290 Irritating to the eyes, respiratory system and skin. P302+352 In case of contact with skin, wash immediately with plenty of water. P304+340 In case of inhalation, move to fresh air and rest. Seek medical attention if symptoms persist. P305+351+338 In case of contact with eyes, rinse immediately with plenty of water. Seek medical attention in case of irritation. P308+313 In case of exposure, seek medical attention immediately. P312 In case of eye contact, rinse immediately with plenty of water. Seek medical attention in case of irritation. P314 In case of skin contact, wash immediately with plenty of water. Seek medical attention in case of irritation. P315 In case of contact with skin, wash immediately with plenty of water. P320 Specific treatment (see instructions on label). P330 If swallowed, rinse the mouth with water. Seek medical attention. P331 If swallowed, do not induce vomiting. Seek medical attention. P332 If eyes are irritated, rinse immediately with plenty of water. Seek medical attention in case of irritation. P333 If irritated, rinse immediately with plenty of water. P337+331 In case of contact with eyes, rinse immediately with plenty of water. Seek medical attention in case of irritation. P340 If irritated, rinse immediately with plenty of water. P341 If irritated, rinse immediately with plenty of water. P350 If skin is irritated, wash immediately with plenty of water. P351+330 In case of contact with skin, wash immediately with plenty of water. Seek medical attention in case of irritation. P352 If on clothing, remove contaminated clothing and wash immediately with plenty of water. P360+353 Before use, ensure adequate ventilation. P370+372 Flammable. Keep away from heat, open flames, sparks, hot surfaces and other sources of ignition. P373 Flammable gas. Do not breathe gas. P374+377+378 In case of fire, do not breathe gas. Evacuate the area. Do not use water to extinguish. Use dry powder, CO ₂ or foam. P375+377+378 In case of fire, do not breathe gas. Evacuate the area. Do not use water to extinguish. Use dry powder, CO ₂ or foam. P376+377+378 In case of fire, do not breathe gas. Evacuate the area. Do not use water to extinguish. Use dry powder, CO ₂ or foam. P380+381+382+383+384+385+386+387+388+389+390+391+392+393+394+395+396+397+398+399+400+401+402+403+404+405+406+407+408+409+410+411+412+413+414+415+416+417+418+419+420+421+422+423+424+425+426+427+428+429+430+431+432+433+434+435+436+437+438+439+440+441+442+443+444+445+446+447+448+449+450+451+452+453+454+455+456+457+458+459+460+461+462+463+464+465+466+467+468+469+470+471+472+473+474+475+476+477+478+479+480+481+482+483+484+485+486+487+488+489+490+491+492+493+494+495+496+497+498+499+500+501+502+503+504+505+506+507+508+509+510+511+512+513+514+515+516+517+518+519+520+521+522+523+524+525+526+527+528+529+530+531+532+533+534+535+536+537+538+539+540+541+542+543+544+545+546+547+548+549+550+551+552+553+554+555+556+557+558+559+560+561+562+563+564+565+566+567+568+569+570+571+572+573+574+575+576+577+578+579+580+581+582+583+584+585+586+587+588+589+590+591+592+593+594+595+596+597+598+599+600+601+602+603+604+605+606+607+608+609+610+611+612+613+614+615+616+617+618+619+620+621+622+623+624+625+626+627+628+629+630+631+632+633+634+635+636+637+638+639+640+641+642+643+644+645+646+647+648+649+650+651+652+653+654+655+656+657+658+659+660+661+662+663+664+665+666+667+668+669+670+671+672+673+674+675+676+677+678+679+680+681+682+683+684+685+686+687+688+689+690+691+692+693+694+695+696+697+698+699+700+701+702+703+704+705+706+707+708+709+710+711+712+713+714+715+716+717+718+719+720+721+722+723+724+725+726+727+728+729+730+731+732+733+734+735+736+737+738+739+740+741+742+743+744+745+746+747+748+749+750+751+752+753+754+755+756+757+758+759+760+761+762+763+764+765+766+767+768+769+770+771+772+773+774+775+776+777+778+779+780+781+782+783+784+785+786+787+788+789+790+791+792+793+794+795+796+797+798+799+800+801+802+803+804+805+806+807+808+809+810+811+812+813+814+815+816+817+818+819+820+821+822+823+824+825+826+827+828+829+830+831+832+833+834+835+836+837+838+839+840+841+842+843+844+845+846+847+848+849+850+851+852+853+854+855+856+857+858+859+860+861+862+863+864+865+866+867+868+869+870+871+872+873+874+875+876+877+878+879+880+881+882+883+884+885+886+887+888+889+890+891+892+893+894+895+896+897+898+899+900+901+902+903+904+905+906+907+908+909+910+911+912+913+914+915+916+917+918+919+920+921+922+923+924+925+926+927+928+929+930+931+932+933+934+935+936+937+938+939+940+941+942+943+944+945+946+947+948+949+950+951+952+953+954+955+956+957+958+959+960+961+962+963+964+965+966+967+968+969+970+971+972+973+974+975+976+977+978+979+980+981+982+983+984+985+986+987+988+989+990+991+992+993+994+995+996+997+998+999+1000			
The information in this safety data sheet is based on data and samples provided to BG. This sheet was written to the best of our ability and according to the state of knowledge at that time. The safety data sheet only constitutes a guideline for the safe handling, use, consumption, storage, transportation and disposal of the substances/preparations/mixtures mentioned under point 1. New safety data sheets are written from time to time. Only the most recent version may be used. Old versions must be destroyed. Unless indicated otherwise word forwarded on the safety data sheet, the information does not apply to substances/preparations/mixtures in pure form, mixed with other substances or in processes. The safety data sheet offers no quality specification for the substances/preparations/mixtures in question. Compliance with the instructions in this safety data sheet does not release the user from the obligation to take all measures dictated by common sense, regulations and recommendations, or which are necessary and/or useful based on the real application circumstances. BG does not guarantee the accuracy, completeness of the information provided and cannot be held liable for any damage by third parties. This safety data sheet is only to be used within the European Union, Switzerland, Iceland, Norway and Liechtenstein. Any use outside of this area is at your own risk. Use of this safety data sheet is subject to the license and liability limiting conditions as stated in your BG license agreement or in this sheet, the general conditions of BG. All intellectual property rights to this sheet are the property of BG and its distribution and reproduction are limited. Consult the methods agreement/conditions for details.			
Reason for revision: CLP		Publication date: 2008-01-07 Date of revision: 2013-02-25	
Revision number: 0800		Product number: 47206 17 / 17	

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SC Auto (Myanmar) Co., Ltd.

PU Foam B3																																																							
<p>13.1 Waste treatment methods:</p> <p>13.1.1 Provisions relating to waste</p> <p>Waste materials (Directive 2006/98/EC, decision 2000/532/EC).</p> <p>06 04 09* (waste materials and substances containing organic solvents or other dangerous substances). Depending on the kind of industry and production process, a further EU RAL codes may be applicable. Hazardous waste according to Directive 2006/98/EC.</p> <p>13.1.2 Dispose (methods)</p> <p>Remove waste in accordance with local and/or national regulations. Hazardous waste shall not be mixed together with other waste. Different types of hazardous waste shall not be mixed together if this may entail a risk of pollution or acute problems for the further management of the waste. Hazardous waste shall be managed responsibly. All activities that is to, transport and handle hazardous waste shall be the necessary measures to prevent risks of pollution or damage to people or animals. Specific treatment. Do not discharge into air or the environment.</p> <p>13.1.3 Packaging/Container</p> <p>Waste materials (Directive 2006/98/EC).</p> <p>19 01 50* (packaging containing residues of contaminated by dangerous substances).</p>																																																							
SECTION 14: Transport information																																																							
<p>Road (ADR)</p> <p>14.1 UN number:</p> <table border="1"> <tr> <td>UN number</td> <td>19 50</td> </tr> </table> <p>14.2 UN proper shipping name:</p> <table border="1"> <tr> <td>Proper shipping name</td> <td>Hexosol</td> </tr> </table> <p>14.3 The report hazard classes:</p> <table border="1"> <tr> <td>Hazard identification number</td> <td></td> </tr> <tr> <td>Class</td> <td>9</td> </tr> <tr> <td>Classification code</td> <td>PF</td> </tr> </table> <p>14.4 Packing group:</p> <table border="1"> <tr> <td>Packing group</td> <td></td> </tr> <tr> <td>Label</td> <td>2.1</td> </tr> </table> <p>14.5 Environmentally hazardous substances:</p> <table border="1"> <tr> <td>Environmentally hazardous substance mark</td> <td>No</td> </tr> </table> <p>14.6 Special precautions for use:</p> <table border="1"> <tr> <td>Special provisions</td> <td>180</td> </tr> <tr> <td>Special provisions</td> <td>227</td> </tr> <tr> <td>Special provisions</td> <td>244</td> </tr> <tr> <td>Special provisions</td> <td>223</td> </tr> <tr> <td>Limited quantities</td> <td>Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)</td> </tr> </table> <p>Rail (RID)</p> <p>14.1 UN number:</p> <table border="1"> <tr> <td>UN number</td> <td>19 50</td> </tr> </table> <p>14.2 UN proper shipping name:</p> <table border="1"> <tr> <td>Proper shipping name</td> <td>Hexosol</td> </tr> </table> <p>14.3 The report hazard classes:</p> <table border="1"> <tr> <td>Hazard identification number</td> <td>93</td> </tr> <tr> <td>Class</td> <td>9</td> </tr> <tr> <td>Classification code</td> <td>PF</td> </tr> </table> <p>14.4 Packing group:</p> <table border="1"> <tr> <td>Packing group</td> <td></td> </tr> <tr> <td>Label</td> <td>2.1</td> </tr> </table> <p>14.5 Environmentally hazardous substances:</p> <table border="1"> <tr> <td>Environmentally hazardous substance mark</td> <td>No</td> </tr> </table> <p>14.6 Special precautions for use:</p> <table border="1"> <tr> <td>Special provisions</td> <td>180</td> </tr> <tr> <td>Special provisions</td> <td>227</td> </tr> <tr> <td>Special provisions</td> <td>244</td> </tr> <tr> <td>Special provisions</td> <td>223</td> </tr> <tr> <td>Limited quantities</td> <td>Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)</td> </tr> </table> <p>Inland waterways (ADN)</p> <p>14.1 UN number:</p> <table border="1"> <tr> <td>UN number</td> <td>19 50</td> </tr> </table>		UN number	19 50	Proper shipping name	Hexosol	Hazard identification number		Class	9	Classification code	PF	Packing group		Label	2.1	Environmentally hazardous substance mark	No	Special provisions	180	Special provisions	227	Special provisions	244	Special provisions	223	Limited quantities	Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)	UN number	19 50	Proper shipping name	Hexosol	Hazard identification number	93	Class	9	Classification code	PF	Packing group		Label	2.1	Environmentally hazardous substance mark	No	Special provisions	180	Special provisions	227	Special provisions	244	Special provisions	223	Limited quantities	Combination packagings: not more than 1 liter per inner packaging for liquids. A package shall not weigh more than 30 kg (gross mass)	UN number	19 50
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PU Foam B3								
dirnity letter	Parameter	Method	Value	Duration	Species	Test design	Fresh/water	Value determination
	Acute toxicity fishes	LC50	> 4100 mg/l	96 h	Poecilia reticulata	Static system	Fresh water	Expe rime ntl value
	Acute toxicity invertebrates	EC50	> 4400 mg/l	48 h	Daphnia magna			Expe rime ntl value
	Toxicity algae and other aquatic plants	EC0	EC0 SA Fv1.00 1.94-9 mg/l	96 h	Algae			Expe rime ntl value
	Acute toxicity other aquatic organisms	LC50	> 4400 mg/l	96 h	Daphnia magna			Expe rime ntl value
	Toxicity aquatic micro-organisms	EC10	> 1600 mg/l		Pseudomonas putida	Static system	Fresh water	Life span study

Classification of the mixture is based on the relevant ingredients of the mixture

Conclusion
 Not classified as dangerous for the environment according to the criteria of Directive 67/542/EEC
 Not classified as dangerous for the environment according to the criteria of Regulation (EC) No 1272/2008

12.2 Persistence and degradability:
 tri-*p*-chloro-*s*-methylthyl phosphite

Biodegradability in water

Method	Value	Duration	Value determination
OECD 301A: Modified OECD Screening Test	58 %	28 days	Expe rime ntl value
OECD 301C: Modified WMT Test II	0 %	28 days	Expe rime ntl value

poly(methyl methacrylate)

Biodegradability in water

Method	Value	Duration	Value determination
OECD 300C: Inherent biodegradability: (Modified WMT Test II)	680 %		Expe rime ntl value

Biodegradability in soil

Method	Value	Duration	Value determination
OECD 301B: Modified OECD Screening Test	70 %		Expe rime ntl value
Other	70 %	14 days	Expe rime ntl value

Half-life soil (1/2 soil)

Method	Value	Primary degradation/mineralisation	Value determination
Note applicable			

Volatility

Biodegradability in water

Method	Value	Duration	Value determination
OECD 301A: Closed Bottle Test	72.6 %	28 days	Life span study

Half-life soil (1/2 soil)

Method	Value	Primary degradation/mineralisation	Value determination
Note applicable			

dirnity letter

Biodegradability in water

Method	Value	Duration	Value determination
OECD 301D: Closed Bottle Test	0 %	28 days	Expe rime ntl value

Half-life soil (1/2 soil)

Method	Value	Primary degradation/mineralisation	Value determination
Note applicable			

Conclusion
 Contains non readily biodegradable component

12.3 Bioaccumulative potential:

Method	Parameter	Value	Temperature	Value determination
	Log Kow			
	Note applicable mixture			

Reason for revision: CLP
 Publication date: 2008-01-07
 Date of revision: 2019-02-23

Revision number: 0800
 Product number: 47206
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PU Foam B3								
Suspected of causing cancer. Not classified for mutagenic or genotoxic toxicity. Not classified for reproductive or developmental toxicity.								
Toxicity other effects								
PU Foam B3 No test data on the mixture available.								
Chronic effects from short and long term exposure								
PU Foam B3 ON CONTINUOUS/REPEATED EXPOSURE/CONTACT: feeling of weakness, itching, skin rash/irritation, itchy skin, dry skin, coughing, possible inflammation of the respiratory tract. Respiratory difficulties.								
11.1.2 Other information								
PU Foam B3								
EC classification: Category 2								
CLP classification: Category 2								
Polymethyl methacrylate								
EC classification: Category 2								
CLP classification: Category 2 (Polymethyl methacrylate)								
GHS - Hazard statement: Category 2								
GHS - Pictogram								
GHS - Signalword								
GHS - Preposition								
SECTION 12: Ecological information								
12.1 Toxicity:								
PU Foam B3 No test data on the mixture available.								
tri- <i>p</i> -chloro- <i>s</i> -methylthyl phosphite								
Parameter	Method	Value	Duration	Species	Test design	Fresh/water	Value determination	
Acute toxicity fishes	LC50	96.2 mg/l	96 h	Bachyda nibe no	Static system	Fresh water	Expe rime ntl value; SLP	
Acute toxicity invertebrates	EC50	6.5-33.5 mg/l	48 h	Daphnia magna			Expe rime ntl value; SLP	
Toxicity algae and other aquatic plants	EC50	73 mg/l	96 h	Scenedesmus subspicuosus			Expe rime ntl value; SLP	
Parameter	Method	Value	Duration	Species	Test design	Fresh/water	Value determination	
Acute toxicity other aquatic organisms	LC50	> 1000 mg/l	96 h				Life span study	
Toxicity aquatic micro-organisms	EC50	> 100 mg/l		Activated sludge			Life span study	
Parameter	Method	Value	Duration	Species	Test design	Fresh/water	Value determination	
Acute toxicity fishes	LC50	24 mg/l	96 h	Pike			Life span study	
Acute toxicity invertebrates	EC50	7 mg/l	48 h	Daphnia magna			Life span study	
Toxicity algae and other aquatic plants	EC50	5 mg/l	72 h	Algae			Life span study	
Acute toxicity other aquatic organisms	EC50	10-100 mg/l		Activated sludge			Estimated value	
Long-term toxicity fish	EC0	2.4-3.7 mg/l	768 h	Pime phales promelas			DSAP	
Long-term toxicity aquatic invertebrates	EC0	1.1-2.0 mg/l	204 h	Daphnia magna			DSAP	

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

PU Foam B3									
purpose									
Result	Method	Test substance	Effect	Value determination					
Negative with meta bolic activation, negative without meta bolic activation	OECD471	Bacteria (β-galactosidase)	No effect	Read-across					
Negative with meta bolic activation, negative without meta bolic activation	OECD473	Human lymphocytes	No effect	Read-across					
directly in the									
Result	Method	Test substance	Effect	Value determination					
Negative	Ames test			Literature study					
Negative	OECD473			Literature study					
Mutagenicity (in vivo)									
No test data on the mixture available									
in 12-chloro-1-methyl-3-phosphoric acid									
Result	Method	Exposure time	Test substance	Species	Gender	Organ	Value determination		
Negative	Equivalent to OECD 475		Ret	Rat	Male		Weight of evidence		
purpose									
Result	Method	Exposure time	Test substance	Species	Gender	Organ	Value determination		
Negative	OECD474	83 weeks (6h/day, 5 days/week)	Ret	Rat	Male/female		Read-across		
Carcinogenicity									
No test data on the mixture available									
poly(methyl methacrylate) foam									
Route of exposure	Parameter	Method	Value	Exposure time	Species	Gender	Value determination	Organ	Effect
Inhalation (nose)			STOT RE cat 2		Rat		Literature study		Neoplastic effects
Reproductive toxicity									
No test data on the mixture available									
in 12-chloro-1-methyl-3-phosphoric acid									
Developmental toxicity	Parameter	Method	Value	Exposure time	Species	Gender	Effect	Organ	Value determination
	NOAEL (P)	OECD416	89 mg/kg bw	0-30 weeks (daily)	Rat	Female	Body weight gain, food consumption	Female reproductive organ	Experimental value
	NOAEL (P)	OECD416	59 mg/kg bw	0-30 weeks (daily)	Rat	Male	No effect		Experimental value
	NOAEL	Equivalent to OECD414	8000 mg/kg bw	7 days	Rat	Female	No effect		Experimental value
purpose									
Developmental toxicity	Parameter	Method	Value	Exposure time	Species	Gender	Effect	Organ	Value determination
	NOAEC	OECD422	9000 ppm	6 weeks (6h/day, 7 days/week)	Rat	Male/female	No effect		Read-across
	NOAEC	OECD422	1394 mg/m ³ air	6 weeks (6h/day, 7 days/week)	Rat	Male/female	No effect		Read-across
	NOAEC	OECD434	80000 ppm	2 weeks (6h/day, 7 days/week)	Rat	Female	No effect		Read-across
Effect on fertility	NOAEC	OECD422	9000 ppm	6 weeks (6h/day, 7 days/week)	Rat	Male/female	No effect		Read-across
Classification of the mixture is based on the relevant ingredients of the mixture									
Conclusion CMB									
Reason for revision: CLP					Publication date: 2008-01-07 Date of revision: 2013-02-29				
Revision number: 0800					Product number: 47306 10 / 17				

PU Foam B3									
No test data on the mixture available									
in 12-chloro-1-methyl-3-phosphoric acid									
Route of exposure	Result	Method	Exposure time	Exposure point	Species	Gender	Value determination		
Skin	Not sensitizing	OECD 429			Mouse		Literature study		
poly(methyl methacrylate) foam									
Route of exposure	Result	Method	Exposure time	Exposure point	Species	Gender	Value determination		
Skin	Sensitizing						Literature study		
Inhalation	Sensitizing						Literature study		
Classification of the mixture is based on the relevant ingredients of the mixture									
Conclusion									
May cause a allergic skin reaction.									
May cause a heavy or a time symptoms or breathing difficulties if inhaled.									
Specific target organ toxicity									
No test data on the mixture available									
PU Foam B3									
No test data on the mixture available									
in 12-chloro-1-methyl-3-phosphoric acid									
Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Gender	Value determination
Oral	NOAEL	Equivalent to OECD408	300 ppm	Liver	Weight gain	13 weeks (daily)	Rat	Male	Experimental value
Oral	NOAEL	Equivalent to OECD408	2900 ppm		No effect	13 weeks (daily)	Rat	Female	Experimental value
poly(methyl methacrylate) foam									
Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Gender	Value determination
Inhalation		STOT RE cat 2							Literature study
purpose									
Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Gender	Value determination
Oral									Body weight
Oral	NOAEC	OECD422	12000 ppm	Female	Body weight reduction	6 weeks (6h/day, 7 days/week)	Rat	Male	Experimental value
Inhalation	NOAEC	OECD422	12000 ppm	Female	Neurotoxic system	6 weeks (6h/day, 7 days/week)	Rat	Male/female	Experimental value
Inhalation	Dose level		300 ppm	Female	No effect	10 days (6h/day)	Human		Read-across
directly in the									
Route of exposure	Parameter	Method	Value	Organ	Effect	Exposure time	Species	Gender	Value determination
Inhalation	NOAEC	Equivalent to OECD432	47106 mg/m ³		No effect	2 years (6h/day, 5 days/week)	Rat		Literature study
Classification of the mixture is based on the relevant ingredients of the mixture									
Conclusion									
May cause damage to organs through prolonged or repeated exposure if inhaled.									
Low sub-chronic toxicity by the dermal route									
Mutagenicity (in vitro)									
No test data on the mixture available									
in 12-chloro-1-methyl-3-phosphoric acid									
Result	Method	Test substance	Effect	Value determination					
Negative		Chinese hamster lung fibroblasts	No effect	Weight of evidence					
Negative	Equivalent to OECD471	Bacteria (β-galactosidase)	No effect	Weight of evidence					
Negative	Equivalent to OECD476	Mouse lymphoma (L5178Y cells)	No effect	Weight of evidence					
Reason for revision: CLP									
Revision number: 0800					Publication date: 2008-01-07 Date of revision: 2013-02-29				
Product number: 47306					17 / 17				

