

Material Safety Data Sheet

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

Material Name : **Methyl Isobutyl Carbinol**
Uses : Use as a solvent only in industrial manufacturing processes.
Product Code : S1216

Manufacturer/Supplier : **Shell Chemicals Europe B.V.**
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2. COMPOSITION/INFORMATION ON INGREDIENTS

Material Formal Name : 4-methylpentan-2-ol
Synonyms : 1,3-dimethyl 1-butanol
MIBC
Methyl Amyl Alcohol

CAS No. : 108-11-2
INDEX No. : 603-008-00-8
EINECS No. : 203-551-7

3. HAZARDS IDENTIFICATION

Health Hazards : Irritating to respiratory system. Vapours may cause drowsiness and dizziness. May cause moderate irritation to skin. Repeated exposure may cause skin dryness or cracking. Moderately irritating to eyes.

Signs and Symptoms : Respiratory irritation signs and symptoms may include a temporary burning sensation of the nose and throat, coughing, and/or difficulty breathing. Skin irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blisters. Eye irritation signs and symptoms may include a burning sensation, redness, swelling, and/or blurred vision. Other signs and symptoms of central nervous system (CNS) depression may include headache, nausea, and lack of coordination.

Aggravated Medical Condition : Pre-existing medical conditions of the following organ(s) or organ system(s) may be aggravated by exposure to this material: Respiratory system. Central nervous system (CNS). Skin. Eyes.

Safety Hazards : Flammable liquid and vapour. Vapours are heavier than air.

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Vapours may travel across the ground and reach remote ignition sources causing a flashback fire danger.

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.
- Advice to Physician** : Causes central nervous system depression. 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. Will float and can be reignited on surface water. The vapour is heavier than air, spreads along the ground and distant ignition is possible.
- Extinguishing Media** : 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 (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

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- Clean Up Methods** : equipment. Monitor area with combustible gas indicator.
: 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. 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** : 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.
- Unsuitable Materials** : Aluminium if > 50 °C. Most plastics.
- 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.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION
Occupational Exposure Limits

Material	Source	Type	ppm	mg/m3	Notation
Methyl Isobutyl Carbinol	ACGIH	TWA	25 ppm		
	ACGIH	STEL	40 ppm		
	ACGIH	SKIN_DES			Can be absorbed through the skin.

- Additional Information** : Skin notation means that significant exposure can also occur by absorption of liquid through the skin and of vapour through the eyes or mucous membranes. 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** : 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. Incidental contact/Splash protection: Neoprene rubber. Nitrile rubber. Viton. 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. 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).

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Protective Clothing	: Monogoggles (EN166) : Use protective clothing which is chemical resistant to this material. Safety shoes and boots should also be chemical resistant.
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. Examples of sources of recommended air monitoring methods are given below or contact supplier. Further national methods may be available. National Institute of Occupational Safety and Health (NIOSH), USA: Manual of Analytical Methods, http://www.cdc.gov/niosh/nmam/nmammenu.html . Occupational Safety and Health Administration (OSHA), USA: Sampling and Analytical Methods, http://www.osha-slc.gov/dts/sltc/methods/toc.html . Health and Safety Executive (HSE), UK: Methods for the Determination of Hazardous Substances, http://www.hsl.gov.uk/search.htm .
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	: Sweet.
Boiling point	: 130 - 133 °C / 266 - 271 °F
Flash point	: 41 °C / 106 °F (IP 170)
Explosion / Flammability limits in air	: 1 - 5.5 %(V)
Auto-ignition temperature	: 305 °C / 581 °F (ASTM E-659)
Vapour pressure	: 420 Pa at 20 °C / 68 °F
Specific gravity	: 0.81 at 20 °C / 68 °F
Density	: 806 - 808 kg/m ³ at 20 °C / 68 °F (ASTM D-4052)
Water solubility	: 16 g/l at 20 °C / 68 °F
Vapour density (air=1)	: 3.5
Volatile organic carbon content	: 70.6 % (EC/1999/13)
Evaporation rate (nBuAc=1)	: 0.3 (ASTM D 3539, nBuAc=1)

