

METHANOL

1. Identification of the substance/preparation and of the company/undertaking

1.1 Identification of the substance or preparation:

Synonyms : Methyl alcohol
 : Methyl hydrate
 : Wood spirit
 : Methyl hydroxide

CAS No. : 67-56-1
EC index No. : 603-001-00-X **NFPA code** : 1-3-0
EINECS No. : 200-659-6 **Molecular weight** : 32.04
RETCs No. : PC1400000 **Formula** : CH₃OH

1.2 Use of the substance or the preparation:

Solvent, fuel, feedstock

1.3 Company/undertaking identification:

Methanex Europe s.a.
 Waterloo Office Park - Building N
 Drève Richelle 161 - box 31
 B-1410 Waterloo, Belgium
 Tel.: (32) 2 352 03 70 - Fax : (32) 2 352 06 99

1.4 Telephone number for emergency:

+32 14 58 45 45
 Brandweerinformatiecentrum voor gevaarlijke stoffen (B.I.G.)
 Technische Schoolstraat 43 A, B-2440 Geel

2. Composition/information on ingredients

Hazardous ingredients	CAS No. EINECS No.	Conc. in %	Hazard symbol	Risks (R-phrases)
methanol	67-56-1 200-659-6	99.85	F+T	11-23/24/25-39/23/24/25 (1)

(1) For R-phrases in full: see heading 16

3. Hazards identification

- Toxic by inhalation, in contact with skin and if swallowed
- Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed
- Highly flammable
- May build up electrostatic charges: risk of ignition
- Vapour-air mixture is flammable/explosive within the explosion limits

4. First aid measures

4.1 Eye contact:

- Rinse immediately with plenty of water for 15 minutes; ensuring all surfaces and crevices are flushed by lifting lower and upper lids
- Consult a doctor/medical service

4.2 Skin contact:

- Remove clothing before washing
- Wash immediately with lots of water and soap for 15 minutes
- Consult a doctor/medical service if irritation occurs

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4.3 After inhalation:

- Remove the victim into fresh air
- Restore or assist breathing if necessary
- Consult a doctor/medical service

4.4 After ingestion:

- Swallowing methanol is life threatening
- Onset of symptoms may be delayed for 18 to 24 hours after ingestion
- If conscious and medical aid is not immediately available, do not induce vomiting
- Transport to medical attention

5. Fire-fighting measures

5.1 Suitable extinguishing media:

- Small fires: Powder, carbon dioxide, halon, water spray, Standard foam
- Large fires: Water spray, AFFF(R) (Aqueous Film Forming Foam (alcohol resistant)) type with either a 3% or 6% foam proportioning system

5.2 Unsuitable extinguishing media:

- Large methanol fires: solid water jet ineffective as extinguishing medium

5.3 Hazardous decomposition products:

- Toxic gases and vapours: carbon monoxide, carbon dioxide and formaldehyde

5.4 Instructions:

- Methanol burns with a clean clear flame, which is almost invisible in daylight
- Keep upwind, mark the danger area
- Concentrations of greater than 25% methanol in water can be ignited
- Cool tanks/drums with water spray/remove them into safety
- Take account of toxic firefighting water
- Use firefighting water with moderation, contain it if possible

5.5 Special protective equipment for firefighters:

- Fire fighters must wear full face, positive pressure, self-contained breathing apparatus or airline and appropriate protective clothing
- Protective fire fighting structural clothing is not effective protection from methanol
- Do not walk through spilled product as it may be on fire and not visible

6. Accidental release measures

6.1 Personal protection/precautions: see 8.2/13

6.2 Environmental precautions:

- Prevent soil and water pollution
- Substance must not be discharged into the sewer
- Plug the leak, cut off the supply
- Dam up the liquid spill
- Try to reduce evaporation
- Recover methanol or dilute with water to reduce fire hazard

6.3 Clean-up:

- Eliminate all ignition sources
- Fluorocarbon alcohol resistant foams may be applied to spill to diminish vapour and fire hazard
- Maximize methanol recovery for recycling or reuse
- Collect liquid with explosion proof pumps
- For small spills: take up into non-combustible sorbent

7. Handling and storage

7.1 Handling:

- Reduce/avoid exposure and/or contact
- Keep container tightly closed
- No smoking or open flame
- Use spark-/explosionproof appliances and lighting system
- Take precautions against electrostatic charges
- Handle uncleaned empty containers as full ones

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7.2 Storage:

- Keep away from heat- en ignition sources, oxidizers, acids, bases
- Store in a dry and well-ventilated area
- Store in totally enclose equipment
- Tanks must be grounded and vented and should have vapour emission controls
- Provide for a tub to collect spills

Materials for packaging:

- Anhydrous methanol is non-corrosive to most metals at ambient temperatures except lead and magnesium
- Coatings of copper (or copper alloys), zinc (including galvanized steel) or aluminium are unsuitable for storage as they are attacked slowly
- Mild steel is the recommended construction material for tanks

