



MATERIAL SAFETY DATA SHEET

1) PRODUCT AND COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY
Midland Michigan 48674
USA

24-Hour Emergency Phone Number: 989-636-4400

Customer Service: 800-366-4740

PRODUCT NAME : VORACOR* CY 3049 Polyol

GMID : 258933

COLLECTIVE ID : 96

MATERIAL TYPE : Polyol blend

ISSUE DATE : 03/01/2006

REVISION DATE : 02/18/2005

2) COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	CAS Number	%
Polyols	Mixture	60-100%
Diethylene Glycol	111-46-6	1-5, 5-10%
Triethyl Phosphate	78-40-0	7-13%
1,1,1,3,3-Pentafluoropropane	460-73-1	7-13%
Bis(2-dimethylaminoethyl)ether	3033-62-3	1-5%
N,N-Dimethylcylcohexylamine	98-94-2	1-5%

3) HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

CAUTION! Contents under pressure.

Vapors reduce oxygen available for breathing and are heavier than air.

May cause moderate eye and skin irritation.

EYE

May cause moderate irritation.

SKIN

May cause moderate irritation

INGESTION

May cause moderate harm if swallowed.

INHALATION

At room temperatures, vapors are minimal due to physical properties; a single exposure is not likely to be hazardous. If material is heated or mist is produced, concentrations may be attained that are sufficient to cause respiratory irritation.

Exposure to fluorocarbons at high concentrations may effect the nervous system and produce a rapid anesthetic effect. The dense vapor of this material can reduce the oxygen available for breathing and produce symptoms such as headache, dizziness, drowsiness, cyanosis and lack of muscle control followed by collapse. Prolonged exposure to an oxygen-deficient atmosphere may be fatal. Inhalation of this material may cause an increase in the sensitivity of the heart to adrenaline, which could result in irregular heart beats and reduced heart function.

SYSTEMIC EFFECTS

Excessive exposure to fluorocarbons may effect the central nervous system and produce anesthetic and narcotic-like symptoms.

4) FIRST-AID MEASURES

** or (R) indicates a Trademark of The Dow Chemical Company

MATERIAL SAFETY DATA SHEET

EYE

Immediately flush eyes with plenty of water. Remove contacts after first few minutes and continue washing.

SKIN

Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists.

INGESTION

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

INHALATION

Remove to fresh air if effects occur. Consult a Physician.

NOTE TO PHYSICIAN

No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

5) FIRE-FIGHTING MEASURES

HAZARDOUS COMBUSTION PRODUCTS

Incomplete combustion may lead to the build-up of toxic pyrolysis products. Complete combustion will result in: Carbon oxides, Nitrogen oxides, Water, Ammonia and trace amounts of Hydrogen Cyanide.

Additional combustion products may include hydrogen fluoride, hydrogen chloride and chlorine.

OTHER FLAMMABILITY INFORMATION

Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. Burning liquids may be extinguished by dilution with water. Do not use direct water stream, it may spread fire.

EXTINGUISHING MEDIA

Use carbon dioxide, dry chemical, foam, water fog or fine spray. Alcohol resistant foams (ATC type) are preferred if available. General purpose synthetic foams (including AFFF) or protein foams may function, but much less effective. Do not use direct water stream which can spread fire.

FIRE FIGHTING INSTRUCTIONS

Keep people away. Isolate fire area and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water is not recommended but may be applied in very large quantities as a fine spray when other extinguishing agents are not available. Contain fire water run-off if possible. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider use of unmanned hose holder or monitor nozzles. Use water spray to cool fire exposed containers and fire affected zone until fire is out. Immediately withdraw all personnel from area in case of rising sound from venting safety devices or discoloration of the containers. Move containers from fire area if this is possible without hazard.

PROTECTIVE EQUIPMENT - FIRE FIGHTERS

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

6) ACCIDENTAL RELEASE MEASURES

MATERIAL SAFETY DATA SHEET

PROTECT PEOPLE

Isolate area. May be a slipping hazard. Wear adequate personal protective equipment

PROTECT THE ENVIRONMENT

Contain material to prevent contamination of ground and surface water. Spills should be collected to prevent contamination of waterways. Recover if possible, or dispose of according to applicable regulations.

CLEAN-UP

Spills should be contained by, and covered with large quantities of sand, earth or any other readily available absorbent material, which is then brushed in vigorously to assist absorption. The mixture can then be collected into drums and removed for disposal. Wash residues from area with soap and water and rinse down. Contaminated water should be retained, not being allowed to flow into ground or surface water.

7) HANDLING AND STORAGE

HANDLING

CAUTION: Contents under pressure. Avoid open flames. Do not puncture or incinerate.

Avoid contact of this product with water at all times during handling and storage. Use only with adequate ventilation. Keep equipment clean. Use disposable containers and tools where possible. Do not eat, drink, or smoke in working area.

