1. PRODUCT AND COMPANY IDENTIFICATION

Product Description: ATPRIME® 2A
SAP ID(s): ATPRIME-2A------KG
Material Code: ATPRIME-2A------KG
Chemical Family: Aromatic Isocyanate
Intended Use: Two-Component Urethane-Based Primer System

Manufacturer: NCS Resins (Pty) Ltd
9 Pineside Road, New Germany 3610
South Africa
Tel +27(0) 31 713 0600
Fax +27(0) 31 705 9858

Supplier: Aurora Glass Fibre (NZ) Ltd
3/16 Zelanian Drive, East Tamaki
Auckland 2013, New Zealand
Tel +64 9 273-3540
Fax +64 9 273-3565

2. HAZARDS IDENTIFICATION

Emergency Overview
- Harmful by inhalation
- May cause sensitization by inhalation and skin contact
- Irritating to eyes and respiratory system
- Preparation reacts slowly with water resulting in evolution of CO2
- Evolution of CO2 in closed containers causes overpressure and produces a risk of bursting

Appearance: Dark Brown
Physical State: Liquid
Odor: Musty

Primary Routes of Entry
- Skin Contact, Inhalation, Eye Contact.

Acute Effects
- Eyes: Moderately irritating to the eyes.
- Skin: May cause sensitization by skin contact. Moderately irritating to the skin.
- Inhalation: Harmful by inhalation. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause sensitization by inhalation.
- Ingestion: Ingestion (swallowing) may irritate the mouth, throat and stomach. May cause damage to Gastrointestinal tract.

Chronic Effects
- May cause sensitization by inhalation and skin contact. This material does not contain 0.1% or more of any chemical listed by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or regulated by the Occupational Safety and Health Administration (OSHA) as carcinogen.

Target Organ(s)
- Lungs, Respiratory System, Skin, Eyes.

HMIS:
- Health: 2*
- Flammability: 1
- Reactivity: 1
- Personal Protection:
3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isocyanic acid, polymethylenepolyphenylene ester</td>
<td>9016-87-9</td>
<td>55</td>
<td>Not Hazardous</td>
</tr>
<tr>
<td>4,4’-Methylene diphenyl Diisocyanate</td>
<td>101-68-8</td>
<td>45</td>
<td>Hazardous</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Skin Contact: Wash off immediately with soap and plenty of water while removing all contaminated clothes and shoes. Wash contaminated clothing before reuse. Get medical attention if irritation develops or persists.

Eye Contact: Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get immediate medical attention.

Inhalation: Move victim to fresh air. If breathing is difficult, give oxygen by trained personnel. If not breathing, give artificial respiration. Get medical attention immediately.

Ingestion: Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Seek immediate medical attention/advice.

5. FIRE-FIGHTING MEASURES

Flammability: Fire or intense heat may cause violent rupture of packages.

Suitable Extinguishing Media: Use extinguishing agent suitable for type of surrounding fire.

Hazardous Combustion Products: Carbon dioxide (CO2), Carbon monoxide, Nitrogen oxides (NOx), Hydrogen cyanide (hydrocyanic acid).

Protective Equipment and Precautions for Firefighters: As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear. Reaction between water or foam and hot Isocyanate can be vigorous. Use water spray to cool unopened containers.

NFPA Rating: Health 2, Flammability 1, Instability 1

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Evacuate personnel to safe areas. Use personal protective equipment as required. Keep people away from and upwind of spill/leak.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Prevent product from entering drains. Do not flush into surface water or sanitary sewer system.

Methods for Containment: Prevent spilled material from 1) contaminating soil, 2) entering sanitary sewers, storm sewers, and drainage systems, and 3) entering bodies of water or ditches that lead to waterways. Prevent spreading over a wide area (e.g. by containment or oil barriers).

Methods for Clean-up: Soak up with inert absorbent material. Shovel into suitable container for disposal. Neutralize small spills with decontaminant. Remove from surface water (e.g. by skimming or siphoning). Retain all contaminated water or flushing liquid for disposal or for treatment prior to release.

