

Safety Data Sheet

SECTION 1: Identification of the substance/mixture and of the company/undertaking

Identification of the substance or mixture

Product code	METHANOLSDS
Product name	METHANOL
Molecular Formula	CH4O
Synonyms	Carbinol; Methyl Alcohol; Methyl Hydroxide; Monohydroxymethane; Wood Alcohol; Wood Naphtha; Wood Spirits; Columbian Spirits
Product Catalog Numbers	P140-40CEPPTTB; P140-40CEPPTTW; PP140-40CEPPTTB; PP140-40CEPPTTW

Company/undertaking identification

EP Scientific Products/ThermoFisher
520 North Main Street
Miami, OK 74354
Business Phone: 1-(828)-658-2711

EMAIL ADDRESS FOR PRODUCT INFORMATION:
cservice@epscientific.com

24 hour Emergency Response for Hazardous Materials [or Dangerous Goods] Incident. Spill, Leak, Fire, Exposure, or Accident. Call CHEMTREC CHEMTREC: 1-800-424-9300 (U.S./Canada/Puerto Rico) [24-hours]
CHEMTREC: +1-703-527-3887 (Outside North America) [24-hours]

Country Specific Emergency Number (if available):

Product Use: Various

SECTION 2: Hazards identification

GHS - Classification

Signal Word
DANGER

Hazard pictograms



Health hazards

Acute oral toxicity	Category 3
Acute dermal toxicity	Category 3
Acute inhalation toxicity - gas	Category 3
Specific target organ systemic toxicity (single exposure)	Category 1

Physical hazards

GHS Physical Hazard	Flammable liquids
GHS Physical Hazard Category Number	Category 2

Environmental hazards

Not Hazardous

Hazard Statements

H225 - Highly flammable liquid and vapor
 H301 + H311 + H331 - Toxic if swallowed, in contact with skin or if inhaled
 H370 - Causes damage to organs if inhaled
 H370 - Causes damage to organs if swallowed
 H370 - Causes damage to organs in contact with skin

Precautionary Statements

Prevention

P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
 P240 - Ground/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
 P260 - Do not breathe dust/fume/gas/mist/vapors/spray
 P270 - Do not eat, drink or smoke when using this product
 P271 - Use only outdoors or in a well-ventilated area
 P280 - Wear protective gloves/protective clothing/eye protection/face protection

Response

P370 + P378 - In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction
 P301 + P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
 P303 + P361 + P353 - IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
 P330 - Rinse mouth
 P362 - Take off contaminated clothing
 P304 + P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
 P311 - Call a POISON CENTER or doctor
 P322 - Specific measures (see Both ethanol and fomepizole are effective antidotes for methanol poisoning, although fomepizole is preferred. P363: Wash contaminated clothing before reuse. on this label)

Storage

P403 + P233 - Store in a well-ventilated place. Keep container tightly closed
 P405 - Store locked up

Disposal

P501 - Dispose of contents/ container to an approved waste disposal plant

Other hazards

Not Applicable

HMIS

Health	2
Flammability	3
Reactivity	0

EMERGENCY OVERVIEW: Product Description: This product is a clear, colorless liquid with a characteristic weak, alcohol-like odor. Health Hazards: Danger! Poison! May be harmful or toxic by ingestion, skin absorption and inhalation. May cause adverse eye effects by ingestion or skin absorption. Causes adverse central nervous system effects. May cause irritation of the eyes, skin and respiratory system. Chronic skin exposure to low concentration may cause defatting of the skin. If swallowed, an aspiration hazard may exist; damage to lungs can follow. Suspect reproductive toxin, based on animal data. Flammability Hazards: Danger! Highly flammable liquid and vapor. Can readily form explosive mixtures in air. Fumes can collect in confined spaces creating flammability and toxicity hazard. If involved in a fire it may generate irritating fumes and toxic gases (e.g., carbon oxides and formaldehyde). Reactivity Hazards: Methanol is not reactive, but is hygroscopic and will absorb moisture from the air. Environmental Hazards: This product may cause harm to organisms if accidentally released. Emergency Considerations: Emergency responders should wear appropriate protection for situation to which they respond.

SECTION 3: Composition/information on ingredients

Component	CAS-No	EINECS-No	Weight %
Methyl alcohol 67-56-1 (100)	67-56-1	200-659-6	100

We recommend handling all chemicals with caution.

SECTION 4: First aid measures

Description of first aid measures

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO THIS MATERIAL WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT, OR BY THEMSELVES. If necessary, Self-Contained Breathing Apparatus and fire-retardant clothing should be worn. All first aid procedures should be periodically reviewed by a doctor familiar with the material and its conditions of use in the workplace. Provide general supportive measures (comfort, warmth, rest). Consult a doctor and/or the nearest Poison Control Centre for all exposure except minor instances of inhalation or skin contact. Take a copy of label and SDS to physician or health professional with the contaminated individual.

Skin contact

If skin contact causes irritation, flush with running water. Under running water, remove contaminated clothing, shoes, and leather goods (e.g., watchbands, belts). Transport victim to an emergency care facility immediately. Discard contaminated clothing, shoes and leather goods. DO NOT reuse. Seek medical attention if adverse effects occur after flushing.

Eye contact

Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 30 minutes, by the clock, while holding the eyelid(s) open. DO NOT INTERRUPT FLUSHING. Do NOT allow victim to rub eyes or keep eyes closed. Have victim "roll" eyes. Neutral saline solution may be used as soon as it is available. If necessary, keep emergency vehicle waiting. Take care not to rinse contaminated water into the non-affected eye or onto the face. Quickly transport victim to an emergency care facility.

