

DAK Americas

DAK Americas LLC
Material Safety Data Sheet

MSDS NUMBER: DK0004
 REVISION: 01/21/2008

ETHYLENE GLYCOL

CHEMICAL PRODUCT/COMPANY IDENTIFICATION

MATERIAL IDENTIFICATION:

CAS Number: 107-21-1
 Formula: HOC2H4OH
 Molecular Weight: 62.07
 CAS Name: 1,2-ETHANEDIOL
 Grade: 2

TRADE NAMES AND SYNONYMS:

GLYCOL, ETHYLENE
 ETHYLENE GLYCOL, VIRGIN
 REFINED GLYCOL

COMPANY IDENTIFICATION:

MANUFACTURER/DISTRIBUTOR
 DAK AMERICAS LLC
 3500 Daniels Road NE
 Leland, NC 28451

PHONE NUMBERS:

Product Information: 1-877-432-2766
 Transport Emergency: CHEMTREC 1-800-424-9300

COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENTS:

Material	CAS Number	%
*ETHYLENE GLYCOL	107-21-1	95-100
DIETHYLENE GLYCOL	111-46-6	0-5

* Disclosure as a toxic chemical is required under Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372.

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HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS:

ETHYLENE GLYCOL:

The estimated approximate lethal oral dose in humans is 100 mL.

INHALATION:

ETHYLENE GLYCOL:

Immediate effects of overexposure may include: Irritation of the nose and throat with sneezing, sore throat or runny nose. Gross overexposure may cause: Pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed.

SKIN CONTACT:

ETHYLENE GLYCOL:

Immediate effects of overexposure may include: Irritation with itching, burning, redness, swelling or rash. Skin permeation may occur in amounts capable of producing the effects of systemic toxicity. There are no reports of human sensitization.

EYE CONTACT:

ETHYLENE GLYCOL:

Immediate effects of overexposure may include: Eye irritation with tearing, pain or blurred vision.

INHALATION OR INGESTION:

ETHYLENE GLYCOL:

Immediate effects of overexposure may include: Headache, nausea. Gross overexposure may cause: Central nervous system depression with dizziness, confusion, lack of coordination, drowsiness or unconsciousness. Convulsions. Altered kidney function which may be accompanied by abnormal urine volume, low back pain, discomfort or edema. Kidney failure. Deposits of calcium oxalate in the brain, spinal cord and kidneys. Liver abnormalities. High blood pressure. Irregular heart beat with a strange sensation in the chest, "heart thumping", apprehension, lightheadedness, feeling of fainting, dizziness, weakness, sometimes progressing to loss of consciousness and death. Congestive heart failure. Retention of acid in the blood, making oxygen less available in the blood stream and leading to symptoms of increased breathing rate, nausea, vomiting, confusion and weakness which may progress to loss of consciousness. Low blood sugar. Low blood calcium. Muscle twitching. Involuntary movement of the eyes. Facial paralysis. Other effects include fatality.

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HAZARDS IDENTIFICATION

----- **ADDITIONAL HEALTH EFFECTS:**

ETHYLENE GLYCOL:

No increases in chromosomal changes were noted in the circulating blood of exposed workers. Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the kidneys.

DIETHYLENE GLYCOL:

HUMAN HEALTH EFFECTS:

The estimated approximate lethal oral dose of Diethylene glycol in humans is 13-89 mL (15-100 grams).

Prolonged or repeated skin contact with Diethylene glycol may cause irritation with itching, burning, redness, swelling or rash. Skin permeation may occur in amounts capable of producing systemic toxicity. Diethylene glycol may be absorbed through damaged skin in amounts capable of causing toxic effects. There are inconclusive or unverified reports of human sensitization.

Eye contact with Diethylene glycol may cause eye irritation with tearing, pain or blurred vision.

Ingestion of Diethylene glycol may cause nausea; vomiting; central nervous system depression with dizziness, confusion, lack of coordination, drowsiness or unconsciousness; altered kidney function which may be accompanied by abnormal urine volume, low back pain, discomfort or edema; altered liver function with abdominal pain, vomiting or jaundice; and bladder stones. Gross over-exposure may result in fatality. Individuals with preexisting diseases of the central nervous system, kidneys or liver may have increased susceptibility to the toxicity of excessive exposures.

