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PRIVATE LIMITED

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT IDENTIFIER: **Methanol**

PRODUCT SYNONYMS: Methyl Alcohol, Methyl Hydrate, Wood Alcohol

GENERAL USE: Methanol has wide industrial use as a solvent and is extensively employed as a paint and varnish remover, as a chemical intermediate, and in the preparation of stains, enamels, plastics, and films. It is used to manufacture formaldehyde and methyl esters of organic and inorganic acids; chemical synthesis; automotive antifreeze; denaturant for ethyl alcohol; dehydrator for natural gas.

PRODUCT DESCRIPTION: Clear, colorless, flammable, poisonous, mobile, highly polar liquid with slight alcohol odor; miscible with water, alcohol, ether, ketones and most other organic solvents. Burns with a nonluminous, bluish flame.

MANUFACTURER:

Dakota Gasification Company
P. O. Box 1149
Beulah, North Dakota 58523
(701) 873-6677

EMERGENCY TELEPHONE NUMBERS:

Dakota Gasification (701) 873-6600
CHEMTREC (800) 424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>INGREDIENTS</u>	<u>WT. %</u>	<u>CAS Registry #</u>
Methanol	98	67-56-1
Water	1.8	7732-18-5

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200): EXPOSURE LIMITS 8 hrs. TWA(ppm)

	<u>OSHA PEL</u>	<u>ACGIH TLV</u>
Methanol	200 ppm	200 ppm
Water	Not Established	Not Established

3. HAZARDS IDENTIFICATION / EMERGENCY OVERVIEW

Routes of entry for methanol are primarily absorption through the skin, eye contact, inhalation, or ingestion. Industrial exposures are primarily vapor exposures and skin contact. Initial symptoms from ingestion or inhalation may be only mild intoxication, but may become severe after 12-18 hours. Toxic effects from repeated over exposure to methanol have an accumulative affect the central nervous system, especially the optic nerve. These symptoms may linger for several days after exposure. Methanol can seriously impair vision and may cause blindness.

POTENTIAL HEALTH EFFECTS:

- EYE CONTACT:** Methanol can seriously impair vision and may cause blindness. Immediate signs and symptoms include the following: vapors are slightly uncomfortable and splashes very irritating; irritation with painful burning or stinging sensation; watering of eyes; inflammation of the eyelids; eyes are sensitive to and painful in the light.
- SKIN CONTACT:** Direct skin contact with methanol may cause irritation, dermatitis, erythema, and scaling. Methanol is highly volatile and will produce a feeling of cold. Alcohols remove oils from the skin, which becomes dry and eventually develops cracks or dermatitis. Methanol which can be absorbed by the skin, causes headache, fatigue, and reduction of visual acuity.
- INHALATION:** Sign and symptoms of acute poisoning include the following: slight irritation of the nose and eyes; head feels hot and face is flushed; excitability and talkativeness; drunken behavior; staggering and lack of coordination; headache; mental confusion and visual disturbance; tiredness.
- INGESTION:** Signs and symptoms of acute poisoning are gastrointestinal irritation; head feels hot and face is flushed; excitability and talkativeness; drunken behavior; staggering and lack of coordination; headache; mental confusion and visual disturbance; tiredness.
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4. FIRST AID MEASURES