Ingestion

If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. NEVER give anything by mouth if victim is rapidly losing consciousness, is unconscious or is convulsing. Have victim rinse mouth thoroughly with water. DO NOT INDUCE VOMITING. Have victim drink 240 to 300 mL (8 to 10 oz.) of water to dilute material in stomach. If milk is available, it may be administered AFTER the water has been given. If vomiting occurs naturally, rinse mouth and repeat administration of water. Quickly transport victim to an emergency care facility.

Inhalation

If aerosols from of this product are inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. If breathing is difficult, give oxygen. Seek medical attention if adverse effect occurs after removal to fresh air.

Notes to Physician

Treat symptomatically.

Most important symptoms and effects, both acute and delayed

H225 - Highly flammable liquid and vapor H301 + H311 + H331 - Toxic if swallowed, in contact with skin or if inhaled
H370 - Causes damage to organs if inhaled H370 - Causes damage to organs if swallowed H370 - Causes damage to organs in contact with skin

Indication of any immediate medical attention and special treatment needed

Treat symptoms and eliminate exposure. The following information is for specific treatment for Methanol. The severity of outcome following methanol ingestion may be more related to the time between ingestion and treatment, rather than the amount ingested. Therefore, there is a need for rapid treatment of any ingestion exposure. Both ethanol and fomepizole are effective antidotes for methanol poisoning, although fomepizole is preferred.

Medical conditions aggravated by exposure

Pre-existing skin and respiratory disorders or severe hepatic dysfunction may be aggravated by exposure to this product.

PROTECTION OF FIRST AID RESPONDERS: See Sections 6 (Accidental Release Measures) and 8 (Exposure Controls-Personal Protection).

Extinguishing media**Suitable extinguishing media**

For small fires, use dry chemical, carbon dioxide, or water spray. For large fires, use dry chemical, carbon dioxide, alcohol-resistant foam, or water spray. Water may not be effective as it may not cool burning Methanol below its flashpoint. Cool containers with flooding quantities of water until well after fire is out. Water sprays may be used to direct or block flammable vapors. Consideration for surrounding materials must be taken into account. .

Unsuitable extinguishing media

No information available.

Special hazards arising from the substance or mixture

Methanol is highly flammable and can ignite if exposed to ignition source or temperature at or above its flash point. Containers may explode when heated. Methanol burns with a clear, almost invisible, or non-luminous light-blue flame. Mixtures of Methanol and water at concentrations greater than 20% methanol can burn. If involved in a fire, this product may decompose and produce irritating vapors and toxic gases (e.g., carbon oxides and formaldehyde). Vapors are heavier than air and may travel to a source of ignition and flash back. Vapors can spread along the ground and collect in low or confined areas creating a toxicity and flammability hazard.

Advice for fire-fighters

Do not direct steady stream of water at burning product, which can spread material and fire. In the event of fire, cool containers of this material with water to prevent failure. Water fog or spray can also be used by trained fire-fighters to disperse vapors of this product and to protect personnel. Move containers from fire area if it can be done without risk to firefighters. For small releases, if it is not possible to stop the leak, and it does not endanger personnel, let the fire burn itself out. Structural firefighters must wear Self-Contained Breathing Apparatus (SCBA) and full protective equipment. If protective equipment is contaminated by this product, it should be thoroughly washed with soapy water prior to removal of SCBA respiratory protection. Firefighters whose protective equipment becomes contaminated should thoroughly shower with warm, soapy water and should receive medical evaluation if they experience any adverse effects.

Explosion Sensitivity to Mechanical Impact/ Explosion Sensitivity to Static Discharge

Explosion Sensitivity to Mechanical Impact: Not sensitive.

Explosion Sensitivity to Static Discharge: Static discharge may cause this product to ignite.

Personal precautions, protective equipment and emergency procedures

Trained personnel using pre-planned procedures should respond to uncontrolled releases. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. An accidental release can result in a fire. Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a spill, clear the affected area and protect people. Use non-sparking tools. ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Avoid allowing water runoff to contact spilled material. Call CHEMTREC (1-800-424-9300) for emergency assistance. Or if in Canada, call CANUTEC (613-996-6666). The level of vapors must be below 10% of the LEL (see Section 5, Fire-Fighting Measures), if applicable, before personnel are allowed into the spill area. The atmosphere must have levels of components lower than those listed in Section 8, (Exposure Controls and Personal Protective Equipment), if applicable, and have at least 19.5 percent oxygen before personnel can be allowed into the area without Self-Contained Breathing Apparatus.

EQUIPMENT:

Small Spills: Wear double-gloves (rubber over latex gloves), rubber apron, and splash goggles or safety glasses. Protective goggles should be cleaned with an alcohol wipe after the cleanup.

Large Spills: Trained personnel following pre-planned procedures should handle non-incident releases. Minimum Personal Protective Equipment should be rubber gloves, rubber boots, face shield, and Tyvek suit. The minimum level of personal protective equipment for all releases must be Level B: triple-gloves (fire-retardant gloves and nitrile gloves over latex gloves), chemical resistant suit and boots, hard hat, and Self-Contained Breathing Apparatus. A fire retardant suit must be worn over the chemical resistant suit.

Environmental precautions

Prevent material from entering sewer or confined spaces, waterways, soil or public waters. Do not flush to sewer.

Methods and material for containment and cleaning up

Small Spills: Absorb spilled liquid with activated carbon, polypads, or other suitable inert absorbent materials. Place spilled material in appropriate container for disposal, sealing tightly. Remove all residue before decontamination of spill area.

