1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

Material Name: Methyl Ethyl Ketone

Other names: Ethyl methyl ketone ETHYL METHYL KETONE, MEK

Product Code: S2113

Supplier: Auschem (NSW) Pty. Ltd.
ABN: 32 084 260 159
PO Box 6309, Wetherill Park
91 Newton Road, Wetherill Park
NSW 2164 Australia

Telephone: +612 9756 5559
Fax: +612 9756 5558

Local Contact

Telephone: +612 9756 5559
Fax: +612 9756 5558

Emergency Telephone Number: 1800 651 818 (24 hours) / (International) +613 8823 3095

2. HAZARDS IDENTIFICATION

HAZARDOUS SUBSTANCE. DANGEROUS GOODS.

Classified as hazardous according to the criteria of NOHSC, and as Dangerous Goods according to the Australian Dangerous Goods Code.

Symbol(s):
- F Highly flammable.
- Xi Irritant.

R-phrase(s):
- R11 Highly flammable.
- R36 Irritating to eyes.
- R66 Repeated exposure may cause skin dryness or cracking.
- R67 Vapours may cause drowsiness and dizziness.

S-phrase(s):
- S2 Keep out of the reach of children.
- S9 Keep container in a well-ventilated place.
- S16 Keep away from sources of ignition - No smoking.
- S2 Keep out of the reach of children.

Health Hazards:
Vapours may cause drowsiness and dizziness. Repeated exposure may cause skin dryness or cracking. Irritating to eyes. Harmful: may cause lung damage if swallowed.

Aggravated Medical Condition:
Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Eyes. Respiratory system.
Material Safety Data Sheet
Methyl Ethyl Ketone

Safety Hazards: Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger. Exposure may enhance the toxicity of other materials. Highly flammable.

SUSMP Schedule: 5

3. COMPOSITION/INFORMATION ON INGREDIENTS

CAS No.: 78-93-3
INDEX No.: 606-002-00-3
EINECS No.: 201-159-0

Hazardous Components

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>CAS</th>
<th>EINECS</th>
<th>Symbol(s)</th>
<th>R-phrase(s)</th>
<th>Conc.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>78-93-3</td>
<td>201-159-0</td>
<td></td>
<td>100.00 %</td>
<td></td>
</tr>
</tbody>
</table>

Additional Information: Refer to chapter 16 for full text of EC R-phrases.

4. FIRST AID MEASURES

Inhalation: Remove to fresh air. If rapid recovery does not occur, transport to nearest medical facility for additional treatment.

Skin Contact: Remove contaminated clothing. Flush exposed area with water and follow by washing with soap if available.

Eye Contact: Immediately flush eyes with large amounts of water for at least 15 minutes while holding eyelids open. Transport to the nearest medical facility for additional treatment.

Ingestion: If swallowed, do not induce vomiting; transport to nearest medical facility for additional treatment. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. If any of the following delayed signs and symptoms appear within the next 6 hours, transport to the nearest medical facility: fever greater than 101° F (38.3° C), shortness of breath, chest congestion or continued coughing or wheezing. If vomiting occurs spontaneously, keep head below hips to prevent aspiration. Give nothing by mouth. Do not induce vomiting.

Advice to Physician: Potential for chemical pneumonitis. Consider: gastric lavage with protected airway, administration of activated charcoal. Call a doctor or poison control center for guidance.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Specific Hazards: Carbon monoxide may be evolved if incomplete combustion occurs. The vapour is heavier than air, spreads along the ground and distant ignition is possible.
6. ACCIDENTAL RELEASE MEASURES

Observe all relevant local and international regulations.

Protective Measures: Avoid contact with spilled or released material. Immediately remove all contaminated clothing. For guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. For guidance on disposal of spilled material see Chapter 13 of this Material Safety Data Sheet. Shut off leaks, if possible without personal risks. Remove all possible sources of ignition in the surrounding area. Use appropriate containment (of product and fire fighting water) to avoid environmental contamination. Prevent from spreading or entering drains, ditches or rivers by using sand, earth, or other appropriate barriers. Attempt to disperse the vapour or to direct its flow to a safe location for example by using fog sprays. Take precautionary measures against static discharge. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Monitor area with combustible gas indicator.

