MATERIAL SAFETY DATA SHEET

SECTION 1  PRODUCT AND COMPANY IDENTIFICATION

PRODUCT
Product Name: MEK
Product Description: Ketone
Intended Use: Solvent

COMPANY IDENTIFICATION
Supplier: ExxonMobil Chemical Australia Pty. Ltd.
12 Riverside Quay
Southbank
Victoria       Australia

24 Hour Environmental / Health Emergency Telephone  +1800 023 005 (24 HOURS)
Supplier General Contact  +1800 503 966

SECTION 2  HAZARDS IDENTIFICATION

HAZARD CLASSIFICATION: HAZARDOUS SUBSTANCE. DANGEROUS GOOD.

Classified in accordance with Approved Criteria for Classifying Hazardous Substances NOHSC:1008 & according to Australian Dangerous Goods Code.

CLASSIFICATION: | Xi; R36 | R66 | R67 |

POISON SCHEDULE NUMBER: S5

PHYSICAL / CHEMICAL HAZARDS
Highly flammable. Material can release vapours that readily form flammable mixtures. Vapour accumulation could flash and/or explode if ignited.

HEALTH HAZARDS
Irritating to eyes. Repeated exposure may cause skin dryness or cracking. Vapours may cause drowsiness and dizziness. If swallowed, may be aspirated and cause lung damage. May cause central nervous system depression.

SAFETY PHRASE(S): S9; Keep container in a well-ventilated place. S16; Keep away from sources of ignition - No smoking.

NOTE: This material should not be used for any other purpose than the intended use in Section 1 without expert advice. Health studies have shown that chemical exposure may cause potential human health risks which may vary from person to person.
SECTION 3  COMPOSITION / INFORMATION ON INGREDIENTS

This material is regulated as a substance.

Reportable Hazardous Substance(s) or Complex Substance(s)

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS#</th>
<th>Concentration</th>
<th>Symbols/Risk Phrases</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHYL ETHYL KETONE</td>
<td>78-93-3</td>
<td>100%</td>
<td>F;R11, Xi;R36, R66, R67</td>
</tr>
</tbody>
</table>

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume. Other ingredients determined not to be hazardous up to 100%.

SECTION 4  FIRST AID MEASURES

INHALATION
Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT
Wash contact areas with soap and water. Remove contaminated clothing. Launder contaminated clothing before reuse.

EYE CONTACT
Flush thoroughly with water for at least 15 minutes. Get medical assistance.

INGESTION
Seek immediate medical attention. Do not induce vomiting.

NOTE TO PHYSICIAN
If ingested, material may be aspirated into the lungs and cause chemical pneumonitis. Treat appropriately.

SECTION 5  FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA
Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING
Fire Fighting Instructions: Evacuate area. If a leak or spill has not ignited, use water spray to disperse the vapours and to protect personnel attempting to stop a leak. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Highly flammable. Vapour is flammable and heavier than air. Vapour may travel across the ground and reach remote ignition sources, causing a flashback fire danger. Hazardous material. Firefighters should consider protective equipment indicated in Section 8.
Hazardous Combustion Products: Smoke, Fume, Incomplete combustion products, Oxides of carbon

FLAMMABILITY PROPERTIES
Flash Point [Method]: -4°C (25°F) [ ASTM D-56]
Flammable Limits (Approximate volume % in air): LEL: 1.8 UEL: 11.5
Autoignition Temperature: >450°C (842°F)

Hazchem Code: •2YE

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES
In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES
Avoid contact with spilled material. Warn or evacuate occupants in surrounding and downwind areas if required, due to toxicity or flammability of the material. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for Personal Protective Equipment.

SPILL MANAGEMENT
Land Spill: Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop leak if you can do so without risk. All equipment used when handling the product must be grounded. Do not touch or walk through spilled material. Prevent entry into waterways, sewer, basements or confined areas. A vapour-suppressing foam may be used to reduce vapour. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Large Spills: Use clean non-sparking tools to collect absorbed material. Large Spills: Water spray may reduce vapour, but may not prevent ignition in enclosed spaces. Recover by pumping or with suitable absorbent.