STORAGE

Store in a dry place between 75F-105F (24C-41C). Keep containers tightly closed when not in use. Protect from atmospheric moisture. Maintain a nitrogen atmosphere. Do not store product contaminated with water to prevent potentially hazardous reaction.

8) EXPOSURE CONTROL/PERSONAL PROTECTION

ENGINEERING CONTROLS

Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

EYE/FACE PROTECTION

Use chemical goggles. If vapor exposure causes eye discomfort, use a full-face respirator. Eye wash fountain should be located in immediate work area.

SKIN PROTECTION

Use gloves impervious to this material. Wear clean, long-sleeved, body covering clothing. After work and before eating, drinking or smoking wash and clean yourself carefully with soap and water. Contaminated clothing should be washed and/or dry cleaned before re-use.

RESPIRATORY PROTECTION

For most conditions, no respiratory protection is needed; however, if handling at elevated temperature without sufficient ventilation or in presence of aerosols, use an approved air-purifying respirator. Atmospheric levels should be maintained below the exposure guideline.

EXPOSURE GUIDELINES(S)

1,1,1,3,3 pentafluoropropane: 300 ppm TWA set by manufacturer.

Diethylene glycol: 10 mg/m³ TWA8 AIHA WEEL and Interim IHG (aerosol)

50 ppm TWA8 Interim IHG (aerosol and vapor)

Bis (N,N-dimethylaminoethyl)ether ACGIH TWA is 0.05 ppm; STEL is 0.15 ppm.

Supplier IHG for N,N-Dimethylethanolamine (DMEA) is 5 ppm TWA8 Interim.; 25 ppm STEL interim.

9) PHYSICAL AND CHEMICAL PROPERTIES

MATERIAL SAFETY DATA SHEET

APPEARANCE/PHYSICAL STATE

Brown liquid.

ODOR

ammonia

VAPOR PRESSURE

69 kPa (10 psi) at 55C (131F).

SPECIFIC GRAVITY

1.21

10) STABILITY AND REACTIVITY

CHEMICAL STABILITY

Stable under recommended storage conditions.

CONDITIONS TO AVOID

Product can oxidize or decompose at elevated temperatures.

INCOMPATIBILITY WITH OTHER MATERIALS

Avoid contact with oxidizing materials and strong acids. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

HAZARDOUS DECOMPOSITION PRODUCTS

None under normal conditions of storage and use.

HAZARDOUS POLYMERIZATION

Will not occur by itself.

11) TOXICOLOGICAL INFORMATION

TOXICOLOGICAL INFORMATION

Assesments may be based on studies of the individual components or on families of chemicals.

ACUTE

Inhalation LD50 for diethylene glycol is >4.4 mg/l for 4 hours (rat).

Triethyl Phosphate acute inhalation LC 50 is greater than 2050 mg/m3 - 6 hrs in rats.

The acute inhalation toxicity, LD50 (rat) for dimethylcyclohexylamine (DMCHA) is 9.00 mg/L/1 hour.

Bis (N,N-dimethylaminoethyl)-ether acute inhalation toxicity LC50 in rats is 1.088 mg/l in 6 hours.

1,1,1,3,3-pentafluoropropane: acute inhalation LC50 in rats >200,000 ppm (4 hours). No lethality at 200,000 ppm. Evidence of transient anesthetic effect. Acute inhalation in mice >100,000 ppm (4 hours). No lethality at 100,000 ppm; evidence of transient underactivity during exposure.

SKIN

Polyol: LD50 in rabbits is >2000 mg/kg.

LD50 for diethylene glycol is 12510 mg/kg (rabbit).

1,1,1,3,3-pentafluoropropane Dermal LD50 in rabbits >2000 mg/kg.

Triethyl Phosphate dermal LD50 in guinea pigs is >20 ml/kg. Triethyl phosphate is mildly irritating to the guinea pig skin, and repeated applications caused only slight irritation and no sensitizations.

The dermal LD50 (rabbit) for dimethylcyclohexylamine (DMCHA) is >400.00 mg/kg.

Bis (N,N-dimethylaminoethyl)-ether skin absorption LD50 in rabbits is 235 mg/kg.

INGESTION

Polyol: LD50 in rats is >2000 mg/kg.

MATERIAL SAFETY DATA SHEET

Human lethal dose of diethylene glycol is approx. 2 ounces (65 ml) (1/4 cup).

LD50 for diethylene glycol is 25244 mg/kg (rat).

Triethyl Phosphate acute oral LD50 in rats is 1311 mg/kg.

Oral LD50 (rat) for dimethylcyclohexylamine (DMCHA) is 272.00 mg/kg.

Bis(N,N-dimethylaminoethyl)ether oral LD₅₀ in rats is 677 mg/kg.