Clean Up Methods: For large liquid spills (> 1 drum), transfer by mechanical means such as vacuum truck to a salvage tank for recovery or safe disposal. Do not flush away residues with water. Retain as contaminated waste. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.
For small liquid spills (< 1 drum), transfer by mechanical means to a labelled, sealable container for product recovery or safe disposal. Allow residues to evaporate or soak up with an appropriate absorbent material and dispose of safely. Remove contaminated soil and dispose of safely.

Additional Advice: See Chapter 13 for information on disposal. Notify authorities if any exposure to the general public or the environment occurs or is likely to occur. Vapour may form an explosive mixture with air.

7. HANDLING AND STORAGE

General Precautions: Avoid breathing vapours or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. On guidance on selection of personal protective equipment see Chapter 8 of this Material Safety Data Sheet. Use
the information in this data sheet as input to a risk assessment of local circumstances to help determine appropriate controls for safe handling, storage and disposal of this material.

**Handling:**
Avoid contact with the skin. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment to reduce the risk. The vapours in the head space of the storage vessel may lie in the flammable/explosive range and hence may be flammable. Extinguish any naked flames. Do not smoke. Remove ignition sources. Avoid sparks. Handling Temperature: Ambient.

**Storage:**
Keep away from aerosols, flammables, oxidizing agents, corrosives and from products harmful or toxic to man or to the environment. Must be stored in a well-ventilated area, away from sunlight, ignition sources and other sources of heat. Storage Temperature: Ambient.

**Product Transfer:**
Keep containers closed when not in use. Do not use compressed air for filling, discharging or handling. Refer to guidance under Handling section.

**Recommended Materials:**
For container paints, use epoxy paint, zinc silicate paint. For containers, or container linings use mild steel, stainless steel.

**Unsuitable Materials:**
Aluminum; Plastics.; Natural, neoprene or nitrile rubbers.

**Container Advice:**
Containers, even those that have been emptied, can contain explosive vapours. Do not cut, drill, grind, weld or perform similar operations on or near containers.

**Additional Information:**
Ensure that all local regulations regarding handling and storage facilities are followed. See additional references that provide safe handling practices: American Petroleum Institute 2003 (Protection Against Ignitions Arising out of Static, Lightning and Stray Currents) or National Fire Protection Agency 77 (Recommended Practices on Static Electricity).

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### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

#### Occupational Exposure Limits

<table>
<thead>
<tr>
<th>Material</th>
<th>Source</th>
<th>Type</th>
<th>ppm</th>
<th>Mg/m³</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>ACGIH</td>
<td>STEL</td>
<td>300</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ACGIH</td>
<td>TWA</td>
<td>200</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>AU OEL</td>
<td>TWA</td>
<td>150</td>
<td>445</td>
<td></td>
</tr>
<tr>
<td></td>
<td>AU OEL</td>
<td>STEL</td>
<td>300</td>
<td>890</td>
<td></td>
</tr>
</tbody>
</table>

**Additional Information:** Wash hands before eating, drinking, smoking and using the toilet.

#### Biological Exposure Index (BEI)

<table>
<thead>
<tr>
<th>Material</th>
<th>Determinant</th>
<th>Sampling time</th>
<th>BEI</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>MEK in urine</td>
<td>End of Shift</td>
<td>2 mg/l</td>
<td>ACGIH (2003)</td>
</tr>
<tr>
<td>MEK in urine</td>
<td>End of Shift</td>
<td>2 mg/l</td>
<td></td>
<td>ACGIH BEL (02 2013)</td>
</tr>
</tbody>
</table>

**Exposure Controls:**
The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Select controls based on a risk assessment of local circumstances. Appropriate measures include: Adequate explosion-proof ventilation to control airborne concentrations below the exposure guidelines/limits. Local exhaust ventilation is recommended.
Eye washes and showers for emergency use. Always observe good personal hygiene measures, such as washing hands after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practice good housekeeping. Define procedures for safe handling and maintenance of controls. Educate and train workers in the hazards and control measures relevant to normal activities associated with this product. Ensure appropriate selection, testing and maintenance of equipment used to control exposure, e.g. personal protective equipment, local exhaust ventilation. Drain down system prior to equipment break-in or maintenance. Retain drain downs in sealed storage pending disposal or for subsequent recycle.