Water Spill: Stop leak if you can do so without risk. Eliminate sources of ignition. Warn other shipping. Seek the advice of a specialist before using dispersants.

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS
Large Spills: Dyke far ahead of liquid spill for later recovery and disposal. Prevent entry into waterways, sewers, basements or confined areas.

SECTION 7 HANDLING AND STORAGE

HANDLING
Avoid contact with skin. Avoid contact with eyes. Prevent exposure to ignition sources, for example use non-sparking tools and explosion-proof equipment. Potentially toxic/irritating fumes/vapour may be evolved from heated or agitated material. Use only with adequate ventilation. Do not enter storage areas or confined spaces unless adequately ventilated. Use proper bonding and/or earthing procedures. However, bonding and
earthing may not eliminate the hazard from static accumulation. Prevent small spills and leakage to avoid slip hazard.

**Loading/Unloading Temperature:** [Ambient]

**Transport Temperature:** [Ambient]

**Transport Pressure:** [Ambient]

**Static Accumulator:** This material is not a static accumulator.

### STORAGE

Ample fire water supply should be available. A fixed sprinkler/deluge system is recommended. Keep container closed. Handle containers with care. Open slowly in order to control possible pressure release. Store in a cool, well-ventilated area. Outside or detached storage preferred. Storage containers should be earthed and bonded. Fixed storage containers, transfer containers and associated equipment should be grounded and bonded to prevent accumulation of static charge.

**Storage Temperature:** [Ambient]

**Storage Pressure:** [Ambient]

**Suitable Containers/Packing:** Tank Trucks; Drums; Barges; Tank Cars

**Suitable Materials and Coatings (Chemical Compatibility):** Carbon Steel; Stainless Steel; Polyester; Teflon; Butyl Rubber

**Unsuitable Materials and Coatings:** Ethylene-propylene-diene monomer (EPDM); Polyacrylonitrile; Polypropylene; Polystyrene; Polyvinyl Alcohol; PVC; Polyethylene; Natural Rubber

### SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

#### EXPOSURE LIMIT VALUES

Exposure limits/standards (Note: Exposure limits are not additive)

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>Form</th>
<th>Limit/Standard</th>
<th>Note</th>
<th>Source</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHYL ETHYL KETONE</td>
<td>STEL</td>
<td>890 mg/m3</td>
<td>300 ppm</td>
<td>Australia OELs</td>
<td>2005</td>
</tr>
<tr>
<td>METHYL ETHYL KETONE</td>
<td>TWA</td>
<td>445 mg/m3</td>
<td>150 ppm</td>
<td>Australia OELs</td>
<td>2005</td>
</tr>
<tr>
<td>METHYL ETHYL KETONE</td>
<td>STEL</td>
<td>300 ppm</td>
<td></td>
<td>ACGIH</td>
<td>2009</td>
</tr>
<tr>
<td>METHYL ETHYL KETONE</td>
<td>TWA</td>
<td>200 ppm</td>
<td></td>
<td>ACGIH</td>
<td>2009</td>
</tr>
</tbody>
</table>

**NOTE:** Limits/standards shown for guidance only. Follow applicable regulations.

#### Biological limits

<table>
<thead>
<tr>
<th>Substance Name</th>
<th>Specimen</th>
<th>Sampling Time</th>
<th>Limit</th>
<th>Determinant</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHYL ETHYL KETONE</td>
<td>Urine</td>
<td>End of shift</td>
<td>2 mg/l</td>
<td>MEK</td>
<td>ACGIH BELs</td>
</tr>
</tbody>
</table>

### ENGINEERING CONTROLS
The level of protection and types of controls necessary will vary depending upon potential exposure conditions.
Control measures to consider:
    Adequate ventilation should be provided so that exposure limits are not exceeded. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:
    Type A filter material
    Half-face filter respirator

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:
    Butyl
    If prolonged or repeated contact is likely, chemical-resistant gloves are recommended. If contact with forearms is likely, wear gauntlet-style gloves.

