

MATERIAL SAFETY DATA SHEET

PM SOLVENT

1. IDENTIFICATION

Product Name	:	PM SOLVENT
Chemical Family	:	Propylene Glycol Ethers
CAS Number	:	107-98-2
Synonyms	:	Propylene glycol monomethyl ether
Type of Use	:	Solvent.
Supplier	:	Srithana Perfect Co.,Ltd.
Address	:	440/4-6 Prachacuen Road, Bangsue, Bangsue, Bangkok 10800 Thailand
Telephone	:	+66 2 913 7999 (Auto 20 lines)
Fax	:	+66 2 586 0990-4
Website	:	www.srithanaperfect.com
E-mail	:	info@srithanaperfect.com
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2. HAZARD IDENTIFICATION

Emergency Overview

Hazards

Flammable liquid. May be irritating to the eyes, skin, and respiratory system. Slight skin absorption hazard. May form reactive peroxides. However, there is no known evidence that it has nearly the peroxide forming potential as, for example, diethyl ether, etc.

Physical State

liquid

Color

Clear, colorless.

Odor

Ether-like odor.

Odor Threshold

10 ppm / Odor is not an adequate warning of potentially hazardous ambient air concentrations.

Potential Health Effects

Routes of Exposure

Eye. Inhalation. Skin.

Signs and Symptoms of Acute Exposure

See component summary.

- 1-Methoxy-2-propanol 107-98-2
Slight inhalation hazard. Slight eye irritant. Slight skin irritant. Slight skin absorption hazard.
- 2-Methoxy-1-propanol 1589-47-5
Respiratory tract irritant. Skin irritant. Moderate eye irritant.

Skin

May be absorbed through the skin and produce toxic effects such as CNS depression.

Inhalation

Vapors may cause irritation of the eyes, nose and throat as well as CNS depression (fatigue, dizziness, loss of concentration, with collapse, coma and death possible in cases of severe overexposure). High vapor concentrations may be irritating to the upper respiratory tract.

Eye

Mild eye irritation reported with vapor.

Ingestion

This material may be a slight health hazard if ingested in large quantities.

Chronic Health Effects

No adverse chronic health effects are expected from anticipated conditions of normal use of this material, based on animal test data.

- 1-Methoxy-2-propanol 107-98-2
Prolonged or high exposures may cause CNS effects and liver and kidney changes. Mild skin irritation with repeated dermal exposure.
- 2-Methoxy-1-propanol 1589-47-5
Damages developing fetus. See section 11.

3. COMPOSITION/INFORMATION ON INGREDIENTS

<u>Component Name</u>	<u>CAS #</u>	<u>EU Inventory</u>	<u>Concentration Wt.%</u>
1-Methoxy-2-propanol	107-98-2	203-539-1	> 99.0
2-Methoxy-1-propanol	1589-47-5	216-455-5	< 0.5

Compositions given are typical values not specifications.

4. FIRST AID MEASURES

General

Take proper precautions to ensure your own health and safety before attempting rescue and providing first aid. For specific information refer to the Emergency Overview in Section 2 of this MSDS.

Skin

Remove contaminated clothing as needed. Wash skin thoroughly with mild soap and water. Flush with lukewarm water for 15 minutes. If sticky, use waterless cleaner first. Seek medical attention if ill effect or irritation develops.

Inhalation

If overcome by exposure, remove victim to fresh air immediately. Give oxygen or artificial respiration as needed. Obtain medical attention if breathing difficulty persists.

Eye

Immediately flush the eyes with large amounts of clean low-pressure water for at least 15 minutes, occasionally lifting the upper and lower lids. If pain or irritation persists, promptly obtain medical attention.

Ingestion

If large quantity swallowed, give lukewarm water (pint/ 1/2 litre) if victim completely conscious/alert. Do not induce vomiting. Risk of damage to lungs exceeds poisoning risk. Obtain emergency medical attention.

Note to Physician

Treat symptomatically. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE FIGHTING MEASURES

Flammable Properties

Classification

Flammable liquid.

Flash Point

31.7 °C (89.06 °F) (TCC).