10. STABILITY AND REACTIVITY

Stability	: Stable under normal conditions of use. Reacts with strong oxidising agents. Reacts with strong acids.
Conditions to Avoid	: Avoid heat, sparks, open flames and other ignition sources.
Materials to Avoid	: Strong oxidising agents. Strong acids.
Hazardous	: 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.
Decomposition Products	

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11. TOXICOLOGICAL INFORMATION

Basis for Assessment	:	Information given is based on product testing.
Acute Oral Toxicity	:	Low toxicity: LD50 >2000 mg/kg , Rat
Acute Dermal Toxicity	:	Low toxicity: LD50 >2000 mg/kg , Rabbit
Acute Inhalation Toxicity	:	Low toxicity: LC50 greater than near-saturated vapour concentration. / 4 hours, Rat High concentrations may cause central nervous system depression resulting in headaches, dizziness and nausea; continued inhalation may result in unconsciousness and/or death.
Skin Irritation	:	May cause moderate skin irritation (but insufficient to classify). Prolonged/repeated contact may cause defatting of the skin which can lead to dermatitis.
Eye Irritation	:	Moderately irritating to eyes (but insufficient to classify).
Respiratory Irritation	:	Inhalation of vapours or mists may cause irritation to the respiratory system.
Sensitisation	:	Not expected to be a skin sensitiser.
Repeated Dose Toxicity	:	Kidney: caused kidney effects in male rats which are not considered relevant to humans
Mutagenicity	:	No evidence of mutagenic activity.
Carcinogenicity	:	Not expected to be carcinogenic.
Reproductive and Developmental Toxicity	:	Data not available.

12. ECOLOGICAL INFORMATION

Acute Toxicity	:	
Fish	:	Low toxicity: LC/EC/IC50 > 100 mg/l
Aquatic Invertebrates	:	Expected to have low toxicity: LC/EC/IC50 > 100 mg/l
Microorganisms	:	Expected to have low toxicity: LC/EC/IC50 > 100 mg/l
Mobility	:	Floats on water. If product enters soil, it will be highly mobile and may contaminate groundwater.
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. 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.

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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**ADR**

Class : 3
Packing group : III
Classification code : F1
Hazard identification no. : 30
UN No. : 2053
Danger label (primary risk) : 3
Proper shipping name : Methyl isobutyl carbinol

RID

Class : 3
Packing group : III
Classification code : F1
Hazard identification no. : 30
UN No. : 2053
Danger label (primary risk) : 3
Proper shipping name : Methyl isobutyl carbinol

IMDG

Identification number : UN 2053
Proper shipping name : METHYL ISOBUTYL CARBINOL
Class / Division : 3
Packing group : III
Marine pollutant: No

IATA (Country variations may apply)

UN No. : 2053
Proper shipping name : Methyl isobutyl carbinol
Class / Division : 3
Packing group : III

15. REGULATORY INFORMATION

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

EC Label Name : METHYL ISOBUTYL CARBINOL
EC label/EC Number : 203-551-7
EC Classification : Irritant.
EC Annex I Number : 603-008-00-8
EC Symbols : Xi Irritant.
EC Risk Phrases : R10 Flammable.

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		R37 Irritating to respiratory system.
EC Safety Phrases	:	S24/25 Avoid contact with skin and eyes.
AICS	:	Listed.
DSL	:	Listed.
INV (CN)	:	Listed.
ENCS (JP)	:	Listed. (2)-217
TSCA	:	Listed.
EINECS	:	Listed. 203-551-7
KECI (KR)	:	Listed. KE-24720
PICCS (PH)	:	Listed.
National Legislation	:	
OE_HP	:	Listed.

16. OTHER INFORMATION

R-phrases)

R10 Flammable.
R37 Irritating to respiratory system.

MSDS Version Number	:	1.3
MSDS Effective Date	:	22.04.2009
MSDS Revisions	:	A vertical bar () in the left margin indicates an amendment from the previous version.
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	:	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.