7. HANDLING AND STORAGE

Handling: Do not breathe vapor or mist. Ensure adequate ventilation. Avoid contact with eyes, skin and clothing. Wear personal protective equipment. Take off contaminated clothing and wash before reuse.
Storage
Keep containers tightly closed in a dry, cool and well-ventilated place. Do not reseal contaminated containers.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits

**Isocyanic acid, polymethylenepolyphenylene ester (CAS #: 9016-87-9)**
- Canada – Alberta OELs: 0.005 ppm TWA
- Canada – Alberta OELs: 0.07 mg/m³ TWA

**4,4’-Methylenediphenyl Diisocyanate (CAS #: 101-68-8)**
- ACGIH – TLV: 0.005 ppm TWA
- OSHA PEL: 0.02 ppm Ceiling
- Canada – Alberta OELs: 0.005 ppm TWA
- Canada – Ontario OELs: 0.005 ppm TWA
- Canada – British Columbia OELs: 0.005 ppm TWA
- NIOSH IDLH: 75 mg/m³ Immediately dangerous to life or health IDLH
- Mexico OEL: 0.02 ppm TWA

Engineering Controls
Use general ventilation to maintain airborne concentrations to levels that are below regulatory and recommended occupational exposure limits. Local ventilation may be required during certain operations.

Personal Protective Equipment

**Eye / Face Protection**
Tight sealing safety goggles. If splashes are likely to occur: Face-shield. Ensure that eyewash stations and safety showers are close to the workstation location.

**Skin Protection**
Wear chemical resistant gloves. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasions.

**Respiratory Protection**
None required if hazards have been assessed and airborne concentrations are maintained below the exposure limits listed in Section 8. Where airborne concentrations may exceed exposure limits in Section 8, wear an approved air-purifying respirator with organic vapor cartridges and a HEPA (P100) particulate filter along with a cartridge change-out schedule developed in accordance with applicable respiratory protection standards. Use an approved positive-pressure air-supplied respirator with emergency escape provisions if there is any potential for an uncontrolled release, airborne concentrations are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

**General Hygiene Considerations**
Wash hands and face before breaks and immediately after handling the product. Take off contaminated clothing and wash before reuse. Contaminated work clothing should not be allowed out of the workplace.

9. PHYSICAL AND CHEMICAL PROPERTIES

**Appearance**
Dark brown

**Odor**
Musty

**Odor Threshold**
No information available

**Physical State**
Liquid

**pH**
No information available

**Flash Point**
230 °C / 446 °F

**Flash Point Method**
Closed cup

**Autoignition Temperature**
> 600 °C / > 1112 °F

**Boiling point / boiling range**
341 °C / 646 °F
Freezing Point: No information available
Flammability Limit in Air:
- Lower: No information available
- Upper: No information available
Specific Gravity: 1.23 @ 25 °C
Solubility: Insoluble (Water)
Evaporation Rate: No information available
Vapor Pressure: No information available
Vapor Density: 8.5 (Air = 1.0)
Percent Volatile, wt.%: No information available
VOC Content: No information available
Viscosity: 180 – 240 cps @ 25 °C

10. STABILITY AND REACTIVITY

Chemical Stability: Stable under normal conditions. Preparation reacts slowly with water resulting in evolution of CO2.
Conditions to Avoid: Contamination by those materials referred to under Incompatible materials. Avoid high temperatures.
Hazardous Polymerization: Polymerization may occur at elevated temperatures in the presence of alkalies, amines and metal compounds.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity
Isocyanic acid, polymethylene polyphenylene ester
- Oral LD50: >10000 mg/kg - rat
- Dermal LD50: >9400 mg/kg - rabbit
- Inhalation LC50: 310 mg/m³ – rat - 4h

4,4’-Methylenediphenyl Diisocyanate
- Oral LD50: >10000 mg/kg – rat
- Dermal LD50: >9400 mg/kg – rabbit
- Inhalation LC50: 0.49 mg/L – rat – 4h

Chronic Toxicity
NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA: No component of this product at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Isocyanic acid, polymethylene polyphenylene ester
IARC: Group 3 – The agent is not classifiable as to its carcinogenicity to humans.

4,4’-Methylenediphenyl Diisocyanate
IARC: Group 3 – The agent is not classifiable as to its carcinogenicity to humans.

Legend
- NTP – National Toxicology Program
- OSHA – Occupational Safety and Health Administration
- IARC – International Agency for Research on Cancer

Repeated Dose Toxicity: Persons allergic to isocyanates, and particularly those suffering from asthma or other respiratory conditions, should not work with isocyanates.
Sensitization  
May cause sensitization by inhalation and skin contact.