PU Foam B3			
Product name	Test	Value	Remark
Isocyanates	MOGH	0.02	
Isocyanates	MOGH	0.01	
B.1.3 Applicable limit values when using the substance or mixture are indicated. If limit values are applicable and available these will be listed below.			
B.1.4 DNEL/PNEC values			
DNEL-Work area			
1,3-Diisocyanato-2-methylbutyl phosphite			
Effect level (DNEL/DNEL)	Type	Value	Remark
DNEL	Acute systemic effects dermal	0.333 mg/kg bw/day	
	Acute systemic effects inhalation	0.33 mg/m ³	
	Long-term systemic effects dermal	0.333 mg/kg bw/day	
	Long-term systemic effects inhalation	0.33 mg/m ³	
1,3-Diisocyanato-2-methylbutyl phosphite			
Effect level (DNEL/DNEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	0.94 mg/m ³	
DNEL-General population			
1,3-Diisocyanato-2-methylbutyl phosphite			
Effect level (DNEL/DNEL)	Type	Value	Remark
DNEL	Acute systemic effects dermal	0.264 mg/kg bw/day	
	Acute systemic effects inhalation	0.33 mg/m ³	
	Acute systemic effects oral	0.33 mg/kg bw/day	
	Long-term systemic effects dermal	0.264 mg/kg bw/day	
	Long-term systemic effects inhalation	0.33 mg/m ³	
	Long-term systemic effects oral	0.33 mg/kg bw/day	
1,3-Diisocyanato-2-methylbutyl phosphite			
Effect level (DNEL/DNEL)	Type	Value	Remark
DNEL	Long-term systemic effects inhalation	0.71 mg/m ³	
PNEC			
1,3-Diisocyanato-2-methylbutyl phosphite			
Component	Value	Remark	
Residue water	0.155 mg/l		
Soil water	0.036 mg/l		
Aquatic (infinite release)	1.349 mg/l		
Wastewater treatment plant	160 mg/l		
Residue sediment	0.651 mg/kg		
Marine waste sediment	0.069 mg/kg		
Soil	0.045 mg/kg		
B.1.5 Control banding If applicable and available it will be listed below.			
B.2 Exposure controls: The information in this section is a general description. If applicable and available, exposure scenarios are attached in annex. Always use the relevant exposure scenarios that correspond to your identified use.			
B.2.1 Appropriate engineering controls Use spray/exposure proof equipment and lighting system. Keep away from naked flames/heat. Keep away from ignition sources & park. Mess use the concentration in the air regularly.			
B.2.2 Individual protection measures, such as personal protective equipment Observe strict hygiene - avoid contact. Do not eat/drink/smile during work.			
a) Respiratory protection: Wear gas mask with filter type A if conc. in air exposure limit.			
b) Hand protection: G gloves.			
Material	Breakthrough time	Thickness	
LDPE (Low Density Poly Ethylene)	40 minutes	0.025 mm	
c) Eye protection: Protective goggles.			
d) Skin protection: Head/neck protection. Protective clothing.			
B.2.3 Environmental exposure controls: See headings 6.2, 6.3 and 13			
Reason for revision: CLP	Publication date: 2008-01-07		
Revision number: 0800	Date of revision: 2013-02-25	Product number: 47806	6 / 17

PU Foam B3			
7.2.1 Safe storage requirements: Storage in temperature: < 30 °C. Store in a cool area. Keep out of direct sunlight. Ventilation not for level. Fireproof store room. Unauthorized persons are not admitted. Observe the legal requirements. Max. storage time: 1 year (p).			
7.2.2 Keep away from: Heat sources, ignition sources, (strong) acids, (strong) bases, amines.			
7.2.3 Suitable packaging material: Acrosol.			
7.2.4 Non suitable packaging material: No data available.			
7.3 Specific end use(s): If applicable and available, exposure scenarios are attached in annex. See information supplied by the manufacturer.			
SECTION 8: Exposure controls/personal protection			
B.1 Control parameters: B.1.1 Occupational exposure limit values: If limit values are applicable and available these will be listed below.			
The Netherlands			
Dimethyl ether	Short time value	253 ppm 2500 mg/m ³	Public occupational exposure limit value
	Time-weighted average exposure limits h	256 ppm 2500 mg/m ³	Public occupational exposure limit value
EU			
Dimethyl ether	Time-weighted average exposure limits h	1000 ppm 9920 mg/m ³	Indicative occupational exposure limit value
Belgium			
Cyclic diisocyanate	Time-weighted average exposure limits h	1000 ppm 9920 mg/m ³	
Hydrocarbons aliphatics saturated (Aldenes C 8-CA)	Time-weighted average exposure limits h	1000 ppm	
	Time-weighted average exposure limits h	1000 ppm	
USA (TLV-HCS/H)			
Aliphatic hydrocarbon gases - alkenes (C 1-11)	Time-weighted average exposure limits h	1000 ppm	TLV - Adopted Value
Germany			
Isobutan	Time-weighted average exposure limits h	1000 ppm 9400 mg/m ³	TRGS 900
Dimethyl ether	Time-weighted average exposure limits h	1000 ppm 9900 mg/m ³	TRGS 900
Propan	Time-weighted average exposure limits h	1000 ppm 9800 mg/m ³	TRGS 900
France			
Cyclic diisocyanate	Time-weighted average exposure limits h	1000 ppm 9920 mg/m ³	VPL: Valeur réglementaire indicative
UK			
Isocyanates, all (Is - NCO) except methy	Short time value	0.07 mg/m ³	Workplace exposure limit (EH40/2009)
Isocyanate	Time-weighted average exposure limits h	0.02 mg/m ³	Workplace exposure limit (EH40/2009)
Dimethyl ether			
	Short time value	100 ppm 990 mg/m ³	Workplace exposure limit (EH40/2009)
	Time-weighted average exposure limits h	100 ppm 966 mg/m ³	Workplace exposure limit (EH40/2009)
a) National biological limit values: If limit values are applicable and available these will be listed below.			
B.1.2 Sampling methods			
Reason for revision: CLP	Publication date: 2008-01-07		
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PU Foam B3	
<p>4.2 Most important symptoms and effects, both acute and delayed:</p> <p>4.2.1 Acute symptoms After inhalation: Dry/sore throat, Coughing, Irritation of the respiratory tract, Irritation of the nasal mucous membranes, Runny nose. FOLLOWING SYMPTOMS MAY APPEAR LATER: Possible inflammation of the respiratory tract, Risk of lung oedema, Respiratory difficulties.</p> <p>After skin contact: Tingling/irritation of the skin.</p> <p>After eye contact: Irritation of the eye tissues, Lacrimation.</p> <p>After ingestion: Not applicable.</p> <p>4.2.2 Delayed symptoms No effects known.</p> <p>4.3 Indication of any immediate medical attention and special treatment needed: If applicable and available it will be listed below.</p>	
SECTION 5: Firefighting measures	
<p>5.1 Extinguishing media:</p> <p>5.1.1 Suitable extinguishing media: Quantities of water, Polyvalent foam, BC powder, Carbon dioxide.</p> <p>5.1.2 Unsuitable extinguishing media: No unsuitable extinguishing media known.</p> <p>5.2 Special hazards arising from the substance or mixture: On burning: release of toxic and corrosive gases/vapours [phosphorus oxides, nitrous vapours, hydrogen chloride, carbon monoxide, carbon dioxide]. May polymerize on exposure to temperature rise. On heating: release of toxic/combustible gases/vapours [hydrogen cyanide].</p> <p>5.3 Advice for firefighters:</p> <p>5.3.1 Instructions: If exposed to fire cool the closed container by spraying with water. Physical explosion risk: extinguish/cool from behind cover. Do not move the bed if exposed to heat. After cooling: persistent risk of physical explosion. Dilute toxic gases with water spray.</p> <p>5.3.2 Special protective equipment for firefighters: Goggles, Protective goggles, Head/neck protection, Protective clothing, Heat/fire exposure, compressed air/oxygen apparatus.</p>	
SECTION 6: Accidental release measures	
<p>6.1 Personal precautions, protective equipment and emergency procedures: Stop fighting and no smoking. No naked flames or sparks and explosion proof appliances and lighting equipment.</p> <p>6.1.1 Protective equipment for non-emergency personnel: See heading 8.2</p> <p>6.1.2 Protective equipment for emergency responders: Goggles, Protective goggles, Head/neck protection, Protective clothing. <u>Suitable protective clothing</u> See heading 8.2</p> <p>6.2 Environmental precautions: Dem up the solid spill. Use appropriate containment to avoid environmental contamination.</p> <p>6.3 Methods and material for containment and cleaning up: Allow product to solidify and remove it by mechanical means. Carefully collect the spill in a drum. Clean (metal) contaminated surfaces with acetone. The collected spill to the manufacturer's competent authority. Wash clothing and equipment after handling.</p> <p>6.4 Reference to other sections: See heading 8.3.</p>	
SECTION 7: Handling and storage	
<p>The information in this section is general in nature. It is applicable and available, exposure scenarios are attached in a annex. Always use the relevant exposure scenarios that correspond to your identified use.</p> <p>7.1 Precautions for safe handling: Use spark/expllosion proof appliances and lighting system. Use away from naked flames/heat. Use away from ignition sources/sparks. Gas/vapour heavier than air at 20°C. Observe very strict handling - avoid contact. Remove contaminated clothing immediately.</p> <p>7.2 Conditions for safe storage, including any incompatibilities:</p>	
Reason for revision: CLP	Publication date: 2008-01-07 Date of revision: 2013-02-25
Revision number: 0300	Product number: 47306 4 / 17

PU Foam B3																																																		
<p>- Persons already sensitized to isocyanates may develop allergic reactions when using this product.</p> <p>- Persons suffering from asthma, eye or skin problems should avoid contact, including dermal contact, with this product.</p> <p>- This product should not be used under conditions of poor ventilation unless a protective mask with an appropriate gas filter (type A1 according to standard EN 14387) is used.</p> <p>2.3 Other hazards:</p> <p>CLP May be ignited by sparks Gas/vapours present at floor level; ignition hazard Aerosol may explode under the effect of heat</p> <p>DS/D/DPD May be ignited by sparks Gas/vapours present at floor level; ignition hazard Aerosol may explode under the effect of heat</p>																																																		
SECTION 3: Composition/information on ingredients																																																		
<p>3.1 Substances: Not applicable</p> <p>3.2 Mixtures:</p>																																																		
<table border="1"> <thead> <tr> <th>Name (REACH Registration No)</th> <th>CAS No. (EC No)</th> <th>Conc. (%)</th> <th>Classification according to GSD/DP/CLP</th> <th>Classification according to CLP</th> <th>Note</th> <th>Remarks</th> </tr> </thead> <tbody> <tr> <td>tris[2-chloro-1-methyl-ethyl] phosphite [03-2199477-56-34]</td> <td>15674-84-3 257-135-7</td> <td>0% < 0.05%</td> <td>Xn, P22</td> <td>Acute Tox. 4; H302</td> <td>[1] [10]</td> <td>Constituent</td> </tr> <tr> <td>poly(methylene poly(methyl isocyanate) [-])</td> <td>9046-27-9</td> <td>> 2.0%</td> <td>Ca. 2, Ca. 3, P40 Xn, P20-48/20 Xn, P36/37/38 P43/43</td> <td>Carc. 2; H351 Acute Tox. 4; H332 STOT RE 3; H373 Eye Irrit. 2; H336 STOTS RE 3; H335 Skin Irrit. 2; H315 Respir. Sens. 1; H334 SWH 3; H410</td> <td>[1] [P] [10]</td> <td>UVCB</td> </tr> <tr> <td>propene [-]</td> <td>44-99-6 200-272-9</td> <td>0% < 0.10%</td> <td>P; P12</td> <td>Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280</td> <td>[1] [P] [10]</td> <td>Propellant</td> </tr> <tr> <td>isobutene [-]</td> <td>75-28-3 200-272-2</td> <td>0% < 0.05%</td> <td>P; P12</td> <td>Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280</td> <td>[1] [P] [10]</td> <td>Propellant</td> </tr> <tr> <td>dimethyl ether [03-219472-132-97]</td> <td>33-20-6 200-063-8</td> <td>0% < 0.05%</td> <td>P; P12</td> <td>Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280</td> <td>[1] [P] [10]</td> <td>Propellant</td> </tr> <tr> <td>[1,3-butadiene, conc. 0.3%] [-]</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>[1] For P-phrases and H-phrases in full see heading 8.6 [2] Substance with a Community workplace exposure limit [10] Subject to restrictions of Annex XVII of Regulation (EC) No. 1907/2006</p>		Name (REACH Registration No)	CAS No. (EC No)	Conc. (%)	Classification according to GSD/DP/CLP	Classification according to CLP	Note	Remarks	tris[2-chloro-1-methyl-ethyl] phosphite [03-2199477-56-34]	15674-84-3 257-135-7	0% < 0.05%	Xn, P22	Acute Tox. 4; H302	[1] [10]	Constituent	poly(methylene poly(methyl isocyanate) [-])	9046-27-9	> 2.0%	Ca. 2, Ca. 3, P40 Xn, P20-48/20 Xn, P36/37/38 P43/43	Carc. 2; H351 Acute Tox. 4; H332 STOT RE 3; H373 Eye Irrit. 2; H336 STOTS RE 3; H335 Skin Irrit. 2; H315 Respir. Sens. 1; H334 SWH 3; H410	[1] [P] [10]	UVCB	propene [-]	44-99-6 200-272-9	0% < 0.10%	P; P12	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280	[1] [P] [10]	Propellant	isobutene [-]	75-28-3 200-272-2	0% < 0.05%	P; P12	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280	[1] [P] [10]	Propellant	dimethyl ether [03-219472-132-97]	33-20-6 200-063-8	0% < 0.05%	P; P12	Flam. Gas 1; H220 Press. Gas - Liquefied gas; H280	[1] [P] [10]	Propellant	[1,3-butadiene, conc. 0.3%] [-]						
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SECTION 4: First aid measures																																																		
<p>4.1 Description of first aid measures:</p> <p>General: Check the vital functions. Unconscious: maintain adequate airway and respiration. Respiratory arrest: artificial respiration or oxygen. Cardiac arrest: perform resuscitation. Victim conscious with laboured breathing: half-seated. Victim in shock: on his back with legs slightly raised. Vomiting: prevent asphyxiation prone position. Prevent cooling by covering the victim (no warming up). Keep watching the victim. Give psychological aid. Keep the victim calm, avoid physical strain. Depending on the victim's condition: doctor/doctor.</p> <p>After inhalation: Remove the victim into fresh air. Respiratory problems: consult doctor/medical advice. After skin contact: Wash immediately with lots of water. Take victim to a doctor if irritation persists. After eye contact: Rinse immediately with plenty of water. Do not apply neutralizing agents. Take victim to an ophthalmologist if irritation persists. After ingestion: Rinse mouth with water. Immediately after ingestion: give lots of water to drink. Do not induce vomiting. Consult a doctor/medical advice if you feel unwell.</p>																																																		
Reason for revision: CLP	Publication date: 2008-01-07 Date of revision: 2013-02-25																																																	
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SC Auto (Myanmar) Co., Ltd.

PU Foam B3

2.2 Label elements:

Labelling according to Regulation EC No 1272/2008 (CLP)

Contains polymethylene polyphenyl isocyanate.

Signal word: Danger

H-statements

H222	Extremely flammable aerosol.
H351	Suspected of causing cancer.
H373	May cause damage to organs through prolonged or repeated exposure if inhaled.
H339	Causes serious eye irritation.
H335	May cause respiratory irritation.
H335	Causes skin irritation.
H334	May cause allergy or asthma symptoms or breathing difficulties if inhaled.
H317	May cause an allergic skin reaction.



P-statements

P301	If medical advice is needed, have product container or label at hand.
P302	Keep out of reach of children.
P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P251	Pressurized container. Do not pierce or burn, even after use.
P280	Wear protective gloves and eye protection/face protection.
P260	Do not breathe spray.
P309 + P311	If exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.
P410 + P412	Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122°F.
P501	Dispose of contents/container to manufacturer/competent authority.

Supplemental information

- Persons already sensitised to diisocyanates may develop allergic reactions when using this product.
- Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
- This product should not be used under conditions of poor ventilation unless a protective mask with an appropriate gas filter (i.e. type A1 according to standard EN 14387) is used.

Labelling according to Directive 67/548/EEC-1999/45/EC (DSD/DPD)

Extremely flammable Harmful

Contains: polymethylene polyphenyl isocyanate.

R-phrases

20	Harmful by inhalation
36/37/38	Irritating to eyes, respiratory system and skin
40	Limited evidence of a carcinogenic effect
42/43	May cause sensitisation by inhalation and skin contact
45/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation

S-phrases

(02)	(Keep out of the reach of children)
16	Keep away from sources of ignition - No smoking
23	Do not breathe spray
36/37	Wear suitable protective clothing and gloves
45	In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible)
51	Use only in well-ventilated areas
(65)	In case of accident by inhalation: remove casualty to fresh air and keep at rest

Additional recommendations

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C.
Do not pierce or burn, even after use.
Do not spray on a naked flame or any incandescent material.
Contains isocyanates. See information supplied by the manufacturer.


Reason for revision: CLP

Publication date: 2009-01-07
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SAFETY DATA SHEET

Based upon Regulation (EC) No. 1907/2006, as amended by Regulation (EC) No. 453/2010

PU Foam B3

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier:

Product name	: PU Foam B3
Registration number REACH	: Not applicable (mixture)
Product type REACH	: Mixture

1.2 Relevant identified uses of the substance or mixture and uses advised against:

1.2.1 Relevant identified uses:
polyurethane

1.2.2 Uses advised against:
No uses advised against known

1.3 Details of the supplier of the safety data sheet:

Supplier of the safety data sheet:

SODAL N.V.
Ewerdogenlaan 18-20
B-2900 Turnhout
Tel: +32 34 42 42 31
Fax: +32 34 44 39 71
msds@soudal.com

Manufacturer of the product:

SODAL N.V.
Ewerdogenlaan 18-20
B-2900 Turnhout
Tel: +32 34 42 42 31
Fax: +32 34 44 39 71
msds@soudal.com

1.4 Emergency telephone number:
24h/24h: +32 34 58 45 45 (BIG) (Telephone advice: English, French, German, Dutch)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture:

2.1.1 Classification according to Regulation EC No 1272/2008
The classification of the mixture is not yet evaluated according to CLP

Class	Category	Hazard statements
Flam. Aerosol	category 1	H222: Extremely flammable aerosol.
Carc.	category 2	H351: Suspected of causing cancer.
STOT RE	category 2	H373: May cause damage to organs through prolonged or repeated exposure if inhaled.
Eye Irrit.	category 2	H339: Causes serious eye irritation.
STOT SE	category 3	H335: May cause respiratory irritation.
Skin Irrit.	category 2	H335: Causes skin irritation.
Resp. Sens.	category 1	H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Skin Sens.	category 1	H317: May cause an allergic skin reaction.

2.1.2 Classification according to Directive 67/548/EEC-1999/45/EC
Classified as dangerous in accordance with the criteria of Directives 67/548/EEC and 1999/45/EC

Carc. Cat. 3, R40 - Limited evidence of a carcinogenic effect
F+; R12 - Extremely flammable.
Xn; R20 - 48/20 - Harmful by inhalation. Harmful: danger of serious damage to health by prolonged exposure through inhalation.
Xi; R36/37/38 - Irritating to eyes, respiratory system and skin.
R42/43 - May cause sensitisation by inhalation and skin contact.

Created by: Brandveerinformatiecentrum voor gevaarlijke stoffen vzw (BIG)
Technische Schoolstraat 43 A, B-2440 Geel
http://www.big.be
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Initial Environmental Examination Report
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SAFETY DATA SHEET
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R134a


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Glossary


WEL Workplace Exposure Limit (UK HSE EH40)
 COM The company aims to control exposure in its workplace to this limit
 TLV The company aims to control exposure in its workplace to the ACGIH limit
 TLV-C The company aims to control exposure in its workplace to the ACGIH Ceiling limit
 MAK: The company aims to control exposure in its workplace to the German limit
 Sk: Can be absorbed through the skin
 Sen: Capable of causing respiratory sensitisation
 Bmgv: Biological monitoring guidance value (UK HSE EH40)

Hazard statement(s)

H280: Contains gas under pressure; may explode if heated.



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Effect on effluent treatment Discharges of the product will enter the atmosphere and will not result in long term aqueous contamination.

13. Disposal considerations

Recommended Best to recover and recycle. If this is not possible, destruction is to be in an approved facility which is equipped to absorb and neutralise acid gases and other toxic processing products.

14. Transport information

Hazard label



Road/rail	
UN No.	3159
ADR/RID Class	2.2
ADR/RID Proper Shipping Name	1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R134a)
Sea	
IMDG Class	2.2
Marine Pollutant	Not classified as a marine pollutant
EmS Code	FC-SV
Air	
ICAO/IATA	2.2

15. Regulatory information

European Regulations


Special restrictions The fluorinated greenhouse gas R134a may be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases covered by the Koyoto Protocol. The fluorinated greenhouse gases in containers may not be vented to the atmosphere.

Regulation (EC) No.842/2006 of the European Parliament and the Council on certain fluorinated greenhouse gases.

Directive 2006/40/EC of the European Parliament and the Council relating to emissions from air-conditioning systems in motor vehicles and amending Council Directive 70/156/EC.

16. Other information

This datasheet was prepared in accordance with Regulation (EC) No. 1907/2006.




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Email: info@singsweebee.com Website: www.singsweebee.com

SAFETY DATA SHEET
According to Regulation (EC) No.1907/2006

R134a

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9. Physical and chemical properties

Form	Liquefied gas
Colour	Colourless
Odour	Slight ethereal
Solubility (water)	Slightly soluble
Solubility (other)	Soluble in: alcohols, chlorinated solvents, polyethylene glycol
Boiling point (°C)	-26.2
Melting point (°C)	-101
Vapour density (air=1)	3.66 at normal boiling point
Vapour pressure (mm Hg)	4270 at 20°C
Specific gravity	1.22 at 20°C

10. Stability and reactivity

Hazardous reactions Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Incompatible materials: finely divided metals, magnesium and alloys containing more than 2% magnesium. Can react violently if in contact with alkali metals and alkaline earth metals - sodium, potassium, barium.

Hazardous decomposition product(s) Hydrogen Fluoride by thermal decomposition and hydrolysis

11. Toxicological information

Inhalation LC50 (rat) (4 hrs) > 500,000 ppm (2,080,000 mg/m³). High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation.

Skin contact Liquid splashes or spray may cause freeze burns. Unlikely to be hazardous by skin absorption.

Eye contact Liquid splashes or spray may cause freeze burns.