Auto-Ignition Temperature

277.8 °C (532.04 °F)

Lower Flammable Limit

3 vol%

Upper Flammable Limit

12 vol%

Extinguishing Media

Suitable:

Dry chemical. CO2. Water spray. Alcohol resistant foam.

Unsuitable:

Do not use solid water stream.

Protection of Firefighters

Protective Equipment/Clothing:

Wear an approved positive pressure self-contained breathing apparatus and firefighter turnout gear. Structural firefighters protective clothing will only provide limited protection.

Fire Fighting Guidance:

Individuals should perform only those fire-fighting procedures for which they have been trained. Fire fighters should wear self-contained breathing apparatus in the positive pressure mode with a full facepiece when there is a possibility of exposure to smoke, fumes or hazardous decomposition products. Cool tanks and containers exposed to fire with water. Water may be ineffective in firefighting due to low flash point. Burning liquid may float on water. Even if material is water soluble, may not be practical to extinguish fire by water dilution. Notify authorities immediately if liquid enters sewer/public waters.

Hazardous Combustion Products:

Incomplete combustion may produce carbon monoxide and other toxic gases.

6. ACCIDENTAL RELEASE MEASURESRelease Response

Flammable liquid. Release can cause fire or explosion. Vapors may ignite. Equip responders with proper protection extinguish all ignition sources. Blanket with firefighting foam. Contain spill with dike to prevent entry into sewers or waterways. For large spills, dike and pump into properly labeled containers for reclamation or disposal. For small spills,

Release Response

soak up with absorbent material and place in properly labeled containers for disposal. All recovered material should be packaged, labeled, transported and disposed of or reclaimed in conformance with applicable laws and regulations and in conformance with good engineering practices. Reclaim where possible.

7. HANDLING AND STORAGE**Handling**

For industrial use only. Keep container tightly closed when not in use. The potential for peroxide formation is enhanced when this solvent is used in processes such as distillation. Use only non-sparking tools. Properly ground containers before beginning transfer. When transferring propylene glycol ethers with flash points at or below 60 °C (140 °F) into fixed site vessels, the vessel should be purged and inerted prior to transfer. Propylene glycol ethers may be transferred into air atmospheres if the temperature of the product and the ambient temperature within the shipping container are both at least 16.7 °C (30 °F) less than the product's flash point. After loading, nitrogen blanketing is required if the contents of the transportation container could exceed a temperature of 16.7 °C (30 °F) less than the product flash point during any subsequent transportation activities. If the product flash point is less than 16.7 °C (30 °F) above either the ambient temperature of the transportation container or the storage temperature of the product, the container should be purged and inerted with nitrogen prior to loading and nitrogen blanketed after loading. Handle empty containers with care. Flammable/combustible residue remains after emptying. The purging of all empty shipping containers, regardless of the flashpoint, is recommended when received with air atmospheres. Isolate, vent, drain, wash and purge systems or equipment before maintenance or repair. Use adequate personal protective equipment. Observe precautions pertaining to confined space entry.

Storage

Store only in tightly closed, properly vented containers away from heat, sparks, open flame and strong oxidizing agents. Storage under nitrogen atmosphere is recommended to minimize possible formation of highly reactive peroxides. Store in properly lined steel/stainless steel to avoid slight discoloration from mild steel/copper. Aluminum (5000 series alloys - U.S. Aluminum Association Standard) showed no corrosion after 30 days contact with ARCOSOLV® PM Acetate, ARCOSOLV® DPM, TPM, PTB, or PM at 71°C (160°F). Some plastics/rubbers are attacked by Glycol Ethers/Ether Esters. This product will absorb water if exposed to air.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering Controls

General room or local exhaust ventilation is usually required to meet exposure limit(s).

Personal Protection

Inhalation

If exposure can potentially exceed the exposure limit(s), respiratory protection recommended or approved by appropriate local, state or international agency must be used.

Skin

Wear chemical resistant gloves such as: Neoprene. Depending on the conditions of use, protective gloves, apron, boots, head and face protection should be worn.

Eye

Chemical splash goggles and/or face shield should be worn.