Spills in Hoods: Decontamination of all interior hood surfaces may be required after the above procedures for small spills have been followed. If the HEPA filter of a hood is contaminated, the unit must be labeled "Do not use-contaminated" and the filter must be changed and disposed of properly as soon as possible.

Large Spills: Trained personnel following pre-planned procedures should handle all releases of this material. Cover spilled material with activated carbon or other non-reactive material. Prevent material from entering sewer or confined spaces, waterways, soil or public waters. Monitor area and confirm levels are below exposure limits given in Section 8 (Exposure Controls-Personal Protection), if applicable, before non-response personnel are allowed into the spill area.

Reference to other sections

See Section 13, Disposal Considerations for more information.

SECTION 7: Handling and storage

Precautions for safe handling

As with all chemicals, avoid getting this product ON YOU or IN YOU. Do not eat, drink, smoke, or apply cosmetics while handling this product. Wash hands thoroughly after handling this product or equipment and containers of this compound. Follow SPECIFIC USE INSTRUCTIONS supplied with product. Use in a well-ventilated location, segregated from other materials and operations. Keep away from heat, sparks, and other sources of ignition. Use non-sparking tools. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose empty containers to heat, sparks or open flames. Bond and ground containers during transfers of material. Containers of this product must be properly labeled. Keep container tightly closed when not in use. .

Conditions for safe storage, including any incompatibilities

Store away from direct sunlight or sources of intense heat. Material should be stored in secondary containers or in a diked area, as appropriate. Store containers away from incompatible chemicals (see Section 10, Stability and Reactivity). Containers should be separated from oxidizing materials by a minimum distance of 20 ft. or by a barrier of non-combustible material at least 5 ft. high having a fire-resistance rating of at least 0.5 hours. Storage areas should be made of fire resistant materials. Local Fire Departments should be notified of the storage of this product on site. Storage and processing areas of this product should be identified with a NFPA 704 placard (diamond) large enough to be seen from a distance. Post warning and "NO SMOKING" signs in storage and use areas, as appropriate. Have appropriate extinguishing equipment in the storage area (such as sprinkler systems or portable fire extinguishers). Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged. Refer to NFPA 30, Flammable and Combustible Liquids Code, for additional information on storage. .

Specific end use(s)

This product has various uses in different industries. Follow all industry standards for use of this product.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT

When cleaning non-disposable equipment, wear latex or butyl rubber (double gloving is recommended), goggles, and lab coat. Wash equipment with soap and water. Wipe equipment down with damp sponge or polypad. Collect all rinsates and dispose of according to applicable Federal, State, and local procedures standards. .

SECTION 8: Exposure controls/personal protection

Control parameters

Chemical Name	ACGIH-TLVs (TWA)	ACGIH-TLVs (STEL)	OSHA-PELs (TWA)	OSHA-PELs (STEL)
Methyl alcohol	200 mg/m ³ (skin)	250 mg/m ³ (skin)	200 mg/m ³	Not Established

Chemical Name	NIOSH-RELs (TWA)	NIOSH-RELs (STEL)	NIOSH (IDLH)	Other
Methyl alcohol	200 mg/m ³ (skin)	250 mg/m ³ (skin)	3000 mg/m ³	DFG MAKs:TWA = 200 (skin)PEAK/CEILING: 4•MAK 15 min. average value, 1-hr interval, 4 per shiftDFG MAK Pregnancy Risk Classification: C

International Exposure Limits Currently, the following international exposure limits are in place for Methanol.

This may not be a complete list and exposure limits change and should be checked for currency.

METHANOL:

ARAB Republic of Egypt: TWA = 200 ppm (260 mg/m³), Skin, JAN 1993

Australia: TWA = 200 ppm (262 mg/m³), STEL = 250 ppm (328 mg/m³), JUL 2008

Austria: MAK-TMW = 200 ppm (260 mg/m³); KZW = 800 ppm (1040 mg/m³), skin, 2007

Belgium: TWA = 200 ppm (266 mg/m³), MAR 2002

Belgium: STEL = 250 ppm (333 mg/m³), Skin, MAR 2002
Denmark: TWA = 200 ppm (260 mg/m³), skin, MAY 2011
EC: TWA = 260 mg/m³ (200 ppm), skin, FEB 2006
Finland: TWA = 200 ppm (270 mg/m³), STEL = 250 ppm (330 mg/m³), skin, NOV 2011
France: VME = 200 ppm (260 mg/m³), VLE = 1000 ppm (1300 mg/m³), FEB 2006
Germany: MAK = 200 ppm (270 mg/m³), 2011
Hungary: TWA = 260 mg/m³, STEL 1040 mg/m³, Skin, SEP 2000
Iceland: TWA = 200 ppm (260 mg/m³), skin, NOV 2011
Japan: OEL = 200 ppm (260 mg/m³), skin, MAY 2012
Korea: TWA = 200 ppm (260 mg/m³), STEL = 250 ppm (310 mg/m³), skin, 2006
Mexico: TWA = 200 ppm (260 mg/m³); STEL = 310 mg/m³ (250 ppm), 2004
The Netherlands: MAC-TGG = 260 mg/m³, Skin, 2003
New Zealand: TWA = 200 ppm (262 mg/m³); STEL = 250 ppm (328 mg/m³), skin, JAN 2002
Norway: TWA = 100 ppm (130 mg/m³), JAN 1999
Peru: TWA = 200 ppm (262 mg/m³); STEL = 250 ppm (328 mg/m³), JUL 2005
The Philippines: TWA = 200 ppm (260 mg/m³), JAN 1993
Poland: MAC(TWA) = 100 mg/m³, MAC(STEL) = 300 mg/m³, JAN 1999
Russia: TWA = 5 mg/m³, STEL 15 mg/m³, Skin, JUN 2003
Sweden: TWA = 200 ppm (250 mg/m³); STEL = 250 ppm (350 mg/m³), Skin, JUN 2005
Switzerland: MAK-W = 200 ppm (260 mg/m³), KZG-W = 800 ppm (1040 mg/m³), skin, JAN 2011
Thailand: TWA = 200 ppm (260 mg/m³), JAN 1993
Turkey: TWA = 200 ppm (260 mg/m³), JAN 1993
United Kingdom: TWA = 200 ppm (266 mg/m³); STEL = 250 ppm (333 mg/m³), skin, OCT 2007
In Argentina, Bulgaria, Colombia, Jordan, Singapore, Vietnam, check ACGIH TLV