Target Organ(s)  
Lungs, Respiratory System, Skin, Eyes.

12. ECOLOGICAL INFORMATION

Ecotoxicity

Ecotoxicity effects  
No information available.

Persistence / Degradability  
Immiscible in water. Reacts with water to form inert and non-biodegradable solids.

Bioaccumulation  
No information available.

4,4’-Methylenediphenyl Diisocyanate

Aquatic Invertebrates  
EC50 (Daphnia) > 1000 mg/L (48h)

Fish  
LC50 (Fish) > 1000 mg/L (96h)

13. DISPOSAL CONSIDERATIONS

Disposal Considerations  
NOT A RCRA HAZARDOUS WASTE: When discarded in its purchased form, this material would not be regulated as a RCRA Hazardous waste under 40 CFR 261. The product should not be allowed to enter drains, water courses or the soil.

Contaminated Packaging  
Empty containers should be taken for local recycling, recovery or waste disposal.

US EPA Waste Number  
Not applicable.

14. TRANSPORT INFORMATION

DOT  
Proper Shipping Name  
NOT REGULATED

TDG  
Proper Shipping Name  
NOT REGULATED

IATA  
Proper Shipping Name  
NOT REGULATED

IMDG/IMO  
Proper Shipping Name  
NOT REGULATED

15. REGULATORY INFORMATION

International Inventories

TSCA Inventory Status:  
All components of this material are listed on the US Toxic Substances Control Act (TSCA) inventory.

Canadian Inventory Status:  
All components of this material are listed on the Canadian Domestic Substances List (DSL).

Australian Inventory Status:  
This product contains only chemicals which are currently listed on the Australian Inventory of Chemical Substances.

Korean Inventory Status:  
This product contains only chemicals which are currently listed on the Korean Chemical Substances List.

Philippine Inventory Status:  
This product contains only chemicals that are currently listed on the Philippines Inventory of Chemicals and Chemical Substances.

Japan ENCS:  
This product contains only chemicals that are currently listed on the Japanese Inventory of Existing and New Chemical Substances.
Chinese IECS: This product contains only chemicals that are currently listed on the Chinese Inventory of Existing Chemical Substances.

New Zealand Inventory: This product contains only chemicals which are currently listed on the New Zealand Inventory of Chemicals.

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>SARA 313 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-Methylene diphenyl Diisocyanate</td>
<td>101-68-8</td>
<td>45</td>
<td>Listed</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazardous Categorization

Acute Health Hazard Yes
Chronic Health Hazard Yes
Fire Hazard No
Sudden Release of Pressure Hazard No
Reactive Hazard No

TSCA 12(b) – Export Notification
This material does not contain any components that are subject to the US Toxic Substances Control Act (TSCA) Section 12(b) Export Notification requirements.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product contains the following HAPs:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>HAPs Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-Methylene diphenyl Diisocyanate</td>
<td>101-68-8</td>
<td>45</td>
<td></td>
</tr>
</tbody>
</table>

CERCLA
This product contains the following reportable quantities:

<table>
<thead>
<tr>
<th>Component</th>
<th>40 CFR 302.4 RQ</th>
<th>40 CFR 355 EHS TPQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-Methylene diphenyl Diisocyanate</td>
<td>5000 lb</td>
<td>2270 kg</td>
</tr>
</tbody>
</table>

State Regulations

California Proposition 65
This product is not known to contain any chemicals listed by the State of California (Safe Drinking Water and Toxic Enforcement Act of 1986) to cause cancer or reproductive toxicity.

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
D1A – Very toxic materials
D2A – Very toxic materials
D2B – Toxic materials

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>WHMIS Ingredient Disclosure List</th>
</tr>
</thead>
<tbody>
<tr>
<td>4,4’-Methylene diphenyl Diisocyanate</td>
<td>101-68-8</td>
<td>0.1%</td>
</tr>
</tbody>
</table>
16. OTHER INFORMATION

Prepared By Kreson Moodley – Based on information supplied by Reichhold Product Regulatory Department
Phone Number: +27 (0)31 713 0600

Revision Date 09 Sep 2014

Revision Number 2

Revision Summary This data sheet contains changes from the previous version in section(s): 2, 4 – 11 and 15

Former Date 27 May 2011

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CONSEQUENTIAL DAMAGES.

