



Material Safety Data Sheet

The Dow Chemical Company

Product Name: DOWANOL* EPH Plus

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The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

DOWANOL* EPH Plus

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400
Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview

Color: Colorless to yellow

Physical State: Liquid.

Odor: Mild

Hazards of product:

WARNING! Causes eye irritation. May be harmful if absorbed through skin. May be harmful if swallowed. Isolate area.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause moderate eye irritation. May cause moderate corneal injury.

Skin Contact: Prolonged exposure not likely to cause significant skin irritation. May cause more severe response on covered skin (under clothing, gloves).

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts. Repeated skin contact may result in absorption of harmful amounts. Excessive exposure may cause hemolysis, thereby impairing the blood's ability to transport oxygen.

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility. Vapor from heated material may cause respiratory irritation and other effects.

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Effects of Repeated Exposure: In animals, effects have been reported on the following organs: Blood. Kidney. Liver. Thyroid. Respiratory tract.

3. Composition Information

Component	CAS #	Amount
Ethylene glycol monophenyl ether	122-99-6	> 90.0 %
Diethylene glycol monophenyl ether	104-68-7	< 10.0 %

4. First-aid measures

Eye Contact: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Eye wash fountain should be located in immediate work area.

Skin Contact: Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Obtain medical attention without delay. Wash clothing before reuse. Properly dispose of contaminated leather items, such as shoes, belts, and watchbands. Safety shower should be located in immediate work area.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Notes to Physician: Maintain adequate ventilation and oxygenation of the patient. If hemolysis is suspected, monitor hemoglobin, hematocrit, plasma free hemoglobin, and urinalysis. Whole blood or packed RBC transfusion may be required in severe cases. Alkalinization of urine with bicarbonate may prevent renal damage. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Medical Conditions Aggravated by Exposure: Excessive exposure may aggravate preexisting liver and kidney disease.

Emergency Personnel Protection: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

5. Fire Fighting Measures

Extinguishing Media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective. Water fog, applied gently may be used as a blanket for fire extinguishment.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be

moved by flushing with water to protect personnel and minimize property damage. Water fog, applied gently may be used as a blanket for fire extinguishment.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

6. Accidental Release Measures

Steps to be Taken if Material is Released or Spilled: Small spills: Absorb with materials such as: Sand. Vermiculite. Collect in suitable and properly labeled containers. Large spills: Contain spilled material if possible. Pump into suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

Personal Precautions: Isolate area. Refer to Section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental Precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

7. Handling and Storage

Handling

General Handling: Do not swallow. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Keep container closed. Use with adequate ventilation. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Other Precautions: Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

Storage

Store in the following material(s): Carbon steel. Stainless steel. Phenolic lined steel drums. Do not store in: Aluminum. Copper. Galvanized iron. Galvanized steel. See Section 10 for more specific information.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Ethylene glycol monophenyl ether	Dow IHG	TWA	25 ppm SKIN

A "skin" notation following the inhalation exposure guideline refers to the potential for dermal absorption of the material including mucous membranes and the eyes either by contact with vapors or by direct skin contact.

It is intended to alert the reader that inhalation may not be the only route of exposure and that measures to minimize dermal exposures should be considered.

Personal Protection

Eye/Face Protection: Use chemical goggles. Eye wash fountain should be located in immediate work area.

Skin Protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task. Remove contaminated clothing immediately, wash skin area with soap and water, and launder clothing before reuse or dispose of properly.

Hand protection: Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Polyethylene. Chlorinated polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Viton. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). Nitrile/butadiene rubber ("nitrile" or "NBR"). NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Physical State	Liquid.
Color	Colorless to yellow
Odor	Mild
Odor Threshold	No test data available
Flash Point - Closed Cup	121 °C (250 °F) <i>Literature</i> (TCC)
Flammability (solid, gas)	No
Flammable Limits In Air	Lower: 0.95 %(V) <i>Literature</i> Upper: No test data available
Autoignition Temperature	495 °C (923 °F) <i>Literature</i>
Vapor Pressure	0.004 mmHg @ 25 °C <i>Estimated.</i>
Boiling Point (760 mmHg)	244 °C (471 °F) <i>Literature .</i>
Vapor Density (air = 1)	4.77 <i>Literature</i> (relative to air at 25°C)
Specific Gravity (H₂O = 1)	1.109 25 °C/25 °C <i>ASTM D4052</i>
Liquid Density	1.11 g/cm ³ @ 25 °C <i>Literature</i>
Freezing Point	12 °C (54 °F) <i>Literature</i>
Melting Point	Not applicable to liquids
Solubility in water (by weight)	2.5 % <i>Literature</i>
pH	No test data available
Molecular Weight	138.2 g/mol <i>Literature</i>
Decomposition Temperature	No test data available
Partition coefficient, n-octanol/water (log Pow)	1.16 <i>Measured</i>
Evaporation Rate (Butyl Acetate = 1)	No test data available