- EYES:** Remove the victim from the source of contamination and take him to the nearest eye wash, shower, or other source of clean water. Gently rinse the affected eye(s) with clean, lukewarm water for at least 15 minutes. Have the victim lie or sit down and tilt his head back. Hold the eyelid(s) open and pour water slowly over the eyeball(s) at the inner corners, letting the water run out of the outer corners. Ask the victim to look up, down and side to side as you rinse in order to better reach all parts of the eye(s). If the victim cannot tolerate light, protect his eye(s) with a clean, loosely tied handkerchief or strip of clean, soft cloth or bandage. Seek medical attention immediately.
- SKIN:** Remove the victim from the source of contamination. Remove clothing, shoes, socks, and jewelry from the affected areas. Be careful not to get any of the chemical on your skin or clothing. Wash the affected area with tepid water. Dry the skin gently with a clean, soft towel. Seek medical attention immediately.
- INHALATION:** Remove the victim from the contaminated area while protecting yourself from exposure by wearing an appropriate respirator. Put a similar respirator on the victim. Remove contaminated clothing and equipment, while wearing gloves, being careful not to contaminate yourself. Administer CPR if necessary. Seek medical attention immediately.
- INGESTION:** Remove the victim from the contaminated area to a quiet, well ventilated area. Call a poison control center, inform them of the chemical swallowed and follow their advice. Seek medical attention immediately.
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5. FIRE FIGHTING MEASURES

- FLASH POINT: 54°F (Tagliabue / Tag Closed Tester)
- AUTO-IGNITION TEMPERATURE: 725°F
- FIRE AND EXPLOSION HAZARDS: Methanol burns with a clean, clear flame, being almost invisible in daylight.
- UPPER EXPLOSIVE / FIRE LIMITS: 36.50%
- LOWER EXPLOSIVE / FIRE LIMITS: 6.72%
- EXTINGUISHING MEDIA: Use dry chemical alcohol foam, or carbon dioxide; water spray may be ineffective as an extinguishing agent, but water should be used to keep fire-exposed containers cool.
- SPECIAL FIRE FIGHTING PROCEDURES: Vapors are slightly heavier than air and may flow along surfaces to ignition sources. Water may be ineffective in "in-depth methanol fires". Fire fighters should use self-contained breathing apparatus and protective clothing.
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6. ACCIDENTAL RELEASE MEASURES

- SPILL OR LEAK PROCEDURES: Eliminate all ignition sources. Stop spill source. If spill is small use absorbent material to soak up spill. Dike large spill areas. Recover large spills by recovering the methanol or by diluting with water to reduce the fire hazard. Salvage the liquid by using a recommended absorbent material. Prevent methanol from entering sewers, drains, or waterways. Always notify proper authorities of spills.
- WASTE DISPOSAL METHOD: Dispose of material in accordance with your local, state, federal or other applicable regulations.
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7. HANDLING AND STORAGE

- STORAGE TEMPERATURE: Keep cool.
- SHELF LIFE: Unknown.
- SPECIAL SENSITIVITY: Methanol is a flammable substance.
- HANDLING / STORAGE PRECAUTIONS: Store containers in well-ventilated place. Large volume storage should be remote from inhabited buildings or structures. Keep away from all sources of ignition. Wear chemical goggles or face shield, supplied-air or self contained breathing apparatus, rubber gloves, aprons and boots.
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8. EXPOSURE CONTROLS / PERSONAL PROTECTION

RECOMMENDED WORK / HYGIENE PROCEDURES:	Adequate ventilation. Wear chemical goggles or face shield, supplied-air or self contained breathing apparatus, rubber gloves, aprons and boots.
EYE PROTECTION REQUIREMENTS:	Chemical safety goggles or face shields should be worn.
HAND PROTECTION REQUIREMENTS:	Natural rubber gloves.
PROTECTIVE CLOTHING REQUIREMENTS:	Appropriate protective clothing, including gloves, aprons, suits, boots, and face shields that are impervious to methyl alcohol should be worn to prevent repeated or prolonged skin contact.
RESPIRATORY REQUIREMENTS:	Supplied-air or self contained breathing apparatus operated in the positive pressure mode.
WASH REQUIREMENTS:	Soap and water should be available to clean contaminated skin. Wash thoroughly prior to consuming food or beverage, smoking, or using restroom facilities.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Clear, colorless liquid.
ODOR:	Alcohol odor.
PHYSICAL STATE:	Liquid.
VAPOR PRESSURE:	(at 20°C) 96 mmHg
VAPOR DENSITY:	(air = 1) 1.11
MELTING POINT:	-97.6°C
BOILING POINT:	(at 760 mmHg) 64.5°C
SPECIFIC GRAVITY:	(water = 1) 0.7915 at 68°F
EVAPORATION RATE:	(Butyl Acetate = 1) 4.6
PERCENT VOLATILES:	100% (by volume)
BULK DENSITY:	6.63 lbs. per gallon
SOLUBILITY IN WATER:	Miscible.
SOLVENT SOLUBILITY:	Solubility in alcohols, ketones, esters, and halogenated hydrocarbons - Miscible.
MOLECULAR WEIGHT:	32.04
CHEMICAL FORMULA:	CH ₃ OH
CHEMICAL FAMILY:	Alcohols