Eye Protection: Chemical goggles are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:
    If prolonged or repeated contact is likely, chemical, and oil resistant clothing is recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing 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. Practise good housekeeping.

ENVIRONMENTAL CONTROLS
    See Sections 6, 7, 12, 13.

SECTION 9          PHYSICAL AND CHEMICAL PROPERTIES

Typical physical and chemical properties are given below. Consult the Supplier in Section 1 for additional data.
GENERAL INFORMATION

Physical State: Liquid
Form: Clear
Colour: Colourless
Odour: Characteristic
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 20 C): 0.805
Flash Point [Method]: -4C (25F) [ASTM D-56]
Flammable Limits (Approximate volume % in air): LEL: 1.8 UEL: 11.5
Autoignition Temperature: >450°C (842°F)
Boiling Point / Range: 79°C (173°F) - 81°C (178°F)
Vapour Density (Air = 1): > 1 at 101 kPa
Vapour Pressure: 9.3 kPa (69.75 mm Hg) at 20 C | 22.3 kPa (167.25 mm Hg) at 38C |
| 43.6 kPa (327 mm Hg) at 55C
Evaporation Rate (n-butyl acetate = 1): 6
pH: N/D
Log Pow (n-Octanol/Water Partition Coefficient): N/D
Solubility in Water: Appreciable
Viscosity: [N/D at 40°C] | 0.52 cSt (0.52 mm²/sec) at 25C
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: -86°C (-123°F)
Melting Point: N/D
Molecular Weight: 72
Hygroscopic: Yes
Coefficient of Thermal Expansion: 0.00129
Decomposition Temperature: N/D

SECTION 10 STABILITY AND REACTIVITY

STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid heat, sparks, open flames and other ignition sources.

INCOMPATIBLE MATERIALS: Strong oxidisers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS REACTIONS: Will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

<table>
<thead>
<tr>
<th>Route of Exposure</th>
<th>Conclusion / Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Minimally Toxic. Based on test data for the material.</td>
</tr>
<tr>
<td>Toxicity: Data available.</td>
<td>May be irritating to the respiratory tract. The effects are reversible. Based on test data for the material.</td>
</tr>
<tr>
<td>Irritation: Data available.</td>
<td></td>
</tr>
</tbody>
</table>
Ingestion
Toxicity: Data available.  Minimally Toxic. Based on test data for the material.

Skin
Toxicity: Data available.  Minimally Toxic. Based on test data for the material.
Irritation: Data available.  May dry the skin leading to discomfort and dermatitis. Based on test data for the material.

Eye
Irritation: Data available.  Irritating and will injure eye tissue. Based on test data for the material.

CHRONIC/OTHER EFFECTS
For the product itself:
Vapour concentrations above recommended exposure levels are irritating to the eyes and the respiratory tract, may cause headaches and dizziness, are anaesthetic and may have other central nervous system effects. Prolonged and/or repeated skin contact with low viscosity materials may defat the skin resulting in possible irritation and dermatitis. Small amounts of liquid aspirated into the lungs during ingestion or from vomiting may cause chemical pneumonitis or pulmonary edema.
METHYL ETHYL KETONE (MEK): Simultaneous exposure to Methyl Ethyl Ketone (MEK) or Methyl Isobutyl Ketone (MIBK) and n-Hexane can potentiate the risk of adverse effects from n-Hexane on the peripheral nervous system.

Additional information is available by request.

IARC Classification:
The following ingredients are cited on the lists below: None.

--REGULATORY LISTS SEARCHED--
1 = IARC 1
2 = IARC 2A
3 = IARC 2B

SECTION 12 ECOLOGICAL INFORMATION
The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY
Material -- Not expected to be harmful to aquatic organisms.