CARCINOGENICITY INFORMATION:

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

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FIRST AID MEASURES

FIRST AID:

INHALATION:

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT:

Flush skin with water after contact. Wash contaminated clothing before reuse.

EYE CONTACT:

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION:

If swallowed, immediately give 2 glasses of water and induce vomiting. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physicians:

Ethanol (ETOH) is antidotal and should be administered early in the treatment. Ethanol is a potent inhibitor of Ethylene Glycol metabolism because it is preferentially acted on by liver alcohol dehydrogenase, thus delaying or preventing toxic metabolites from Ethylene Glycol.

Treatment is started after residual ingested substance is removed from the stomach. Ethanol is administered orally or IV with a goal of maintaining a blood alcohol level of approximately 22 mmol/L or 1.0 mg/L.

To prepare antidote, make a solution using 100 mL of 100 proof ethyl alcohol and 1900 mL of water. Give 1.5 mL/kg or 100 mL for an average adult. This may be mixed with orange juice for oral use if necessary. More Ethanol is to be given at 2 hour intervals to achieve and maintain the desired blood alcohol levels. Treatment may be necessary for several days.

The patient should be monitored for metabolic acidosis. Use of appropriate buffering solutions, such as bicarbonate, may be indicated.

Hemodialysis may be required.

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FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

Flash Point: 115.6 C (240.1 F)

Method: TOC
Flammable limits in Air, % by Volume
LEL: 3.2
UEL: 15.3
Auto-ignition: 413 C (775 F)

Hazardous gases/vapors produced in fire are carbon monoxide and carbon dioxide.

EXTINGUISHING MEDIA:

Water, Water Spray, Foam, Dry Chemical, CO2.

FIRE FIGHTING INSTRUCTIONS:

Keep personnel removed and upwind of fire. Wear self-contained breathing apparatus. Wear full protective equipment. Hose with water from a distance to prevent splashing on personnel. Cool tank/container with water spray.

Water or foam may cause violent frothing.

ACCIDENTAL RELEASE MEASURES

SAFEGUARDS (PERSONNEL):

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up.

Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Evacuate personnel, thoroughly ventilate area, use self-contained breathing apparatus.

INITIAL CONTAINMENT:

Remove source of heat, sparks, flame, impact, friction or electricity. Dike spill. Prevent material from entering sewers, waterways, or low areas.

SPILL CLEAN UP:

Recover free liquid for reuse or reclamation. Soak up with sawdust, sand, oil dry or other absorbent material.

ACCIDENTAL RELEASE MEASURES:

CERCLA RQ for Ethylene glycol = 5000 Lbs.

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HANDLING AND STORAGE

HANDLING (PERSONNEL):

Avoid breathing vapors or mist. Avoid contact with eyes, skin, or clothing. Wash thoroughly after handling.

HANDLING (PHYSICAL ASPECTS):

Keep away from heat, sparks and flames.

STORAGE:

Keep container tightly closed.

EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS:

Keep container tightly closed.

Use sufficient ventilation to keep employee exposure below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:

EYE/FACE PROTECTION:

Wear safety glasses. Wear coverall chemical splash goggles and face shield when the possibility exists for eye and face contact due to splashing or spraying of material.

RESPIRATORS:

A NIOSH approved air purifying respirator with an organic vapor with dust/mist filter cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

PROTECTIVE CLOTHING:

Wear impervious clothing, such as gloves, apron, boots or whole bodysuit made from Neoprene, as appropriate.

If there is potential contact with hot/molten material, wear heat resistant clothing and footwear.

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EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE GUIDELINES:

Exposure Limits

ETHYLENE GLYCOL

PEL (OSHA): None Established
 TLV (ACGIH): Ceiling: 39.4 ppm, 100 mg/m³, aerosol, A4
 AEL * (DuPont): 50 ppm, 8 Hr. TWA, vapor, 10 mg/m³, 8 Hr. TWA, particulate

Other Applicable Exposure Limits

DIETHYLENE GLYCOL

PEL (OSHA): None Established
 TLV (ACGIH): None Established
 AEL * (DuPont): 100 ppm, 8 & 12 Hr. TWA, vapor
 10 mg/m³, 8 & 12 Hr. TWA, aerosol
 WEEL (AIHA): 10 mg/m³, 8 Hr. TWA

* AEL is DUPONT'S Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

- DAK AMERICAS ACCEPTS DUPONT'S AEL.

PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DATA:

Boiling Point: 197.6 C (387.7 F) @ 760 mm Hg
 Vapor Pressure: 0.1 mm Hg @ 25 C (77 F)
 Vapor Density: 2.14 (Air = 1)
 Freezing Point: -13 C (9 F)
 % Volatiles: Negligible
 Evaporation Rate: 0.01 (Butyl Acetate = 1)
 Solubility in Water: 100 WT%
 pH : 6-8 @ 558g/l H₂O
 Odor: Mild
 Odor Threshold: 0.1 ppm
 Form: Viscous Liquid
 Color: Colorless
 Specific Gravity: 1.115 @ 20C (68F)

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STABILITY AND REACTIVITY

CHEMICAL STABILITY:

Stable.

INCOMPATIBILITY WITH OTHER MATERIALS:

Incompatible with strong bases at high temperatures, strong acids, and strong oxidizers.

DECOMPOSITION:

Decomposes with heat.

Hazardous gases/vapors produced are carbon monoxide and/or carbon dioxide.

POLYMERIZATION:

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

ANIMAL DATA:

ETHYLENE GLYCOL

EYE:

Animal testing indicates this material is a mild eye irritant.

SKIN:

LD50, rabbit: > 20 mL/kg.

Animal testing indicates this material is a mild skin irritant.

INGESTION:

LD50, female rat: 4,000 mg/kg.

Repeated exposure caused: Histopathological changes of the kidneys, bone marrow. Kidney effects with oxalate crystal deposition. Altered hematology. Decreased body weight. Long-term exposure caused: Kidney effects with oxalate crystal deposition. Histopathological changes of the kidneys, liver, blood vessels, testes, sperm. Decreased body weight.

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INHALATION:

No deaths occurred in animals exposed to saturated vapors of the compound. Repeated exposure caused: Histopathological changes of the liver, lungs. Eye irritation. Clouding of the eye (corneal opacity).

TOXICOLOGICAL INFORMATION

CARCINOGENIC, DEVELOPMENTAL, REPRODUCTIVE, MUTAGENIC EFFECTS:

In animal testing this material has not caused carcinogenicity.

Reproductive data on adult animals show: Interference with reproduction only at levels which produce other toxic effects in the adult animal. Tests have shown this material to cause developmental toxicity in animals. This material has not produced genetic damage in bacterial cultures. There are reports indicating that this material does not produce genetic damage In some animal or mammalian cell culture tests; however, there are reports in the literature that suggest positive results.

DIETHYLENE GLYCOL:

Dermal LD50: 11.9 mL/kg (13,324 mg/kg) in rabbit
Oral LD50: 20,760 mg/kg in rats

Animal testing indicates that Diethylene glycol is a mild eye irritant but not a skin irritant.

Single exposure by ingestion to high doses of Diethylene glycol caused lethargy, incoordination, abnormal kidney function and tubular necrosis, increased urine output, altered enzyme levels, and liver degeneration. Repeated exposure caused liver and kidney deposition. Long-term exposure caused bladder stones and histologic changes in the pancreas. Tests in some animals exposed to Diethylene glycol demonstrate carcinogenic activity, possibly due to chronic irritation produced by bladder stones that occurred in these animals. Animal data show developmental effects only at exposure levels producing other toxic effects in the adult animal. One published study indicated some reproductive toxicity in mice given high oral doses. Tests have shown that Diethylene glycol does not cause genetic damage in bacterial or mammalian cell cultures. No adequate reports of genetic testing in animals were found.

ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION:

Aquatic Toxicity
Ethylene Glycol
96-hour LC50, Fathead minnow: 49,000 mg/L

Diethylene Glycol:
96-hour LC50, Mosquito fish: >32,000 mg/L

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DISPOSAL CONSIDERATIONS

WASTE DISPOSAL

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Recover for reclamation. Recover non-usable free liquid and dispose of in approved and permitted incinerator. Do not flush to surface water or sanitary sewer system.