End of Material Safety Data Sheet
Material Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Description: ATPRIME® 2B
SAP ID(s): ATPRIME-2B--------KG
Material Code: ATPRIME-2B--------KG
Chemical Family: Unsaturated Polyester Resin
Intended Use: Two-Component Urethane-Based Primer System

Manufacturer: NCS Resins (Pty) Ltd
9 Pineside Road, New Germany 3610
South Africa
Tel +27(0) 31 713 0600
Fax +27(0) 31 705 9858

Emergency Telephone +27(0) 41 627 3283
Poison Information Centre 131126 (South Africa only)

Supplier: Aurora Glass Fibre (NZ) Ltd
3/16 Zelanian Drive, East Tamaki
Auckland 2013, New Zealand
Tel +64 9 273-3540
Fax +64 9 273-3565

2. HAZARDS IDENTIFICATION

Emergency Overview
Flammable Liquid
Vapors may form explosive mixtures with air
Vapor can travel to a source of ignition (spark or flame) and flash back
Material can accumulate static charges which may cause an incendiary electrical discharge
Harmful by inhalation, in contact with skin and if swallowed
Hazardous polymerization may occur
May cause sensitization by skin contact
Irritating to eyes and skin

Appearance Pink - Clear
Physical State Liquid
Odor Pungent

Primary Routes of Entry
Eye contact, Ingestion, Inhalation, Skin Contact, Skin Absorption.

Acute Effects

Eye
Irritating to eyes.

Skin
Harmful by skin absorption. Contact causes skin irritation. Prolonged skin contact may defat the skin and produce dermatitis. May cause sensitization by skin contact.

Inhalation
Harmful by inhalation. May cause irritation of respiratory tract. Inhalation of high vapor concentrations can cause CNS-depression and narcosis.

Ingestion
Harmful if swallowed. Ingestion may cause gastrointestinal irritation, nausea, vomiting and diarrhea. Aspiration hazard if swallowed – can enter lungs and cause damage. Ingestion is not an anticipated route of exposure for this material in industrial use.

Chronic Effects
This material contains a chemical which is listed by the International Agency for Research on Cancer (IARC) as a group 2B cancer causing agent (possibly carcinogenic to humans). The National Toxicology Program (NTP) has listed a chemical in this material as reasonably anticipated to be a human carcinogen.

Target Organ(s)
Liver, Kidney, Central Nervous System (CNS), Respiratory System.

HMIS: Health: 2* Flammability: 3 Reactivity: 2 Personal Protection:
3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene</td>
<td>100-42-5</td>
<td>49.0</td>
<td>Hazardous</td>
</tr>
<tr>
<td>Polyester Resin</td>
<td>Proprietary</td>
<td>45.0</td>
<td>Not Hazardous</td>
</tr>
<tr>
<td>Methyl Methacrylate</td>
<td>80-62-6</td>
<td>6.0</td>
<td>Hazardous</td>
</tr>
</tbody>
</table>

4. FIRST AID MEASURES

Skin Contact: Wash off with warm water and soap. Remove contaminated clothing and shoes. If skin irritation persists, call a physician. Wash contaminated clothing before reuse.

Eye Contact: Immediately flush eyes for at least 15 minutes. Get medical attention.

Inhalation: Remove person to fresh air. If signs/symptoms continue, get medical attention. Keep patient warm and at rest. If not breathing, give artificial respiration. If breathing is labored, administer oxygen. Get medical attention immediately.

Ingestion: DO NOT INDUCE VOMITING. ASPIRATION HAZARD. This material can enter the lungs during vomiting. Never give anything by mouth to an unconscious person. GET IMMEDIATE MEDICAL ATTENTION.

5. FIRE-FIGHTING MEASURES

Flammability: Flammable liquid.

Suitable Extinguishing Media: Carbon dioxide (CO2), Foam, Dry Chemical, Water Spray.

Hazardous Combustion Products: Combustion may produce carbon monoxide, carbon dioxide and irritating or toxic vapors and gases.