Ingestion Highly unlikely - but should this occur freeze burns will result

Long term exposure A lifetime inhalation study in rats has shown that exposure to 50,000 ppm resulted in benign tumours of the testis. The increased tumour incidence was observed only after prolonged exposure to high levels and is considered not to be of relevance to humans occupationally exposed to HFC 134a at or below the occupational exposure limit.


12. Ecological information

Environmental fate and distribution High tonnage material produced in wholly contained systems. High tonnage material used in open systems. Gas.

Persistence and degradation Decomposes comparatively rapidly in the lower atmosphere (troposphere). Atmospheric lifetime is 14 years. Products of decomposition will be highly dispersed and hence will have a very low concentration. Does not influence photochemical smog (i.e. is not a VOC under the terms of the UNECE agreement). Does not deplete ozone. Has a Global warming Potential (GWP) of 1300 (relative to a value of 1 for carbon dioxide at 100 years) according to Annex I of Regulation 842/2006 on certain fluorinated greenhouse gases. Values in Annex I are taken from the third assessment report (TAR) of the Intergovernmental Panel on Climate Change (2001 IPCC GWP values), United Nations Framework Convention on Climate Change (UNFCCC) reporting GWP is 1300.



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SING SWEE BEE ENTERPRISE PTE LTD

Company Registration No: 199206229C
No. 6 Attap Valley Road, Singapore 759906 Tel: (65) 6752 2148 Fax: (65) 6752 1892
Email: info@singsweebee.com Website: www.singsweebee.com

SAFETY DATA SHEET
According to Regulation (EC) No.1907/2006

R134a

Version: CLP01 Date: 01 Jan 2017 Page 3 of 6

7. Handling and storage

Handling Avoid inhalation of high concentrations of vapours. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Atmospheric concentrations well below the occupational exposure limit can be achieved by good occupational hygiene practice. The vapour is heavier than air, high concentrations may be produced at low levels where general ventilation is poor. In such cases, provide adequate ventilation or wear suitable respiratory protective equipment with positive air supply. Avoid contact with naked flames and hot surfaces as corrosive and very toxic decomposition products can be formed. Avoid contact between the liquid and skin and eyes.

Avoid venting to atmosphere.

The fluorinated greenhouse gas R134a may be supplied in returnable containers (drums/cylinders). The container contains fluorinated greenhouse gases covered by the Kyoto Protocol. Fluorinated greenhouse gases in contains may not be vented to the atmosphere. (Regulation (EC) No. 842/2006 of the European Parliament and the Council on certain fluorinated greenhouse gases).


Process Hazards Liquid refrigerant transfers between refrigerant containers and to and from systems can result in static generation. Ensure adequate earthing. Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Care must be taken to mitigate the risk of developing high pressures in systems caused by a temperature rise when liquid is trapped between closed valves or in cases where containers have been overfilled.

Storage Keep in a well ventilated place away from fire risk and avoid sources of heat such as electric or steam radiators. Avoid storing near to the intake of air conditioning units, boiler units and open drains.


Specific use Subject to Member State regulations, applicable uses are: refrigerant, blowing agent, propellant, solvent.

8. Exposure controls / personal protection

General Wear suitable protective clothing, gloves and eye/face protection. Wear thermal insulating gloves when handling liquefied gases. In cases of insufficient ventilation, where exposure to high concentrations of vapour is possible, suitable respiratory protective equipment with positive air supply should be used.




Eye Protection



Gloves

Occupational exposure limits

OEL	CAS No.	LTEL (8hr TWA ppm)	LTEL (8hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
1,1,1,2-Tetrafluoroethane	000811-97-2	1000	4240	-	-	WEL




A member of Sing Swee Bee Group

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.



新瑞美企业私人有限公司
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4. First aid measures

 The first aid advice given for skin contact, eye contact and ingestion is applicable following exposures to the liquid or spray. Also see section 11.

Inhalation Remove patient from exposure, keep warm and at rest. Administer oxygen if necessary. Apply artificial respiration if breathing has ceased or shows signs of failing. In the event of cardiac arrest apply external cardiac massage. Obtain immediate medical attention.

Skin contact Thaw affected areas with water. Remove contaminated clothing. Caution: clothing may adhere to the skin in the case of freeze burns. After contact with skin, wash immediately with plenty of warm water. If irritation or blistering occur, obtain medical attention.

Eye contact Immediately irrigate with eyewash solution or clean water, holding the eyelids apart for at least 10 minutes. Obtain immediate medical attention.

Ingestion Unlikely route of exposure. Do not induce vomiting. Provided the patient is conscious, wash out mouth with water and give 200-300ml (half a pint) of water to drink. Obtain immediate medical attention.

Further medical treatment Symptomatic treatment and supportive therapy as indicated. Adrenaline and similar sympathomimetic drugs should be avoided following exposure as cardiac arrhythmia may result with possible subsequent cardiac arrest.

5. Fire-fighting measures

General HFC 134a is not flammable in air under ambient conditions of temperature and pressure. Certain mixtures of HFC 134a and air when under pressure may be flammable. Mixtures of HFC 134a and air under pressure should be avoided. Certain mixtures of HFCs and chlorine may be flammable or reactive under certain conditions. Thermal decomposition will evolve very toxic and corrosive vapours (hydrogen fluoride). Containers may burst if overheated.

Extinguishing media As appropriate for surrounding fire. Keep fire exposed containers cool by spraying with water.



Fire Fighting Protective Equipment A self contained breathing apparatus and full protective clothing must be worn in fire conditions. Also see section 8.

6. Accidental release measures


Personal protection Ensure suitable personal protection (including respiratory protection) during removal of spillages. Also see section 8.

General Provided it is safe to do so, isolate the source of the leak. Allow small spillages to evaporate provided there is adequate ventilation. Large spillages: Ventilate area. Contain spillages with sand, earth or any suitable adsorbent material. Prevent liquid from entering drains, sewers, basements and workpits since the vapour may create a suffocating atmosphere.



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新瑞美企业私人有限公司
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SAFETY DATA SHEET
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R134a

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1. Identification of the substance / preparation and company / undertaking

Product name: R134a

Use: Subject to Member State regulations, applicable uses are refrigerant, blowing agent, propellant, solvent

2. Hazards identification


Low acute toxicity. High exposures may cause an abnormal heart rhythm and prove suddenly fatal. Very high atmospheric concentrations may cause anaesthetic effects and asphyxiation. Liquid splashes or spray may cause freeze burns to skin and eyes.

EC Classification
EC Directive 67/548/EEC: Not classified
Regulation (EC) No. 1272/2008 (CLP): Gases under pressure - Liquefied gas

Label Elements

Hazard: statement(s): H280: Contains gas under pressure; may explode if heated

Signal word(s): Warning

Hazard pictogram(s): 

GHS04





Precautionary statement(s): P410 + P403: Protect from sunlight. Store in a well-ventilated place.

3. Composition / information on ingredients

Alternative names: 1,1,1,2-tetrafluoroethane (HFC 134a), R134a





Hazardous ingredient(s)

Hazardous ingredient	% (w/w)	CAS No. statement(s)	EC No.	Hazard symbol(s) and hazard
1,1,1,2-tetrafluoroethane (HFC 134a)	100	000811-97-2	212-377-0	GHS04, H280

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APPENDIX (11): License for Chemical and Related Substances





 <p>Central Leading Board</p>	<p>ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဗဟိုကြီးကြပ်ရေးအဖွဲ့</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">ပုံစံ</td> <td style="text-align: center;">၂</td> </tr> <tr> <td style="padding: 2px;">လုပ်ငန်း အရေအတွက် (မျိုး)</td> <td style="text-align: center;">၈</td> </tr> <tr> <td style="padding: 2px;">သက်တမ်း</td> <td style="text-align: center;">၂နှစ်</td> </tr> </table>	ပုံစံ	၂	လုပ်ငန်း အရေအတွက် (မျိုး)	၈	သက်တမ်း	၂နှစ်
	ပုံစံ	၂						
	လုပ်ငန်း အရေအတွက် (မျိုး)	၈						
သက်တမ်း	၂နှစ်							
<p>ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများဆိုင်ရာ လုပ်ငန်းလိုင်စင်</p> <p>လိုင်စင်အမှတ် <u>၀၀၀၆၆၄</u></p> <p>(နည်းဥပဒေ ၁၈)</p> <div style="text-align: right; margin-right: 50px;">  </div> <p style="text-align: center; margin-top: 20px;">ရက်စွဲ၊ ၂၀၂၁ ခုနှစ်၊ မေလ ၃၁ ရက်</p> <p>၁။ <u>၁၀-၁၀-၂၀၂၀</u> ရက်စွဲပါ လျှောက်လွှာအမှတ် <u>၉၇၈</u> ဖြင့် လုပ်ငန်းလိုင်စင် လျှောက်ထားသော <u>SC Auto (Myanmar) Co., Ltd.</u> ကုမ္ပဏီ/ လုပ်ငန်းမှ ဦး/ဒေါ် <u>Ms.Lee Swee Hoon</u> (ဘ) <u>Mr.Lee Yea Kong</u> နိုင်ငံအား စိစစ်ရေးကော်မရှင်/နိုင်ငံခြားသားမှတ်ပုံတင်အမှတ် <u>K1363143R</u> အား ဤ လုပ်ငန်းလိုင်စင်ကို ထုတ်ပေးလိုက်သည်။</p> <p>၂။ ခွင့်ပြုသည့်လုပ်ငန်းအမျိုးအစား <u>သိုလှောင်ခြင်း၊ သုံးစွဲခြင်း၊ တင်သွင်းခြင်း၊ တင်ပို့ခြင်း၊ သယ်ယူပို့ဆောင်ခြင်း၊ လက်ဝယ်ထား</u> <u>ရှိခြင်း၊ ဖြန့်ဖြူးခြင်း၊ ဝယ်ယူခြင်း။</u></p> <p>၃။ လုပ်ငန်းလုပ်ကိုင်ခွင့်ပြုသည့် ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ၏ အမျိုးအမည်များ ထားရှိမည့်နေရာ (ပြည့်စုံစွာဖော်ပြရန်) <u>အမှတ်(၁၈၈၊ ၁၈၉)၊ (၁၀)လမ်း၊ ရန်ကုန်</u> <u>စက်မှုဇုန်၊ ဇေကျာဝင်း၊ မင်္ဂလာဒုံမြို့နယ်၊</u> <u>ရန်ကုန်တိုင်းဒေသကြီး။</u></p> <p>၄။ လုပ်ငန်းလိုင်စင်သက်တမ်းကုန်ဆုံးမည့်နေ့ရက် <u>၃၁-၅-၂၀၂၃</u></p> <div style="text-align: center; margin-top: 20px;">  <div style="margin-left: 200px;">  ဥက္ကဋ္ဌ ဗဟိုကြီးကြပ်ရေးအဖွဲ့ </div> </div>								

စည်းကမ်းချက်များ

လိုင်စင်ရရှိသူသည် အောက်ဖော်ပြပါ စည်းကမ်းချက်များကို လိုက်နာဆောင်ရွက်ရမည်-

- ၁။ ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေးဥပဒေအရ ထုတ်ပြန်သော နည်းဥပဒေ၊ အမိန့်ကြော်ငြာစာ၊ အမိန့်၊ ညွှန်ကြားချက်နှင့် လုပ်ထုံးလုပ်နည်းများပါ စည်းကမ်း ချက်များကို လိုက်နာဆောင်ရွက်ခြင်း၊
- ၂။ လိုင်စင်ကို လုပ်ငန်းခွင်၏ မြင်သာသည့်နေရာ၌ ချိတ်ဆွဲထားခြင်း၊
- ၃။ လုပ်ငန်းနှင့်သက်ဆိုင်သည့် သင်တန်းများ တက်ရောက်ပြီးကြောင်း အထောက်အထားများကို မြင်သာသည့်နေရာ၌ ချိတ်ဆွဲထားခြင်း၊
- ၄။ အန္တရာယ်ရှိသည့်အကြောင်းအရာများ ဖော်ပြထားသော စာတန်း သို့မဟုတ် ရုပ်ပုံအမှတ်အသား တံဆိပ်များ ချိတ်ဆွဲထားခြင်း၊
- ၅။ လုံခြုံရေးကိရိယာ၊ ကိုယ်ခန္ဓာကာကွယ်ရေးကိရိယာနှင့် ဝတ်စုံများ လုံလောက်စွာထားရှိခြင်း၊
- ၆။ မတော်တဆဖြစ်ပွားမှု လျော့နည်းစေရန်နှင့် ကင်းရှင်းစေရန် ဆောင်ရွက်ထားခြင်း၊
- ၇။ ထိခိုက်ဆုံးရှုံးမှုအတွက် လျော်ကြေးပေးနိုင်ရန် အာမခံထားခြင်း၊
- ၈။ အန္တရာယ်ကင်းရှင်းစေရေး ညွှန်ကြားချက်များ လိုက်နာခြင်း၊
- ၉။ အလုပ်လုပ်ကိုင်သူများ၏ ကျန်းမာရေးစစ်ဆေးချက်မှတ်တမ်းများ ထိန်းသိမ်းထားခြင်း၊
- ၁၀။ အန္တရာယ်ရှိသည့် ပစ္စည်းများသိုလှောင်ခွင့်ရပါက သက်ဆိုင်ရာမြို့နယ် အထွေထွေအုပ်ချုပ်ရေး ဦးစီးဌာနသို့ ခွင့်ပြုသည့်အကြောင်းကြားစာ မိတ္တူပေးပို့ခြင်း၊
- ၁၁။ မီးဘေးအန္တရာယ်ဖြစ်စေတတ်သည့်ပစ္စည်း သို့မဟုတ် ပေါက်ကွဲစေတတ်သည့်ပစ္စည်းများ အသုံး ပြုသောလုပ်ငန်းဖြစ်ပါကသက်ဆိုင်ရာမီးသတ်ဦးစီးဌာန၏ လမ်းညွှန်သဘောတူညီချက် ကြိုတင် ရယူခြင်း၊
- ၁၂။ ပြည်တွင်းတွင် သယ်ယူပို့ဆောင်သည့်အခါ သတ်မှတ်ထားသည့် စည်းကမ်းချက်များနှင့်အညီ ခွင့်ပြုထားသော ပမာဏနှင့် နေရာသို့ သယ်ဆောင်ခြင်း၊
- ၁၃။ ခွင့်ပြုသည့်နေရာ ပြောင်းလဲသယ်ယူပို့ဆောင်လိုပါက ဗဟိုကြီးကြပ်ရေးအဖွဲ့ထံမှ ခွင့်ပြုချက် ထပ်မံရယူခြင်း၊
- ၁၄။ စက်ပစ္စည်းကိရိယာများ၏ လုံခြုံစိတ်ချမှု၊ ခံနိုင်ရည်ရှိမှုနှင့် ဘေးအန္တရာယ်ထိခိုက်နိုင်မှု ရှိ၊ မရှိကို သက်ဆိုင်ရာကြီးကြပ်ရေးအဖွဲ့နှင့် စစ်ဆေးရေးအဖွဲ့များ၏ စစ်ဆေးမှုခံယူခြင်း၊
- ၁၅။ စွန့်ပစ်ပစ္စည်းများကို စနစ်တကျသန့်စင်ပြီးမှ စွန့်ပစ်ခြင်း သို့မဟုတ် စနစ်တကျ စုပုံထားခြင်း၊
- ၁၆။ လုပ်ငန်းကြောင့် ပတ်ဝန်းကျင်ထိခိုက်မှုမရှိစေရန် ပတ်ဝန်းကျင်ထိန်းသိမ်းရေးနှင့် သက်ဆိုင် သည့် ဥပဒေများ၊ နည်းဥပဒေများနှင့်အညီ လိုက်နာဆောင်ရွက်ခြင်း၊
- ၁၇။ ထည့်သွင်းထုပ်ပိုးထားသည့် ပစ္စည်းများပေါ်တွင် အန္တရာယ်သတိပေး အမှတ်အသားတံဆိပ်ကပ် ခြင်း၊
- ၁၈။ လုပ်ငန်းလုပ်ကိုင်သည့် ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ၏ အာနိသင်၊ အရည်အသွေးနှင့် စံချိန်စံညွှန်းတို့ကို မမှန်မကန်ကြော်ငြာ၍ မရောင်းချခြင်း။

APPENDIX (12): Registration Certificate for Chemical and Related Substances

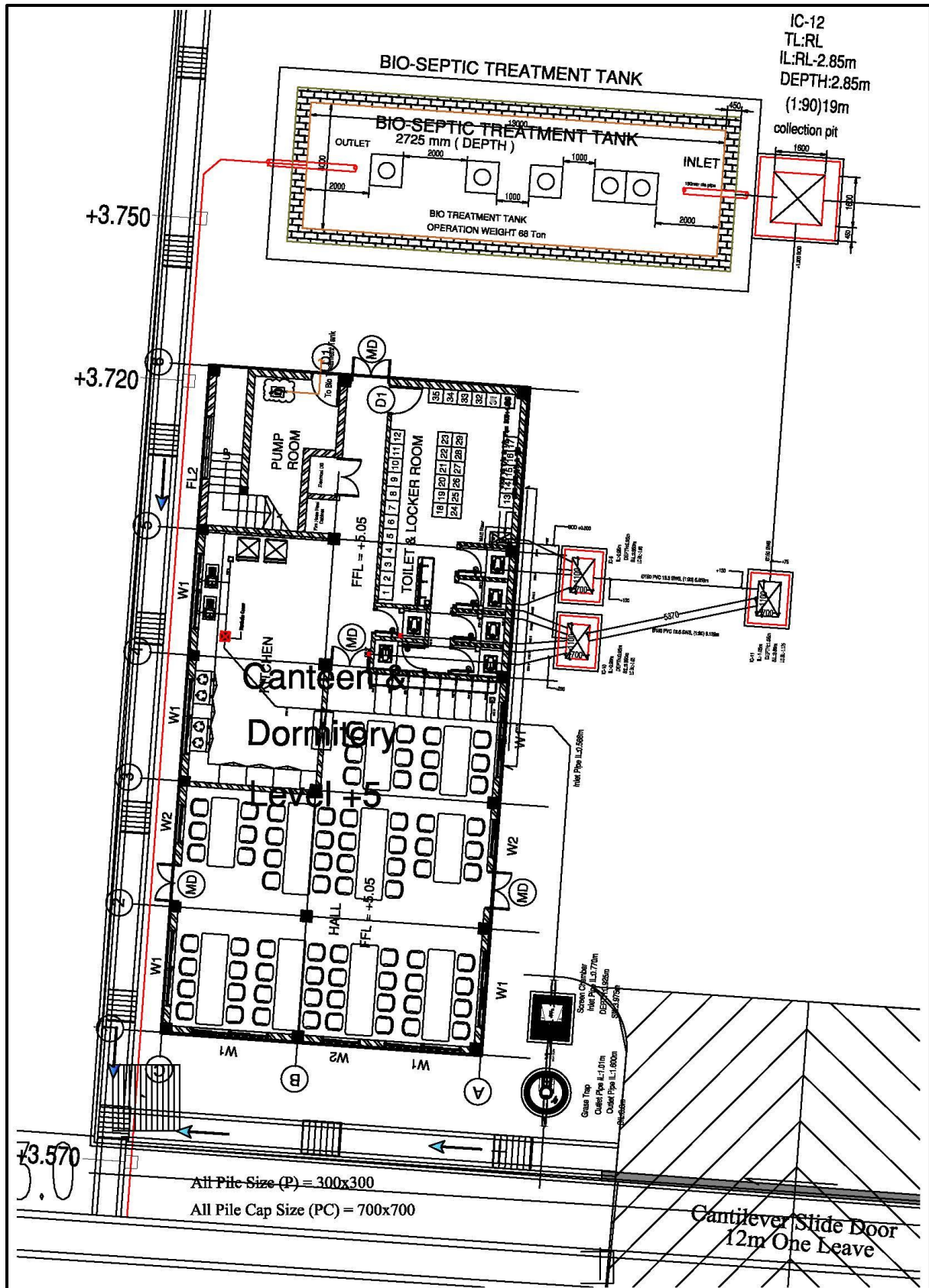
 <p>Central Leading Board</p>	<p>ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေး ဗဟိုကြီးကြပ်ရေးအဖွဲ့</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="font-size: small;">ပုံစံ</td> <td style="text-align: center;">၈</td> </tr> <tr> <td style="font-size: small;">ဓာတုပစ္စည်းအရေအတွက်</td> <td style="text-align: center;">၂၃ (မျိုး)</td> </tr> <tr> <td style="font-size: small;">သက်တမ်း</td> <td style="text-align: center;">၂ နှစ်</td> </tr> </table>	ပုံစံ	၈	ဓာတုပစ္စည်းအရေအတွက်	၂၃ (မျိုး)	သက်တမ်း	၂ နှစ်	
ပုံစံ	၈								
ဓာတုပစ္စည်းအရေအတွက်	၂၃ (မျိုး)								
သက်တမ်း	၂ နှစ်								
<p>ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများ မှတ်ပုံတင်လက်မှတ်</p> <p>မှတ်ပုံတင်လက်မှတ်အမှတ်စဉ် <u> ၀၀၁၀၉၄ </u></p> <p>(နည်းဥပဒေ ၂၃)</p>									
									
