

EMS CATALOG NO: 19700 THROUGH 19775
EMS PRODUCT: Polyethylene Glycol
DATE: 06/15/2006
PAGE NUMBER: One of 12

MATERIAL SAFETY DATA SHEET

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FOR PRODUCT AND SALES INFORMATION

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PRODUCT IDENTIFICATION

PRODUCT NAME: Carbowax Polyethylene Glycol
CHEMICAL NAME: Polyethylene Glycol
CHEMICAL FAMILY: Oxyalkylene Polymer
COMMON NAME: Carbowax Polyethylene Glycol
FORMULA: HO-(CH₂CH₂O)_n-H
SYNONYMS: Polyoxyethylene 200

COMPOSITION INFORMATION

COMPONENT	CAS #	AMOUNT
Poly(ethylene oxide)	25322-68-3	>=95.%
Diethylene glycol	111-46-6	<= 5.%
Ethylene glycol	107-21-1	<= 1.%

HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

APPEARANCE:

Transparent colorless above freezing/melting point - opaque white below freezing/melting point.

PHYSICAL STATE:

Liquid above freezing/melting point - solid below freezing/melting point.

ODOR: Mild.

HAZARDS OF PRODUCT:

ATTENTION! USE PRODUCT PROMPTLY AFTER OPENING. AVOID PROLONGED EXPOSURE TO HEAT AND AIR.

POTENTIAL HEALTH EFFECTS

Effects of Single Acute Overexposure

INHALATION:

Short-term harmful health effects are not expected from vapor generated at ambient temperature.

EYE CONTACT:

No evidence of harmful effects from available information.

SKIN CONTACT:

No evidence of harmful effects from available information.

SKIN ABSORPTION:

No evidence of harmful effects from available information.

SWALLOWING:

No evidence of harmful effects from available information.

Chronic, Prolonged or Repeated Overexposure

EFFECTS OF REPEATED OVEREXPOSURE:

Although this material is not a skin irritant, submersion by workers of unprotected skin in highly concentrated solutions of this material for prolonged periods of time could result in skin dehydration.

OTHER EFFECTS OF OVEREXPOSURE:

Overexposure to vapor generated at high temperatures may result in eye and respiratory tract irritation, dizziness, nausea and the inhalation of harmful amounts of material.

Medial Conditions Aggravated By Exposure

A knowledge of available toxicology information and of the physical and chemical properties of the material suggests that overexposure is unlikely to aggravate existing medical conditions.

POTENTIAL ENVIRONMENTAL EFFECTS

See Section labeled ECOLOGICAL INFORMATION for further information.

FIRST AID PROCEDURES

INHALATION: No emergency care anticipated.

EYE CONTACT:

Flush eyes thoroughly with water for several minutes.
Remove contact lenses, if worn.

SKIN CONTACT: Wash skin with soap and water.

SWALLOWING: No emergency care anticipated.

NOTES TO PHYSICIAN:

Toxicology studies have shown this or similar material to be of very low acute toxicity and nonirritating. There is no specific antidote. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient.

FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT-CLOSED CUP:

Pensky-Martens Closed Cup ASTM D93 185oC (365oF)

FLASH POINT-OPEN CUP:

Cleveland Open Cup ASTM D 92 190oC (375oF)

AUTOIGNITION TEMPERATURE: Not currently available.

FLAMMABLE LIMITS IN AIR:

Lower: Not determined
Upper: Not determined

EXTINGUISHING MEDIA:

Apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

EXTINGUISHING MEDIA TO AVOID:

No information currently available.

SPECIAL FIRE FIGHTING PROCEDURES:

Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.

SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS:

Use self-contained breathing apparatus and protective clothing.

UNUSUAL FIRE AND EXPLOSION HAZARDS:

See section labelled EXPOSURE CONTROLS AND PERSONAL PROTECTION for Engineering Controls.

HAZARDOUS COMBUSTION PRODUCTS:

Burning can produce the following products: Carbon monoxide and/or carbon dioxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant.

ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IF MATERIAL IS RELEASED OR SPILLED:

Small spills can be flushed with large amounts of water; larger spills should be collected for disposal.

PERSONAL PRECAUTIONS:

Wear suitable protective equipment. See section labelled EXPOSURE CONTROLS AND PERSONAL PROTECTION for more information.

HANDLING AND STORAGE

GENERAL HANDLING:

Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

This product may contain trace amounts of ethylene oxide (CAS No 75-21-8), a condition which creates the potential for accumulation of ethylene oxide in the head space of shipping and storage containers and in enclosed areas where the product is being handled or used. Ethylene oxide is listed by OSHA as probably carcinogenic to humans, IARC as carcinogenic to humans, and NTP as reasonably anticipated to be carcinogenic. OSHA considers that, at excessive levels, ethylene oxide may present reproductive, mutagenic, genotoxic, neurologic and sensitization hazards. If the product is handled with adequate ventilation, the presence of these trace amounts is not expected to result in any short or long term hazard.

This product may not be exempt from OSHA'S ethylene oxide standard, 29CFR1910.1047. Users should comply with all applicable provisions. Personnel should be monitored to determine levels of exposure to ethylene oxide. If necessary, protective measures should be taken. The OSHA permissible exposure limit for ethylene oxide is 1 ppm TWA8, the action level is 0.5 ppm TWA8, the ACGIH TLV is 1 ppm TWA8 and OSHA has established an excursion limit of 5 ppm (15 minute average).

VENTILATION:

General (mechanical) room ventilation is expected to be satisfactory.

STORAGE:

No information currently available.

EXPOSURE CONTROLS AND PERSONAL PROTECTION

EXPOSURE LIMITS

COMPONENT:	EXPOSURE LIMITS:	SKIN	IH STATE:
Ethylene glycol	100 mg/m3 CEILING ACGIH		Aerosol
	125 mg/m3 CEILING OSHA		
	50 ppm CEILING OSHA		
	100 mg/m3 ceiling UCC		Mist
Diethylene Glycol	50 ppm/TWA8 AIHA WEEL	No	Vapor and Aerosol
	10 mg/m3 TWA8 AIHA	No	Aerosol
	WEEL		

PERSONAL PROTECTION

RESPIRATORY PROTECTION: None expected to be needed.

VENTILATION:

General (mechanical) room ventilation is expected to be satisfactory.

EYE PROTECTION: Safety glasses or monogoggles

PROTECTIVE GLOVES: PVC-Coated

OTHER PROTECTIVE EQUIPMENT: Eye bath, Safety shower.

ENGINEERING CONTROLS

PROCESS HAZARD:

Sudden release of hot organic chemical vapors or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions.

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE:

Liquid above freezing/melting point - solid below freezing/melting point.

APPEARANCE:

Transparent colorless above freezing/melting point-opaque white below freezing/melting point.

pH: Not currently available.

SOLUBILITY IN WATER (BY WEIGHT): 20°C 100%

ODOR: Mild

FLASH POINT-CLOSED CUP:

Pensky-Martens Closed Cup ASTM D 93 185°C 365°F

FLASH POINT-OPEN CUP:

Cleveland Open Cup ASTM D 92 190°C 375°F

PERCENT VOLATILES: 3.5 Wt%

MOLECULAR WEIGHT: 190-210 g/mol

BOILING POINT (760 mmHg): >200°C >392°F Decomposes

FREEZING POINT: Sets to glass -65°C -85°F

SPECIFIC GRAVITY (H₂O=1): 1.127 20°C/

VAPOR PRESSURE AT 20°C: <0.001 kPa <0.01 mmHg

VAPOR DENSITY (air=1): 7
EVAPORATION RATE (BUTYL ACETATE=1): <0.01
MELTING POINT: Not applicable.