Fire/Explosion Hazard: Flammable. Vapors may form explosive mixtures with air. Flash back possible over considerable distance. This material may polymerize (react) with its container is exposed to heat (as in during a fire). This polymerization increases pressure inside a closed container and may result in the violent rupture of the container. Empty containers may retain product residue (liquid and/or vapor). Do not pressurize, cut, weld, braze, solder, drill, grind, or expose these containers to heat, flame, spark, static electricity, or other sources of ignition as the container may explode and may cause injury or death.

Protective Equipment and Precautions for Firefighters: Wear self-contained breathing apparatus (SCBA) and full fire-fighting protective clothing. Thoroughly decontaminate all protective equipment after use. Evacuate all person from the fire area to a safe location. Move non-burning material, as feasible, to a safe location as soon as possible. Fire fighters should be protected from potential explosion hazard while extinguishing the blaze. DO NOT extinguish a fire resulting from the flow of this flammable liquid until the flow of liquid is effectively shut off. This precaution will help prevent the accumulation of an explosive vapor-air mixture after the initial fire is extinguished. Use water spray to cool fire-exposed containers.

NFPA Rating: Health 2, Flammability 3, Instability 2

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions: Remove all sources of ignition. Evacuate personnel to safe areas. Use personal protective equipment as required. Ensure adequate ventilation. Keep people away from and upwind of spill/leak. Beware of vapors accumulating to form explosive concentrations. Vapors can accumulate in low areas.

Environmental Precautions: Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system. Prevent product from entering drains. Soak up with inert absorbent material and dispose of as hazardous waste.
Methods for Containment
Prevent spilled material from 1) contaminating soil, 2) entering sanitary sewers, storm sewers, and drainage systems, and 3) entering bodies of water or ditches that lead to waterways. Prevent spreading over a wide area (e.g. by containment or oil barriers).

Methods for Clean-up
Soak up with inert absorbent material. Remove from surface water (e.g. by skimming or siphoning). Dispose of contaminated materials as waste according to item 13.

7. HANDLING AND STORAGE

Handling
Do not breathe vapor or mist. Avoid contact with eyes, skin and clothing. Wash hands before breaks and immediately after handling the product. Take off contaminated clothing and wash before reuse. Ensure adequate ventilation. Ground and bond containers when transferring material. Use spark-proof tools and explosion-proof equipment. Consult your supplier of promoters and catalysts for additional instructions on proper mixing and usage. Empty containers may retain product residue (liquid and/or vapor). Do not pressurize, cut, weld, braze, solder, drill, grind, or expose these containers to heat, flame, sparks, static electricity, or other sources of ignition as the container may explode and may cause injury or death. Empty drums should be completely drained and properly bunged. Empty drums should be promptly returned to a drum reconditioner or properly disposed.

Storage
Keep away from heat and sources of ignition. No smoking. Keep away from direct sunlight. Keep containers tightly closed in a cool, well-ventilated place. To ensure maximum stability and maintain optimum resin properties, resins should be stored in closed containers at temperatures below 77°F (25°C).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure Limits
Components with workplace control parameters.

Styrene (CAS #: 100-42-5)

ACGIH - TLV
20 ppm TWA
40 ppm STEL

OSHA PEL
100 ppm TWA
200 ppm STEL

Industry PEL
While the federal workplace exposure limit for styrene is 100 ppm, OSHA accepted the styrene industry’s proposal to voluntary meet a PEL of 50 ppm on an 8 hour TWA and a Short Term Exposure Limit (STEL) of 100 ppm, 15 minute exposure.

Canada – Alberta OELs
40 ppm STEL
170 mg/m³ STEL
20 ppm TWA
85 mg/m³ TWA

Canada – Ontario OELs
35 ppm TWA
100 ppm STEL

Canada – British Columbia OELs
50 ppm TWA
75 ppm STEL

NIOSH IDLH
700 ppm Immediately dangerous to life or health IDLH

Mexico OEL
100 ppm STEL
425 mg/m³ STEL
50 ppm TWA
215 mg/m³ TWA (skin)

Methyl Methacrylate (CAS #: 80-62-6)