12) ECOLOGICAL INFORMATION

ECOLOGICAL INFORMATION

These assessments may be based on the individual components of this blend of materials.

MOVEMENT & PARTITIONING

No bioconcentration of the polyol is expected.

DEGRADATION & PERSISTENCE

Triethyl phosphate is not readily biodegradable. It has a C.O.D. of 1.5 g oxygen/g and has a low potential to degrade with acclimated microorganisms from activated sludge.

ECOTOXICITY

Triethyl phosphate: fathead minnow 96 hr LC₅₀ => >1000 microliters/liter. Daphnid EC₅₀ = 330 microliter/liter. Flatworm 96 hr LC₅₀ => >1000 microliter/liter.

13) DISPOSAL CONSIDERATIONS

DISPOSAL

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal methods 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. THE DOW CHEMICAL COMPANY HAS 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 2 (Composition/Information On Ingredients).

FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: recycler, reclaimer, incinerator or other thermal destruction device.

As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Center at 800-258-2436 or 989-832-1556 for further details.

14) TRANSPORT INFORMATION

US D.O.T.

This product is not regulated when pressures are less than 40 psi. When greater than 40 psi, the classification is: Compressed Gases, N.O.S. (Pentafluoropropane), 2.2 UN1956.

CANADIAN TDG

This product is not regulated when pressures are less than 40 psi. When greater than 40 psi, the classification is: Compressed Gases, N.O.S. (Pentafluoropropane), 2.2 UN1956.

15) REGULATORY INFORMATION

MATERIAL SAFETY DATA SHEET

NOTICE

The information herein is presented in good faith and believed to be accurate as of the effective date shown above. However, no warranty, expressed or implied is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply with federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

REGULATORY INFORMATION

U.S. REGULATIONS

SARA 313 INFORMATION: This product contains the following subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372:

CHEMICAL NAME	CAS NUMBER
---------------	------------

None

SARA HAZARD CATEGORY: This product has been reviewed according to the EPA "Hazard Categories" promulgated under Sections 311 and 312 of the Superfund Amendment and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories:

- An immediate health hazard
- A delayed health hazard
- Fire hazard

TOXIC SUBSTANCES CONTROL ACT (TSCA):
All ingredients are on the TSCA inventory.

CALIFORNIA Prop 65: This product contains the following chemicals known to the State of California to cause cancer or other reproductive harm:
Residual 1,4 dioxane, CAS# 123-91-1 amount: <0.500 ppm in diethylene glycol
Residual Ethylene glycol monomethyl ether, CAS# 109-86-4 amount: <0.050ppm in diethylene glycol

OSHA HAZARD COMMUNICATION STANDARD:
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200. Corrosive, toxic by skin absorption and ingestion, combustible.

COMPREHENSIVE ENVIRONMENTAL RESPONSE COMPENSATION AND LIABILITY ACT (CERCLA, or SUPERFUND):
This product contains the following substance(s) listed as "Hazardous Substances" under CERCLA which may require reporting of releases:

Category:

Chemical Name	CAS#	RQ
---------------	------	----

MATERIAL SAFETY DATA SHEET

NONE

PENNSYLVANIA STATE RIGHT TO KNOW HAZARDOUS SUBSTANCE LIST

Dipropylene Glycol 25265-71-8 <0.8%
Diethylene glycol CAS: 111-46-6 Amount: 1-5%
Residual Ethylene glycol monomethyl ether CAS # 109-86-4 amount: <0.050 ppm in diethylene glycol

CANADIAN REGULATIONS

WHMIS INFORMATION: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

D2B - eye or skin irritant
D1B - toxic
B3 - combustible liquid
E - corrosive

Refer elsewhere in the MSDS for specific warnings and safe handling information. Refer to the employer's workplace education program.

- - - - -

CPR STATEMENT: This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

- - - - -

HAZARDOUS PRODUCTS ACT INFORMATION: This product contains the following ingredients which are Controlled Products and/or on the Ingredient Disclosure List (Canadian HPA section 13 and 14):

COMPONENTS:	CAS #	Amount
N,N-Dimethylcyclohexylamine	98-94-2	1-5%

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA):

One or more substances in this product are not on the Canadian Domestic Substances List (DSL).

16) OTHER INFORMATION

OTHER INFORMATION

EPA intends to promulgate a SNUR (Significant New Use Rule) restricting the use of 1,1,1,3,3 pentafluoropropane. Use as a blowing agent is one of the approved uses.

The Canadian EPA has imposed Managerial Condition 12088 upon the use of 1,1,1,3,3 pentafluoropropane. These conditions must be met before the product can be ordered and used in Canada.

No other information.

(TM), *, or (R) Indicates a trademark of The Dow Chemical Company.