10. STABILITY AND REACTIVITY

INSTABILITY CONDITIONS:	Stable.
INCOMPATIBILITIES:	Beryllium hydride: Intense reaction at 200°C Bromine: Intense exothermic reaction Calcium carbide: Violent reaction Chloroform and sodium hydroxide: Explosive reaction Chromic anhydride: Possible explosion Cyanuric chloride: Uncontrollable violent reaction Magnesium: Violent reaction Nickel: Possible ignition in the presence of nickel catalyst Formaldehyde and carbon monoxide.
DECOMPOSITION:	
HAZARDOUS POLYMERIZATION:	Will not occur.

11. TOXICOLOGICAL INFORMATION

ROUTES OF ENTRY:	A human poison by ingestion. Poison experimentally by skin contact. Moderately toxic experimentally by intravenous and intraperitoneal routes. Mildly toxic by inhalation.
EFFECTS OF ACUTE EXPOSURE:	The main toxic effect is exerted upon the nervous system, particularly the optic nerves and possibly the retina which can progress to permanent blindness. Once absorbed, methanol is only very slowly eliminated. Coma resulting from massive exposures may last as long as 2-4 days. In the body, the products formed by its oxidation are formaldehyde and formic acid, both of which are toxic. Because of the slow elimination, methanol should be regarded as a cumulative poison. Though single exposures to vapors may cause no harmful effect, daily exposure may result in the accumulation of sufficient methanol in the body to cause illness.
SYMPTOMS:	Gastrointestinal irritation; slight irritation of nose and eyes; head feels hot and face is flushed; excitability and talkativeness; drunken behavior; staggering and lack of coordination; headache; mental confusion and visual disturbance; tiredness.
EYE EFFECTS:	Methanol can seriously impair vision. It may cause blurred vision, constricted visual fields, blindness, changes in color perception, double vision, and general visual disturbances. Eye examinations have shown sluggish pupils, pallid optic discs, retinal edema, papilledema, hyperemia to the optic discs with blurred edges and dilated veins. 1200 ppm to 8300 ppm: visual disturbances, dilated unreactive pupils and dim vision.
SKIN EFFECTS:	Skin exposure may cause irritation and dermatitis. Poison experimentally by skin contact. Skin - rabbit: LD ₅₀ : 15,800 mg/kg
ACUTE ORAL EFFECTS:	Ingestion of methanol may cause acidosis, headache, visual disturbances, dizziness, nausea and vomiting, severe upper abdominal pain, dilated nonreactive pupils and death. Death from 2 to 8 ounces has been reported.
ACUTE INHALATION EFFECTS:	May cause headache, dizziness, nausea, vomiting, weakness, vertigo, chills shooting pains in the lower extremities, unsteady gait, numbness, prickling, shooting pain in the back of the hands and forearms, nervousness, gastric pain, insomnia, acidosis, and formic acid in the urine. Inhalation - human: TCL ₀ = 86,000 mg/m ³ (lowest published toxic concentration). Concentrations of 200-375 ppm may cause severe, recurrent headaches. IDLH - 25,000 ppm.
CHRONIC EFFECTS / CARCINOGENICITY:	This agent is not considered a carcinogen by NTP, IARC or OSHA. Effects from repeated over-exposure to methanol are considered to be harmful . Because of the slow elimination, methanol should be regarded as a cumulative poison. Though single exposures to fumes may cause no harmful effect, daily exposure may result in the accumulation of sufficient methanol in the body to cause illness.
MUTAGENICITY:	Reproductive effects: an experimental teratogen in rats exposed to 20,000 ppm. Reported to cause birth defects.
ORGANS AFFECTED BY LONG-TERM EXPOSURE:	Repeated exposure to methanol vapor may be manifested by conjunctivitis, headache, giddiness, insomnia, gastric disturbances, and bilateral blindness.