Engineering measures

This product should be used areas with adequate ventilation. Use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits provided in this section, if applicable. Use a non-sparking, grounded, explosion-proof ventilation system separate from other exhaust ventilation systems. Exhaust directly to the outside, taking necessary precautions for environmental protection. An eyewash and safety shower should be readily accessible.

Exposure controls

Personal Protective Equipment

The following information on appropriate Personal Protective Equipment is provided to assist employers in complying with OSHA regulations found in 29 CFR Subpart I (beginning at 1910.132, including U.S. Federal OSHA Respiratory Protection (29 CFR 1910.134), OSHA Eye Protection 29 CFR 1910.133, OSHA Hard Protection 29 CFR 1910.138, OSHA Foot Protection 29 CFR 1910.136 and OSHA Body Protection 29 CFR 1910.132), equivalent standards of Canada (including CSA Respiratory Standard Z94.4-02, Z94.3-M1982, Industrial Eye and Face Protectors and CSA Standard Z195-02, Protective Footwear), or standards of EU member states (including EN 529:2005 for respiratory PPE, CEN/TR 15419:2006 for hand protection, and CR 13464:1999 for face/eye protection). Please reference applicable regulations and standards for relevant details.

Respiratory protection

Maintain airborne contaminant concentrations below limits listed above, if applicable. In instances where inhalable aerosols may be generated and respiratory protection is necessary, use only respiratory protection authorized under appropriate regulations. In the U.S., oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-facepiece pressure/demand SCBA or a full facepiece, supplied air respirator with auxiliary self-contained air supply is required under OSHA's Respiratory Protection Standard

(1910.134-1998).

The following are NIOSH respiratory protection equipment guidelines for Methanol and are provided for additional information on the selection of respiratory protection equipment.

METHANOL

CONCENTRATION

RESPIRATORY PROTECTION

Up to 2000 ppm:

Any Supplied-Air Respirator (SAR).

Up to 5000 ppm:

Any SAR operated in a continuous-flow mode.

Up to 6000 ppm:

Any SAR that has a tight-fitting facepiece and is operated in a continuous-flow mode, or any Self-Contained Breathing Apparatus (SCBA) with a full facepiece, or any SAR with a full facepiece.

Emergency or Planned Entry into Unknown Concentrations or IDLH Conditions: Any SCBA that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode, or any SAR that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary SCBA operated in pressure-demand or other positive-pressure mode.

Escape:

Any appropriate escape-type, SCBA.

Hand protection

Use butyl rubber, Teflon, Viton, Saranex, or Responder gloves for routine industrial use. Use triple gloves for spill response, as stated in Section 6 (Accidental Release Measures) of this SDS. If necessary, refer to applicable regulations.

Eye protection

Splash goggles or safety glasses. Splash goggles and faceshield should be considered when handling solutions made from this product. If necessary, refer to appropriate country regulations and standards for further information.

Skin and Body Protection

Use body protection appropriate for task. Full-body chemical protective clothing is recommended for emergency response procedures. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection. Refer to appropriate country regulations and standards for further information.

Hygiene measures

Handle in accordance with good industrial hygiene and safety practice

Environmental exposure controls

Prevent material from entering sewer or confined spaces, waterways, soil or public waters. Do not flush to sewer.

Information on basic physical and chemical properties

Appearance	liquid	
Color	Clear, colorless. APHA: 10 max	
Odor	Characteristic weak, alcohol-like odor	
Odor Threshold	160 ppm (detection, geometric mean); 690 ppm (recognition, geometric mean)	
Molecular Weight	32.04	
pH	No data available	
Freezing point	-98°C (-143.9°F)	
Melting point / melting range	°C -98	°F -143.9
Boiling point / boiling range	°C @ 760 mmHg: 64.7	°F 148.46
Flash point	°C (closed cup): 12°C	°F (closed cup): 53.6°F
Autoignition Temperature	°C 455°C	°F 851°F
Decomposition temperature	°C Mixture has not been tested	°F Mixture has not been tested
Evaporation rate	(ether = 1): 5.2	
Flammability (solid, gas)	(in air by volume, %): LEL: 6.0% UEL: 31.0%	
Upper explosion limit	Mixture has not been tested	
Lower explosion limit	Mixture has not been tested	
Vapor Pressure	(air = 1) @ 20°C: 128 mmHg	
Vapor density (air= 1)	1.11	
Relative density	Mixture has not been tested	
Specific gravity	@ 20°C: 0.7910 g/cm ³	
Solubility	(Water) miscible	
Partition coefficient: n-octanol/water	Log P(oct) = -0.77	
Viscosity	@ 20°C: 0.55 cPs	
Explosive properties	Mixture has not been tested	
Oxidizing properties	No oxidizing properties	

Other information

SOLUBILITIES IN OTHER LIQUIDS: Soluble in all proportions in ethanol, other alcohols, benzene, chloroform, diethyl ether, other ethers, esters, ketones, and most other organic solvents.