ACGIH – TLV
50 ppm TWA
100 ppm STEL

OSHA PEL
100 ppm TWA
410 mg/m³ TWA

Canada – Alberta OELs
100 ppm STEL
410 mg/m³ STEL
50 ppm TWA
205 mg/m³ TWA

Canada – Ontario OELs
50 ppm TWA
100 ppm STEL
Canada – British Columbia OELs

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>OEL</td>
<td>50 ppm TWA</td>
</tr>
<tr>
<td>STEL</td>
<td>100 ppm</td>
</tr>
<tr>
<td>STEL</td>
<td>1000 ppm Immediately dangerous to life or health IDLH</td>
</tr>
<tr>
<td>Mexico OEL</td>
<td>125 ppm TWA</td>
</tr>
<tr>
<td>STEL</td>
<td>510 mg/m³ STEL</td>
</tr>
<tr>
<td>STEL</td>
<td>100 ppm TWA</td>
</tr>
<tr>
<td>STEL</td>
<td>410 mg/m³ TWA</td>
</tr>
</tbody>
</table>

**Legend**

- ACGIH - American Conference of Governmental Industrial Hygienists
- TLV® - Threshold Limit Value
- TWA - time-weighted average
- STEL - Short Term Exposure Limit
- OSHA - Occupational Safety and Health Administration
- PEL - Permissible Exposure Limit
- OEL - Occupational Exposure Limit
- NIOSH - National Institute for Occupational Safety and Health
- IDLH - Immediately Dangerous to Life or Health

**Skin**: Skin Absorption

**Engineering Controls**

Use general ventilation to maintain airborne concentrations to levels that are below regulatory and recommended occupational exposure limits. Local ventilation may be required during certain operations. Use explosion-proof equipment.

**Personal Protective Equipment**

**Eye / Face Protection**

Safety glasses with side-shields. If splashes are likely to occur: Tight sealing safety goggles. Ensure that eyewash stations and safety showers are close to the workstation location.

**Skin Protection**

Wear protective nitrile rubber or Viton™ gloves. Gloves made of nitrile rubber or polyvinyl chloride (PVC) may be used for splash protection and brief or intermittent contact with styrenated polyester resin. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. Also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion. Impervious clothing. Rubber or plastic boots.

**Respiratory Protection**

None required if hazards have been assessed and airborne concentrations are maintained below the exposure limits listed in Section 8. Wear an approved air-purifying respirator with organic vapor cartridges and particulate filters where airborne concentrations may exceed exposure limits in Section 8 and/or there is exposure to dust or mists due to sanding, grinding, cutting, or spraying. Use an approved positive-pressure air-supplied respirator with emergency escape provisions if there is any potential for an uncontrolled release, airborne concentrations are not known, or any other circumstances where air-purifying respirators may not provide adequate protection.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Pink - Clear</td>
</tr>
<tr>
<td>Odor</td>
<td>Pungent</td>
</tr>
<tr>
<td>Odor Threshold</td>
<td>0.2 ppm (Styrene)</td>
</tr>
<tr>
<td></td>
<td>0.05 – 0.21 ppm (Methyl Methacrylate)</td>
</tr>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>pH</td>
<td>No information available</td>
</tr>
<tr>
<td>Flash Point</td>
<td>26 °C / 79 °F</td>
</tr>
<tr>
<td>Flash Point Method</td>
<td>Seta closed cup</td>
</tr>
<tr>
<td>Autoignition Temperature</td>
<td>806 °F – 914 °F / 430 °C – 490 °C</td>
</tr>
<tr>
<td>Boiling point / boiling range</td>
<td>212 °F – 295 °F / 100 °C – 146 °C</td>
</tr>
<tr>
<td>Freezing Point</td>
<td>&lt; 0 °F / &lt; -18 °C</td>
</tr>
<tr>
<td>Flammability Limit in Air</td>
<td></td>
</tr>
<tr>
<td>Lower</td>
<td>1.1 %</td>
</tr>
<tr>
<td>Upper</td>
<td>12.5 %</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>0.98 – 1.03 @ 25 °C</td>
</tr>
<tr>
<td>Solubility</td>
<td>Insoluble (Water)</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>0.49 – 3.1 (BuAc = 1)</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>6.12 – 20 mmHg @ 68 °F / 20 °C</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>3.45 – 3.6 (Air = 1)</td>
</tr>
</tbody>
</table>
### 10. STABILITY AND REACTIVITY

**Chemical Stability**
Stable under normal conditions. Stable under recommended storage conditions.

**Conditions to Avoid**
Heat, flames and sparks. Contamination by those materials referred to under Incompatible Materials.