TRANSPORTATION INFORMATION

SHIPPING INFORMATION:

DOT/IMO	
Proper Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (ETHYLENE GLYCOL)
Hazard Class:	9
UN No.:	UN 3082
Packing Group:	III
Reportable quantity:	5,000 LBS

SHIPPING CONTAINERS:

Tank Cars.

NOTE: Packages containing less than 5,000 lbs Ethylene Glycol are not regulated by DOT, IMO (for water), or IATA/ICAO (for air).

REGULATORY INFORMATION

U.S. FEDERAL REGULATIONS:

TSCA Inventory Status: Reported/Included.

TITLE III HAZARD CLASSIFICATIONS SECTIONS 311, 312:

Acute:	Yes
Chronic:	Yes
Fire:	No
Reactivity:	No
Pressure:	No

LISTS:

SARA Extremely Hazardous Substance	- No
CERCLA Hazardous Material	- No
SARA Toxic Chemical	- Yes

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CANADIAN WHMIS CLASSIFICATION:

Not regulated.

OTHER INFORMATION

NFPA, NPCA-HMIS:

NFPA Rating
Health: 1
Flammability: 1
Reactivity: 0

NPCA-HMIS Rating
Health: 2
Flammability: 1
Reactivity: 0

Personal Protection rating to be supplied by user depending on use conditions.

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsible for MSDS: Cape Fear Site MSDS Coordinator
Address: 3500 Daniels Rd.
Leland, NC 28451
Telephone: 1-910-371-4000

ADDITIONAL INFORMATION

Dacron®*** is a registered trademark of DuPont, licensed to DAK Americas LLC.

See DAK Americas Caution Statement on next page.

End of MSDS

CAUTION

DAK Americas LLC Caution Bulletin No. 1

DO NOT USE DAK AMERICAS MATERIALS IN MEDICAL APPLICATIONS INVOLVING **PERMANENT, BRIEF, OR TEMPORARY IMPLANTATION** IN THE HUMAN BODY OR PERMANENT CONTACT WITH INTERNAL BODY FLUIDS OR TISSUES, UNLESS THE MATERIAL HAS BEEN PROVIDED DIRECTLY FROM DAK AMERICAS UNDER A CONTRACT WHICH EXPRESSLY ACKNOWLEDGES THE CONTEMPLATED USE.

DAK AMERICAS MAKES NO REPRESENTATION, PROMISE, EXPRESS WARRANTY OR IMPLIED WARRANTY CONCERNING THE SUITABILITY OF THESE MATERIALS FOR USE IN THE HUMAN BODY OR IN CONTACT WITH INTERNAL BODY FLUIDS OR TISSUES.

THE CONTENT OF DAK AMERICAS MATERIAL IS NOT CERTIFIED FOR IMPLANTS. DAK Americas materials are not designed or manufactured for use in implantation in the human body or in contact with internal body fluids or tissues. DAK Americas has not performed clinical testing of these materials for implantation. DAK Americas will not provide to customers making implantable devices any notice concerning its materials, as specified under 21 C.F.R section 820.81, or any other information necessary for medical device use of the materials under any other statute or FDA regulation. DAK Americas has neither sought, nor received, approval from the FDA for the use of these materials in implantation in the human body or in contact with internal body fluids or tissues.

ALL IMPLANTABLE MEDICAL DEVICES CARRY A RISK OF FAILURE AND ADVERSE CONSEQUENCES

The medical judgment of a physician, a medical device seller and the FDA should be relied upon for identification of both harmful consequences and life-saving benefits from an implantation device comprised of specific materials. These benefits and risks can be found in published medical cases performing clinical medical studies of an implantable medical device. DAK Americas does not support the use of its products in these applications and cannot weigh the benefits against the risk defined in these articles. DAK Americas can not offer a medical judgment on the safety or efficacy of the use of its materials in such devices.

DO NOT MAKE REFERENCE TO THE DAK AMERICAS NAME OR ANY DAK AMERICAS TRADEMARK IN ASSOCIATION WITH AN IMPLANTABLE MEDICAL DEVICE.

Do not use a DAK Americas trademark or licensed trademark as the descriptive name of an implantable medical device (e.g. do not call it the "Dacron®" prosthesis", do not call it a "Delcraon®" prosthesis, or do not call it a " Laser+® device").

End of Bulletin