<p>ရက်စွဲ၊ ၂၀၂၁ ခုနှစ်၊ ဇွန်လ ၂၄ ရက်</p>									
<p>၁။ <u> ၁-၆-၂၀၂၁ </u> ရက်စွဲပါ လျှောက်လွှာအမှတ် <u> ၀၀၁၁၀၆ </u> ဖြင့် မှတ်ပုံတင်ခွင့်ပြုရန် လျှောက်ထားသော ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများအား မြန်မာနိုင်ငံ အတွင်း အသုံးပြုရန် မှတ်ပုံတင်ပြီးဖြစ်သည်။</p>									
၂။ တာဝန်ခံလျှောက်ထားသူ၏အမည်	<u> Ms. Lee Swee Hoon </u>								
၃။ နိုင်ငံသားစိစစ်ရေးကတ်ပြားအမှတ်	<u> K1363143R </u>								
၄။ သို့မဟုတ် နိုင်ငံခြားသားမှတ်ပုံတင်အမှတ်	<u> No.188 & 189, 10th Street, Yangon Industrial Zone, Mingaladon Township, Yangon. </u>								
၅။ အမြဲတမ်းနေရပ်လိပ်စာ	<u> 09-254088442 </u>								
၆။ ဆက်သွယ်ရန်ဖုန်းနံပါတ် သို့မဟုတ် ဖက်စ်(Fax)နံပါတ် သို့မဟုတ် e-mail လိပ်စာ	<u> Waiphyo.aung@ sc.auto.com.sg </u>								
၇။ လုပ်ငန်းလိပ်စာ	<u> အမှတ် (၁၈၈၊ ၁၈၉) (၁၀)လမ်း၊ ရန်ကုန်စက်မှုဇုန်၊ ဧကမ္ဘာဝင်း၊ မင်္ဂလာဒုံမြို့နယ်၊ ရန်ကုန်တိုင်းဒေသကြီး။ </u>								
၈။ ဆက်သွယ်ရန်လုပ်ငန်းဖုန်းနံပါတ် သို့မဟုတ် ဖက်စ်(Fax)နံပါတ် သို့မဟုတ် e-mail လိပ်စာ	<u> နေ့ကဆက်တွဲပါအတိုင်းဖြစ်ပါသည်။ </u>								
၉။ မှတ်ပုံတင်ခွင့်ပြုသောဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများ (နောက်ဆက်တွဲစာရင်းအရ)	<u> ၂၄ - ၆- ၂၀၂၃ </u>								
၁၀။ သက်တမ်းကုန်ဆုံးမည့် နေ့ရက်	<u> ၂၄ - ၆- ၂၀၂၃ </u>								
									
<p> ဥက္ကဋ္ဌ ဗဟိုကြီးကြပ်ရေးအဖွဲ့</p>									

စည်းကမ်းချက်များ

မှတ်ပုံတင်လက်မှတ်ရရှိသူသည် အောက်ဖော်ပြပါ စည်းကမ်းချက်များကို လိုက်နာဆောင်ရွက်ရမည်-

- ၁။ ဓာတုပစ္စည်းနှင့်ဆက်စပ်ပစ္စည်းများအန္တရာယ်မှ တားဆီးကာကွယ်ရေးဥပဒေအရ ထုတ်ပြန်သော နည်းဥပဒေ၊ အမိန့်ကြော်ငြာစာ၊ အမိန့်၊ ညွှန်ကြားချက်နှင့် လုပ်ထုံးလုပ်နည်းများပါ စည်းကမ်းချက်များကို လိုက်နာခြင်း၊
- ၂။ မှတ်ပုံတင်ထားသည့်စာရင်းတွင် ပါရှိသော်လည်း အသုံးမပြုလိုသော ပစ္စည်းများရှိပါက ဗဟိုကြီးကြပ်ရေးအဖွဲ့သို့ အသိပေးတင်ပြခြင်း၊
- ၃။ မှတ်ပုံတင်ထားသည့်စာရင်းတွင် မပါရှိသည့်ပစ္စည်းများ အသုံးပြုခြင်း၊ မှတ်ပုံတင်ထားသည့် ပစ္စည်းများ၏ ကုန်အမှတ်တံဆိပ် သို့မဟုတ် အမျိုးအမည် ပြောင်းလဲခြင်း၊ ပါဝင်မှုပမာဏ ပြောင်းလဲခြင်း၊ အရည်အသွေးအာမခံချက်နှင့် စံချိန်စံညွှန်းပြောင်းလဲခြင်းနှင့် အမျိုးသားအဆင့် ဓာတုပစ္စည်းနှင့် ဆက်စပ်ပစ္စည်းများစာရင်းတွင် မပါရှိသည့်ပစ္စည်းသစ်များ အသုံးပြုရန်ရှိပါက မှတ်ပုံတင်လက်မှတ် ထပ်မံလျှောက်ထားခြင်း၊
- ၄။ လုပ်ငန်းနှင့်စပ်လျဉ်းသည့် အန္တရာယ်များကို တင်ပြခြင်း၊
- ၅။ လုပ်ငန်းလုပ်ကိုင်ရာတွင် အန္တရာယ်ကင်းရှင်းစေရန် ဆောင်ရွက်ထားရှိခြင်း၊
- ၆။ ပတ်ဝန်းကျင်ထိခိုက်မှုမရှိစေရန် စွန့်ပစ်ပစ္စည်းများကို စနစ်တကျသန့်စင်ပြီးမှ စွန့်ပစ်ခြင်း သို့မဟုတ် စနစ်တကျ စုပုံထားခြင်း။

APPENDIX (13): Sanitary Treatment System Insalltion Layout



APPENDIX (14): Essential First Aid Kit Supply List



ESSENTIAL FIRST AID KIT SUPPLIES LIST



800-221-9222



800-221-9222

ABOUT THIS GUIDE

This Ebook tackles the common question of what supplies are essential to keep in a first aid kit. The purpose of a first aid kit is to have supplies on hand to treat those minor injuries that happen like cuts, scrapes and burns. The essential list of first aid kit supplies include items that will stop bleeding, prevent infection and help relieve pain.

Because not everyone has medical training, there are lots of questions as to what first aid supplies are needed, what they treat and how they are used. The purpose of this guide is to answer common questions about first aid supplies and first aid kits. We want to make it easy for you to determine the list of first aid kit supplies that are perfect for you. As always, you should talk with your medical professional about any special supplies you may need to keep you in optimal health.



COMMON QUESTIONS

- 1 Why do I need a first aid kit?
- 2 What type of first aid kit do I need?
- 3 What essential items should I keep in my first aid kit?
- 4 How do I maintain/restock my first aid kit?
- 5 Where should I keep my first aid kit?



WHY DO I NEED

1 A FIRST AID KIT ?

A basic first aid kit can be used to help reduce blood loss, infection, and future medical complications. Having a first aid kit onhand allows you to immediately treat injuries so the body can begin to heal.

Everyone, including families, workers, teachers, campers, boaters, hikers, and travelers should keep a first-aid-kit close by to treat basic cuts, scrapes, burns, and other minor injuries.



WHAT TYPE OF FIRST AID KIT

2 DO I NEED?

When choosing which first aid kit is right for you, first determine when and where it will be used and if there are environmental factors that should be considered. For example, a boating first aid kit should be waterproof but a home first aid kit can be a nylon bag or compact box. If you need a first aid kit for a business, it's important to select a kit that can be mounted on a wall and easily accessible for employees.

When determining the right first aid kit for your use, consider how many people the first aid kit needs to treat and the possible injuries that are likely to occur. Select the kit with the appropriate first aid supplies to treat that number of people and injuries.



TYPES OF FIRST AID KITS

- HOME
- WORKPLACE / OSHA
- OUTDOOR RECREATION
- TRAVEL
- PERSONAL
- CAR/AUTO
- MARINE
- EMERGENCY PREPARE

WHAT ESSENTIAL ITEMS SHOULD

3 I KEEP IN MY FIRST-AID-KIT?

Every basic first aid kit should include the essential first aid supplies used to treat minor injuries including cuts, scrapes and burns. Depending on your use, you may want to include additional items that will treat possible injuries for your specific use including eye wash, cold packs, splints, CPR masks, gauze and medicines.

The following is a list of the basic first aid essentials that should be included in your first aid kit.



SEE WHAT ESSENTIAL ITEMS YOU SHOULD KEEP IN YOUR FIRST AID KIT



Bleeding Control

MFASCO
Health & Safety
800-221-9222



Band-aids

Keeping different shapes and sizes of bandages is always a good idea.



Sterile Gauze Pads:

Gauze pads absorb blood and protect the wound from infection.



Gauze Roll:

Wrap and protect a gauze pad or wound area from infection.



Non-Latex Gloves:

Reduce exposure from blood and other bodily fluids.



Large Pressure Bandage:

A combination of a thick gauze pads and gauze rolls stop bleeding.

Bleeding control supplies help stop bleeding and protect the wound from infection

Other

MFASCO
Health & Safety
800-221-9222



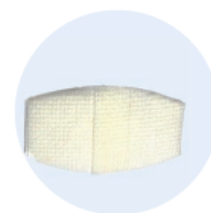
Antiseptic wipes:

Antiseptic wipes (Peroxide, Alcohol) to clean wounds.



Triple Antibiotic Ointment

Ointment used to help keep a wound site from getting infected.



Eye Pads:

Used to protect an injured eye and absorb fluid drainage.



Eye Wash:

Sterile wash solutions are perfect to help rinse the eye or a wound site.



CPR Shield:

Barrier protects both victim and rescuer from bodily fluids during CPR

Treating minor injuries includes cleaning, disinfecting, protection of the wound site and reducing bodily fluid exchange.

Strains + Sprains



800-221-9222



Tongue Depressors:

Used for splinting or even applying ointments.



Elastic Bandage

Used to help secure dressings, cold packs, wrap and protect an injured area.



Triangular bandage:

Use as a sling, tourniquet or even to help splinting.



Adhesive Tape:

First aid or medical tape, holds gauze dressings and splinting material in place



Cold Pack

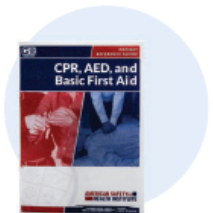
Instant, ready-to-use cold pack helps control swelling, sprains, fractures, burns and contusions.

Control swelling with cold therapy and wrap the injured area with elastic bandages or splinting material.

First Aid Tools



800-221-9222



First Aid Book:

Booklet offering pictures and instructions on how to give basic first aid.



Scissors:

Used to cut clothes, gauze or other items when providing first aid.



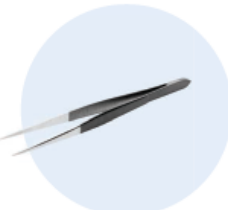
Thermometer:

Used to determine body temperature. It is an inexpensive and handy diagnostic tool.



Penlight:

This mini flashlight is perfect for looking in ears, or in throats.



Tweezers:

Remove splinters from under the skin.

First aid tools like an instruction book, instruments and diagnostic supplies help to quickly treat injuries.



Comfort items



Aspirin, Tylenol or Motrin:

Good for fever, swelling, pain and headaches



Antihistamine tablet:

Used for allergic reactions from food, insect bites and seasonal allergies.



Anti-diarrhea:

While traveling, consider including other meds like anti-diarrhea.



Hydrocortisone:

Treats skin irritations, redness and itchiness.



Sting Swabs:

Help provide relief from the discomfort of minor insect stings.

Consider including comfort items like pain relievers, cold tablets and stomach related medicines, especially while away from home.

HOW DO I MAINTAIN AND

4

RESTOCK MY FIRST AID KIT?



Use these five free helpful tools to maintain and restock your first aid kits and supplies at mfasco.com.



PRINTABLE CHECKLIST

Every first aid kit we make has a printable checklist. Find an existing first aid kit on our website similar to yours and print the checklist.



REFILL THIS KIT

Every first aid kit we make can be refilled one item at a time. Go to the product page, select "Refill This Kit" and add the items you need to restock.



REORDER LIST

This wish/saved list feature allows you to save kit refill items to a unique list which you can then print as a checklist.



RESTOCKIT

People who have a workplace first aid kit can use this visual refill first aid kit. Simply point, click, and add to cart.



MAKE A FIRST AID KIT

This free tool allows you to pick your own container and supplies, creating your own custom first aid kit print a checklist or reorder with a few clicks of the mouse.

WHERE SHOULD I KEEP 5 MY FIRST AID KIT?

- Ensure the supplies are stored in a central location
- Everyone should know where the first aid kit is stored
- Supplies should be easily accessible
- Every automobile should have a first aid kit



WE ARE HERE TO HELP

We are available to help you choose and refill your supplies.

Connect with us:

MFASCO Health and Safety

800-221-9222

customer.service@mfasco.com

www.mfasco.com



Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

APPENDIX (15): Health and Safety Procedure of the SC Auto (Myanmar) Co., Ltd

SC AUTO MYANMAR Co.,Ltd

BRIEFING On SAFETY



Objectives /

- To educate and instill safety awareness amongst all employees working in the factory
- To brief employees on some in-house safety rules & regulations.



Topics Covered

- ✓ Machine Safety
- ✓ Operating an Overhead Crane
- ✓ Operating of Forklift
- ✓ Work at Height
- ✓ Operating of Scissor Lift
- ✓ Hot Work
- ✓ Welding/Electrical Safety
- ✓ Fire Safety Awareness
- ✓ Good Housekeeping
- ✓ Personal Protective Equipment
- ✓ Reporting of Accident & Incident
- ✓ Others



SC AUTO - BRIEFING ON SAFETY

MACHINE SAFETY



SC AUTO

Summary of Machines in SC Auto

- ❖ ABB Robotics Welding Machine
- ❖ MAZAK 2D Laser Machine
- ❖ SOCO 3D Laser Machine
- ❖ SOCO Tube Bending Machine
- ❖ Ermaksan 2D Sheet Bending Machine (1st Floor)
- ❖ Yaskawa Motoman Robotic Welding Machine
- ❖ CNC Milling Machine
- ❖ CNC Turning Machine
- ❖ CNC conventional turning machine
- ❖ CNC conventional milling machine
- ❖ MAZAK Intenerex 200S (4 to 5 axis) CNC Machine
- ❖ Semi Auto Cutting Machine (Tube Cutting)
- ❖ Wire Processing Machine
- ❖ Overhead Crane
- ❖ Air Compressor
- ❖ Electric Arc Welding Machine
- ❖ MIG Welding Machine Migatron
- ❖ Hydraulic Pressbrake Machine
- ❖ Wheel Cutting Machine



- ❖ Scissor Lift (Manitou 78XE)
- ❖ Forklift
- ❖ Tsacker Nissan Ormic
- ❖ Pallet Jack
- ❖ Emanuel Lift Set
- ❖ Aluminium Cutting Machine
- ❖ Asada Bolt Machine
- ❖ Nissan Forklift
- ❖ Air Dryer ANGSTROM
- ❖ Glass Lifter
- ❖ Electric Power Hoist
- ❖ Hitachi Cutting Machine
- ❖ Everising Metal Cutting Bandsaw
- ❖ Way Train Bemato Metal Cutting Bandsaw
- ❖ Crown Lift Truck (Battery 30 V)
- ❖ Vertical Receiver Tank
- ❖ Folding Machine
- ❖ Man Lift



Personal Protective Equipment

face-shield



ear-muffs



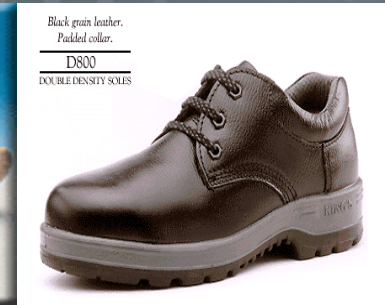
eye-goggles



gloves



safety shoes



SC AUTO

Operating of Machine

Only authorized & trained/certified operators are allowed to operate the machines



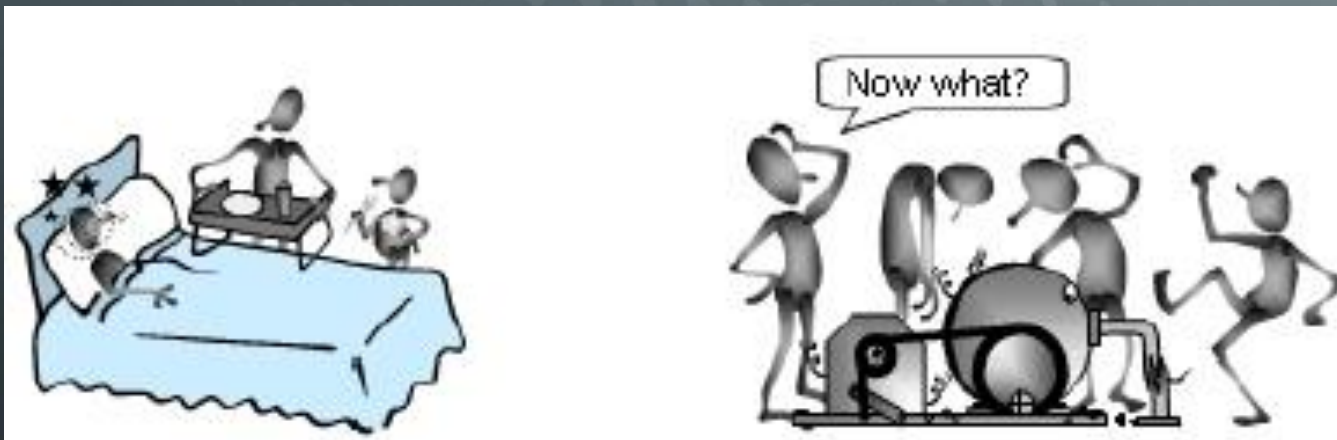
During operating of machines, PPE must be worn at all times.

All machines should be checked and maintained regularly by the individual employee in-charge .



Operating of Machine

If machine is out of order, employee in-charge must notified the maintenance team and their immediate supervisor immediately.



Machine Maintenance

- The maintenance department has put up the Daily, Monthly, Yearly checklist for all machines. Employee in charge of these machines has to do their daily, monthly and yearly maintenance according to the checklist.
- *Machine must be stopped before carrying out cleaning, servicing and maintenance.*



Daily Checklist/ Monthly Checklist/ Yearly Checklist/ Employee In-charge of maintenance. Approved and trained operators to operate machine



DO & DON'TS



SC AUTO

CONSEQUENCES FOR NOT FOLLOWING MACHINE OPERATION SAFETY RULES !!!



OVERHEAD CRANE

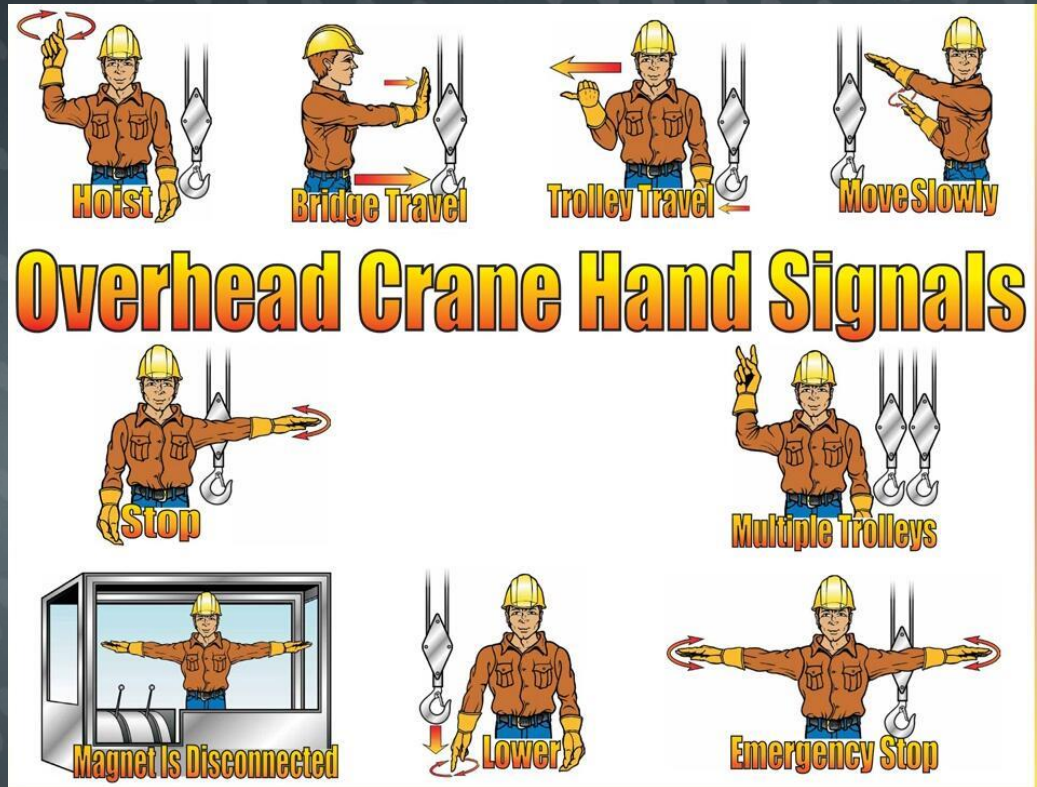


OPERATING THE OVERHEAD CRANE

- ✓ Only trained and license personnel can operate the overhead crane
- ✓ Helmet should be worn at all times during lifting Operations
- ✓ Fencing off the lifting operation area
- ✓ No one should walk below the crane when in operation.



RIGGER & SIGNAL LICENSE PERSONNEL



SC AUTO

Roles and Responsibilities of a Lifting Supervisor

- Co-ordinating and supervising all lifting activities in Accordance to the lifting plans.
- Briefing all lifting team members (i.e Crane operator, Rigger, Signalman) on the lifting plan, risk control measures and safe lifting procedures before the commencement of the lifting Operation.
- Ensuring that only registered crane operator, appointed rigger, Appointed signalmen participate in lifting operation
- Be present during all lifting operation
- Unsafe condition are to be reported to him, to take suitable Measures to rectify the conditions so that the lifting operation can Be conducted safely



Roles and Responsibilities of a Rigger

- ❑ Check the slings and ensure that the rigging angle is correct
- ❑ Make sure load is properly secure and inform the crane operator of the weight of the load
- ❑ Make sure that slings and shackles are well maintained.
- ❑ Make sure loads is stable, secured and balance before lifting operation
- ❑ Ensure no loose items are placed. To prevent load from falling during operations
- ❑ Immediately report any defective or faulty lifting gear To the lifting supervisor
- ❑ Place adequate paddings on the edge of the load to Prevent the sling from damaging



Roles and Responsibilities of a Signalman

- ❖ Check the load is properly rigged before giving clear signal to the Crane Operator to lift up the load
- ❖ Give the correct hand signal to the Crane Operator
- ❖ Communication between Lifting Supervisor, Rigger and Signalman at all times.



OVERCRANE BEFORE OPERATION

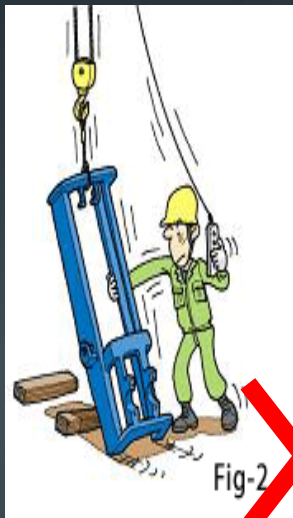
☀️ Hoist operators must inspect equipment daily before use.

☀️ Do not operate a crane or hoist if limit switches, steel ropes, chains or other components are worn or in disrepair.