7.3 Specific uses: See information supplied by the manufacturer

8. Exposure controls/Personal protection

8.1 Exposure limit values:

TLV-TWA	:		mg/m ³	200	ppm
TLV-STEL	:		mg/m ³	250	ppm
OES-LTEL	:	266	mg/m ³	200	ppm
OES-STEL	:	333	mg/m ³	250	ppm
MAK	:	270	mg/m ³	200	ppm
MAK-KZW	:	1080/15'/4x	mg/m ³	800/15'/4x	ppm
MAC-TGG 8 h	:	260	mg/m ³		
MAC-TGG 15 min.	:	520	mg/m ³		
VME-8 h	:	260	mg/m ³	200	ppm
VLE-15 min.	:	1300	mg/m ³	1000	ppm
GWBB-8 h	:	266	mg/m ³	200	ppm
GWK-15 min.	:	333	mg/m ³	250	ppm
EC	:	260	mg/m ³	200	ppm
EC-STEL	:	-	mg/m ³	-	ppm

Odour threshold: 2000 ppm (irritation at 1000 ppm)
(poor olfactory warning properties)

Sampling methods:

NIOSH 2000 / OSHA 91

8.2 Exposure controls:

8.2.1 Occupational exposure controls:

- In confined areas, local and general ventilation should be provided to maintain airborne concentrations below permissible exposure limits
- Ventilation systems must be designed according to approved engineering standards

8.2.2 Environmental exposure controls: see 13

8.3 Personal protection:

8.3.1 respiratory protection:

- Air respirator when airborne concentrations exceed exposure limits

8.3.2 hand protection:

- Gloves
- Suitable materials: - Butyl rubber
- Nitrile rubber
- Breakthroughtime: N.D.

8.3.3 eye protection:

- Face shield and chemical splash goggles

8.3.4 skin protection:

- Protective clothing
- Suitable materials: - Butyl rubber
- Nitrile rubber

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9. Physical and chemical properties

9.1 General information:

Appearance (at 20°C)	: Clear liquid
Odour	: Slight alcohol odour
Colour	: Colourless

9.2 Important health, safety and environmental information:

pH value	: N.D.	
Boiling point/boiling range	: 64.5	°C
Flashpoint	: 11	°C (TCC)
Explosion limits	: 6 - 36	vol%
Vapour pressure (at 20°C)	: 127	hPa
Vapour pressure (at 50°C)	: 535	hPa
Relative density (at 20°C)	: 0.792	
Water solubility	: COMPLETE	
Soluble in	: Ethanol, ether, acetone, chloroform	
Relative vapour density	: 1.1	
Viscosity	: 0.0006	Pa.s
Partition coefficient n-octanol/water	: -0.82/-0.66	
Evaporation rate		
ratio to butyl acetate	: 5.9	
ratio to ether	: 5.3	

9.3 Other information:

Melting point/melting range	: -97.8	°C
Auto-ignition point	: 385	°C
Saturation concentration	: 166	g/m ³

10. Stability and reactivity

10.1 Conditions to avoid/reactivity:

- Stable under normal conditions

10.2 Materials to avoid:

- Keep away from: heat sources, ignition sources, oxidizing agents, acids, halogens, bases, amines

10.3 Hazardous decomposition products:

- Reaction with oxidizers, strong acids, strong bases
- May be corrosive to lead and aluminium
- Hazardous decomposition products: formaldehyde, carbon dioxide and carbon monoxide

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11. Toxicological information

11.1 Acute toxicity:

LD50 oral rat	: 5628	mg/kg
LD50 dermal rabbit	: N.D.	mg/kg
LD50 dermal rabbit	: 15800	mg/kg
LC50 inhalation rat	: 85	mg/l/4 h
LC50 inhalation rat	: 64000	ppm/4 h

The odour threshold of methanol is several times higher than the TLV-TWA

11.2 Chronic toxicity:

EC carc. cat. : not listed
EC muta. cat. : not listed
EC repr. cat. : not listed

Carcinogenicity (MAC) : not listed
Teratogenicity (MAC) : 2

Carcinogenicity (TLV) : not listed
Carcinogenicity (VME) : not listed
Carcinogenicity (GWBB) : not listed

Carcinogenicity (MAK) : not listed
Mutagenicity (MAK) : not listed
Teratogenicity (MAK) : C

IARC classification : not listed

Obligatory medical control (ARAB-Belgium Art. 124):

group: I Number: 23.1

11.3 Routes of exposure: swallowed, inhalation, eye and skin

11.4 Acute effects/symptoms:

- Swallowing even small amounts of methanol may cause blindness or death
- Effects of sub lethal doses may be nausea, headache, abdominal pain, vomiting and visual disturbances ranging from blurred vision to light sensitivity
- Inhalation of high concentrations: irritation of the mucous membranes, headache, sleepiness, nausea, confusion, loss of consciousness, digestive and visual disturbances and death
- High vapour concentration or contact with liquid: irritation of the eyes, tearing and burning
- May be absorbed through the skin in toxic or lethal amounts