HOW TO DETECT THIS SUBSTANCE (identification properties): The odor of Methanol is not a good method to identify Methanol in event of accidental release, as the geometric mean odor threshold is of the same order as the TLV.

SECTION 10: Stability and reactivity

Chemical stability	Methanol is stable when properly stored (see Section 7, Handling and Storage) at normal temperature. Methanol absorbs moisture from the air.
Possibility of hazardous reactions	will not occur.
Conditions to avoid	Avoid extreme temperatures, sources of ignition, confined spaces and contact with incompatible chemicals. Contact with water should be controlled.
Incompatible materials	Methanol is incompatible with strong oxidizing agents (e.g. bromine, chlorine, chromium trioxide, nitric acid, perchlorates or sodium hypochlorite), hydrogen peroxide, metals (e.g. powdered aluminum or magnesium), carbon tetrachloride and metals (e.g. aluminum, magnesium or zinc), alkali metals (e.g. sodium or potassium), acetyl bromide, dichloromethane, perchloric acid or metal perchlorates (e.g. barium perchlorate or lead perchlorate), potassium tert-butoxide, alkylaluminum solutions, beryllium hydride, cyanuric chloride, isocyanates or phosphorus (III) oxide, diethyl zinc, mineral acids (e.g. sulfuric acid), organic acids, acid anhydrides, acid chlorides or sodium hydroxide and chloroform. Methanol is corrosive to type 12L14 carbon steel at room temperature and type 3003 aluminum, copper (10-100% methanol solution) and admiralty brass, at 93°C (199.4°F). Methanol attacks plastics such as nylon 66, nylon 610, acrylonitrile-butadiene-styrene, styrene-acrylonitrile, rigid polyurethane, thermoset isophthalic polyester and polystyrene; elastomers, such as polyacrylate, polyurethane, hard rubber, soft rubber, Viton A; and general purpose epoxy coating.
Hazardous decomposition products	Combustion: If exposed to extremely high temperatures, thermal decomposition may generate irritating fumes and toxic gases (e.g., carbon oxides and formaldehyde). Hydrolysis: None. .

SECTION 11: Toxicological information

Information on toxicological effects

SYMPTOMS OF EXPOSURE BY ROUTE OF EXPOSURE: The health hazard information provided below is pertinent to employees using this product in an occupational setting. The following paragraphs describe the symptoms of exposure by route of exposure.

Inhalation: Symptoms of inhalation may include breathing difficulty, irritation of the mucus membranes, coughing, nasal congestion, and a sore throat. Inhalation may cause adverse central nervous system effects including initial symptoms of dizziness, incoordination, nausea and headache, vomiting. A time period with no obvious symptoms follows (typically 8-24 hrs). This latent period is followed by metabolic acidosis and severe visual effects which may include reduced reactivity and/or increased sensitivity to light, blurred, double and/or snowy vision, and blindness. Depending on the severity of exposure and the promptness of treatment, victims of exposure may recover completely or may have permanent blindness, vision disturbances and/or nervous system effects.

Contact with Skin or Eyes: Contact with the eyes will cause moderate irritation, pain, reddening and watering. Depending on the duration of skin contact, skin exposure may cause reddening, discomfort, and mild irritation.

Repeated skin-exposure to low concentrations can result in dermatitis (inflammation and reddening of the skin).

Skin Absorption: Methanol can be absorbed through intact skin and can cause systemic toxicity by this route of exposure. Skin absorption of Methanol can cause significant disturbances in vision, including blindness. Other symptoms can include those as described under 'Ingestion'.

Ingestion: Methanol is toxic by ingestion and cannot be made non-poisonous. May be harmful, fatal or cause blindness if swallowed. Aspiration hazard; ingestion may result in aspiration into lungs and cause potential fatal chemical pneumonitis or pulmonary edema. May cause gastrointestinal irritation with nausea, vomiting and diarrhea.

May cause systemic toxicity with acidosis. May cause central nervous system depression, characterized by excitement, followed by headache, dizziness, drowsiness, and nausea. Advanced stages may cause collapse, unconsciousness, coma and possible death due to respiratory failure. May cause adverse cardiopulmonary system effects.

Injection: Though not anticipated to be a significant route of exposure for this product, injection (via punctures or lacerations by contaminated objects) may cause redness at the site of injection.

OTHER HEALTH EFFECTS/INFORMATION: Methanol is significantly less toxic to most experimental animals than humans, because most animal species metabolize Methanol differently. Non-primate species do not ordinarily show symptoms of metabolic acidosis or the visual effects which have been observed in primates and humans.

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in Lay Terms. Exposure to this product may cause the following health effects:

Acute: Methanol can cause adverse central nervous system effects by all routes of exposure. Inhalation and ingestion may cause damage to the optic nerve and blindness. Ingestion may be harmful or fatal.

Chronic: Symptoms of chronic exposure may be the same as acute symptoms. Repeated, low concentration skin contact of this product may cause dermatitis. Methanol is only very slowly eliminated from the body. Because of this slow elimination, methanol should be regarded as a cumulative poison. Though a single exposure may cause no effect, daily exposure may result in the accumulation of a harmful amount.

TARGET ORGANS:

Acute: Eyes, central nervous system, skin.