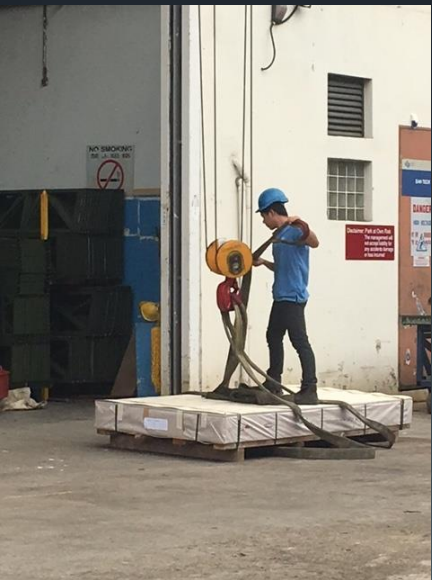
☀️ Replace nylon or web slings immediately if excessively worn.



DO & DON'TS



DO & DON'TS



SC AUTO

CONSEQUENCES FOR NOT FOLLOWING OVERHEAD CRANE OPERATION SAFETY RULES !!!



OPERATING A FORKLIFT



Operating a Forklift

Only authorized & trained/certified operators are allowed to operate the forklift.

During operating of forklift, seat belt and reflective vest must be worn .



OPERATING A FORKLIFT

- *No supplier and contractors should operate the forklift.*
- *Suppliers and contractors should ask for warehouse assistant when they need someone to operate the forklift.*



SC AUTO

OPERATION OF FORKLIFT

Forklift Safe Work Procedures (SWP)

- Forklift Training
- Pre-Operation Check
- Load Assessment
- Common Safe Practice
- Traffic Control
- Maintenance of Forklift



SC AUTO

Pre-Checked List - Forklift

Forklift Pre-Operation Checklist

Forklift Identification: _____ Model: _____ Month / Year: _____

SN	Description	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	22	23	24	25	26	27	28	29	31	31
1	Is there excessive cuts on the tyres ?																														
2	Is the tyres properly secured ?																														
3	Is there any damaged to the mast?																														
4	Is there any leakage to the hydraulic?																														
5	Is the lift & tilt control functioning effectively?																														
6	Is the forward & reverse control functioning properly?																														
7	Is the forward & reverse lights functioning properly?																														
8	Is the brake functioning effectively?																														
9	Is the horn functioning properly?																														
10	Is the warning light / reversing buzzer functioning properly?																														

Name of Operator: _____ Sign: _____

Supervisor Name & Signature: _____

- Yes - No NA - Not Applicable



SC AUTO

Trained and Approved/License personnel to
operate the Forklift



SC AUTO

Common Forklift Hazards

- ❑ Overloading
- ❑ Unsafe stacking
- ❑ Speeding
- ❑ Raised forks
- ❑ Unauthorized operation of forklift
- ❑ Untrained forklift operators
- ❑ Body/limbs caught in moving parts of the forklift
- ❑ Falling loads
- ❑ Poor condition tyres e.g. without thread markings
- ❑ Electric Shock (Battery operated forklift)

Common Forklift Hazards



- ❑ Lifting of persons on forks
- ❑ Pedestrians and forklifts moving in the same place
- ❑ Travelling on slope
- ❑ Obstruction in the path e.g. overhead, blind corners
- ❑ Poor ground conditions e.g. slippery, uneven, potholes



DO & DON'TS



Travelling on Slopes

Pedestrian and forklift moving at the same place

Unsecured Load



Speeding

Lifting Person on

Worn out tyres

DO & DON'TS



Put on seat belts



Pre-checked of Forklift at the beginning of each shift

CONSEQUENCES FOR NOT FOLLOWING FORKLIFT OPERATION SAFETY RULES !!!



WORK AT HEIGHT



WORK AT HEIGHT



Working at Height exceeding 2 metres

- 1) To issue permit
- 2) Permit to be submitted weekly to department head
- 3) To give to HR for filing
- 4) Work At Height supervisor to supervise workers during working at height.
- 5) Helmet and Harness should be worn when working at height.
- 6) Workers who need to work exceeding 2m, has to be trained.



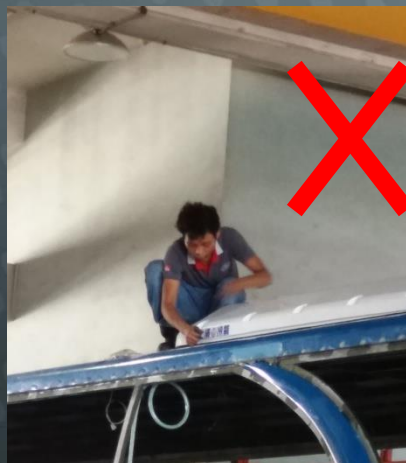
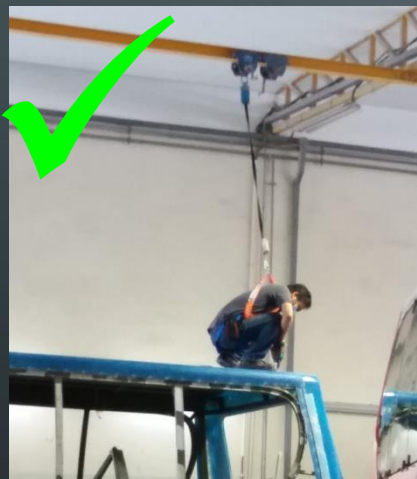
SC AUTO

WORK AT HEIGHT

Pre-Use Checks - Always check the conditions of the ladder before use. Check for damaged rungs, missing rubber stoppers & faulty locking spreaders/latches etc.



DO & DON'TS



SC AUTO

CONSEQUENCES FOR NOT FOLLOWING WORK AT HEIGHT SAFETY RULES !!!



Workers gathering at a site in Tampines, where a fatal accident happened in April this year.
PHOTO: MANO ELANGOVAN/FACEBOOK

Workplace injuries up* in first half of 2016



Top workplace injuries

Number of injuries by type	Severity of injury		
	Fatal	Major	Minor
Fall from heights	11	33	-
Slips, trips and falls	-	83	1,552
Struck by moving objects	6	36	971
Caught in/ between objects	7	33	-
Cut/stabbed by objects	-	-	721

NOTE: *Data is from January to June this year, compared with the same period last year.

Will fatalities keep rising?

Here are some of the workplace deaths that have occurred since June

- July 1**
 A worker died after falling from a 1.8m ladder while cleaning the glass panels of a shelf.
- Aug 8**
 A construction worker building a stairwell in Tuas died after being hit by a chain that snapped and swung into him.
- Aug 14**
 A worker helping to unload cargo from a vessel docked at Jurong Port was killed after a bundle of steel bars that were being moved slammed into him.
- Aug 28**
 A worker fell seven storeys and died at a construction site.
- Sept 3**
 A worker died after being struck by a falling metal pipe when it got dislodged from the hook of the crane lifting it.
- Sept 7**
 A worker was crushed to death between his excavator and the hydraulic arm of another heavy vehicle.

OPERATING A SCISSOR LIFT



Operating a Scissor Lift



- 1) Only Approved and trained personnel can use the scissor Lift.
- 2) Those who need to use the scissor lift which exceed height of 2 meter have to comply to the work at height procedure.
- 3) Helmet and Harness must be wear at all times.



Operating of Scissor Lift

- ☀ The operator is responsible for the lift and its safe operation. ◦
- ☀ The operator is responsible for performing inspections
- ☀ The supervisor is responsible for making sure they are done.
 - ☀ The operator is responsible for making sure anyone in the lift has fall protection.
- ☀ Full body harness is mandatory.

Approved Trained Operator SCISSOR LIFT



SC AUTO

DO & DON'TS



Hook your harness to a designated anchorage point.



Work within the work platform.
DO NOT climb or stretch over the guard rails.



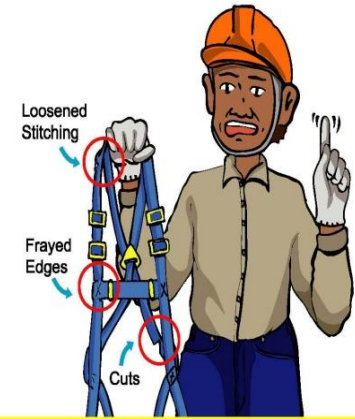
Observe the safe working load limit.



Secure loads with separate equipment.
DO NOT attach logs to the boom of the platform.



Use proper work platforms.
DO NOT use suspended mancages to prune trees.



Check your harness and lanyard.
Make sure it fits well and is not damaged.



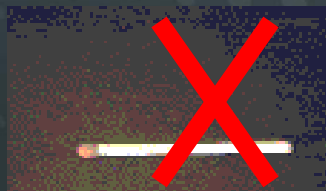
SC AUTO

HOT WORKS



Hot-Work

- ✓ Only trained and license personnel can operate the welding equipment
- ✓ Welding Gloves, Welding Shield and goggles should be worn at all times during welding Operations Always check all hot-work equipments before start operation.
- ✓ Check and ensure that areas are cleared of combustibles & flammable materials.



Welding Checklist Form

Hot-Work Safety Checklist

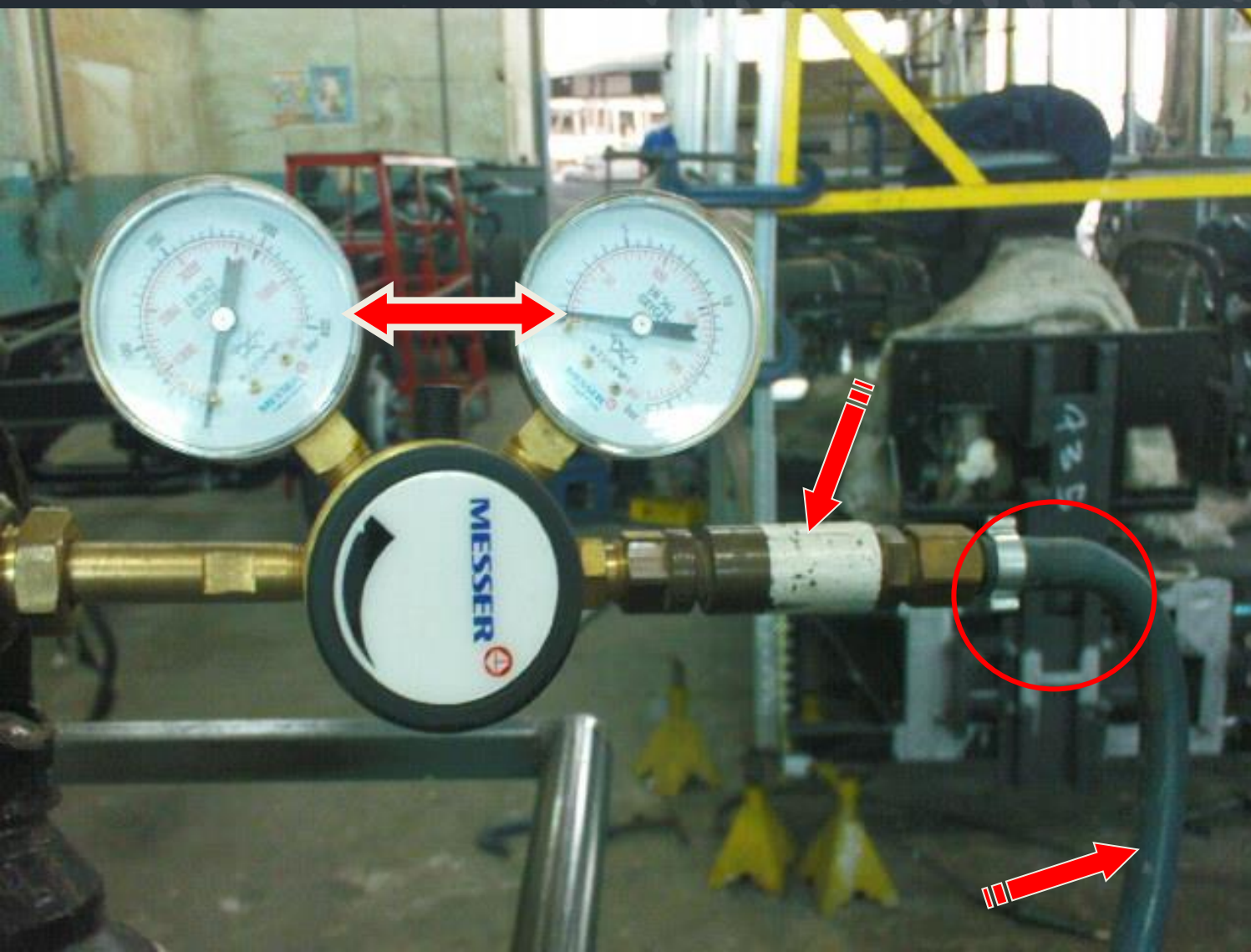
	Yes	No	NA	Rmks
(A) Oxy-Acetylene Gas Cutting				
1 Are all gas cylinders kept secured in a upright position during operation / storage ?				
2 Are flash-back arrestors installed & functioning properly (at valve or torch ends) ?				
3a Are gas hoses free from defects (such as kinks, joints, burns or cuts) ?				
3b Are gas hoses connected according to colour-codes (Oxygen – Blue / Acetylene – Red) ?				
3c Are gas hoses check for leaks (visually before use) /(with soap solution at least once a week) ?				
4 Are gas torch nozzle free from defects (such as blockage or cracks) ?				
5 Are pressure flow-gauges in good working conditions (no leaks or broken glass) ?				
6 Are gas cylinders (especially near valve ends) free from grease ?				
7 Are proper hose-securing devices used instead of "jubilee clips" ?				
8 Are spark-gun used to ignite gas touch (instead of using naked lights) ?				
(B) Storage of Gas Cylinders				
1 Are cylinders stored only in designated areas (away from potential heat / electrical sources) ?				
2 Is proper storage of gas cylinders in place? (In upright position, not to be stacked, strapped together for increased stability, segregating between oxygen & acetylene / empty & full.) ?				
3 Are fire fighting equipments such as fire extinguishers or hose-reels standby near storage ?				
(C) Welding				
1 Are equipments in good servicing conditions ?				
2 Are hoses free from defects (such as joints or cuts) ?				
3 Are proper earthing clips used instead of make-shift devices ?				
(E) Personal Protective Equipment (PPE)				
1 Are person carrying out hot-works don necessary PPEs such as eye-protection, face-shields, hand-gloves, protective clothing, mask etc.				
(F) General	Yes	No	NA	Rmks
1 Are fire fighting equipments such as fire extinguishers or hose-reels standby near hot-works ?				
2 Is the hot-work areas located at a minimum safety distance of 3 metres from flammable or combustible sources?				
3 Are means taken to contain & minimize the spreads of sparks during hot-works ?				

Checked By: _____ Date: _____ Sign: _____



SC AUTO

Welding Safety



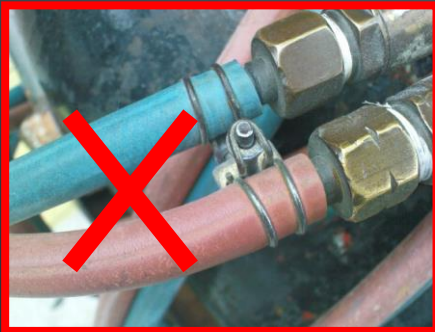
Welding Safety



▶ Always check if there's any exposed wires from the cable cord.

▶ Do not laid cables messily across work areas / passageways.

DO & DON'TS



CONSEQUENCES FOR NOT FOLLOWING WELDING SAFETY RULES !!!



OTHER WORK RELATED SAFETY



Electrical Safety



- ✓ Always check if there's any exposed wires or damaged from the cable cord, socket or plug.
- ✓ Do not laid cables messily across work areas / passageways.



Fire Safety Awareness



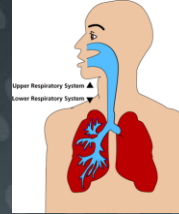
Covered up all flammable
Liquids to prevent accumulating
flammable vapour.



Keep all passageways, fire
exits & alarm call point clear
from obstruction.

Chemical Safety

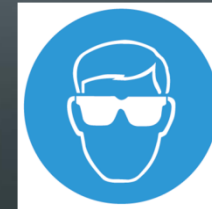
- Be aware of the dangers involved of the chemicals.



- Read the precautionary labels on the containers carefully.



- Wear the correct protective equipment.



SC AUTO

Manual Material Handling



Correct Lifting Technique



1. Feet apart to give stability



2. Straight back with chin tucked well in



3. Firm palm grip. Elbows against body

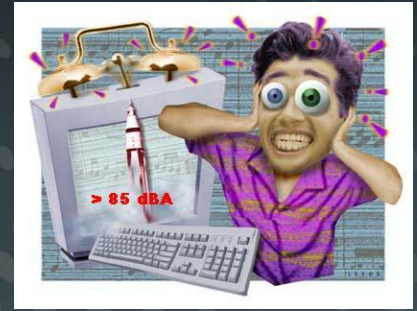


4. Weight of body kept directly over feet

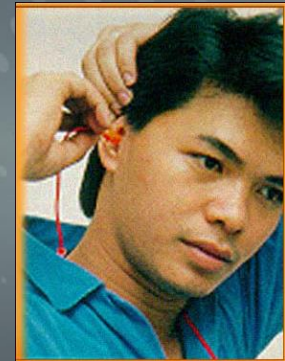


SC AUTO

Noise Hazards



- You run the risk of hearing loss if you are exposed over a period of time, to an average of more than 85dB(A) over an 8hrs.
- Use ear plugs to protect your hearing.
- Wear ear plugs correctly and effectively .
- Replace worn or damaged ear plugs immediately .



Others

- ▶ **Wear proper work attire and keep your hair short or tie-up your hair. Avoid wearing loose clothing and jewellery that can cause accident as you work.**
- ✓ **No horseplaying or distracting others**
- ▶ **Do not enter "out-of-bound" and "restricted" areas without permission.**
- ▶ **Use correct tools and equipment.**
- ▶ **No food and drink at production area.**



SC AUTO (MYANMAR)CO.LTD

Any employees found not wearing uniforms & PPE are not allowed to enter the Production Area.

Only Option : To purchase uniforms & PPE at the above listed price.



SC AUTO

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

APPENDIX (16): Drainage System Layout and Drain Design

N1875950M

STN-2
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Y = 1875927.323
Z = 4.985

