Safety Data Sheet METHYL ETHYL KETONE

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SECTION 1: Identification

GHS Product identifier

Product name	METHYL ETHYL KETONE

Other means of identification

Product	Product Code
2-Butanone, MEK, Methyl acetone	
METHYL ETHYL KETONE AR	MA011
METHYL ETHYL KETONE TG	MT011

Recommended use of the chemical and restrictions on use

Solvent, particularly for various coating systems, such as vinyl, adhesives, nitrocellulose, and acrylic coatings; for paint removers, lacquers, varnishes, spray paints, sealers, glues, magnetic tapes, printing inks, resins, rosins, cleaning solutions, and polymerization; used in dewaxing lubricating oils, degreasing of metals, in the production of synthetic leathers, transparent paper and aluminium foil, and as a chemical intermediate and catalyst; extraction solvent in the processing of foodstuffs and food ingredients and laboratory reagent. MEK is found in some fruits and vegetables and occurs naturally in blood, urine and exhaled air, probably as a minor product of normal metabolism.

Supplier's details

Name	ChemSupply Australia Pty Ltd
Address	38-50 Bedford Street 5013 Gillman South Australia Australia
Telephone	08 8440 2000
email	www.chemsupply.com.au

Emergency phone number

CHEMCALL 1800 127 406 (Australia) / +64-4-917-9888 (International)

SECTION 2: Hazard identification

General hazard statement

Classified as dangerous goods according to the Australian Dangerous Goods Code (ADG).

Classified as Hazardous according to the Globally Harmonised System of classification and labelling of Chemicals (GHS) including Work, Health and Safety regulations, Australia.

Classification of the substance or mixture

GHS classification in accordance with: UN GHS revision 7

- Serious eye damage/eye irritation, Cat. 2
- Flammable liquids, Cat. 2

- Specific target organ toxicity following single exposure, Cat. 3

GHS label elements, including precautionary statements

Pictograms

Signal word	**Danger**

Hazard statement(s)

H225	Highly flammable liquid and vapor
H319	Causes serious eye irritation
H336	May cause drowsiness or dizziness

Precautionary statement(s)

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233	Keep container tightly closed.
P240	Ground and bond container and receiving equipment.
P241	Use explosion-proof [electrical/ventilating/lighting/...] equipment.
P242	Use non-sparking tools.
P243	Take action to prevent static discharges.
P261	Avoid breathing dust/fume/gas/mist/vapors/spray.
P271	Use only outdoors or in a well-ventilated area.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340	IF INHALED: Remove person to fresh air and keep 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.
P312	Call a POISON CENTER/doctor/physcian if you feel unwell.
P337+P313	If eye irritation persists: Get medical advice/attention.
P370+P378	In case of fire: Use agents recommended in Section 5 of SDS for extinction
P403+P235	Store in a well-ventilated place. Keep cool.
P405	Store locked up.
P501	Dispose of contents/container to an approved waste disposal facility

SECTION 3: Composition/information on ingredients

Mixtures

Molecular weight	72.11

Component	Identification	Weight %	Classifications
Methyl ethyl ketone	CAS no.: 78-93-3 EC no.: 201-159-0 Index no.: 606-002-00-3	<= 100 %	CLASSIFICATIONS: Flammable liquids, Cat. 2; Specific target organ toxicity, single exposure, Cat. 3; Eye damage/irritation, Cat. 2A. HAZARDS: H225 - Highly flammable liquid and vapor; H319 - Causes serious eye irritation; H336 - May cause drowsiness or dizziness.

SECTION 4: First-aid measures

Description of necessary first-aid measures

General advice	For advice, contact a Poisons Information Centre (e.g. phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor (at once). First Aid Facilities: Maintain eyewash fountain in work area.
If inhaled	If inhaled, remove from contaminated area to fresh air immediately. Apply artificial respiration if not breathing. If breathing is difficult, give oxygen. Get medical aid if cough or other symptoms appear.
In case of skin contact	Rinse with plenty of water. Get medical attention if irritation develops and persists.
In case of eye contact	Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open. In all cases of eye contamination it is a sensible precaution to seek medical advice.
If swallowed	Rinse mouth thoroughly with water immediately, repeat until all traces of product have been removed. DO NOT INDUCE VOMITING. Seek medical advice if effects persist.

Most important symptoms/effects, acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

Indication of immediate medical attention and special treatment needed, if necessary
For advice, contact the National Poisons Information Centre (Phone Australia 13 11 26; New Zealand 0800 764 766) or a doctor.

SECTION 5: Fire-fighting measures

Suitable extinguishing media
Caution: Use of water spray when fighting fire may be inefficient.
Small fire: Use alcohol resistant foam, dry chemical, CO2 or fine water spray.
Large fire: Use alcohol resistant foam, fog or water spray - Do not use water jets.
If safe to do so, move undamaged containers from fire area. Cool containers with flooding quantities of water until well after fire is out. Avoid getting water inside containers.