Chronic: Eyes, skin, cardiovascular system. Currently, the following toxicity data are available for Methanol.

Standard Draize Test (Skin-Rabbit, adult) 20 mg/24hours Moderate irritation effects

Standard Draize Test (Eye-Rabbit, adult) 100 mg/24 hours Moderate irritation effects

DNA Inhibition (Human-lymphocyte) 300 mmol/L

Microsomal Mutagenicity Assay (Mouse-lymphocyte) 7900 mg/L

LC50 (Inhalation-Rat) 64,000 ppm/4 hours

LD50 (Oral-Rat) 5628 mg/kg

LD50 (Oral-Mouse) 7300 mg/kg

LD50 (Intraperitoneal-Rat) 7529 mg/kg

LD50 (Intraperitoneal-Mouse) 10,765 mg/kg

LD50 (Intravenous-Rat) 2131 mg/kg

LD50 (Subcutaneous-Mouse) 9800 mg/kg

LD50 (Intravenous-Mouse) 4710 mg/kg

TCLo (Inhalation-Rat) 10,000 ppm/7 hours (7-15 days preg): Teratogenic effects

TCLo (Inhalation-Human) 86,000 mg/m³: Eye effects, Pulmonary system effects

TCLo (Inhalation-Human) 300 ppm: Eye effects, Central nervous system effects, Pulmonary system effects

LDLo (Oral-Man) 6422 mg/kg: Central nervous system effects, Pulmonary system effects, Gastrointestinal tract effects

LDLo (Oral-Human) 428 mg/kg: Central nervous system effects, Pulmonary system effects

LDLo (Oral-Human) 143 mg/kg: Eye effects, Pulmonary system effects, Gastrointestinal tract effects

TDLo (Oral-Woman) 4 g/kg: Eye effects, Pulmonary system effects, Gastrointestinal tract effects

TDLo (Oral-Woman) 4 g/kg

TDLo (Oral-Man) 3429 mg/kg: Eye effects

TDLo (Oral-Rat) 7500 mg/kg (17-19 days preg): Reproductive effects

LDLo (Oral-Monkey) 1000 mg/kg

LDLo (Skin-Monkey) 393 mg/kg

LCLo (Inhalation-Monkey) 1000 ppm.

Principal Routes of Exposure

Irritation

This product may cause moderate irritation to the eyes and mild irritation of the skin and respiratory system.

Corrosivity

Conclusive but not sufficient for classification

Sensitization	This product is not known to cause human skin or respiratory sensitization.
STOT - Single Exposure	Conclusive but not sufficient for classification
STOT - Repeated Exposure	Conclusive but not sufficient for classification
Carcinogenicity	This material is not found on the following lists: U.S. EPA, U.S. NTP, U.S. OSHA, U.S. NIOSH, GERMAN MAK, IARC, and ACGIH, and therefore are not considered to be, nor suspected to be cancer-causing agents by these agencies.
Mutagenicity	Methanol is not reported to cause human mutagenic effects. There is insufficient information available to conclude that methanol is mutagenic. A positive result was obtained in a limited oral study in mice, however other oral and inhalation studies in live rats and mice have given negative results. Mostly negative results have been obtained in cultured mammalian cells, bacteria and fruit flies (<i>Drosophila</i>).
Reproductive toxicity	Listed below is information concerning the effects of Methanol on human and animal reproductive systems. /Teratogenicity: Methanol is not reported to cause human embryotoxic or teratogenic effects. Methanol has produced fetotoxicity in rats and teratogenicity in mice exposed by inhalation to high concentrations that did not produce significant maternal toxicity. Toxicity: Methanol is not reported to cause human reproductive effects.
Aspiration hazard	Conclusive but not sufficient for classification

SYNERGISTIC MATERIALS
No synergistic materials are known.

ACGIH BIOLOGICAL EXPOSURE INDICES (BEIs)
Currently, ACGIH Biological Exposure Indices (BEIs) have not been determined for the components of this product.

SECTION 12: Ecological information

Toxicity
Methanol may cause harm to organisms if released to the environment. The following aquatic toxicity data are available. Due to the large volume of data available, only select data are provided in this SDS. Contact EP Scientific for information on additional data.

- EC50 (*Daphnia magna* Water flea; immobilization) 24 hours = > 10,000 mg/L
- LC50 (*Pimephales promelas* fathead minnows) 96 hours = 29.4 g/L
- LC50 (*Oncorhynchus mykiss* Rainbow trout, 0.8 g) 96 hours = 19,000 mg/L
- LC50 (*Lepomis macrochirus* Bluegill) 96 hours = 15,400 mg/L; flow-through
- LC50 (*Alburnus alburnus* Bleak, 8 cm) 96 hours = 28,000 mg/L; static
- LC50 (*Nitocra spinipes* Harpacticoid copepod, adult) 96 hours = 12,000 mg/L
- LC50 (*Helisoma trivolvis* aquatic mollusk) 96 hours = > 100 mg/L
- LC50 (*Dugesia tigrina* aquatic worm) 96 hours = > 100 mg/L
- LC50 (*Lumbriculus variegatus* aquatic worm) 96 hours = > 100 mg/L
- LC50 (*Crangon crangon* Brown shrimp, adult) 96 hours = 1340 mg/L
- LC50 (*Mytilus edulis* Mussel, 5-7 cm) 96 hours = 15,900 mg/L
- LC50 (*Agonus cataphractus* Armed bullhead, adult) 96 hours = 7900-26,070 mg/L.