MOBILITY
Material -- Expected to remain in water or migrate through soil.

PERSISTENCE AND DEGRADABILITY
Biodegradation:
Material -- Expected to be readily biodegradable.
Hydrolysis:
Material -- Transformation due to hydrolysis not expected to be significant.
Photolysis:
Material -- Expected to degrade at a moderate rate in water when exposed to sunlight.
Atmospheric Oxidation:
Material -- Transformation due to atmospheric oxidation not expected to be significant.

OTHER ECOLOGICAL INFORMATION

VOC: Yes

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Product is suitable for burning in an enclosed controlled burner for fuel value or disposal by supervised incineration at very high temperatures to prevent formation of undesirable combustion products.

Empty Container Warning
Empty Container Warning (where applicable): Empty containers may contain residue and can be dangerous. Do not attempt to refill or clean containers without proper instructions. Empty drums should be completely drained and safely stored until appropriately reconditioned or disposed. Empty containers should be taken for recycling, recovery, or disposal through suitably qualified or licensed contractor and in accordance with governmental regulations. DO NOT PRESSURISE, CUT, WELD, BRAZE, SOLDER, DRILL, GRIND, OR EXPOSE SUCH CONTAINERS TO HEAT, FLAME, SPARKS, STATIC ELECTRICITY, OR OTHER SOURCES OF IGNITION. THEY MAY EXPLODE AND CAUSE INJURY OR DEATH.

SECTION 14 TRANSPORT INFORMATION

LAND (ADG)

Proper Shipping Name: ETHYL METHYL KETONE
Dangerous Goods Class/Subsidiary Risk: 3
Hazchem Code: •2YE
UN Number: 1193
Packing Group: II
EPG: 3A1
Label(s): 3

SEA (IMDG)

Proper Shipping Name: ETHYL METHYL KETONE
Hazard Class & Division: 3
EMS Number: F-E, S-D
UN Number: 1193
Packing Group: II
Label(s): 3
Transport Document Name: UN1193, ETHYL METHYL KETONE (Methyl Ethyl Ketone), 3, PG II, (-4°C c.c.)

AIR (IATA)

Proper Shipping Name: ETHYL METHYL KETONE
Hazard Class & Division: 3
SECTION 15  REGULATORY INFORMATION

Material is hazardous as defined by the Approved Criteria for Classifying Hazardous Substances NOHSC:1008.

CLASSIFICATION:  Irritant. The classification of this product is based all or in part on test data.

Nature of Special Risk:  R36; Irritating to eyes.  R66; Repeated exposure may cause skin dryness or cracking.  R67; Vapours may cause drowsiness and dizziness.

SAFETY PHRASE(S):  S9; Keep container in a well-ventilated place.  S16; Keep away from sources of ignition - No smoking.

Contains:  METHYL ETHYL KETONE

Product is regulated according to Australian Dangerous Goods Code.

Poison Schedule number allocated by the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) established under the Therapeutic Goods Act.

REGULATORY STATUS AND APPLICABLE LAWS AND REGULATIONS

Complies with the following national/regional chemical inventory requirements:  AICS, IECSC, DSL, EINECS, ENCS, KECI, PICCS, TSCA

SECTION 16  OTHER INFORMATION

KEY TO ABBREVIATIONS AND ACRONYMS:
N/D = Not determined, N/A = Not applicable, STEL = Short-Term Exposure Limit, TWA = Time-Weighted Average

KEY TO THE RISK CODES CONTAINED IN SECTION 2 AND 3 OF THIS DOCUMENT (for information only):  
R36; Irritating to eyes.
R66; Repeated exposure may cause skin dryness or cracking.
R67; Vapours may cause drowsiness and dizziness.

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:
Revision Changes:
Section 07: Handling and Storage - Storage Phrases was modified.

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