SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **Methanol**
Product Description: Alcohol
Chemical Formula: CH_3OH
Recommended Use: Solvent

COMPANY IDENTIFICATION

Supplier: **UNION PETROCHEMICAL PUBLIC COMPANY LIMITED**
728 Union House Building, Baromratchonnani Rd.,
Bangbumru, Bangplad, Bangkok 10700
Supplier General Contact: +662 881 8288

This (M)SDS is a generic document with no country specific information included.

SECTION 2 HAZARDS IDENTIFICATION

This material is hazardous according to UN GHS Criteria. Classification includes all GHS hazard classes. For hazard categories with two cut-off/concentration limits, classification was based on the higher limit.

GHS CLASSIFICATION:

FLAMMABLE LIQUIDS - Category 2
ACUTE TOXICITY (oral) - Category 3
ACUTE TOXICITY (dermal) - Category 3
ACUTE TOXICITY (inhalation) - Category 3
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (central nervous system (CNS), optic nerve) - Category 1

GHS LABEL ELEMENTS:
Pictogram:

Signal Word: Danger

Hazard Statements:

Signal word : Danger
Hazard statements: Highly flammable liquid and vapor.
Toxic if swallowed, in contact with skin or if inhaled.
Causes damage to organs. (central nervous system (CNS), optic nerve)

Precautionary Statements:

Prevention: Wear protective gloves: > 8 hours (breakthrough time): butyl rubber. Wear eye or face protection: Recommended: full-face mask. Wear protective clothing. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use explosion-proof electrical, ventilating, lighting and all material handling equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Keep container tightly closed. Use only outdoors or in a well-ventilated area. Do not breathe vapor. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Response: IF exposed or concerned: Call a POISON CENTER or physician. IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. IF ON SKIN: Take off immediately all contaminated clothing and wash it before reuse. Wash with plenty of soap and water. Call a POISON CENTER or physician if you feel unwell.
Storage: Store locked up. Store in a well-ventilated place. Keep cool.
Disposal: Dispose of contents and container in accordance with all local, regional, national and international regulations.

Other hazard information:

Prolonged or repeated contact may dry skin and cause irritation.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a substance.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	Concentration*	CAS#
methanol	≥99.85%	67-56-1

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4 FIRST AID MEASURES

INHALATION

Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Get medical attention. If necessary, call a poison center or physician. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

SKIN CONTACT

Wash skin thoroughly with soap and water or use recognized skin cleanser. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

EYE CONTACT

Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Get medical attention. If necessary, call a poison center or physician.

INGESTION

Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

NOTE TO PHYSICIAN

Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled. Symptoms may occur after a latency period has elapsed.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing media

Suitable extinguishing media : Use dry chemical CO2, alcohol-resistant foam or water spray (fog).
Unsuitable extinguishing media : Do not use water jet.

Specific hazards arising from the chemical

Highly flammable liquid and vapor. Runoff to sewer may create fire or explosion hazard. In a fire or if heated, a pressure increase will occur and the container may burst, with the risk of a subsequent explosion.

Hazardous thermal decomposition products

Decomposition products may include the following materials: carbon dioxide carbon monoxide

Special protective actions for fire-fighters

Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Move containers from fire area if this can be done without risk. Use water spray to keep fire-exposed containers cool.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

SECTION 6 ACCIDENTAL RELEASE MEASURES

For non-emergency personnel

No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off all ignition sources. No flares, smoking or flames in hazard area. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders

If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions

Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Spill Management

Small spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill: Stop leak if without risk. Move containers from spill area. Use spark-proof tools and explosion-proof equipment. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with noncombustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

SECTION 7 HANDLING AND STORAGE

Protective measures

Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Do not enter storage areas and confined spaces unless adequately ventilated. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Store and use away from heat, sparks, open flame or any other ignition source. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Use only non-sparking tools. Take precautionary measures against electrostatic discharges. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene

Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

STORAGE

Store in accordance with local regulations. Store in a segregated and approved area. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Store locked up. Eliminate all ignition sources. Separate from oxidizing materials. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters/Exposure limits:

Exposure limits/standards (Note: Exposure limits are not additive)

Product/ingredient name	Exposure limits
methanol	**Workplace Safety and Health Act (Singapore, 2/2006).** PEL (short term): 328 mg/m³ 15 minutes. PEL (short term): 250 ppm 15 minutes. PEL (long term): 262 mg/m³ 8 hours. PEL (long term): 200 ppm 8 hours.

