

1. MATERIAL AND COMPANY IDENTIFICATION

Material Name : Methyl Ethyl Ketone
Uses : Use as a solvent only in industrial manufacturing processes.
Product Code : S2113
Company : Shell Chemical LP
PO Box 2463
HOUSTON TX 77252-2463
USA
MSDS Request : 1-800-240-6737
Customer Service : 1-800-872-7435

Emergency Telephone Number
Chemtrec Domestic : 1-800-424-9300
(24 hr)
Chemtrec : 1-703-527-3887
International (24 hr)

2. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	Concentration
Methyl ethyl ketone	78-93-3	100.00 %

3. HAZARDS IDENTIFICATION

Emergency Overview	
Appearance and Odor	: Clear. Liquid. Characteristic.
Health Hazards	: Irritating to eyes. Vapours may cause drowsiness and dizziness. Harmful: may cause lung damage if swallowed.
Safety Hazards	: Flammable liquid and vapour. Vapours are heavier than air. Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger. Electrostatic charges may be generated during pumping. Electrostatic discharge may cause fire.

Health Hazards
Inhalation : Slightly irritating to respiratory system. Vapours may cause drowsiness and dizziness.
Skin Contact : May cause moderate irritation to skin. Repeated exposure may cause skin dryness or cracking.
Eye Contact : Irritating to eyes.
Ingestion : Harmful: may cause lung damage if swallowed.
Signs and Symptoms : Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Defatting dermatitis signs and symptoms may include a burning sensation and/or a dried/cracked appearance. Respiratory

irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing. If material enters lungs, signs and symptoms may include coughing, choking, wheezing, difficulty in breathing, chest congestion, shortness of breath, and/or fever. Breathing of high vapour concentrations may cause central nervous system (CNS) depression resulting in dizziness, light-headedness, headache, nausea and loss of coordination. Continued inhalation may result in unconsciousness and death.

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. Skin.

4. FIRST AID MEASURES

General Information : In general no treatment is necessary, however, obtain medical advice.

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.

Advice to Physician : Causes central nervous system depression. Consult a Poison Control Centre for guidance.

5. FIRE FIGHTING MEASURES

Clear fire area of all non-emergency personnel.

Flash point : -4 °C / 25 °F (Abel)

Explosion / Flammability limits in air : 1.8 - 11.5 %(V)

Auto ignition temperature : 515 °C / 959 °F (ASTM E-659)

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.

Extinguishing Media : Alcohol-resistant foam, water spray or fog. Dry chemical powder, carbon dioxide, sand or earth may be used for small fires only. Do not discharge extinguishing waters into the aquatic environment.

Unsuitable Extinguishing Media : Do not use water in a jet.

Protective Equipment for Firefighters : Wear full protective clothing and self-contained breathing apparatus.

Additional Advice : Keep adjacent containers cool by spraying with water.

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 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. U.S. regulations may require reporting releases of this material to the environment which exceed the reportable quantity (refer to Chapter 15) to the National Response Centre at (800) 424-8802.

7. HANDLING AND STORAGE

General Precautions : Avoid breathing of or contact with material. Only use in well ventilated areas. Wash thoroughly after handling. For 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 charges may be generated during pumping. Electrostatic discharge may cause fire. Ensure electrical continuity by bonding and grounding (earthing) all equipment. Restrict line velocity during pumping

- in order to avoid generation of electrostatic discharge (≤ 10 m/sec). Avoid splash filling. Do NOT use compressed air for filling, discharging, or handling operations. 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.
- Recommended Materials** : For container paints, use epoxy paint, zinc silicate paint. For containers, or container linings use mild steel, stainless steel.
- Unsuitable Materials** : Aluminium.; 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.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Methyl ethyl ketone	ACGIH	TWA	200 ppm		
	ACGIH	STEL	300 ppm		
	OSHA Z1	PEL	200 ppm	590 mg/m3	
	OSHA Z1A	TWA	200 ppm	590 mg/m3	
	OSHA Z1A	STEL	300 ppm	885 mg/m3	

- Additional Information** : Shell has adopted as Interim Standards, the OSHA PELs that were established in 1989 and later rescinded. Wash hands before eating, drinking, smoking and using the toilet.
- 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. Eye washes and showers for emergency use.
- 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 suitable, select an appropriate combination of mask and filter. Select a filter suitable for organic gases and vapours [boiling point >65 °C (149 °F)] meeting EN141. Where air-filtering respirators are unsuitable (e.g., airborne concentrations are high, risk of oxygen deficiency, confined space) use appropriate positive pressure breathing apparatus.
- Hand Protection** : Longer term protection: Butyl rubber. Polyvinyl alcohol. Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material, glove thickness, dexterity. Always seek advice from glove suppliers. Contaminated gloves should be replaced.
- Eye Protection** : Chemical splash goggles (chemical monogoggles).
- Protective Clothing** : Use protective clothing which is chemical resistant to this material. Safety shoes and boots should also be chemical resistant.
- Environmental Exposure Controls** : Local guidelines on emission limits for volatile substances must be observed for the discharge of exhaust air containing vapour.