STABILITY AND REACTIVITY

STABILITY/INSTABILITY: Stable

INCOMPATIBLE MATERIALS:

Normally unreactive; however, avoid strong bases at high temperatures, strong acids, strong oxidizing agents and materials reactive with hydroxyl compounds.

THERMAL DECOMPOSITION:

Thermal decomposition may produce aldehydes. Acute overexposure to aldehydes may result in irritation of the eyes, skin and respiratory tract. In addition, some aldehydes are skin sensitizers and/or probable carcinogens.

HAZARDOUS POLYMERIZATION: Will not occur.

INHIBITORS/STABILIZERS: Not applicable.

TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Peroral: rat LD50 33.99 (30.70-37.65) ml/kg

MAJOR SIGNS: Narcosis, tremors

GROSS PATHOLOGY: lungs, liver, kidneys, intestines discolored

Percutaneous: rabbit 24 hr occluded 20 ml/kg

KILL RATE: 1/6

MAJOR SIGNS: No information available.

INHALATION: Static generation of vapors at room temperature Exposure
Time 8 h rat

KILL RATE: 0/6

INHALATION: Mist from vapor generated at 170°C Exposure Time 4 h rat

KILL RATE: 0/6

INHALATION: Mist from vapor generated at 170°C Exposure Time 5 h rat

KILL RATE: 6/6

IRRITATION

SKIN: Rabbit 24 hr uncovered no irritation

EYE: Rabbit 0.5ml no corneal injury

SENSITIZATION (ANIMAL AND HUMAN STUDIES)

Human patch test erythema on 22% of subjects upon initial contact and retest

SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMANS

A chronic dietary feeding study of diethylene glycol with rats showed mild kidney injury at 1% while concentrations of 2% and 4% caused more marked kidney injury. In addition, at 2% and 4% of diethylene glycol in the diet, some rats developed benign papillary tumors in the urinary bladder. These have been attributed to the presence of urinary bladder calcium oxalate stones. No evidence of carcinogenicity was found with a chronic skin-painting study with diethylene glycol in mice. The absence of a direct chemical carcinogenic effect accords with the results in-vitro genotoxicity studies which show that it does not produce mutagenic or clastogenic effects. A feeding study employing up to 5.0% diethylene glycol in the diet failed to produce any teratogenic effects. In a mouse continuous breeding study with large doses of diethylene glycol in drinking water, there was evidence for reproductive toxicity at 3.5% (equivalent to 6.1 g/kg/day) as reduced numbers of litters, live pups per litter, and live pup weight. No such effects were seen at 1.75% (approximately 3.05 g/kg/day). The relevance of these very high dosages to human health is uncertain. Pregnant rats receiving undiluted diethylene glycol by gavage over the period of organogenesis had toxic effects at 4.0 and 8.0 ml/kg/day as mortality, decreased body weight, decreased food consumption, increased water consumption, and increased liver and kidney weights. Fetotoxicity was seen only at these maternally toxic dosages. Decreased fetal body weight occurred at 8.0 ml/kg/day, and increased skeletal variants at 4.0 and 8.0 ml/kg/day. No embryotoxic or teratogenic effects were seen. Neither maternal toxicity nor fetotoxicity occurred at 1.0 ml/kg/day. In a study with mice also receiving undiluted diethylene glycol over the period of organogenesis, maternal toxicity occurred at 2.5 and 10.0 ml/kg/day, but not at 0.5 ml/kg/day. Definitive developmental toxicity was not seen in this species.

ADDITIONAL STUDIES:

Although this material is not a skin irritant, submersion by workers of unprotected skin in highly concentrated solutions of this material for prolonged periods of time could result in skin dehydration.