N1875950M

N1875900M

N1875900M

N1875850M

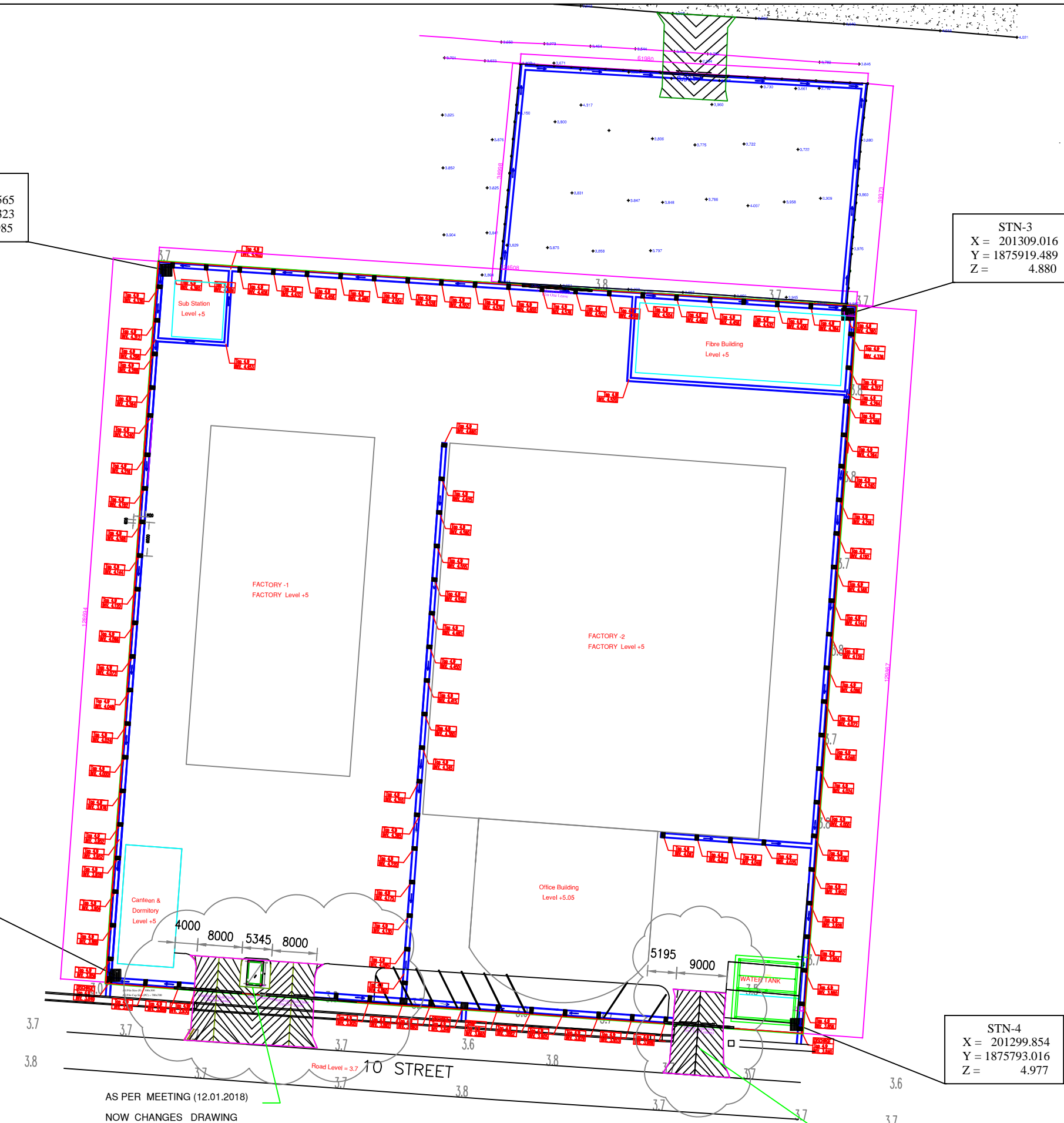
N1875850M

N1875800M

N1875800M

STN-1
X = 201178.429
Y = 1875801.779
Z = 4.955

STN-4
X = 201299.854
Y = 1875793.016
Z = 4.977



DRAIN INVERT LEVEL AND SUMP LOCATION
UPDATE DRAWING


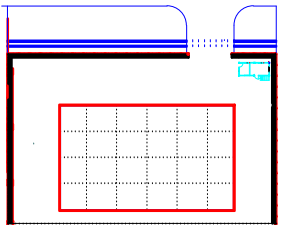

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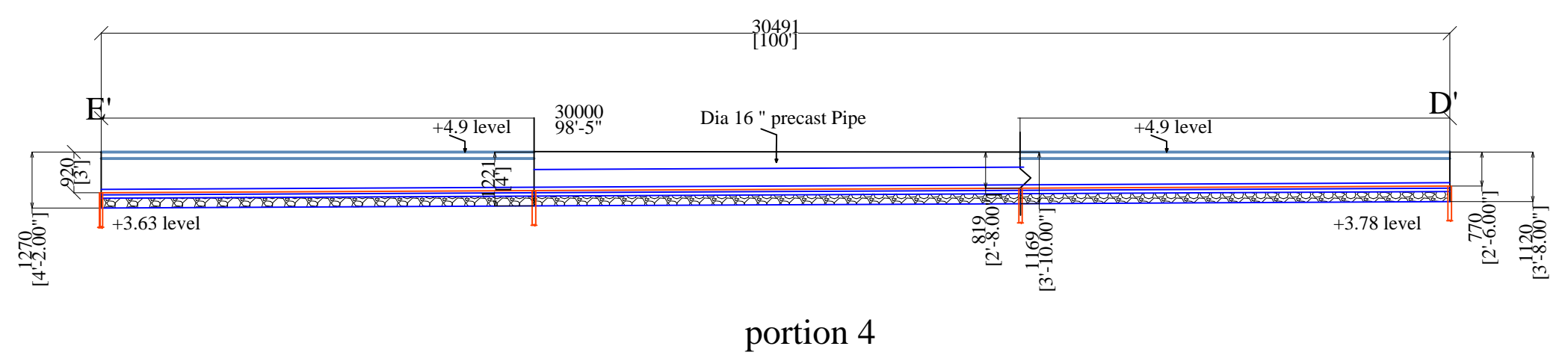
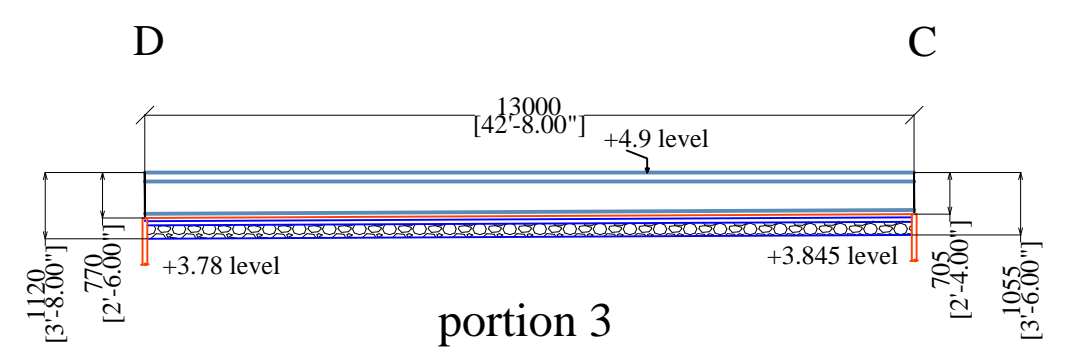
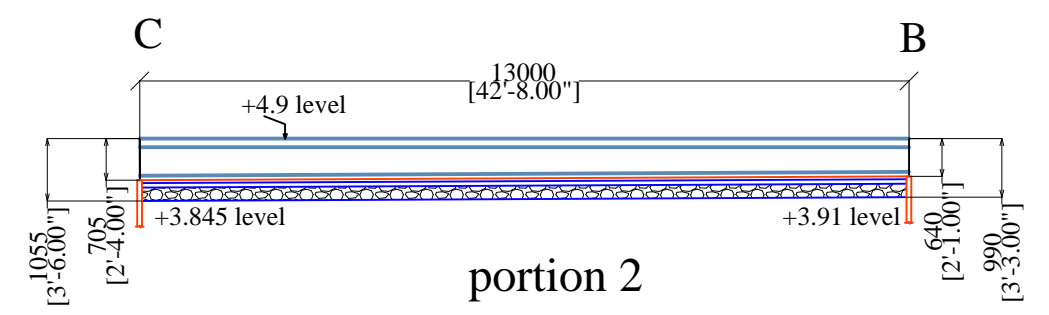
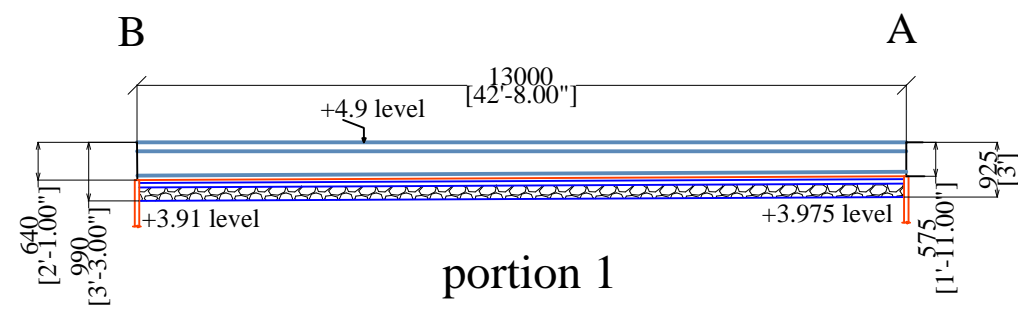
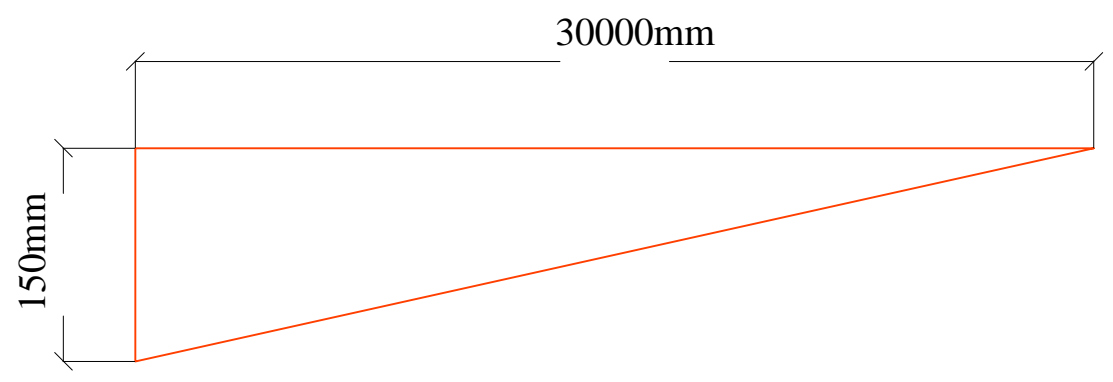
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PROJECT TITLE SC AUTO FACTORY PROJECT	
EMPLOYER	
Construction Drawing	
M&E GLOBAL HI TECH CO., LTD	
FACADE SC Auto Myanmar Co.,Ltd.	
KEY PLAN 	
REV BY DATE DESCRIPTION	
Q.P. / P.E. LEGEND <input type="checkbox"/> APPROVED FOR SUBMISSION <input type="checkbox"/> APPROVED NO SUBMISSION REQUIRED <input type="checkbox"/> REVISE AND RESUBMIT	
FINAL COMBINED STATUS	
RTO REVIEW <input type="checkbox"/> APPROVED FOR SUBMISSION <input type="checkbox"/> APPROVED NO SUBMISSION REQUIRED <input type="checkbox"/> REVISE AND RESUBMIT	
MAIN CONTRACTOR	
Client Approval Signature:	
DRAWING TITLE SC AUTO - FACTORY (YGN) DRAIN INVERT LEVEL & SUMP LOCATION	
RAYAO Myanmar Co.,Ltd.	
DATE 15 JANUARY 2016	SCALE 1:800
DRAWN RAYAO	CHECKED ERIC
PROJECT SCM	ORIGINATOR RAYAO
TYPE CID	DRAWING NUMBER 015123
REVISION 2	

Item No	Point Name	Layer	Level	Depth(from +/-4.9)	Distance	Remarks
1	Point A & A'	Finished Level(Top)	+ 4.9	+ 4.9	13000 mm	
		Invert Level	+ 4.4	500 mm		
		Timber Top Level	+ 4.32	575 mm		
		LNC Layer Level	+ 4.27	625 mm		
		Hard Core Top Level	+ 4.2	700 mm		
2	Point B & B'	Finished Level(Top)	+ 4.9	+ 4.9	13000 mm	
		Invert Level	+ 4.33	565 mm		
		Timber Top Level	+ 4.26	640 mm		
		LNC Layer Level	+ 4.21	690 mm		
		Hard Core Top Level	+ 4.13	765 mm		
3	Point C & C'	Finished Level(Top)	+ 4.9	+ 4.9	13000 mm	
		Invert Level	+ 4.27	630 mm		
		Timber Top Level	+ 4.19	705 mm		
		LNC Layer Level	+ 4.14	755 mm		
		Hard Core Top Level	+ 4.07	830 mm		
4	Point D & D'	Finished Level(Top)	+ 4.9	+ 4.9	30000 mm	
		Invert Level	+ 4.2	695 mm		
		Timber Top Level	+ 4.13	770 mm		
		LNC Layer Level	+ 4.08	820 mm		
		Hard Core Top Level	+ 4.0	895 mm		
5	Point E & E'	Finished Level(Top)	+ 4.9	+ 4.9		
		Invert Level	+ 4.055	845 mm		
		Timber Top Level	+ 3.98	920 mm		
		LNC Layer Level	+ 3.93	970 mm		
		Hard Core Top Level	+ 3.855	1045 mm		

Drain(Level)

Project Title SC AUTO SERVICE FACTORY PROJECT			
Elevator SC AUTO COMPANY CO. LTD			
M/E  Royal Onyx Engineering Co. Ltd			
ACADE			
Key plan 			
1	UAC	1	Rc drain Level
Rev	B	Date	Description
LEGEND			
RTO Review <input type="checkbox"/> Approved for Submission <input type="checkbox"/> Approved No Submission Required <input type="checkbox"/> Revise And Resubmit			
I.P.E Review <input type="checkbox"/> Approved for Submission <input type="checkbox"/> Approved No Submission Required <input type="checkbox"/> Revise And Resubmit			
Final Code Status			
Main Contractor  United Aces Co. Ltd			
Client Approval Signature			
Drawing Title SC Auto Service Factory S1-RD-DT-Level-63 E RC Drain Level(Detail)			
DATE 7 August 2013		Scale	
DRAWN United Aces	CHECKED	CHECKED	ER
Drawing Title SCM	ORIGINATOR UNITEDACES	TYPE C/D	Drawing Number 0113
			REVISION 0



Project Title
SC AUTO SERVICE FACTORY PROJECT

Client
SC AUTO COMPANY CO. LTD

M/E
ONYX Royal Onyx Engineering Co. Ltd

Software
AutoCAD

Key plan

Rev	UAC	Date	Description
1	UAC	1	Rc drain Section

LEGEND

RTO Review
 Approved for Submission
 Approved No Submission Required
 Revise And Resubmit

P.E Review
 Approved for Submission
 Approved No Submission Required
 Revise And Resubmit

Final Confirmation Status

Main Contractor
 United Aces Co. Ltd

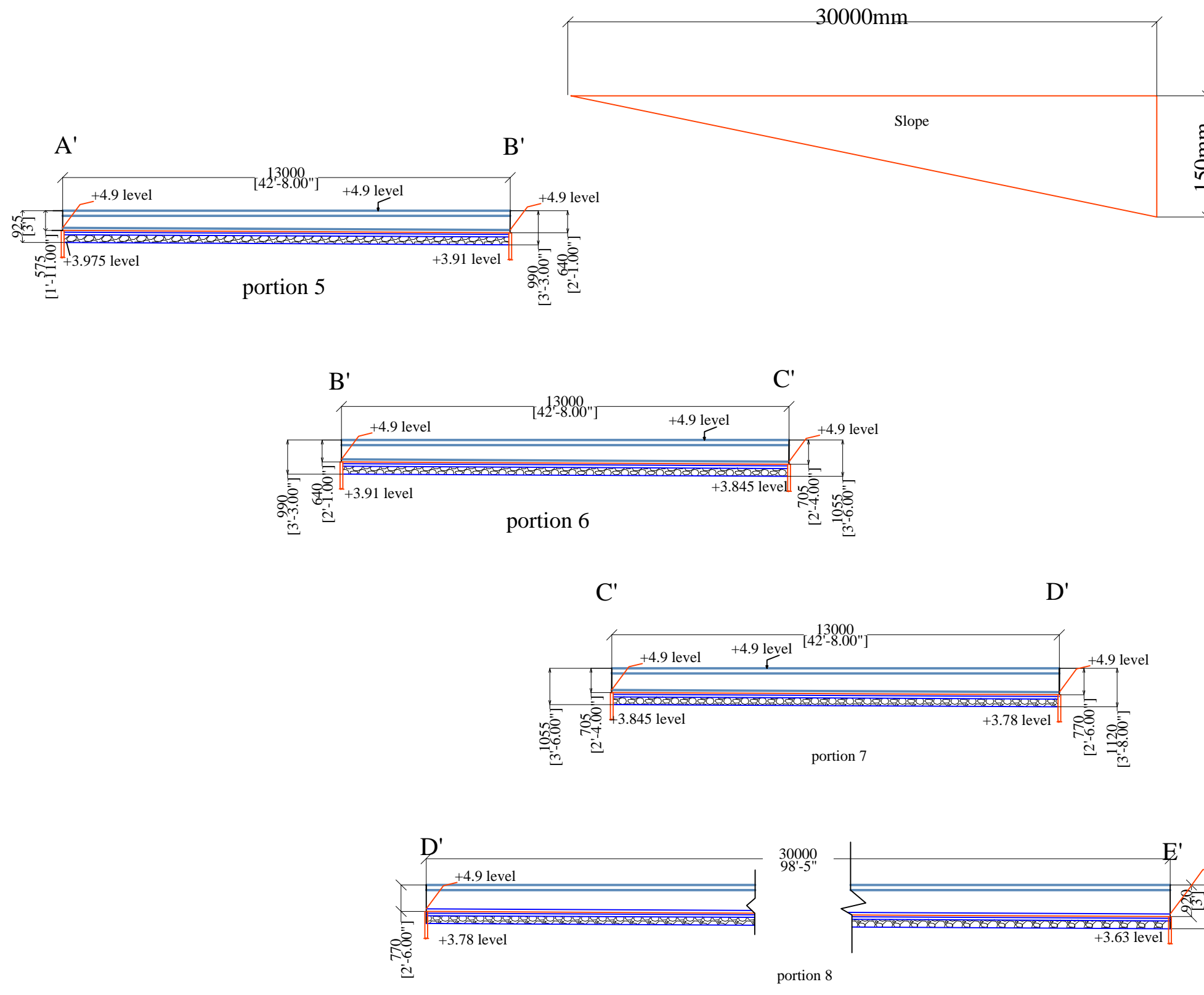
Client Approval Signature

Drawing Title
 SC Auto Service Factory
 Site RD-DT-SC-63 D
 RC Drain Section

DATE: 7 August 2011 Scale

DRAWN: United Aces CHECKED: CHECKED

Drawing Title	ORIGINATOR	TYPE	Drawing Number	REV
SCM	UNITEDACES	C/D	0113	0



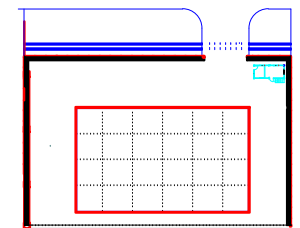
Project Title
SC AUTO SERVICE FACTORY PROJECT

Employer
SC AUTO COMPANY CO. LTD

M/E
ONYX Royal On Engineering Co. Ltd

ACADE

Key plan



Rev	UAC	Date	Description
1	UAC	1	Rc drain Section

LEGEND

RTO Review
 Approved for Submission
 Approved No Submission Required
 Revise And Resubmit

P.E Review
 Approved for Submission
 Approved No Submission Required
 Revise And Resubmit

Final Code Status

Main Contractor
 United Aces Co. Ltd

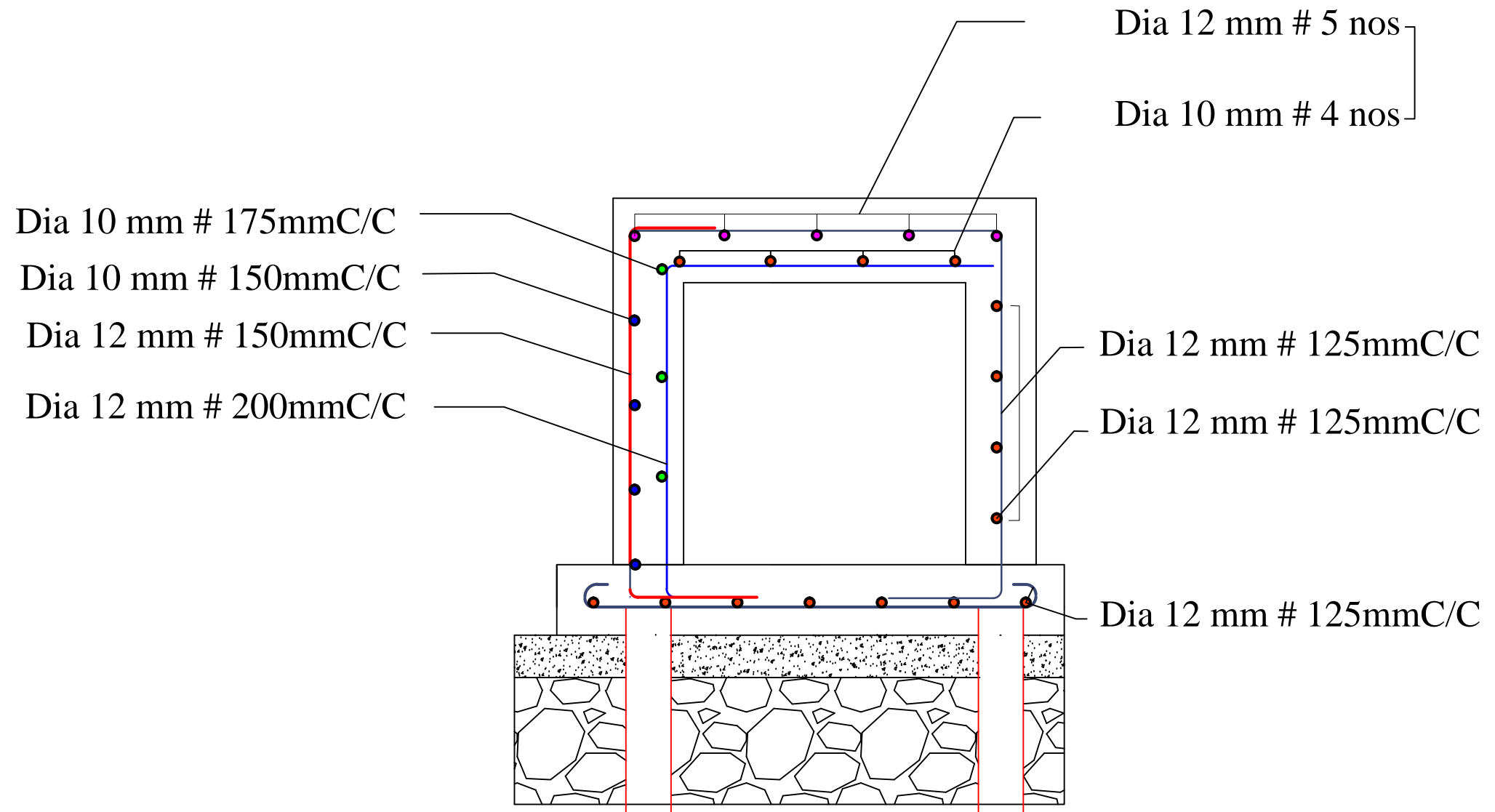
Client Approval Signature

Drawing Title
 SC Auto Service Factory
 S1-RD-DT-SC-63 C
 RC Drain Section

DATE: 7 August 2013 Scale

DRAWN: United Aces CHECKED: CHECKED

Drawing Title	ORIGINATOR	TYPE	Drawing Number	REV
SCM	UNITEDACES	C/D	0113	0



Old Fence Side

Drain Section

For Slab

Project Title
SC AUTO SERVICE FACTORY PROJECT

Employer
SC AUTO COMPANY CO. Ltd

M/E
 Royal On Engineering Co. Ltd

ACADE

Key plan

Rev	UAC	Date	Description
1	B		Rc drain (Steel Detail)

LEGEND

RTO Review
 Approved for Submission
 Approved No Submission Required
 Revise And Resubmit

P.E Review
 Approved for Submission
 Approved No Submission Required
 Revise And Resubmit