Specific hazards arising from the chemical
Hazards from Combustion Products: Explosive peroxides, such as MEK peroxide; carbon monoxide, carbon dioxide.

HIGHLY FLAMMABLE: These products have a low flash point - Will be easily ignited by heat, sparks or flames at ambient temperatures. Vapours will form explosive mixtures with air. Vapours will travel to source of ignition and flash back. Fire may produce irritating, poisonous and/or corrosive gases. Containers may explode when heated. Many liquids are lighter than water. Many vapours are heavier than air and will collect in low or confined areas (drains, basements, tanks). Vapours from run-off may create an explosion hazard.

Special protective actions for fire-fighters
SCBA and structural firefighter's uniform may provide limited protection. Fully-encapsulating, gas-tight suits should be worn for maximum protection.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures
Evacuate the area of all non-essential personnel. Avoid inhalation, contact
with skin, eyes and clothing.
Wear protective clothing specified for normal operations (see Section 8)

Methods and materials for containment and cleaning up
ELIMINATE all ignition sources (no smoking, flares, sparks or flame) within at least 50m - All equipment used in handling the product must be earthed.
Do not touch or walk through spilled material.
Stop leak if safe to do so - Prevent entry into waterways, drains or confined areas.
Vapour-suppressing foam may be used to control vapours.
Absorb spill with earth, sand or other non-combustible material - Use clean, non-sparking tools to collect material and place it in loosely-covered metal or plastic containers for later disposal. Water spray may be used to knock down or divert vapour clouds.
SEEK EXPERT ADVICE ON HANDLING AND DISPOSAL.

Absorb or contain liquid with sand, earth or spill control material. Shovel up using non sparking tools and place in a labelled, sealable container for subsequent safe disposal. Put leaking containers in a labelled drum or overdrum.

SECTION 7: Handling and storage

Precautions for safe handling
Keep locked up. Do not ingest. Do not breathe fumes/vapour/spray. Do not get in eyes, on skin, on clothing. Avoid prolonged or repeated exposure. Wash thoroughly after handling. Wear suitable protective clothing. Remove contaminated clothing and wash before reuse. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, metals, acids, alkalis. Use only with adequate ventilation. Keep away from heat and all sources of ignition - Do not smoke. Fumes can combine with air to form an explosive mixture. Take precautions against static discharge. All electrical equipment must be flameproofed. Ground all equipment containing material. Use grounding and bonding connection when transferring material to prevent static discharges, fire or explosion. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapours, liquid); observe all warnings and precautions listed for the product. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks, open flames.

Conditions for safe storage, including any incompatibilities
Store tightly closed, in a cool, dry, well-ventilated area away from incompatible substances. Keep protected from direct sunlight and moisture. Store away from oxidizers, reducing agents and alkalis (caustic solutions). May form peroxides, which may be explosive after prolonged exposure to air and heat and upon prolonged storage. Protect against physical damage. Store away from heat and sources of ignition such as flame, sparks and static electricity. Storage and use areas should be No Smoking areas. Ensure that all storage and handling equipment is properly rated, grounded and installed to satisfy electrical classification requirements. Static electricity may accumulate and create a fire hazard. All storage containers, including containers such as drums, cylinders and IBC's, must be bonded and grounded during filling and emptying operations. Store small containers in suitable flammable liquid storage cabinets when not in use. Larger drums (200L) must be kept in purpose-built stores. Outside or detached storage is preferred. Store in a segregated and approved area. Flammables-area.

Corrosiveness: Attacks copper in the presence of acetylene.

Storage Temperatures: Store at temperatures below 30 °C, room temperature (15 to 25°C) recommended.

Unsuitable Materials: Many plastics, resins and rubber.

SECTION 8: Exposure controls/personal protection

Control parameters

CAS: 78-93-3
Methyl ethyl ketone
AU/SWA (Australia): 300 ppm; 890 mg/m3 STEL inhalation [Methyl ethyl ketone (MEK)]; 150 ppm; 445 mg/m3 TWA inhalation [Methyl ethyl ketone (MEK)]

Appropriate engineering controls
Use ventilation adequate to keep exposures (airborne levels of dust, fume, vapor, gas, etc.) below recommended exposure limits.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection
The use of a face shield, chemical goggles or safety glasses with side shield protection as appropriate. Must comply with Australian Standards AS 1337 and be selected and used in accordance with AS 1336.

Skin protection
Clean impervious clothing should be worn. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Body protection
Footwear: Safety boots in industrial situations is advisory, foot protection should comply with AS 2210, Occupational protective footwear - Guide to selection, care and use.

Body Protection: Clean clothing or protective clothing should be worn, preferably with and apron. Clothing for protection against chemicals should comply with AS 3765 Clothing for Protection Against Hazardous Chemicals.