Mobility Using a structure estimation method based on molecular connectivity indices, the Koc for Methanol can be estimated to be 1. According to a classification scheme, this estimated Koc value suggests that Methanol is expected to have very high mobility in soil.

Persistence and degradability If released to the atmosphere, a vapor pressure of 127 mm Hg at 25°C indicates that Methanol will exist solely in the vapor phase. Vapor phase Methanol is degraded in the atmosphere by reaction with photochemically-produced hydroxyl radicals; the half-life for this reaction in air is estimated to be 17 days. If released to soil, Methanol is expected to have very high mobility based upon an estimated Koc of 1. Volatilization from moist soil surfaces is expected to be an important fate process based upon a Henry's Law constant of 4.55×10^{-6} atm-cu m/mole. Methanol may also volatilize from dry soils based upon its vapor pressure. Biodegradation of methanol in soils is expected to occur rapidly based on half-lives in a sandy silt loam from Texas and a sandy loam from Mississippi of 1 and 3.2 days, respectively. If released into water, Methanol is not expected to adsorb to suspended solids and sediment based upon the estimated Koc. Volatilization from water surfaces is expected to be an important fate process based upon this compound's Henry's Law constant. Estimated volatilization half-lives for a model river and model lake are 3 and 35 days, respectively. Biodegradation is expected to occur in natural waters since methanol is degraded quickly in soils and was biodegraded rapidly in various aqueous screening tests using sewage seed or activated sludge. Hydrolysis of Methanol and photolysis in sunlit surface waters are not expected since methanol lacks functional groups that are susceptible to hydrolysis or photolysis under environmental conditions.

Bioaccumulative potential Fish (golden ide) exposed to 0.05 mg/L of Methanol for three days in an aquatic tank had measured BCF values of less than 10. Based on a classification scheme, this BCF value suggests that bioconcentration in aquatic organisms is low.

Results of PBT and vPvB assessment

No information available.

EXPOSURE CONTROLS: Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Other adverse effects Components of this product are not listed or expected to have having ozone depletion potential.

SECTION 13: Disposal considerations

Waste treatment methods

It is the responsibility of the generator to determine at the time of disposal whether the product meets the criteria of a hazardous waste per regulations of the area in which the waste is generated and/or disposed of. Waste disposal must be in accordance with appropriate Federal, State, and local regulations. This product, if unaltered by use, may be disposed of by treatment at a permitted facility or as advised by your local hazardous waste regulatory authority. Shipment of wastes must be done with appropriately permitted and registered transporters.

DISPOSAL CONTAINERS: Waste materials must be placed in and shipped in appropriate 5-gallon or 55-gallon poly or metal waste pails or drums. Permeable cardboard containers are not appropriate and should not be used. Ensure that any required marking or labeling of the containers be done to all applicable regulations.

PRECAUTIONS TO BE FOLLOWED DURING WASTE HANDLING: Wear proper protective equipment when handling waste materials. Dispose of in accordance with applicable Federal, State, and local procedures and standards.

EPA Waste number

Wastes from this product should be tested to see if they meet D001 (Waste Characteristic-Ignitability). RCRA U Series Wastes: CAS# 67-56-1: waste number U154 (Ignitable waste).

WASTE CODES: 16 05 08: Discarded Organic Chemicals Consisting of or Containing Dangerous Substances.

SECTION 14: Transport information

INTERNATIONAL AIR TRANSPORT ASSOCIATION SHIPPING INFORMATION (IATA)

This product is classified as dangerous goods, per the International Air Transport Association.

UN number	UN 1230
UN proper shipping name	Methanol
Transport hazard class(es)	3 (Flammable), 6.1 (Toxic)
Packing group	II
Excepted Quantities	E2
Passenger and Cargo Aircraft Packing Instruction	352
Passenger and Cargo Aircraft Maximum Net Quantity per Pkg.	1 L
Passenger and Cargo Aircraft Limited Quantity Packing Instruction	Y341
Passenger and Cargo Aircraft Limited Quantity Maximum Net Quantity per Pkg.	1 L
Cargo Aircraft Only Packing Instruction	364
Cargo Aircraft Only Maximum Net Quantity per Pkg.	60 L
Special Provisions	A104, A113
ERG Code	3P

U.S. DEPARTMENT OF TRANSPORTATION REGULATIONS

This product is classified as dangerous goods, per U.S. DOT regulations, under 49 CFR 172.101.

UN number	UN 1230
UN proper shipping name	Methanol
Transport hazard class(es)	3 (Flammable), 6.1 (Toxic)
Packing group	II
DOT Label(s) Required	Class 3 (Flammable), 6.1 (Toxic)
Emergency Response Guidebook Number, 2012	128
Marine Pollutant	Methanol does not meet the criteria of the DOT as Marine Pollutant (as defined by 49 CFR 172.101, Appendix B). NOTE: Shipments of this product may be shipped under small quantity and limited quantity exceptions as indicated under 49 CFR §173.4 and 49 CFR §173.154, if all requirements are met.

Quantity Exception

Small Quantity Exception (49 CFR 173.4): Small quantities of Class 3 material are not subjected to other requirements of the Hazardous Materials Regulations (Subchapter C) when the maximum quantity per inner receptacle is limited to 30 mL (1 oz). Refer to 49 CFR 173.4 for specific information in packaging small quantity materials.

Limited Quantity Exceptions [49 CFR 173.150(b)]: Limited quantities for Class 3, Packing Group II materials have inner packagings not over 1.0 L net capacity each, packed in strong outer packaging.