**Incompatible Materials**

**Hazardous Decomposition Products**
Hydrocarbons. Carbon monoxide. Carbon dioxide (CO2). Thermal decomposition can lead to release of irritating and toxic gases and vapors.

**Hazardous Polymerization**
Polymerization can occur. Hazardous polymerization will occur if contaminated with peroxides, metal salts and polymerization catalysts. Product will undergo hazardous polymerization at temperatures above 150 F (65 C).

### 11. TOXICOLOGICAL INFORMATION

**Acute Toxicity**

**Styrene**
- Oral LD50: 5000 mg/kg - rat
- Dermal LD50: >2000 mg/kg - rat
- Inhalation LC50: 11.8 mg/l – rat (4 hours)

**Methyl Methacrylate**
- Oral LD50: 8400 mg/kg – rat
- Dermal LD50: >9400 mg/kg – rabbit
- Inhalation LC50: 7093 mg/l (4 hours)

**Eye Effects**
Studies indicate that exposures to concentrations of styrene above 200 ppm cause irritation of the eyes. Styrene causes transient moderate eye irritation without corneal involvement.

**Sensitization**
May cause sensitization by skin contact.

**Chronic Toxicity**
Components influencing toxicology.

**Styrene**
- NTP: Reasonably anticipated to be human carcinogen
- IARC: Group 2B – Possibly Carcinogenic to Humans

**Legend**
- NTP – National Toxicology Program
- IARC – International Agency for Research on Cancer

**Repeated Dose Toxicity**
In humans, styrene may cause a transient decrease in color discrimination and effects on hearing. Repeated or prolonged exposure may cause skin irritation and dermatitis, due to defatting properties of the product. May cause damage to the kidneys, liver, eyes, brain, respiratory system, central nervous system through prolonged or repeated exposure if inhaled.

**Sensitization**
Contains methacrylates, which are known to be weak sensitizers.

**Mutagenic Effects**
Styrene has given mixed positive and negative results in a number of mutagenicity tests. Styrene was not mutagenic without metabolic activation but gave negative and positive mutagenic results with metabolic activation.

**Development Toxicity**
Results from studies in experimental animals indicate little or no potential for styrene to produce developmental toxicity.
12. ECOLOGICAL INFORMATION

Ecotoxicity

Styrene

Log Kow 2.95
Bioconcentration factor (BCF) 74
Algae
EC50 = 1.4 mg/L (Pseudokirchneriella subcapitata) (72h)
EC50 0.46 – 4.3 mg/L (Pseudokirchneriella subcapitata) (72h)
Aquatic Invertebrates
EC50 3.3 – 7.4 mg/L (Daphnia magna) (48h)
Fish
LC50 3.24 – 4.99 mg/L (Pimephales promelas) (96h) flow-through
LC50 19.03 – 33.53 mg/L (Lepomis macrochirus) (96h) static
LC50 6.75 – 14.5 mg/L (Pimephales promelas) (96h) static
LC50 58.75 – 95.32 mg/L (Poecilia reticulata) (96h) static

Methyl Methacrylate

Log Kow 0.7
Aquatic Invertebrates
EC50 = 69 mg/L (Daphnia magna) (48h)
Fish
LC50 243 – 275 mg/L (Pimephales promelas) (96h) flow-through
LC50 125.5 – 190.7 mg/L (Pimephales promelas) (96h) static
LC50 170 – 206 mg/L (Lepomis macrochirus) (96h) flow-through
LC50 152.9 – 341.8 mg/L (Lepomis macrochirus) (96h) static
LC50 > 79 mg/L (Oncorhynchus mykiss) (96h) flow-through
LC50 > 79 mg/L (Oncorhynchus mykiss) (96h) static
LC50 326.4 – 426.9 mg/L (Poecilia reticulata) (96h) static

13. DISPOSAL CONSIDERATIONS

Disposal Considerations Hazardous waste. Can be incinerated, when in compliance with local regulations.

Contaminated Packaging Empty containers should be taken for local recycling, recovery or waste disposal.