Respiratory protection
If engineering controls are not effective in controlling airborne exposure then an approved respirator with a replaceable vapor/ mist filter should be used. Refer to relevant regulations for further information concerning respiratory protective requirements. Reference should be made to Australian Standards AS/ NZS 1715, Selection, Use and Maintenance of Respiratory Protective Devices; and AS/ NZS 1716, Respiratory Protective Devices, in order to make any necessary changes for individual circumstances.

SECTION 9: Physical and chemical properties

Basic physical and chemical properties

Physical state	Liquid
Appearance, such as physical state and colour	No data available.
Colour	Colourless liquid.
Odour	Strong characteristic, fresh or sweet/sharp, fragrant, acetone-like odour.
Odour threshold	2-83 ppm (detection); 5.4-55 ppm (recognition).
Melting point and freezing point	-86.3 °C
Boiling point or initial boiling point and boiling range	79.6 °C
Flammability	No data available.
Lower and upper explosion limit or lower and upper flammability limit	Flammable Limits - Lower: 1.8 vol% Flammable Limits - Upper: 11.5 vol%
Flash point	-9 °C to -2 °C (closed cup)
Explosive properties	Above flash point, vapour-air mixtures are explosive within flammable limits noted above. Vapours can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated.
Auto-ignition temperature	515 °C
Decomposition temperature	No data available.

Oxidising properties	No data available.
pH	~ 5.5 (300g/l H2O)
Kinematic viscosity	Viscosity: 0.41 mPa.s (0.41 centipoises) at 20 °C
Solubility	Solubility in Water: Moderately Soluble (26.8-29 mg/100 mL at 20 °C). Solubility in Organic Solvents: Soluble in ethanol, acetone, diethyl ether, benzene, oils and other organic solvents.
Partition coefficient — n-octanol/ water (logarithmic value)	Log P(oct) = 0.26; 0.29.
Vapour pressure	105 hPa at 20 °C
Evaporation rate	2.7 (ether=1)
Density and relative density	Specific Gravity: 0.805 at 20 °C (water = 1)
Relative vapour density	2.48 (air = 1)
Particle characteristics	No data available.

Supplemental information regarding physical hazard classes
Surface Tension: 24.6 dynes/cm at 20 °C

Further safety characteristics (supplemental)
Saturated Vapour Concentration: Approximately 102,000 ppm (10.2%) at 20 °C (calculated)

Other Information: Does not dissolve cellulose acetate and most waxes.
Refractive index: 1.379 @ 20 °C
Specific heat: 0.549 cal/g °C

SECTION 10: Stability and reactivity

Reactivity
Stable under normal conditions of storage and handling.

Risk of ignition. Vapours may form explosive mixtures with air

Chemical stability
Stable under recommended storage conditions. May form peroxides, which may be explosive after prolonged exposure to air and heat and upon prolonged storage.

Possibility of hazardous reactions
Oxidising (e.g. peroxides, nitrates, perchlorates) - increased risk of fire and explosion. Strong acids (e.g. oleum, chlorosulfonic acid) - reaction can produce heat and pressure. Mixtures of haloforms (e.g. chloroform) and strong bases (e.g. potassium hydroxide) - may react vigorously or explosively. Mixtures of hydrogen peroxide and nitric acid - may overheat and explode violently due to formation of shock- and heat-sensitive peroxides. Solid potassium t-butoxide - contact with liquid or vapours of MEK can ignite after 0.5 to 1 minute. 2-Propanol - MEK markedly increases the peroxidation of the alcohol in light and the mixture can explode on heating.

Conditions to avoid
Heat, flames, sparks, electrostatic discharge, mechanical shock, ignition sources, confined spaces, contact with air, moisture and incompatibles.

Incompatible materials
Oxidising agents (i.a. CrO3, mixtures of hydrogen peroxide and nitric acid, mixtures of hydrogen peroxide and conc. sulfuric acid), mixtures of haloforms (e.g. chloroform) and strong bases (e.g. potassium hydroxide), strong acids (e.g. oleum, chlorosulfonic acid,

nitric acid), solid potassium t-butoxide, reducing agents, metals, acids, alkalis, chloroform, copper, hydrogen peroxide, 2-propanol, chlorosulfonic acid, amines, ammonia, inorganic acids, isocyanates, pyrindines, many plastics, resins and rubber. Chromium (IV) oxides.

Hazardous decomposition products
Explosive peroxides, such as MEK peroxide; carbon monoxide, carbon dioxide.

SECTION 11: Toxicological information

Information on toxicological effects

Acute toxicity
Acute Toxicity - Oral: LD50 (rat): 3400 mg/kg.