**Personal Protective Equipment:**

Personal protective equipment (PPE) should meet recommended national standards. Check with PPE suppliers.

**Respiratory Protection:**

If engineering controls do not maintain airborne concentrations to a level which is adequate to protect worker health, select respiratory protection equipment suitable for the specific conditions of use and meeting relevant legislation. Check with respiratory protective equipment suppliers. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus. Where air-filtering respirators are suitable, select an appropriate combination of ask and filter.

Select a filter suitable for organic gases and vapours [boiling point >65°C (149°F)].

**Hand Protection:**

Where hand contact with the product may occur the use of gloves approved to relevant standards (e.g. Europe: EN374, US: F739, AS/NZS:2161) made from the following materials may provide suitable chemical protection:

- Longer term protection: Butyl rubber. Polyvinyl alcohol. For continuous contact we recommend gloves with breakthrough time of more 240 minutes with preference for > 480 minutes where suitable gloves can be identified.
- For short-term/splash protection we recommend the same, but recognise that suitable gloves offering this level of protection may not be available and in this case a lower breakthrough time may be acceptable so long as appropriate maintenance and replacement regimes are followed. Glove thickness is not a good predictor of glove resistance to a chemical as it is dependent on the exact composition of the glove material. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly.

Application of a non-perfumed moisturizer is recommended.

**Eye Protection:**

Chemical splash goggles (chemical monogoggles).

**Protective Clothing:**

Chemical resistant gloves/gauntlets. For spillage clean up use chemical resistant knee length boots. Wear antistatic and flame retardant clothing.

**Monitoring Methods:**

Monitoring of the concentration of substances in the breathing zone of workers or in the general workplace may be required to confirm compliance with an OEL and adequacy of exposure controls. For some substances biological monitoring may also be appropriate. Validated exposure measurement methods should be applied by a competent person and

Environmental Exposure Controls:
Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour. Take appropriate measures to fulfill the requirements of relevant environmental protection legislation. Avoid contamination of the environment by following advice given in Chapter 6. If necessary, prevent undissolved material from being discharged to waste water. Waste water should be treated in a municipal or industrial waste water treatment plant before discharge to surface water.

9. PHYSICAL AND CHEMICAL PROPERTIES

- **Appearance:** Clear Liquid.
- **Odour:** Characteristic
- **pH:** Not applicable
- **Boiling point:** 79.5 °C / 175.1 °F
- **Melting / freezing point:** -86 °C / -123 °F
- **Flash point:** -9 °C / 16 °F(Abel)
- **Explosion / Flammability limits in air:** 1.8 - 11.5 %(V)
- **Auto-ignition temperature:** 515 °C / 959 °F(ASTM E-659)
- **Vapour pressure:** 12,600 Pa at 20 °C / 68 °F
- **Specific gravity:** 0.804 - 0.806 at 20 °C / 68 °F
- **Density:** 804 - 806 kg/m3 at 20 °C / 68 °F(ASTM D-4052)
- **Water solubility:** 250 g/l at 20 °C / 68 °F
- **Solubility in other solvents:** Alcohol(s) Completely miscible.
- **Vapour density (air=1):** 2.4 at 20 °C / 68 °F
- **Electrical conductivity:** Electrical conductivity: > 10 000 pS/m, A number of factors, for example liquid temperature, presence of contaminants, and anti-static additives can greatly influence the conductivity of a liquid., This material is not expected to be a static accumulator.
- **Volatile organic carbon:** 66.6 % (EC/1999/13)
- **Evaporation rate (nBuAc=1):** 3.7 (ASTM D 3539, nBuAc=1)
- **Molecular weight:** 72.11 g/mol

10. STABILITY AND REACTIVITY

**Stability:** Stable under normal conditions of use. Reacts with strong oxidising agents.
**Conditions to Avoid:** Avoid heat, sparks, open flames and other ignition sources.
**Materials to Avoid:** Strong oxidising agents.
Hazardous
Decomposition Products: Thermal decomposition is highly dependent on conditions. A complex mixture of airborne solids, liquids and gases, including carbon monoxide, carbon dioxide and other organic compounds will be evolved when this material undergoes combustion or thermal or oxidative degradation.

Sensitivity to Static Discharge: Yes, in certain circumstances product can ignite due to static electricity.