Final Confirmation Status

Main Contractor
 United Aces Co. Ltd

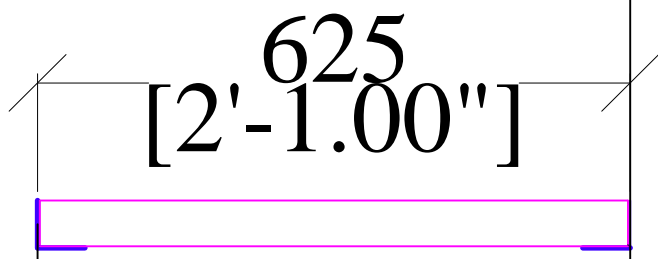
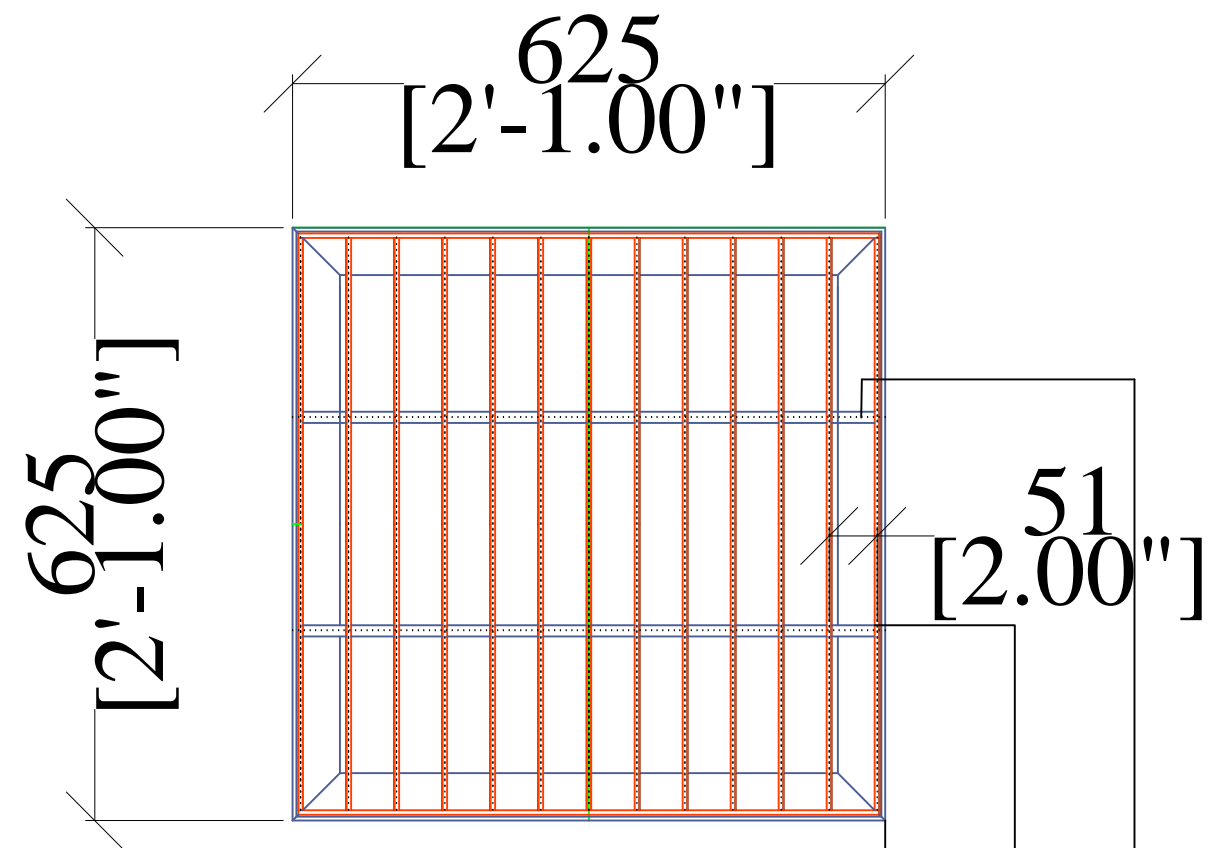
Client Approval Signature

Drawing Title
 SC Auto Service Factory
 S1-RD-DT-ST-63 G
 RC Drain (steel Detail)

DATE: 7 August 2013 Scale

DRAWN United Aces	CHECKED	CHECKED	ER
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Drawing Title	ORIGINATOR	TYPE	Drawing Number	REV
SCM	UNITEDACES	C/D	0113	0



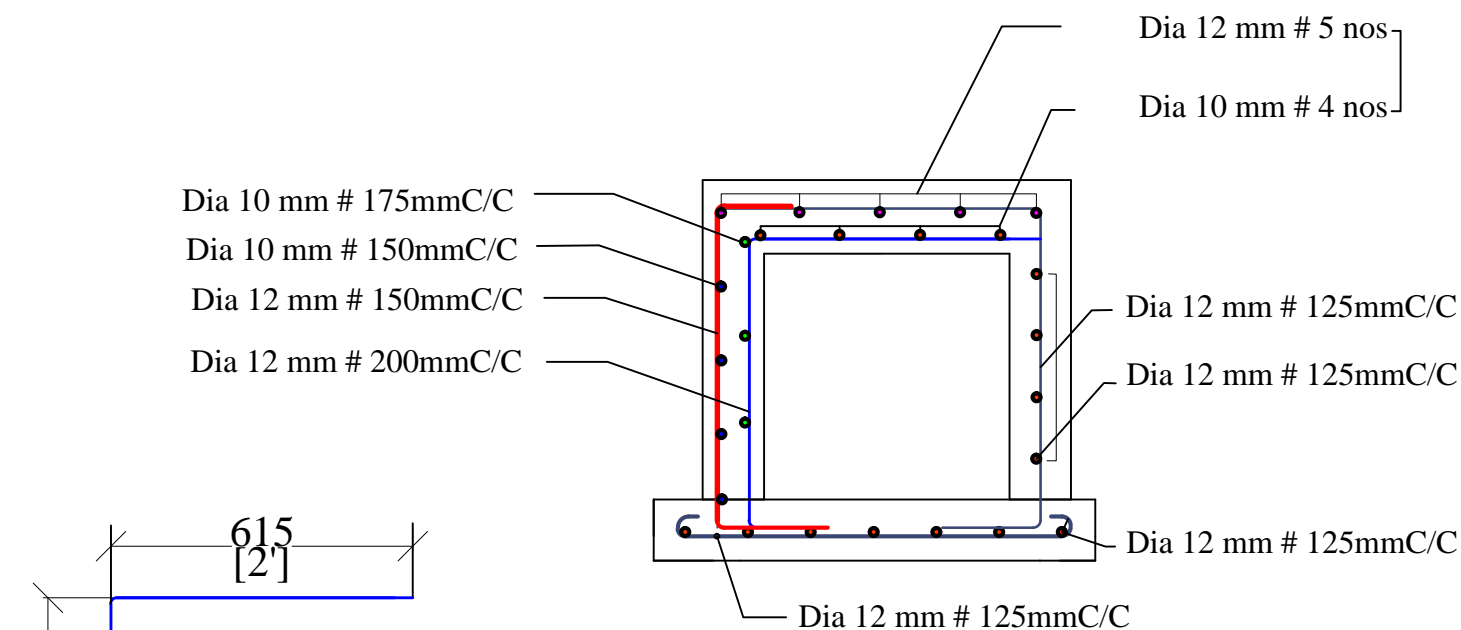
63 x 63 x5 mm Angle

Dia 12 mm Rebar

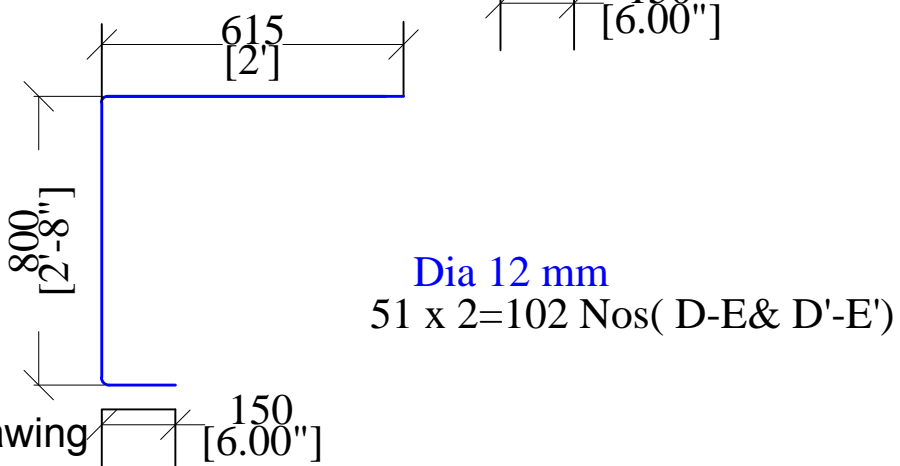
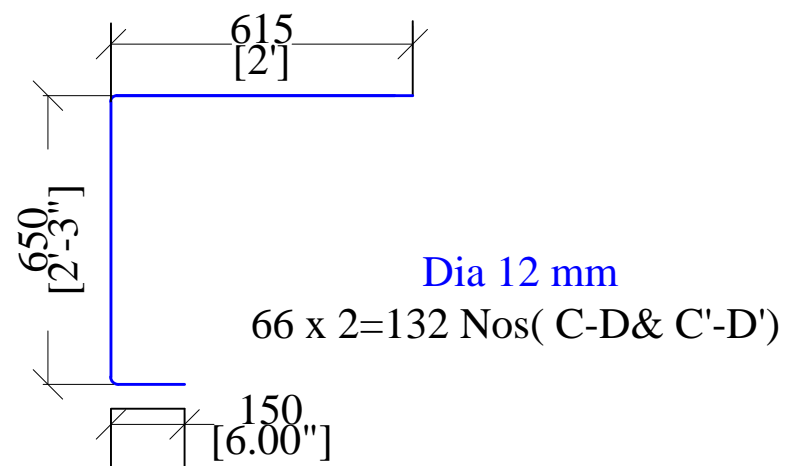
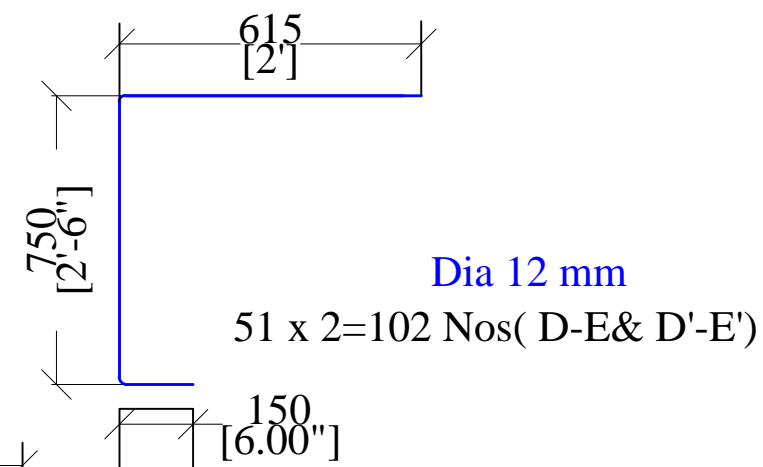
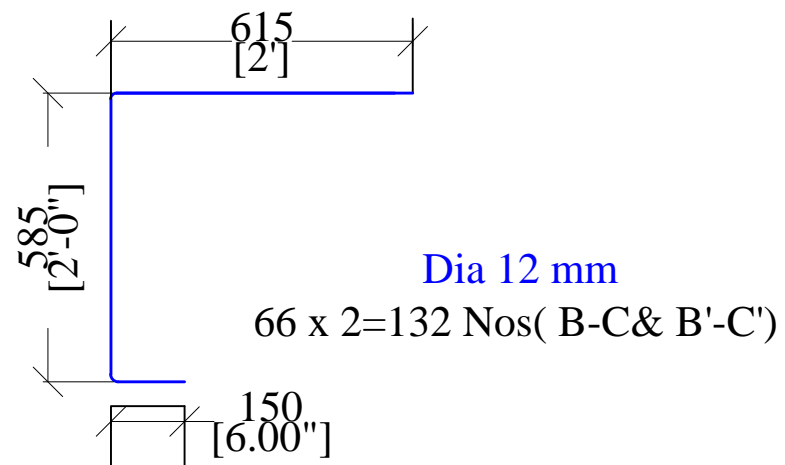
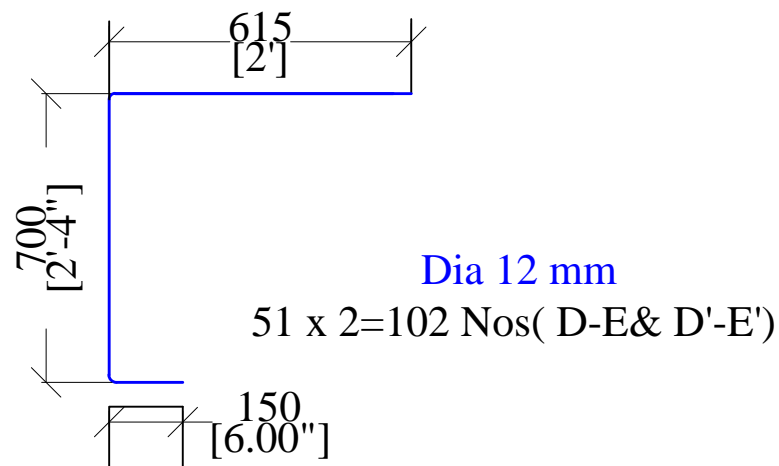
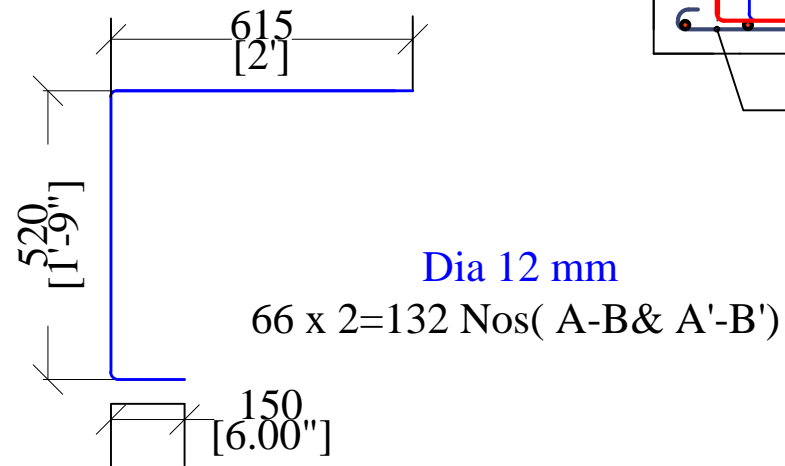
50 x 5 mm MS Flate

63 x 63 x5 mm Angle

Manhole



For Slab



Steel Working Drawing [6.00"]

Project Title
SC AUTO SERVICE FACTORY PROJECT

Employer
SC AUTO COMPANY LTD

M/E
ONYX Royal On Engineering Co. Ltd

ACADE

Key plan

1	UAC	1	RC drain (working drawing)
Rev	B	Date	Description

LEGEND

RTO Review

- Approved for Submission
- Approved No Submission Required
- Revise And Resubmit

P.E Review

- Approved for Submission
- Approved No Submission Required
- Revise And Resubmit

Final Code Status

Main Contractor
 United Aces Co. Ltd

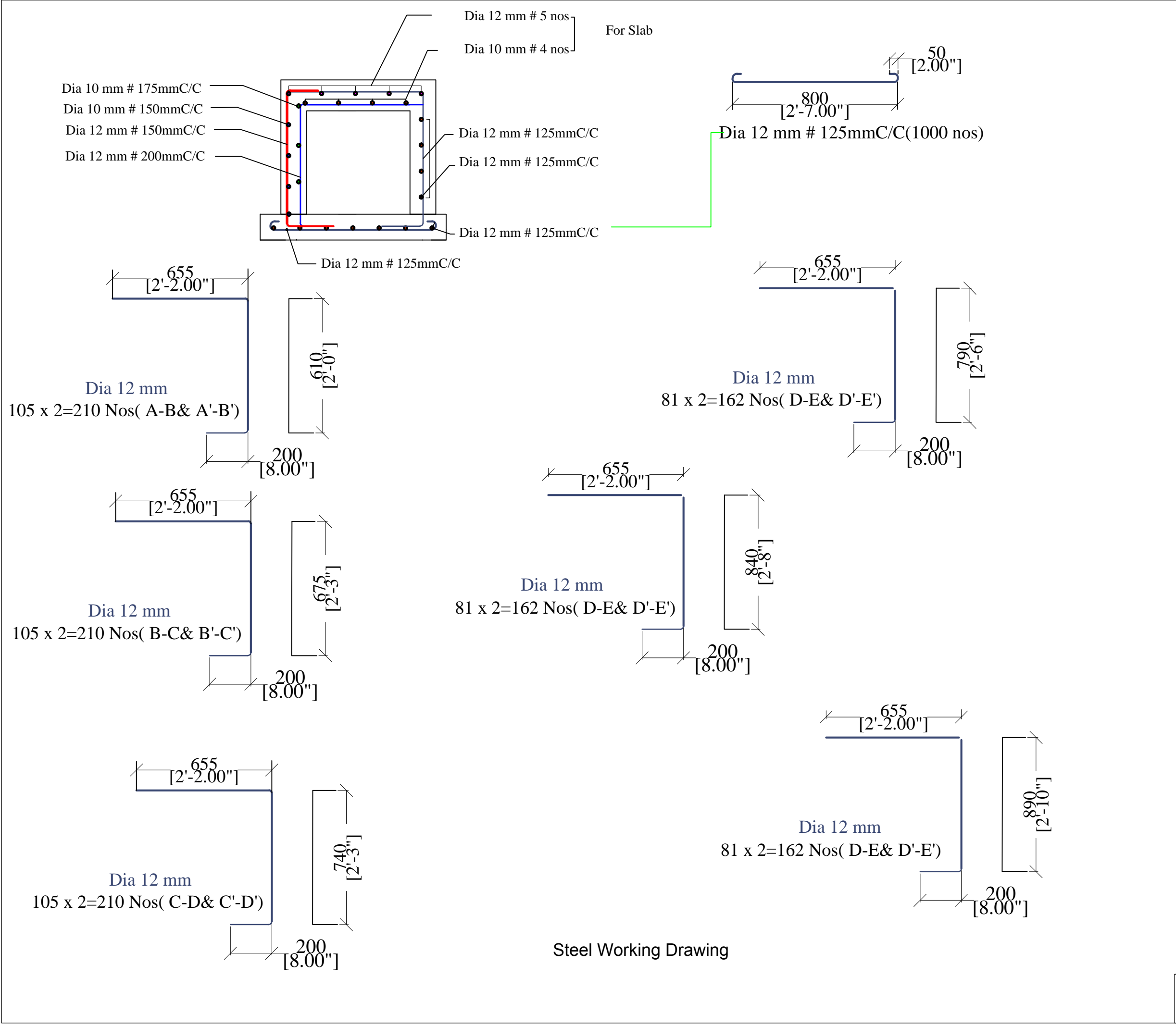
Client Approval Signature

Drawing Title
SC Auto Service Factory
RC Drain (Steel Working Drawing 2)

DATE: 7 August 2011 Scale

DRAWN: United Aces CHECKED: CHECKED

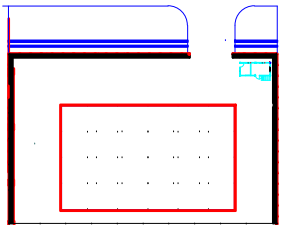
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SCM	UNITED ACES	C/D	01	0



Project Title
SC AUTO SERVICE FACTORY PROJECT

Employer
SC AUTO COMPANY CO. LTD

M/E
 Royal Onyx Engineering Co. Ltd

ACADE


Rev	Date	Description
1	UAC	1 Re drain (working drawing)

LEGEND


RTO Review

- Approved or Submission
- Approved No Submission Required
- Revise And Resubmit

P.E Review

- Approved or Submission
- Approved No Submission Required
- Revise And Resubmit

Final Confirmation Status

Main Contractor
 United Aces Co. Ltd

Client Approval Signature

Drawing Title
SC Auto Service Factory
RC Drain (Steel Working Drawing 2)

DATE: 7 August 2018 Scale

DRAWN: United Aces CHECKED: CHECKED

Drawing Title	ORIGINATOR	TYPE	Drawing Number	REV
SCM	UNITEDACES	C/D	01	0

Initial Environmental Examination Report

“Manufacturing, Assembling and Sales of Buses, Coaches, Repair and Maintenance Services”

SC Auto (Myanmar) Co., Ltd.

APPENDIX (17): Bio-Septic Tank Process Description

BIOTECH'S FIBERGLASS REINFORCED PLASTIC (FRP) CHARACTERISTIC

Our prefabricated tanks are made with special fiberglass reinforced plastic (FRP) material which are proven to be 8 times stronger than polyethylene tanks. With its characteristic, FRP offers various benefits and features over polyethylene materials. These characteristic should be considered early in the stage of constructions.

Corrosion resistance – FRP do not rust, corrode, rot and resist against heat, UV lights, and most industrial and household chemicals wastes. Resistance to corrosion provides longer life and environmental exposure resistance to BIOTECH prefabricated tanks. Chances of tank replacement due to leakage or breakage which are costly, complicated, and undesirable are extremely low.

High Strength, Lightweight – FRP provide high strength to weight ratios exceeding those of aluminum, steel, concrete, or polyethylene with abrasion characteristic. FRP are able to handle compressive pressure very well which is mandatory for underground tanks installations where limited spaces are needed. These unique characteristics are also suitable for saving costs and reducing risks of damaging tanks during transportation domestically and internationally.

Customizable – With the ability to tailor and modify the design of FRP, BIOTECH prefabricated tanks are able to serve our customer with specific requirements such as customizing the thickness of FRP tanks, custom made water storage tanks or conical hatching tanks or even imaginative products. The only restriction is human's imaginations.

Comparison on material use

	CONCRETE MATERIAL	STAINLESS STEEL	POLYETHYLENE (PE)	FIBERGLASS REINFORCED PLASTIC
Strength to weight ratio	X	√	√	√
Flexibility	X	X	X	√
Heat resistance	√	√	X	√
UV resistance	√	√	X	√
Chemical resistance	√	√	X	√
Pressure resistance	√	X	√	√
Costs	X	X	√	√
Transportation	X	√	√	√

X = not capable

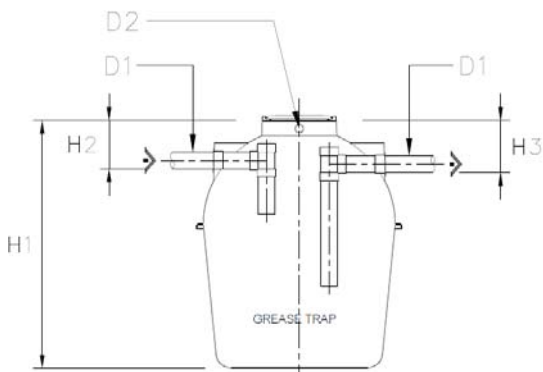
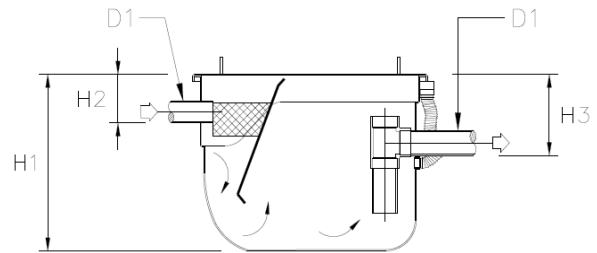
√ = capable

√ = Highly recommended

GREASE TRAP TANKS

GT series BIOTECH Grease Trap tanks designed for installation under kitchen sinks which makes them convenience for maintenance. GT series are squared shape grease trap tanks which is suitable for installing under sinks with different spaces customers' prefer. BIOTECH Grease Trap tanks compose of two chamber:

1. Solid and Grease separation chamber: FRP screener will separate food scraps from clogging other waste management process and acts as a first chamber to separate grease.
2. Main Grease separation chamber: This chamber will separate grease from wastewater with lower density of greases causing it to float.