Additional Remarks

Selection of appropriate personal protective equipment should be based on an evaluation of the performance characteristics of the protective equipment relative to the task(s) to be performed, conditions present, duration of use, and

Additional Remarks

the hazards and/or potential hazards that may be encountered during use. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Use good personal hygiene practices. Wash hands before eating, drinking, smoking, or using toilet facilities. Promptly remove soiled clothing/wash thoroughly before reuse.

Occupational Exposure Limits

Component Name	Source	Type	Value	Notation
1-Methoxy-2-propanol	US (ACGIH)	STEL	150 ppm	None.
	US (ACGIH)	TWA	100 ppm	None.
	OEL (HK)	STEL	150 ppm	None.
			553 mg/m ³	
	OEL (HK)	TWA	100 ppm	None.
			369 mg/m ³	
	OEL (SG)	PEL	100 ppm	None.
			369 mg/m ³	
	OEL (SG)	STEL	150 ppm	None.
			553 mg/m ³	

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : liquid Clear, colorless.

Odor : Ether-like odor.

Odor Threshold : 10 ppm Odor is not an adequate warning of potentially hazardous ambient air concentrations.

pH : Not applicable.

Boiling Point/Boiling Range: ~ 120 °C (248 °F)

Freezing Point/Melting Point: ~ -95 °C (-139 °F)

Flash Point: 31.7 °C (89.06 °F) (TCC).

Auto-ignition: 277.8 °C (532.04 °F)

Flammability: Flammable liquid.

Lower Flammable Limit: 3 vol%

Upper Flammable Limit: 12 vol%

Explosive Properties: No Data Available.

Oxidizing Properties: No Data Available.

Vapor Pressure: 10.9 mm Hg

Evaporation Rate: 0.7 (butyl acetate = 1)

Relative Density: ~ 0.92 @ 25 °C (77 °F)

Relative Vapor Density: > 3.0 @ 15.5 - 32.2 °C (59.9 - 89.96 °F)

Viscosity: ~ 2.0 mm²/s @ 77 °C (170.6 °F)

Solubility (Water): ~ 200 g/l @ 20 °C (68 °F) Complete

Partition Coefficient (Kow): Log Pow = - 0.437

Additional Physical and Chemical Properties: Volatile Characteristics: Moderate: 1.0 to 10.0% Additional properties may be listed in Sections 2 and 5.

10. STABILITY AND REACTIVITY

Chemical Stability

This material is stable when properly handled and stored.

Conditions to Avoid

Extended contact with air or oxygen. The potential for peroxide formation is enhanced when this solvent is used in processes such as distillation. Heat, sparks, open flame, other ignition sources, and oxidizing conditions. Ignition may occur at temperatures below those published in the literature as autoignition or ignition temperatures.

Substances to Avoid

Strong oxidizing agents.

Decomposition Products

No Data Available.

Hazardous Polymerization

Not expected to occur.

Reactions with Air and Water

May react with oxygen to form peroxides. However, there is no known evidence that it has nearly the peroxide forming potential as, for example, diethyl ether, etc.

11. TOXICOLOGICAL INFORMATION

PRODUCT INFORMATION

Product Summary

Propylene glycol monomethyl ether (PGME) exhibits a low acute toxicity hazard after exposure via ingestion, skin contact, or inhalation exposure. Exposure to vapors of PGME may cause irritation of the eyes, nose, or throat. PGME is not a skin sensitizer. PGME is, at most, mildly irritating to the skin and only slightly irritating to the eye. Repeated exposure studies in animals indicate that PGME may cause sedation, enlarged liver, minor kidney changes, and decreased body weight gain during prolonged or high exposures. Reproductive effects observed in animal studies appear to be related to a decrease in maternal body weights and secondary to nutritional stress. PGME is not teratogenic. PGME is not genotoxic in standardized in vitro and in vivo tests. Studies in laboratory animals indicate that PGME is not carcinogenic.