US EPA Waste Number D001 (IGNITABLE): When discarded in its purchased form, this material would be regulated under 40 CFR 261.21 as EPA Hazardous Waste Number D001 based on the characteristic of ignitability.

14. TRANSPORT INFORMATION

DOT
UN-No UN1866
Proper Shipping Name RESIN SOLUTION
Hazard Class 3
Packing Group III
NAERG 127

TDG
UN-No UN1866
Proper Shipping Name RESIN SOLUTION
Hazard Class 3
Packing Group III
NAERG 127

IATA
UN-No UN1866
Proper Shipping Name RESIN SOLUTION
Hazard Class 3
Packing Group III
Packing Instructions 355,366
NAERG 127
15. REGULATORY INFORMATION

International Inventories

TSCA Inventory Status: All components of this material are listed on the US Toxic Substances Control Act (TSCA) Inventory.

Canadian Inventory Status: All components of this material are listed on the Canadian Domestic Substances List (DSL).

Australian Inventory Status: This product contains one or more chemicals currently not on the Australian Inventory of Chemical Substances.

Korean Inventory Status: This product contains only chemicals which are currently listed on the Korean Chemical Substances List.

Philippine Inventory Status: This product contains one or more chemicals currently not on the Philippines Inventory of Chemicals and Chemical Substances.

Japan ENCS: This product contains only chemicals that are currently listed on the Japanese Inventory of Existing and New Chemical Substances.

Chinese IECS: This product contains only chemicals that are currently listed on the Chinese Inventory of Existing Chemical Substances.

New Zealand Inventory: This product contains only chemicals which are currently listed on the New Zealand Inventory of Chemicals.

US Federal Regulations

SARA 313
Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product contains a chemical or chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>SARA 313 Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene</td>
<td>100-42-5</td>
<td>49.0</td>
<td>Listed</td>
</tr>
<tr>
<td>Methyl Methacrylate</td>
<td>80-62-6</td>
<td>6.0</td>
<td>Listed</td>
</tr>
</tbody>
</table>

SARA 311/312 Hazardous Categorization

Acute Health Hazard: Yes
Chronic Health Hazard: Yes
Fire Hazard: Yes
Sudden Release of Pressure Hazard: No
Reactive Hazard: Yes

TSCA 12(b) – Export Notification
This material does not contain any components that are subject to the US Toxic Substances Control Act (TSCA) Section 12(b) Export Notification requirements.

Clean Air Act, Section 112 Hazardous Air Pollutants (HAPs) (see 40 CFR 61)
This product contains the following HAPs:

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>Weight-%</th>
<th>HAPs Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene</td>
<td>100-42-5</td>
<td>49.0</td>
<td>Listed</td>
</tr>
<tr>
<td>Methyl Methacrylate</td>
<td>80-62-6</td>
<td>6.0</td>
<td>Listed</td>
</tr>
</tbody>
</table>
CERCLA
This product contains the following reportable quantities:

<table>
<thead>
<tr>
<th>Component</th>
<th>40 CFR 302.4 RQ</th>
<th>40 CFR 355 EHS TPQs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene</td>
<td>1000 lb</td>
<td>454 kg</td>
</tr>
<tr>
<td>Methyl Methacrylate</td>
<td>1000 lb</td>
<td>454 kg</td>
</tr>
</tbody>
</table>

Chemical Weapons Convention (CWC)
This product does not contain any listed substances.

State Regulations

California Proposition 65
WARNING: This material contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

Canada
This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

WHMIS Hazard Class
B2 – Flammable liquid
D2A – Very toxic materials
D2B – Toxic materials
F – Dangerously reactive material

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS No</th>
<th>WHMIS Ingredient Disclosure List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Styrene</td>
<td>100-42-5</td>
<td>0.1 %</td>
</tr>
<tr>
<td>Methyl Methacrylate</td>
<td>80-62-6</td>
<td>1 %</td>
</tr>
</tbody>
</table>

16. OTHER INFORMATION

Prepared By
Kreson Moodley – Based on information supplied by Reichhold Product Regulatory Department
Phone Number: +27 (0)31 713 0600

Revision Date
23 Sep 2014

Revision Number
2

Revision Summary
This data sheet contains changes from the previous version in section(s): 2, 8, 9, 11, 14, 15

Former Date
26 May 2011

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End of Material Safety Data Sheet