ECOLOGICAL INFORMATION

ENVIRONMENTAL FATE

BOD (% OXYGEN CONSUMPTION)

DAY 5: 4%
DAY 10: 14%
DAY 20: 47%

ECOTOXICITY:

ECOTOXICITY TO MICRO-ORGANISMS: IC50 >5000 mg/l

ECOTOXICITY TO AQUATIC INVERTEBRATES: Daphnia LC50 48 h> 10000 mg/l

ECOTOXICITY TO FISH: Fathead Minnow LC50 96 h>10000 mg/l

FURTHER INFORMATION

THOD (MEASURED): 1.70 mg/mg

THOD (CALCULATED): 1.67 mg/mg

DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHOD

Incinerate in a furnace where permitted under Federal, State, and local regulations. Dispose in accordance with all applicable Federal, State, Provincial, and local environmental regulations. Empty containers should be recycled or disposed of through an approved waste management facility.

DISPOSAL CONSIDERATIONS

At very low concentrations in water, this product is biodegradable in a biological wastewater treatment plant.

Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.

TRANSPORT INFORMATION

U.S.D.O.T.

NON-BULK

PROPER SHIPPING NAME: Not regulated.

BULK

PROPER SHIPPING NAME: Not regulated.

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

REGULATORY INFORMATION

FEDERAL/NATIONAL

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act of 1980 Section 103)

The following components of this product are specifically listed as hazardous substances in 40 CFR 302.4 (unlisted hazardous substances are not identified) and are present at levels which could require reporting.

COMPONENT	CAS#	AMOUNT
Ethylene glycol	107-21-1	<=1.0000%
Acetaldehyde	75-07-0	<=0.0006%
Ethylene Oxide	75-21-8	<=0.0005%
1,4-Dioxane	123-91-1	<=0.0005%
Formaldehyde	50-00-0	<=0.0004%

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTIONS 302 AND 304

The following components of this product are listed as extremely hazardous substances in 40 CFR Part 355 and are present at levels which could require reporting and emergency planning: None

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTION 313

The following components of this product are listed as toxic chemicals in 40 CFR 372.65 and are present at levels which could require reporting and customer notification under Section 313 and 40 CFR Part 372:

COMPONENT	CAS#	AMOUNT
Ethylene glycol	107-21-1	<=1.0000%

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT OF 1986 (SARA) TITLE III SECTIONS 311 AND 312

DELAYED HAZARD: No
FIRE HAZARD: No
IMMEDIATE HEALTH HAZARD: No
REACTIVE HAZARD: No
SUDDEN RELEASE OF PRESSURE HAZARD: No

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

STATE/LOCAL

PENNSYLVANIA (WORKER AND COMMUNITY RIGHT-TO-KNOW ACT)

This product is subject to the Worker and Community Right-to-Know Act. The following components of this product are at levels which could require identification in the MSDS:

COMPONENT	CAS#	AMOUNT
Diethylene Glycol	111-46-6	<=5.0000%
Ethylene Glycol	107-21-1	<=1.0000%

MASSACHUSETTS (HAZARDOUS SUBSTANCES DISCLOSURE BY EMPLOYERS)

The following components of this product appear on the Massachusetts Substance List and are present at levels which could require identification in the MSDS:

COMPONENT	CAS#	AMOUNT
Ethylene glycol	107-21-1	<=1.0000%
Acetaldehyde	75-07-0	<=0.0006%
1,4-Dioxane	123-91-1	<=0.0005%
Ethylene oxide	75-21-8	<=0.0005%
Formaldehyde	50-00-0	<=0.0004%

CALIFORNIA PROPOSITION 65 (SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT OF 1986)

This product contains the following chemical(s) known to the State of California to cause cancer and/or birth defects or other reproductive harm.

COMPONENT	CAS#	AMOUNT
Acetaldehyde	75-07-0	<=0.0006%
1,4-Dioxane	123-91-1	<=0.0005%
Ethylene oxide	75-21-8	<=0.0005%
Formaldehyde	50-00-0	<=0.0004%

CALIFORNIA SCAQMD RULE 443.1 (SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT RULE 443.1, LABELING OF MATERIALS CONTAINING ORGANIC SOLVENTS)

VOC: Vapor pressure <0.01 mmHg at 20oC
91 g/l
93 g/l less water and less exempted solvents

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.