ENGINEERING CONTROLS

Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

PERSONAL PROTECTION

Respiratory Protection: Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use. Recommended: self-contained breathing apparatus (SCBA)

Hand Protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances,

the protection time of the gloves cannot be accurately estimated. > 8 hours (breakthrough time): butyl rubber

Eye/face Protection: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields. Recommended: full-face mask

Skin Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. When there is a risk of ignition from static electricity, wear anti-static protective clothing. For the greatest protection from static discharges, clothing should include anti-static overalls, boots and gloves.

Other skin Protection: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Specific Hygiene Measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

ENVIRONMENTAL CONTROLS

Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Colorless
Odour: Pungent
Odour Threshold: N/D

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density: ≤0.7928
Density : 0.7915 g/cm³
Flammability (Solid, Gas): N/D
Flash Point: Closed cup: 9.7°C Open cup: 15.85°C
Autoignition Temperature: 455°C
Boiling Point / Range: 64.5°C
Freezing/ Melting Point: -97.5°C
Decomposition Temperature: N/D
Vapour Density: 1 [Air = 1]
Vapour Pressure: 16.9 kPa [at Temperature (°C): 25°C]
Evaporation Rate (n-butyl acetate = 1): 2.1
pH: N/D
Solubility in Water: N/D
Viscosity: Dynamic (room temperature): 0.54 to 0.59 mPa·s (0.54 to 0.59 cP)

SECTION 10 STABILITY AND REACTIVITY

STABILITY: The product is stable.

CONDITIONS TO AVOID: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition.

MATERIALS TO AVOID: Reactive or incompatible with the following materials: oxidizing materials

HAZARDOUS DECOMPOSITION PRODUCTS: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

POSSIBILITY OF HAZARDOUS REACTIONS: Under normal conditions of storage and use, hazardous reactions will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

Product/ingredient name	Result	Species	Dose	Exposure
methanol	LC50 Inhalation Vapor LD50 Dermal LD50 Ora LDLo Oral	Rat Rabbit Rat Human	128200 mg/m³ 17100 mg/kg 1187 to 2769 mg/kg 300 to 1000 mg/ kg	4 hours - - - -

Conclusion/Summary: Special remarks on other toxic effects on humans; acidosis

Irritation/Corrosion: Not available.

Conclusion/Summary

Skin: Prolonged or repeated contact with skin or mucous membrane may result in irritation symptoms, such as redness, blistering, dermatitis etc.

Eyes: Slightly irritating to the eyes.

Sensitization: Not available.

Conclusion/Summary

Skin: Non-sensitizer to skin.

Respiratory: Non-sensitizer to lungs.

Mutagenicity Not available.

Conclusion/Summary: No known significant effects or critical hazards.

Carcinogenicity: Not available.

Conclusion/Summary: Based on available data, the classification criteria are not met.

Reproductive toxicity

Product/ingredient name	Maternal toxicity	Fertility	Developm ent toxin	Development toxin	Dose	Exposure
methanol	Negative Negative	- -	Positive Positive	Rat - Male, Female Mouse - Male, Female	Inhalation: 1330 mg/ m³ NOEC Inhalation: 1330 mg/ m³ NOEC	- -

Conclusion/Summary: Developmental Toxicity: Mice, Rats. Not suspected for humans.

Teratogenicity

Product/ingredient name	Result	Species	Dose	Exposure
methanol	Positive – Inhalation Positive - Inhalation	Rat - Male, Female Mouse - Male, Female	1330 mg/m³ NOEC 1330 mg/m³ NOEC	- -

Conclusion/Summary: Developmental Toxicity: Mice, Rats. Not suspected for humans.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
methanol	Category 1	All	central nervous system (CNS) and optic nerve

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard: Not available.

Information on the likely routes of exposure: Routes of entry anticipated: Oral, Dermal, Inhalation

Potential acute health effects

Eye contact: No known significant effects or critical hazards.
Inhalation: Toxic if inhaled.
Skin contact: Toxic in contact with skin. Defatting to the skin. May cause skin dryness and irritation.
Ingestion: Toxic if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact: No specific data.
Inhalation: nausea or vomiting central nervous system depression Permanent vision changes, loss of vision or total blindness. Severe over-exposure can result in death.
Skin contact: Adverse symptoms may include the following: irritation dryness cracking

Ingestion

nausea or vomiting central nervous system depression Permanent vision changes, loss of vision or total blindness. Severe over-exposure can result in death.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects: Not available. Short term exposure
Potential delayed effects : Not available.

Long term exposure

Potential immediate effects: Not available. Long term exposure
Potential delayed effects: Not available.

Potential chronic health effects: Not available.