Kinematic Viscosity 19.39 mm²/s @ 25 °C *Literature*

10. Stability and Reactivity

Stability/Instability

Thermally stable at typical use temperatures.

Conditions to Avoid: Do not distill to dryness. Product can oxidize at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Strong acids. Strong bases. Strong oxidizers.

Hazardous Polymerization

Will not occur.

Thermal Decomposition

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Ketones. Organic acids.

11. Toxicological Information

Acute Toxicity

Ingestion

LD50, Rat 1,400 - 4,000 mg/kg

Skin Absorption

LD50, Rabbit > 2,000 mg/kg

Sensitization

Skin

Did not cause allergic skin reactions when tested in guinea pigs. Did not cause allergic skin reactions when tested in humans.

Repeated Dose Toxicity

In animals, effects have been reported on the following organs: Blood. Kidney. Liver. Thyroid. Respiratory tract.

Developmental Toxicity

Did not cause birth defects or other effects in the fetus even at doses which caused toxic effects in the mother.

Reproductive Toxicity

In animal studies, repeated exposures did not have any effects on reproductive organs.

Genetic Toxicology

In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative.

12. Ecological Information

ENVIRONMENTAL FATE

Movement & Partitioning

Bioconcentration potential is low (BCF less than 100 or log Pow less than 3). Potential for mobility in soil is high (Koc between 50 and 150).

Henry's Law Constant (H): 2.0E-07 atm*m³/mole; 25 °C Measured

Partition coefficient, n-octanol/water (log Pow): 1.16 Measured

Partition coefficient, soil organic carbon/water (Koc): 16 - 102 Estimated.

Distribution in Environment: Mackay Level 1 Fugacity Model:

Air	Water.	Biota	Soil	Sediment
	99 %			

Persistence and Degradability

Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

Stability in Water (1/2-life):

> 1 y; 50 °C; pH 7; Estimated.

OECD Biodegradation Tests:

Biodegradation	Exposure Time	Method
90 %	28 d	OECD 301F Test

Biological oxygen demand (BOD):			
BOD 5	BOD 10	BOD 20	BOD 28
22 %	71 %	80 %	

Chemical Oxygen Demand: 1.55 mg/mg 2.12 mg/mg

Theoretical Oxygen Demand: 2.18 mg/mg

ECOTOXICITY

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

LC50, fathead minnow (Pimephales promelas), flow-through, 96 h: 344 - 347 mg/l

LOEC mortality, fathead minnow (Pimephales promelas), flow-through, 34 d: 50 mg/l

Aquatic Invertebrate Acute Toxicity

EC50, water flea Daphnia magna, immobilization: > 500 mg/l

Aquatic Plant Toxicity

EC50, alga Scenedesmus sp., biomass growth inhibition: > 500 mg/l

Toxicity to Micro-organisms

EC50; bacteria, Growth inhibition (cell density reduction), 17 h: 880 mg/l

13. Disposal Considerations

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk

NOT REGULATED

DOT Bulk

NOT REGULATED

IMDG

NOT REGULATED

ICAO/IATA

NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	Yes
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
Glycol Ethers	Not available	> 99.5 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Glycol Ethers	Not available	> 99.5 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Product Literature

Additional information on this product may be obtained by calling your sales or customer service contact. Additional information on this and other Dow products may be obtained by visiting our web page at www.dow.com.

Recommended Uses and Restrictions

Industrial solvent for cleaner and coating formulations.

Revision

Identification Number: 50016 / 0000 / Issue Date 10/06/2009 / Version: 3.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.