- 1-Methoxy-2-propanol 107-98-2

Acute Toxicity - Lethal Doses

<u>LC50 (Inhl)</u>	rat	> 7,559 PPM	6 HOURS
<u>LD50 (Oral)</u>	rat	> 5,000 MG/KG BWT	
<u>LD50 (Skin)</u>	rabbit	13,000 MG/KG BWT	

Acute Toxicity - Effects

Inhalation

This substance is considered nontoxic by the inhalation route. Exposure to vapor may cause irritation of the eyes, nose, or throat. Exposure to very high concentrations of aerosols may cause CNS depression.

Ingestion

This substance is considered nontoxic by the oral route. High doses may cause CNS depression (fatigue, dizziness and possibly loss of concentration, with collapse, coma and death in cases of severe over-exposure).

Skin Contact

May be absorbed through the skin and produce toxic effects such as CNS depression. This substance is considered nontoxic by the dermal route of exposure. However, very high exposures may cause skin injury or systemic toxicity. (death)

Irritation

Skin

This substance is a mild skin irritant.

Eye

Liquid is not irritating to the eye. Mild eye irritation reported with vapor.

Sensitization

Does not induce skin sensitization.

Repeated Dose Toxicity

PGME is a low concern to health following prolonged oral, inhalation, or dermal exposures. Repeated exposure studies performed in multiple animal species indicate that PGME may cause transient, dose-related sedation with secondary effects of decreased body weight gain at oral doses of ≥ 460 mg/kg bwt/day, at dermal exposures of ≥ 1840 mg/kg bwt/day, and vapor concentrations of $\geq 3,000$ ppm. Liver and/or kidney changes were noted at oral doses of ≥ 920 mg/kg bwt/day, at dermal exposures of $\geq 6,440$ mg/kg bwt/day, and at vapor concentrations of $\geq 3,000$ ppm. Repeated dermal exposure of rabbits to undiluted PGME at concentrations up to 1,000 mg/kg bwt/day caused no systemic toxicity and failed to cause more than very mild dermal irritation.

Reproductive Effects

This substance is not expected to cause reproductive toxicity at dose levels that are not also toxic to the parents. Effects noted in animal reproductive toxicity studies appear to be related to a decrease in maternal body weights and secondary to general toxicity and/or nutritional stress. At vapor concentrations of 3,000 ppm, parental effects included sedation and decreased mean body weights. In female rats, toxicity was accompanied by lengthened estrous cycles, decreased fertility, decreased ovary weights, reduced pup survival and litter size, slight delays on the onset of puberty, and histological changes in the liver and thymus of the first and second generation offspring. Also, there was an increase in histological ovarian atrophy in the first and second generation parental females. No reproductive or neonatal effects were observed in rats at doses as high as 1000 ppm of PGME.

Developmental Effects

This substance is not a teratogen. No teratogenic effects but slight fetotoxicity (evidenced by delayed skeletal ossification) was observed in rats or rabbits exposed to concentrations of PGME up to 3000 ppm. Maternal general toxicity included mild transient CNS depression, decreased food consumption and body weight gain at the 3000 ppm dose groups for both rats and rabbits.

Genetic Toxicity

Developmental Effects

No evidence of genotoxicity in standard bacterial and mammalian test systems in vitro. No increase in micronuclei in mice after in vivo exposure.

Carcinogenicity

Studies in laboratory animals indicate that this substance is not carcinogenic. Long-term exposure (2 years) of PGME via inhalation at concentrations up to 3000 ppm caused no statistical significant increases in tumors in any tissue for either sex of rats or mice. This substance is not classified for carcinogenicity by IARC, OSHA, NTP, or the EPA.

- 2-Methoxy-1-propanol 1589-47-5

Developmental Effects

2-Methoxy-1-propanol has been shown to cause developmental effects in offspring of female rabbits exposed to 0, 145, 225, 350, and 545 ppm by inhalation during pregnancy. 145 ppm was the no observed effect level (NOEL) in this study. The acetate of 2-methoxy-1-propanol also has been tested for developmental effects. Information for the acetate is pertinent since the acetate portion of this molecule is quickly removed in a living organism to yield 2-methoxy-1-propanol. The offspring of rats exposed to concentrations of 0, 110, 550, or 2,700 ppm developed vertebral incisions at the highest exposure level, in the presence of maternal toxicity. Rabbits exposed to 0, 36, 145, or 550 ppm of 2-methoxy-1-propanol acetate bore offspring that showed malformations of sternum, paws, major blood vessels and the heart at the highest exposure level. A concentration of 145 ppm was the no observed effect level (NOEL) for adverse developmental effects from the acetate of 2-methoxy-1-propanol.