Conclusion/Summary: No known significant effects or critical hazards.
General: Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/ or dermatitis.
Carcinogenicity: No known significant effects or critical hazards.
Mutagenicity: No known significant effects or critical hazards.
Teratogenicity: No known significant effects or critical hazards.
Developmental effect: No known significant effects or critical hazards.
Fertility effects: No known significant effects or critical hazards.

Numerical measures of toxicity
Acute toxicity estimates

Route	ATE value
Oral	100 mg/kg
Derma	300 mg/kg
Inhalation (vapors)	3 mg/l

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

TOXICITY

Product/ingredient name	Result	Species	Exposure
methanol	EC50 20000 mg/l Fresh water	Micro-organism	15 hours
	Acute EC50 >10000 mg/l Fresh water	Daphnia	48 hours
	Acute EC50 71700 mg/l	Micro-organism - Tubiflex tubiflex	3 minutes
	Acute LC50 2500 mg/l Marine water	Crustaceans-Crangon crangon - Adult	48 hours
	Acute LC50 3289 to 4395 mg/l Fresh water	Daphnia - Daphnia magna –	48 hours
	Acute LC50 15400 mg/l Fresh water	Neonate	96 hours
	Acute LC50 290 mg/l Fresh water	Fish - Lepomis macrochirus	96 hours
	Chronic EC50 22000 mg/l Fresh water	Fish - Danio rerio - Egg	96 hours
	Chronic NOEC 7900 mg/l Fresh water	Algae - Selenastrum capricornutum	
		Fish - Oryzias latipes - Juvenile (Fledgling, Hatchling, Weanling)	200 hours

ECOLOGICAL DATA

Persistence/degradability

Product/ingredient name	Test	Result	Dose	Inoculum
methanol	311 Anaerobic Biodegradation of Organic Compounds in Digested Sludge - Method by Measurement of Gas Production	83 to 91 % - 3 days	-	Fresh water sediment
	Aerobic	53.4 % - 5 days		Soil
	Anaerobic	53.4 % - 5 days		Soil

Product/ingredient name	**Aquatic half-life**	**Photolysis**	**Biodegradability**
methanol	-	50%; 17 day(s)	Inherent

Bioaccumulative potential

Product/ingredient name	LogPow	BCF	Potential
methanol	-	Low 10	Low

Mobility in soil
Soil/water partition coefficient (KOC) : 0.13 to 1
Other adverse effects : No known significant effects or critical hazards.

SECTION 13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and nonrecyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

SECTION 14 TRANSPORT INFORMATION

	UN	IMDG	IATA
UN number	UN1230	UN1230	UN1230
UN proper shipping name	METHANOL	METHANOL	METHANOL
Transport hazard class(es)	3 (6.1) 	3 (6.1) 	3 (6.1) 
Packing group	II	II	II
Environmental hazards	No.	No.	No.
Additional information	Special provisions 279	Emergency schedules F-E, S-D Special provisions 279 Remarks This product is being carried under the scope of Annex II (MARPOL)	Quantity limitation Passenger and Cargo Aircraft: 1 L. Packaging instructions: 352. Cargo Aircraft Only: 60 L. Packaging instructions: 364. Limited Quantities - Passenger Aircraft: 1 L. Packaging instructions: Y341. Special provisions A113

Special precautions for user : Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex I/II of Marpol and the IBC Code
Proper shipping name : Methyl alcohol
Ship type : 3
Pollution category : Y

SECTION 15 REGULATORY INFORMATION

Singapore - hazardous chemicals under government control
None.
International lists
National inventory
Australia : All components are listed or exempted.
Canada : All components are listed or exempted.
China : All components are listed or exempted.
Europe : All components are listed or exempted.

Japan	: Japan inventory (ENCS): All components are listed or exempted. Japan inventory (ISHL) : All components are listed or exempted.
Republic of Korea	: All components are listed or exempted.
Malaysia	: All components are listed or exempted.
New Zealand	: All components are listed or exempted.
Philippines	: All components are listed or exempted.
Taiwan	: All components are listed or exempted.
United States	: All components are listed or exempted

SECTION 16 OTHER INFORMATION

History

Date of printing : 11/21/2019
Date of issue/Date of revision : 11/21/2019
Date of previous : 10/4/2018
Version : 8
Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC Code = International Bulk Chemical Code
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships,1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

Procedure used to derive the classification

Classification	Justification
FLAMMABLE LIQUIDS - Category 2	On basis of test data
ACUTE TOXICITY (oral) - Category 3	Calculation method
ACUTE TOXICITY (dermal) - Category 3	Calculation method
ACUTE TOXICITY (inhalation) - Category 3	Calculation method
SPECIFIC TARGET ORGAN TOXICITY (SINGLE EXPOSURE) (central nervous system (CNS), optic nerve) - Category 1	Calculation method

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