9. PHYSICAL AND CHEMICAL PROPERTIES

- Appearance : Clear Liquid
Odour : Characteristic
Boiling point : 79 - 80.5 °C / 174 - 176.9 °F
Flash point : -4 °C / 25 °F (Abel)
Explosion / Flammability : 1.8 - 11.5 % (V)
limits in air
Auto-ignition temperature : 515 °C / 959 °F (ASTM E-659)
Vapour pressure : 9,500 Pa at 20 °C / 68 °F
Specific gravity : 0.804 - 0.806 at 20 °C / 68 °F
- Water solubility : 250 g/l at 20 °C / 68 °F Miscible.
Solubility in other solvents : Alcohol(s) Completely miscible.
Vapour density (air=1) : 2.4 at 20 °C / 68 °F
Volatile organic carbon : 100 %
content
Evaporation rate (nBuAc=1) : 3.7 (ASTM D 3539, nBuAc=1)

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.

11. TOXICOLOGICAL INFORMATION

Material Safety Data Sheet

Effective Date 06/27/2003

According to OSHA Hazard Communication Standard, 29 CFR
1910.1200

Basis for Assessment	:	Information given is based on product testing.
Acute Oral Toxicity	:	Low toxicity: LD50 >2000 mg/kg , Rat Aspiration into the lungs when swallowed or vomited may cause chemical pneumonitis which can be fatal.
Acute Dermal Toxicity	:	Low toxicity: LD50 >2000 mg/kg , Rabbit
Acute Inhalation Toxicity	:	High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death. Rat Low toxicity: LC50>5000 ppm Rat
Skin Irritation	:	Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis.
Eye Irritation	:	Moderately irritating to eyes.
Respiratory Irritation	:	Inhalation of vapours or mists may cause irritation to the respiratory system.
Sensitisation	:	Not a skin sensitiser.
Mutagenicity	:	Not mutagenic.
Reproductive and Developmental Toxicity	:	Causes slight foetotoxicity. Effects were seen at high doses only.
Additional Information	:	Exposure may enhance the toxicity of other materials

12. ECOLOGICAL INFORMATION

Acute Toxicity	:	
Fish	:	Low toxicity: LC/EC/IC50 > 1000 mg/l
Aquatic Invertebrates	:	Low toxicity: LC/EC/IC50 > 100 mg/l
Algae	:	Low toxicity: LC/EC/IC50 > 1000 mg/l
Microorganisms	:	Low toxicity: LC/EC/IC50 > 1000 mg/l
Mobility	:	Dissolves in water.
Persistence/degradability	:	Readily biodegradable meeting the 10 day window criterion. 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.
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 complied with.

14. TRANSPORT INFORMATION



Material Safety Data Sheet

Methyl Ethyl Ketone

MSDS# 5390

Version 14.

Effective Date 06/27/2003

According to OSHA Hazard Communication Standard, 29 CFR

1910.1200

US Department of Transportation Classification (49CFR)

Identification number	UN 1193
Proper shipping name	Methyl ethyl ketone
Class / Division	3
Packing group	II
Hazardous subst./material RQ:	METHYL ETHYL KETONE/5,000.00 LB
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IMDG

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

IATA (Country variations may apply)

Identification number	UN 1193
Proper shipping name	Methyl ethyl ketone
Class / Division	3
Packing group	II

15. REGULATORY INFORMATION

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

Federal Regulatory Status

Notification Status

AICS	Listed.
DSL	Listed.
INV (CN)	Listed.
ENCS (JP)	Listed. (2)-542
TSCA	Listed.
EINECS	Listed. 201-159-0
KECI (KR)	Listed. KE-24094
PICCS (PH)	Listed.

Comprehensive Environmental Release, Compensation & Liability Act (CERCLA)

Methyl ethyl ketone (78-93-3)	Reportable quantity: 5,000 lbs
Methyl ethyl ketone (78-93-3)	Reportable quantity: 5,000 lbs

SARA Hazard Categories (311/312)

Immediate (Acute) Health Hazard. Fire Hazard.



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1910.1200

SARA Toxic Release Inventory (TRI) (313)

Methyl ethyl ketone (78-93-3) 100.00%

State Regulatory Status

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)

This material does not contain any chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

New Jersey Right-To-Know Chemical List

Methyl ethyl ketone (78-93-3) 100.00%

Pennsylvania Right-To-Know Chemical List

Methyl ethyl ketone (78-93-3) 100.00% Environmental hazards
Listed.

16. OTHER INFORMATION

HMIS Rating (Health, Fire, Reactivity) : 2, 3, 0

NFPA Rating (Health, Fire, Reactivity) : 1, 3, 0

MSDS Version Number : 14

MSDS Effective Date : 06/27/2003

MSDS Revisions : 06/27/2003

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

MSDS Regulation : The content and format of this MSDS is in accordance with the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Uses and Restrictions : Use as a solvent only in industrial manufacturing processes.

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

Disclaimer : The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty or guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.