Carcinogenicity

Not listed by IARC, NTP, OSHA or EPA.

12. ECOLOGICAL INFORMATION

PRODUCT INFORMATION

Ecotoxicity

See component summary.

Environmental Fate and Pathway

See component summary.

COMPONENT INFORMATION

- 1-Methoxy-2-propanol 107-98-2

Ecotoxicity

Acute toxicity to fish

LC50 / 96 HOURS Golden orfe. 6,812 mg/l (nominal)

LC50 / 96 HOURS fathead minnow 20,800 mg/l (nominal)

LC50 / 96 HOURS rainbow trout. > 1,000 mg/l (nominal)

Summary: Acute toxicity to fish is very low.

Acute toxicity to aquatic invertebrates

EC50 / 48 HOURS waterflea (daphnia magna). > 500 mg/l (nominal)

Summary: This material is not harmful or toxic to aquatic invertebrates.

Toxicity to aquatic plants

EC50 / 96 HOURS green algae (Selenastrum). > 1,000 mg/l (nominal)

Summary: Growth

Summary: Causes little or no inhibition of algal growth.

Toxicity to microorganisms

IC50 / 3 HOURS Sewage microbes > 1,000 mg/l (nominal)

Summary: Low toxicity to sewage microbes.

Chronic toxicity to fish

Summary: No measured data available. QSAR (Quantitative structure-activity relationship) based calculation predicts low chronic toxicity.

Chronic toxicity to aquatic invertebrates

Summary: No measured data available. QSAR (Quantitative structure-activity relationship) based calculation predicts low chronic toxicity.

Other Adverse Effects

No additional information available.

Environmental Fate and Pathway

Mobility

Transport between environmental compartments: Rapid dissipation in soil expected: Koc value between 1 and 50, indicating very high soil mobility. If released to the environment, this substance is expected to partition mainly into the water compartment (open waters and perhaps soil groundwater/porewater).

Persistence and Degradability

Biodegradation: In water, hydrolytic stability not determined but readily biodegradable (96% degraded in 28 days). Atmospheric vapor rapidly photodegraded (half-life <1 day).

Bioaccumulation: Based on high water solubility, ready biodegradability and low Kow value, significant bioaccumulation is not expected. QSAR calculations based on chemical structure predict a BCF value of 3.2.

- 2-Methoxy-1-propanol 1589-47-5

Ecotoxicity

No Data Available.

Environmental Fate and Pathway

No Data Available.

13. DISPOSAL CONSIDERATIONS

Contaminated product, soil, water, container residues and spill cleanup materials may be hazardous wastes. Comply with applicable local, state or international regulations concerning solid or hazardous waste disposal and/or container disposal.

14. TRANSPORT INFORMATION**Special Requirements**

If you reformulate or further process this material, you should consider re-evaluation of the regulatory status of the components listed in the composition section of this sheet, based on final composition of your product.

Proper Shipping Name 1-METHOXY-2-PROPANOL

ID No. UN3092

Hazard Class 3

PG III

15. REGULATORY INFORMATION**Regulatory Status**

This product and its components are listed, or exempt from listing, on the following :

Country	Inventory
Australia	AICS
Canada	DSL
China	IECS
European Union	EINECS
Japan	ENCS
Korea	ECL
Philippines	PICCS
United States	TSCA

Contact product.safety@lyondellbasell.com for additional global inventory information.

16. OTHER INFORMATION**Latest Revision(s)**

Last revision: Translation correction. Date of Revision: January 22 2008

Revised Section(s): 1 April 29 2009

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Numerical Data Presentation

The presentation of numerical data, such as that used for physical and chemical properties and toxicological values, is

expressed using a comma (,) to separate digits into groups of three and a period (.) as the decimal marker. For example, 1,234.56 mg/kg = 1 234,56 mg/kg.

Language Translations

This document may be available in languages other than English.