Ingestion: May cause irritation of the digestive tract. Possible aspiration hazard. May cause central nervous system depression, drowsiness, nausea, drop in blood pressure. Animal evidence suggests that MEK can be aspirated (inhaled) into the lungs during ingestion or vomiting.

Inhalation: Inhalation of vapors may cause drowsiness and dizziness. May cause central nervous system effects such as nausea and headache. Neurobehavioural effects of exposure to MEK (200 ppm for 4 hrs) were studied with 137 volunteers. There were no statistically significant effects observed in biochemical, psychomotor, sensorimotor and psychological tests.

Skin corrosion/irritation
May cause irritation to skin. Symptoms may include redness, itching, and pain. May be absorbed through the skin in harmful amounts with possible systemic effects. Repeated or prolonged exposure may cause drying and cracking of the skin.

Serious eye damage/irritation
Splashes can produce painful irritation and eye damage.

Respiratory or skin sensitization
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.

Specific target organ toxicity (STOT) - single exposure
Specific target organ toxicity - Single Exposure Category 3
H336 May cause drowsiness or dizziness.

Specific target organ toxicity (STOT) - repeated exposure
Not classified based on available information.

Aspiration hazard
Not classified based on available information.

Additional information
Chronic Effects: Chronic inhalation may cause effects similar to those of acute inhalation. Prolonged or repeated skin contact may cause defatting and dermatitis. Chronic overexposure to vapours may cause lung damage. Chronic exposure may cause central nervous system effects.

SECTION 12: Ecological information

Toxicity
Acute Toxicity - Fish: LC50 (P. promelas): 3220 mg/l/96h.
Acute Toxicity - Daphnia: EC50 (Daphnia magna): 5091 mg/l.

Acute Toxicity - Algae: EC5 (Sc. quadricauda): >4300 mg/l/17d

Acute Toxicity - Bacteria: EC5 (Pseudomonas putida): 1150 mg/l

Acute Toxicity - Other Organisms: aquatic organisms LC50: > 1000 mg/l /96 h.

Persistence and degradability
Abiotic degradation: Rapid degradation. (air)
Biologic degradation: Readily biodegradable. (Reduction: >70%, BOD>60%; BOD5 to COD>50%)
TOD: 2.44 g/g; COD 100 % of TOD; COD 95% from TOD.

Bioaccumulative potential
Low bioaccumulation potential.

Mobility in soil
Distribution: log P(o/w): 0.29.

SECTION 13: Disposal considerations

Disposal methods

Product disposal
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers.

Sewage disposal
Low bioaccumulation potential.

Other disposal recommendations
Do not discharge this material into waterways, drains and sewers.

SECTION 14: Transport information

ADG (Road and Rail)
UN Number: 1193
Class: 3
Packing Group: II
Proper Shipping Name: ETHYL METHYL KETONE (METHYL ETHYL KETONE)

Hazchem emergency action code (EAC)
2[Y]E

IMDG
UN Number: 1193
Class: 3
Packing Group: II
EMS Number:
Proper Shipping Name: ETHYL METHYL KETONE (METHYL ETHYL KETONE)

IATA
UN Number: 1193
Class: 3
Packing Group: II
Proper Shipping Name: ETHYL METHYL KETONE (METHYL ETHYL KETONE)

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

Australia SUSMP
Poison Schedule: S5

SECTION 16: Other information

Further information/disclaimer
ChemSupply Australia Pty Ltd does not warrant that this product is suitable for any use or purpose. The user must ascertain the suitability of the product before use or application intended purpose. Preliminary testing of the product before use or application is recommended. Any reliance or purported reliance upon ChemSupply Australia Pty Ltd with respect to any skill or judgement or advice in relation to the suitability of this product of any purpose is disclaimed. Except to the extent prohibited at law, any condition implied by any statute as to the merchantable quality of this product or fitness for any purpose is hereby excluded. This product is not sold by description. Where the provisions of Part V, Division 2 of the Trade Practices Act apply, the liability of ChemSupply Australia Pty Ltd is limited to the replacement of supply of equivalent goods or payment of the cost of replacing the goods or acquiring equivalent goods.

Preparation information
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Standard for the Uniform Scheduling of Medicines and Poisons, Commonwealth of Australia
National Road Transport Commission, 'Australian Code for the Transport of Dangerous Goods by Road and Rail 7th. Ed.'
Safe Work Australia, 'National Code of Practice fot the Preparation of Safety Data Sheets for Hazardous Chemicals', July 2020.
Safe Work Australia, 'National Guide for Classifying Hazardous Chemicals', July 2020.
Safe Work Australia, Workplace Exposure Standards for Airbourne Contaminants, December 2019
Safe Work Australia, Hazardous Chemical Information System (HCIS), hcis.safeworkaustralia.gov.au
IATA, Dangerous Goods Regulations (DGR)
IMO, International Maritime Dangerous Goods Code (IMDG)