12. ECOLOGICAL INFORMATION

Aquatic Toxicity Rating: T1m 96: Over 1000 ppm

Toxicity threshold (cell multiplication inhibition test):

Trout: T1m (48 hr) 8,000 mg/l

Bacteria (*Pseudomonas*) LD₀: 0.6 g/l

Algae (*Chlorella pyrenoidosa*) toxic: 31,100 mg/l

Low concentrations are biodegradable; therefore, long-term ecological effects are not anticipated.

13. DISPOSAL CONSIDERATIONS

Recycling/reuse of all methanol residuals is recommended. Discarded or spill cleanup material may be considered hazardous waste as defined under RCRA 40 CFR 261 (Methanol F003, U154).

Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of the material.

14. TRANSPORTATION INFORMATION

D.O.T. SHIPPING NAME: Alcohol, N.O.S. (Contains Methanol)

D.O.T. HAZARD CLASS: Flammable Liquid, 3

U.N. NUMBER: 1987

D.O.T. PLACARD: Flammable Liquid

D.O.T. LABEL CODE: Flammable Liquid

PACKAGING CLASSIFICATION: Packing Group 2

D.O.T. REPORTABLE QUANTITY: 5000 lbs

15. REGULATORY REQUIREMENTS

EPA DETERMINATIONS

CERCLA, 40 CFR 302

The material contains the following hazardous substance which, when released in quantities equal to or exceeding the Reportable Quantity, triggers National Response Center notification requirements.

Hazardous Substance	Reportable Quantity
Methanol	5000 lbs.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986,
TITLE III - SECTIONS 302, 304, 311, 312, 313

SECTION 302 / 304 - Extremely Hazardous Substances (40 CFR 355)

The material does not contain extremely hazardous substances at greater than 1.0 % concentration; however, it is possible that this material may contain extremely hazardous substances at a lower concentration so that a large enough spill could warrant an Emergency Release under section 304.

SECTION 311/312 - MSDS and Chemical Inventory Reporting Requirements (40 CFR 370)

The material should be reported under the following EPA Hazard categories.

- ✓ Immediate (Acute Health Hazard)
- ✓ Delayed (Chronic Health Hazard)
- ✓ Fire
- Sudden Release of Pressure
- Reactive
- Not Applicable

SECTION 313 - List of Toxic Chemicals (40 CFR 372)

The material contains the following chemical(s) at a level of 1.0% or greater (0.1% for carcinogens) on the list of toxic Chemicals and is subject to toxic chemical release reporting requirements.

Toxic Chemical:	Methanol
CAS Registry Number:	67-56-1
Approximate Concentration (Upper Bound):	98 wt %

TOXIC SUBSTANCES CONTROL ACT (TSCA) (40 CFR 710)

The chemical ingredients in this material are in the Section 8(b) Chemical Substance Inventory (40 CFR 710) and / or are otherwise in compliance with TSCA. In the case of ingredients obtained from other manufacturers, Dakota Gasification Company relies on the assurance of responsible third parties in providing this statement.

LIABILITY DISCLAIMER

The information contained in this Material Safety Data Sheet (MSDS) is believed to be correct since it was obtained from sources we believe are reliable. However no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion.

Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe work place to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.