TRANSPORT CANADA TRANSPORTATION OF DANGEROUS GOODS REGULATIONS

This product is classified as Dangerous Goods, per regulations of Transport Canada.

UN number	UN 1230
UN proper shipping name	Methanol
Transport hazard class(es)	3 (Flammable), 6.1 (Toxic)
Packing group	II
Hazard Label(s) Required	Class 3 (Flammable), Class 6.1 (Toxic)
Special Provisions	43
Explosive Limit and Limited Quantity Index	1
ERAP Index	None.
Passenger Carrying Ship Index	None

Passenger Carrying Road or Rail Vehicle Index	1
Marine Pollutant	This product does not meet the criteria to be a Marine Pollutant.

INTERNATIONAL MARITIME ORGANIZATION SHIPPING INFORMATION (IMO)

This product is classified as dangerous goods, per the International Maritime Organization.

UN number	UN 1230
UN proper shipping name	Methanol
Transport hazard class(es)	3 (Flammable), 6.1 (Toxic)
Packing group	II
Hazard Label(s) Required	Class 3 (Flammable), Class 6.1 (Toxic)
Special Provisions	279
Excepted Quantities	E2
Limited Quantities	1 L
IBCs	Instructions: IBC02; Provisions: None
EmS	F-E, S-D
Stowage and Segregation	Category B. Clear of living quarters.
Marine Pollutant	This product does not meet the criteria to be a Marine Pollutant.

EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY ROAD (ADR)

This product is classified by the Economic Commission for Europe to be dangerous goods.

UN number	UN 1230
UN proper shipping name	Methanol
Transport hazard class(es)	3 (Flammable), 6.1 (Toxic)
Packing group	II
Classification Code	FT1
Label	3 + 6.1
Special Provisions	279
Limited Quantities	1 L
Excepted Quantities	E2
Packing Instructions	P001, IBC02
Packing Special Provisions	None
Mixed Packing Provisions	MP19
Portable Tank & Bulk Container Packing Instructions	T7
Portable Tank & Bulk Container Special Provisions	TP2
Hazard Identification No.	336

Environmental hazards

This material does not meet the criteria of environmentally hazardous according to the criteria of the UN Model Regulations (as reflected in the IMDG Code, ADR, RID, and ADN); components are not specifically listed in Annex III under MARPOL 73/78

Special precautions for user

Not Applicable

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

See the information under the individual jurisdiction listings for IBC information.

SECTION 15: Regulatory information

United States regulations

U.S. SARA Threshold Planning Quantity (TPQ): There are no specific Threshold Planning Quantities for this material. The default Federal MSDS submission and inventory requirement filing threshold of 10,000 lb (4,540 kg) may apply, per 40 CFR 370.20.

U.S. CERCLA Reportable Quantity (RQ): 5000 lb (2270 kg)

U.S. TSCA INVENTORY STATUS: Methanol is listed on the TSCA Inventory.

Other U.S. Federal Regulations: Methanol is listed as a hazardous air pollutant (HAP) generally known or suspected to cause serious health problems. The Clean Air Act, as amended in 1990, directs EPA to set standards requiring major sources to sharply reduce routine emissions of toxic pollutants. EPA is required to establish and phase in specific performance based standards for all air emission sources that emit one or more of the listed pollutants. Methanol is included on this list.

<u>Chemical Name</u>	<u>CAS-No</u>	<u>Weight %</u>	<u>SARA 302(40 CFR 355, Appendix A)</u>	<u>SARA 304(40 CFR Table 302.4)</u>	<u>SARA 313(40 CFR 372.65)</u>
Methyl alcohol	67-56-1	100	No	No	Yes

California Proposition 65

Methanol is on the California Proposition 65 Lists. WARNING! This compound is known to the State of California to cause developmental harm.

<u>Chemical Name</u>	<u>CAS-No</u>	<u>Weight %</u>	<u>Category</u>
Methyl alcohol	67-56-1	100	Developmental

Canadian regulations

Canadian DSL/NDSL Status: Methanol is listed on the DSL inventory.

Canadian Environmental Protection Agency (CEPA) Priorities Substances List: Methanol is a Substance with Greatest Potential For Human Exposure Substance on Environment Canada/Health Canada Pilot Project List (CEPA 1999, Section 73). Meets categorization criteria: *may present, to individuals in Canada, the greatest potential for exposure; or *are persistent or bio-accumulative in accordance with the regulations, and inherently toxic to human beings or to non-human organisms, as determined by laboratory or other studies..

WHMIS Hazard Class

B2 - Flammable liquid
D1B - Toxic materials
D2A - Very toxic materials
D2B - Toxic materials



SECTION 16: Other information

Reason for revision SDS sections updated.
Revision number 1
Revision date 29-Dec-2017

Product Use: Various.

References

- ECHA: <http://echa.europa.eu/>
- TOXNET: <http://toxnet.nlm.nih.gov/>
- eChemPortal: <http://www.echemportal.org/>
- LOLI database: <https://www.chemadvisor.com/loli-database>

"The above information was acquired by diligent search and/or investigation and the recommendations are based on

Revision date 29-Dec-2017
Product code METHANOLSDS

Page 17 / 18
Product name METHANOL

prudent application of professional judgment. The information shall not be taken as being all inclusive and is to be used only as a guide. All materials and mixtures may present unknown hazards and should be used with caution. Since the Company cannot control the actual methods, volumes, or conditions of use, the Company shall not be held liable for any damages or losses resulting from the handling or from contact with the product as described herein. THE INFORMATION IN THIS SDS DOES NOT CONSTITUTE A WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE"

End of Safety Data Sheet