BG series Our underground grease trap tanks are highly recommend for industries with numerous amount of grease being produced and/or whom who want spaces for operation with high grease trap performance tanks installed underground. BG tanks save spaces and does not interfere with factory, restaurant or other location looks while having high efficiency and capacity for grease storage. BG tanks will separate grease from wastewater and will float waiting for disposal.

Benefits of using grease trap tanks

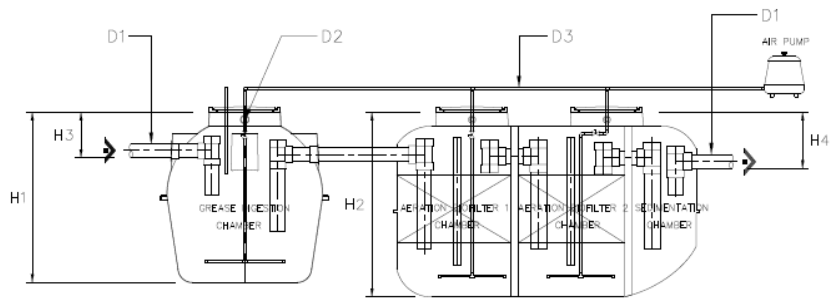
- Reduce in unpleasant odor, sanitary, and looks that are irritating to daily life or business operation.
- Prevention against pipe clog and malfunctioning other wastewater treatment process that might not make them as efficient as it supposed to be.
- In many industries or household that produce grease and/or use cooking oil frequently should install grease trap tanks either under their sinks, outside their buildings, or undergrounds.
- Biotech's grease trap tanks are design to be place under the sinks or installed underground outside the building for the purpose of separating grease and food scraps into the sieve. Dumping food scraps directly into the tanks are not recommended.
- Sink drainage have an average of 1400 mg. /L inflow, after grease trap process wastewater have an average BOD of 500-800 mg. /L.
- Grease trap tanks are capable of reducing BOD up to 64%

Suggestions

- Once water are treated from grease trap tanks, it is still mandatory to treat wastewater in the next process
- Food sieves should be dispose in to black bags daily (since food scraps takes 4-6 hours to rot)
- Disposal of grease should be done once per day into black bags.
- Tank should be clean every 2-4 weeks as grease will cause a disturbing looks.

GREASE DIGESTABLE TANKS

BOA Series Our enzyme grease digestion tanks are supported for any sizeable grease inflow. Enzymes are capable of eliminating grease with high performance through our dosing pump. This new innovation can save time, reduce work, and lower maintenance costs while offering a new method of grease elimination.

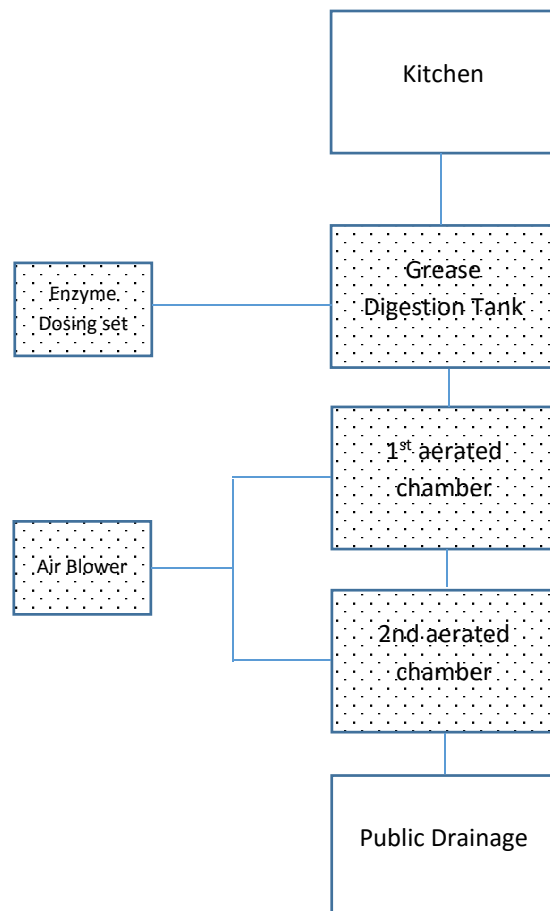


The series compose of three different types of tanks specifically for each individual purposes. With enzyme feeder feeding BIOTECH special enzyme in to first grease digestion chamber, owner does not have to worry about disposal of grease which were unpleasant and time consuming. Owners are now only responsible for easy process of mixing the enzyme with water into the feeder tank. Once set, BIOTECH specialize enzyme will consume oil and grease admirably. BOA tank set are suitable for treating wastewater from top to bottom process without requiring further secondary treatment tanks.

Benefits of Biotech enzyme grease digestion tanks

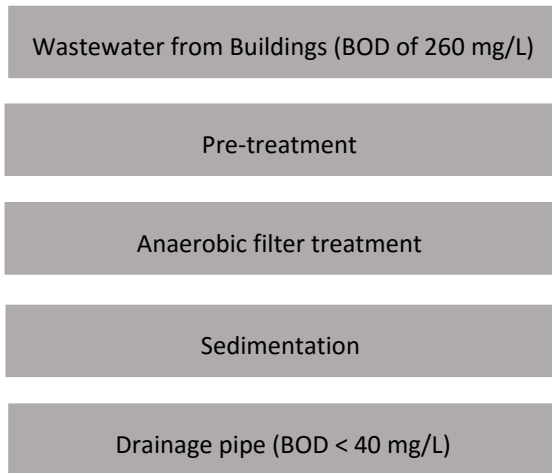
- BOA series are suitable for fast food industries, restaurants, cafeteria, and other buildings with small to large loading of grease.
- There is no need to dispose oil and grease traditional way. Automatic dispenser will do it for you.
- NO unpleasant odor.
- Installation are done underground saving spaces and does not interfere with building looks.
- Sink drainage have an BOD average of 1400 mg. /Cubic inflow, after using BOA series wastewater have BOD less than 20 mg. /cubic. and FOG less than 10mg./l
- BOA has over 95% wastewater treatment efficiency.
- BOA series comes with Air blower and Enzyme dosing tank for performing wastewater treatment
- Wastewater are treated and will be dispose into public drainage without harming the environment.

Flow Diagram



BIOTECH UN-OXYGENATED TREATMENT SERIES

Anaerobic treatment process



Working process

Biotech's un-oxygenated tanks are main treatment process that is used to treat wastewater from the whole building's drainage pipe. It is designed with highest retention time possible for an effective treatment using anaerobic treatment system. The tanks are separated into two chamber.

- Solid Separation chamber: This chamber are designed to separate suspended solid and sludge from wastewater for anaerobe bacteria to digest efficiently. Under this segment, it prevent solids and scum to interfere with next chamber nor to clog up the pipes allowing only wastewater to pass through.
- Anaerobic filtration chamber: This chamber manage to use anaerobe bacteria to treat wastewater by giving anaerobe bacteria a specially designed media host (BIOCELL) to grow and expand for higher efficiency. Sedimentation are included in this chamber

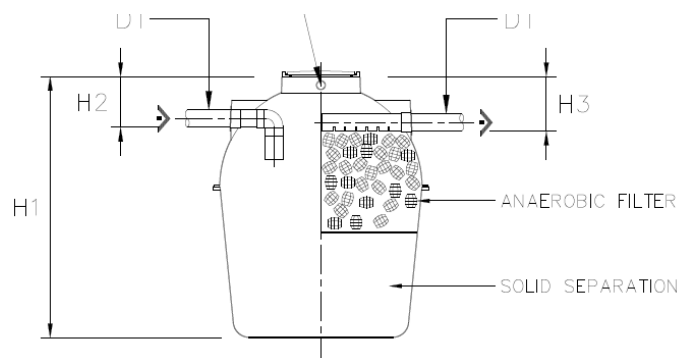
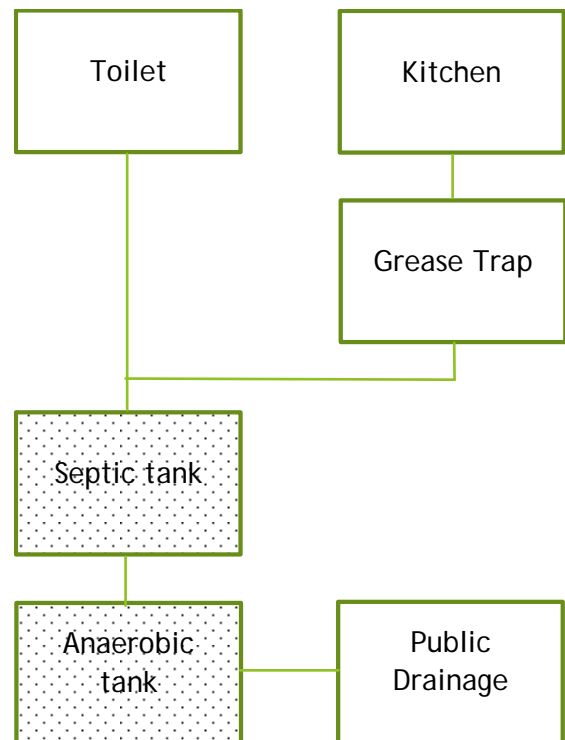
BT series benefits:

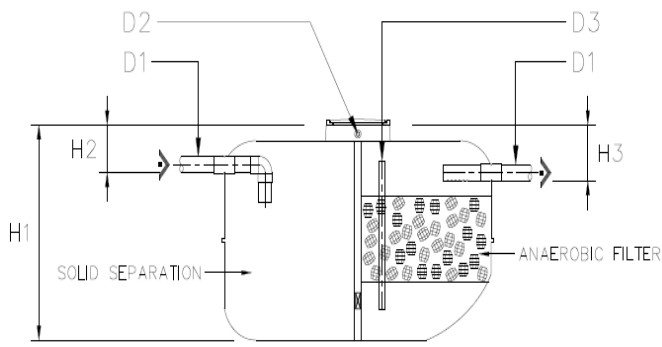
- Oval shape designed to handle 360 degree pressure
- BT series tanks are available with on ground and underground model.
- Tank's Capacity ranging from 600 L – 6200 L
- Suitable for any sizes of housing and any small to medium buildings

Benefit of using Biotech un-oxygenated treatment series

- No consumption of electricity (energy saving)
- Easy to maintenance
- Fast and easy installation
- BOD reduction lower than 40mg./L – 60mg./L
- Meet the Environmental standard of building classification C, D and E
- Treated water from this series can be dispose into public drainage and would not harm the environment.

Flow Diagram



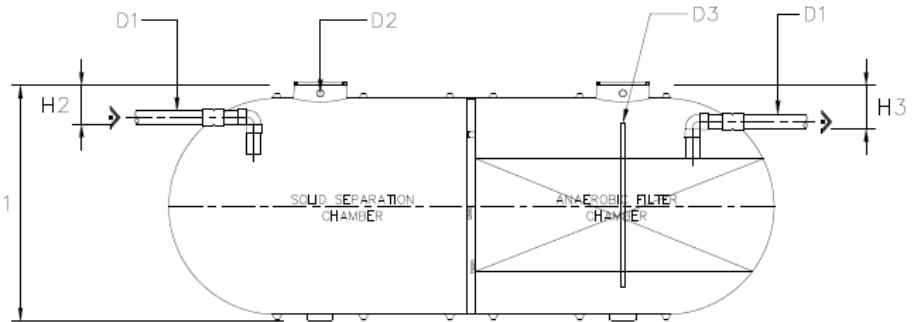


BT-R Series benefits:

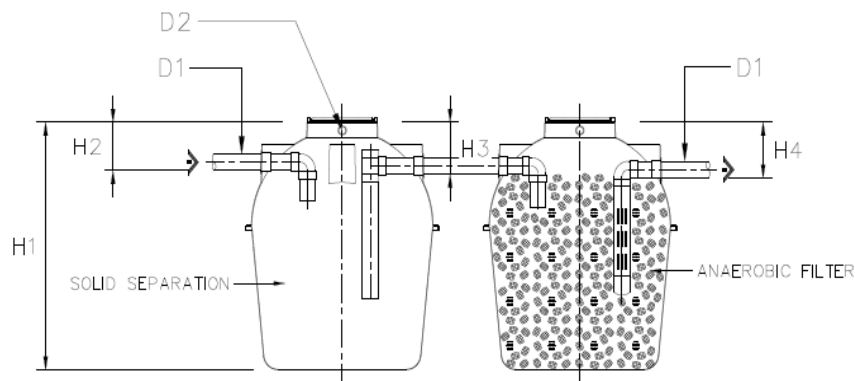
- Rectangular shape design for space saving with small footprint
- Easy installation and maintenance
- BT series tanks are available with on ground and underground model.
- Tank's Capacity ranging from 1300 L – 17500 L
- Suitable for any sizes of housing and any small to medium buildings

BT-K series benefits:

- Capsule shape design for large wastewater treatment capacity
- BT series tanks are available with on ground and underground model.
- Tank's Capacity ranging from 6200 L – 81300 L
- Suitable for all building size especially large buildings.

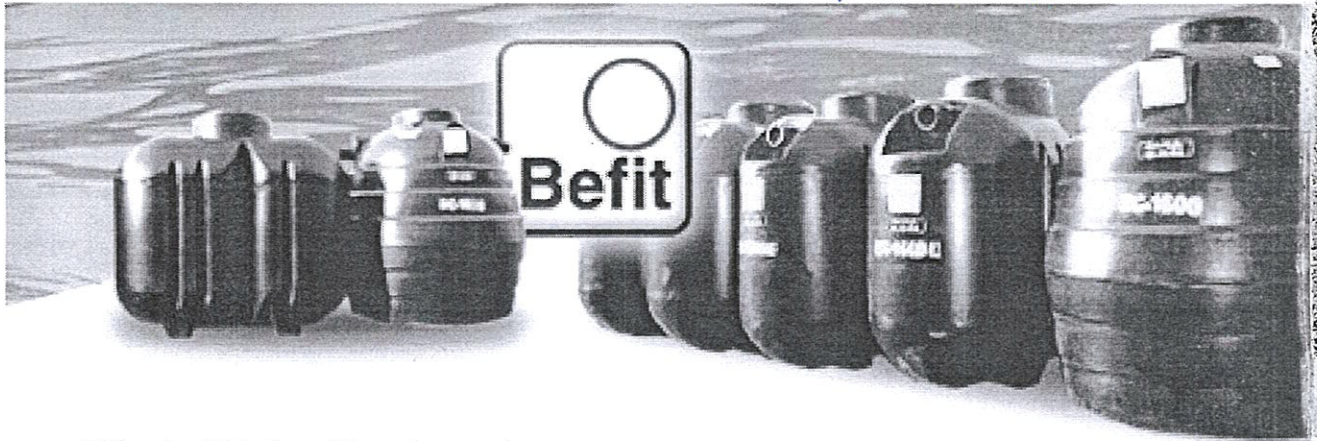


- Tank's body is reinforced with Fiberglass Reinforced Plastic ribs every 1 meter for higher strength
- Tank's stand are made from Fiberglass Reinforced Plastic ribs capable of carrying fully operating tank's weight
- Perfect replacement of traditional concrete wastewater treatment plant
- BT-K series comes with steel sling for holding tank's body in place



BS-BF series benefits:

- One set include two tanks of Septic tank and anaerobic filtration tank
- Installation and wastewater piping of BS-BF set can be done in various ways for spacing and footprint issue
- Replacement and fixing of both tanks can be done easily and less costly
- Capable of treating wastewater from different building's drainage pipe location
- Tank's Capacity ranging from 1200 L – 12400 L
- Suitable for all building size



Waste Water Treatment

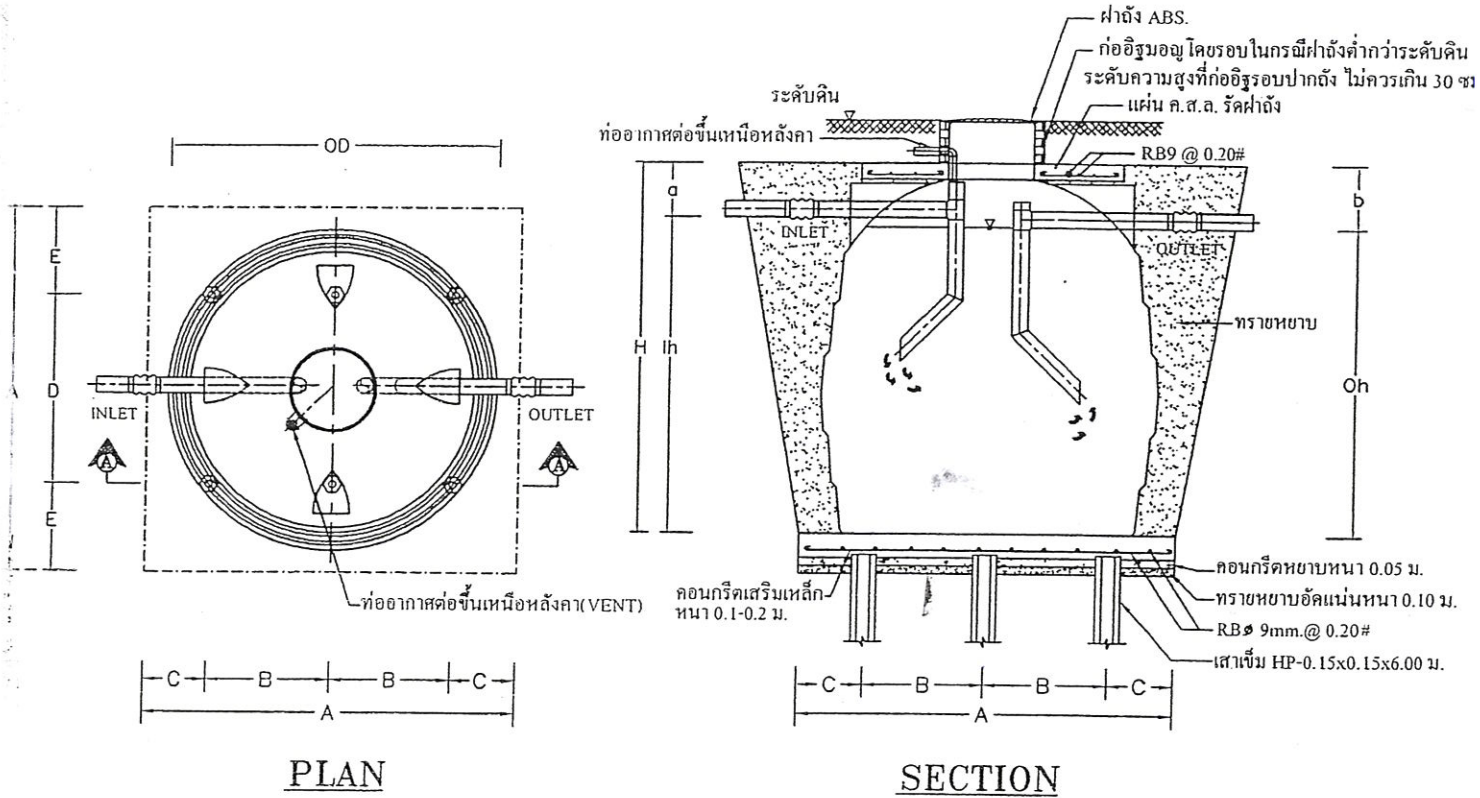


Benefit Sept : BS

Fermenting tank is the first stage in the treatment which must be used in combination with a filter tank which may be an unaerated or aerated system. This tank collects the waste, disintegrates them, and allows the clear water flow to the next treatment.

Model	House (person)		Office/factory (person)		School (person)	
	Bathroom only (60 liter/person/day)	All waste water (200 liter/person/day)	Bathroom only (60 liter/person/day)	Bathroom only (30 liter/person/day)	Bathroom only (30 liter/person/day)	Bathroom only (30 liter/person/day)
800	13	4	13			26
1000	16	5	16			33
1200	20	6	20			40
1600	26	8	26			40
BS 2000	33	10	33			66
3000	50	15	50			100
4000	66	20	66			133
5000	83	25	83			166
6000	100	30	100			200

ถังเกรอะ (BEFIT-SEPT) BS



หมายเหตุ การใช้เสาค้ำกับขนาดถัง
 รุ่น 1000 - 2000 ใช้เสาค้ำจำนวน 4 ต้น
 รุ่น 3000 - 6000 ใช้เสาค้ำจำนวน 6 ต้น
 การเลือกใช้เสาค้ำขึ้นอยู่กับคู่มือของวิศวกรโครงสร้าง

ตารางแสดงขนาดถังเกรอะ(mm.)

MODEL รุ่น	ขนาดถัง				ระดับท่อ		ขนาดฐาน					ขนาดท่อ	
	H	Ih	Oh	OD	เข้า(a)	ออก(b)	A	B	C	D	E	ท่อระบายอากาศ	ท่อเข้า-ท่อออก
BS-800	1250	995	945	1150	255	305	1400	-	-	700	350	50	100
BS-1000	1300	1020	970	1200	280	330	1400	-	-	700	350	50	100
BS-1200	1435	1160	1105	1392	280	330	1400	-	-	700	350	50	100
BS-1600	1490	1240	1180	1430	250	310	1600	-	-	800	400	50	100
BS-2000	1670	1410	1350	1460	260	320	1700	-	-	850	425	50	100
BS-3000	1880	1600	1540	1700	280	340	1900	700	250	900	500	50	100
BS-4000	1910	1650	1590	1850	260	320	2090	750	295	1090	500	50	100
BS-5000	2190	1930	1870	1920	260	320	2170	750	335	1010	580	50	100
BS-6000	2330	1990	1930	2100	340	400	2300	750	400	1200	550	50	100



RUNGSUPHAKIJ CO.,LTD.

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