11. TOXICOLOGICAL INFORMATION

Basis for Assessment: Information given is based on product testing.

Acute Oral Toxicity: Low toxicity: LD50 >2000 - <=5000 mg/kg, Rat

Acute Dermal Toxicity: LD50 >5000 mg/kg, Rabbit

Acute Inhalation Toxicity: LC50>5000 ppm

High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea.

Skin corrosion/irritation: Not irritating to skin.

Serious eye damage/irritation: Causes eye irritation.

Respiratory Irritation: Not expected to be a respiratory irritant.

Sensitisation: Not a skin sensitisier.

Repeated Dose Toxicity: Low systemic toxicity on repeated exposure. Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis.

Germ cell mutagenicity: Not mutagenic.

Carcinogenicity: Not expected to be carcinogenic.

<table>
<thead>
<tr>
<th>Material</th>
<th>Carcinogenicity Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methyl Ethyl Ketone</td>
<td>GHS/CLP: No carcinogenicity classification</td>
</tr>
</tbody>
</table>

Reproductive and Developmental Toxicity: Not expected to impair fertility. Not a developmental toxicant.

Additional Information: Exposure may enhance the toxicity of other materials.

12. ECOLOGICAL INFORMATION

Acute Toxicity
Fish: Practically non toxic: LL/EL/IL50 > 100 mg/l

Aquatic crustacea: Practically non toxic: LL/EL/IL50 > 100 mg/l

Algae/aquatic plants: Practically non toxic: LL/EL/IL50 > 100 mg/l

Microorganisms: Practically non toxic: LL/EL/IL50 > 100 mg/l

Mobility: Dissolves in water.

Persistence/degradability: Readily biodegradable. Oxidises rapidly by photo-chemical reactions in air.

Bioaccumulation: Not expected to bioaccumulate significantly.

13. DISPOSAL CONSIDERATIONS
Material Disposal: Recover or recycle if possible. It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste classification and disposal methods in compliance with applicable regulations.
Do not dispose into the environment, in drains or in water courses. Waste product should not be allowed to contaminate soil or water.

Container Disposal: Drain container thoroughly. After draining, vent in a safe place away from sparks and fire. Residues may cause an explosion hazard. Do not puncture, cut or weld uncleaned drums. Send to drum recoverer or metal reclaimer.

Local Legislation: Disposal should be in accordance with applicable regional, national, and local laws and regulations. Local regulations may be more stringent than regional or national requirements and must be in compliance.

14. TRANSPORT INFORMATION

ADG

UN number: 1193
UN proper shipping name: ETHYL METHYL KETONE
Class: 3
Packing group: II
Hazchem Code: •2YE

IMDG

Identification number: UN 1193
UN proper shipping name: METHYL ETHYL KETONE
Class / Division: 3
Packing group: II
Marine Pollutant: No

IATA (Country variations may apply)

UN number: 1193
UN proper shipping name: Methyl ethyl ketone
Class / Division: 3
Packing group: II

Additional Information: This product may be transported under nitrogen blanketing. Nitrogen is an odourless and invisible gas. Exposure to nitrogen may cause asphyxiation or death. Personnel must observe strict safety precautions when involved with a confined space entry.

15. REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

SUSMP Schedule: 5
Chemical Inventory Status:

Version: 5.0
Effective Date: 10th July 2013
Product: Methyl Ethyl Ketone
Page: 8 of 9
AICS: Listed.
DSL: Listed.
EINECS: Listed. 201-159-0
ENCS (JP): Listed. (2)-542
ISHL (JP): Listed. (2)-542
KECI (KR): Listed. 97-1-81
KECI (KR): Listed. KE-24094
NZIOC: Listed. HSR00119 HSNO Approved 0
PICCS (PH): Listed.
TSCA: Listed.

16. OTHER INFORMATION

R-phrase(s)

R11: Highly flammable.
R36: Irritating to eyes.
R66: Repeated exposure may cause skin dryness or cracking.
R67: Vapours may cause drowsiness and dizziness.

SDS Version Number: 5.0

SDS Effective Date: 10.07.2013

SDS Revisions: A vertical bar (|) in the left margin indicates an amendment from the previous version.

SDS Regulation:

SDS Distribution: The information in this document should be made available to all who may handle the product

Disclaimer: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.