11.5 Chronic effects:

- Repeated exposure by inhalation or absorption: systemic poisoning, brain disorders, impaired vision and blindness
- Inhalation may worsen conditions such as emphysema or bronchitis
- Repeated skin contact may cause dermal irritation, dryness and cracking

Reproductive effects:

- Reported to cause birth defects in rats exposed to 20000 ppm
- Probably hazardous to the foetus

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14. Transport information

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1230

14.1 Classification of the substance in compliance with UN Recommendations
UN-number : 1230
CLASS : 3
SUB RISKS : 6.1
PACKING GROUP : II
PROPER SHIPPING NAME : UN 1230, Methanol

14.2 ADR (transport by road)
CLASS : 3
PACKING GROUP : II
DANGER LABEL TANKS : 3+6.1
DANGER LABEL PACKAGES : 3+6.1
HAZCHEM : 2WE

14.3 RID (transport by rail)
CLASS : 3
PACKING GROUP : II
DANGER LABEL TANKS : 3+6.1
DANGER LABEL PACKAGES : 3+6.1

14.4 ADNR (transport by inland waterways)
CLASS : 3
PACKING GROUP : II
DANGER LABEL TANKS : 3+6.1
DANGER LABEL PACKAGES : 3+6.1

14.5 IMDG (maritime transport)
CLASS : 3
SUB RISKS : 6.1
PACKING GROUP : II
MFAG : 19
EMS : F-E, S-D
MARINE POLLUTANT : -

14.6 ICAO (air transport)
CLASS : 3
SUB RISKS : 6.1
PACKING : II
PACKING INSTRUCTIONS PASSENGER AIRCRAFT : 305/Y305
PACKING INSTRUCTIONS CARGO AIRCRAFT : 307

14.7 Special precautions in connection with transport : none

14.8 Limited quantities (LQ):

When substances and their packaging meet the conditions established by ADR/RID/ADNR in chapter 3.4, **only** the following prescriptions shall be complied with:
each package shall display a diamond-shaped figure with the following inscription:
- 'UN 1230'
or, in the case of different goods with different identification numbers within a single package:
- the letters 'LQ'

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15. Regulatory information

Enumerated in substance list Annex I of directive 67/548/EEC



Highly flammable



Toxic

- R11 : Highly flammable
R23/24/25 : Toxic by inhalation, in contact with skin and if swallowed
R39/23/24/25: Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed
- S(01/02) : (Keep locked up and out of reach of children)
S07 : Keep container tightly closed
S16 : Keep away from sources of ignition - No smoking
S36/37 : Wear suitable protective clothing and gloves
S45 : In case of accident or if you feel unwell, seek medical advice (show the label where possible)

16. Other information

The information provided on this MSDS is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered as a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other material or in any process, unless specified in the text.

- N.A. = NOT APPLICABLE
N.D. = NOT DETERMINED
* = INTERNAL CLASSIFICATION

Full text of any R-phrases referred to under heading 2:

- R11 : Highly flammable
R23/24/25 : Toxic by inhalation, in contact with skin and if swallowed
R39/23/24/25 : Toxic: danger of very serious irreversible effects through inhalation, in contact with skin and if swallowed

Exposure limits:

- TLV : Threshold Limit Value - ACGIH US
OES : Occupational Exposure Standards - United Kingdom
MEL : Maximum Exposure Limits - United Kingdom
MAK : Maximale Arbeitsplatzkonzentrationen - Germany
TRK : Technische Richtkonzentrationen - Germany
MAC : Maximale aanvaarde concentratie - the Netherlands
VME : Valeurs limites de Moyenne d'Exposition - France
VLE : Valeurs limites d'Exposition à court terme - France
GWBB : Grenswaarde beroepsmatige blootstelling - Belgium
GWK : Grenswaarde kortstondige blootstelling - Belgium
EC : Indicative occupational exposure limit values - directive 2000/39/EC

NOTE TO PHYSICIAN

Acute exposure to methanol, either through ingestion or breathing high airborne concentrations can result in symptoms appearing between 40 minutes and 72 hours after exposure. Symptoms and signs are usually limited to CNS, eyes and gastrointestinal tract. Because of the initial CNS's effects of headache, vertigo, lethargy and confusion, there may be an impression of ethanol intoxication. Blurred vision, decreased acuity and photophobia are common complaints. Treatment with ipecac or lavage is indicated in any patient presenting the symptoms within two hours of ingestion. A profound metabolic acidosis occurs in severe poisoning and serum bicarbonate levels are a more accurate measure of severity than serum methanol levels. Treatment protocols are available from most major hospitals and early collaboration with appropriate hospitals is recommended.