

LTWC INC.

MATERIAL SAFETY DATA SHEET

ISSUE DATE: 5-5-98

I PRODUCT IDENTIFICATION

PRODUCT NAME	B-86/C
CHEMICAL FAMILY	POLYETHER GLYCOL
TRADE NAMES	PTMEG/BDO
CAS NUMBER	25190-06-1

II COMPONENTS

POLYETHER POLYOL/GLYCOL BLEND 100%
CONTAINS NO HAZARDOUS CHEMICALS UNDER OSHA 29 CFR 1910.1200

III PHYSICAL DATA

APPEARANCE	WAXY SOLID AT ROOM TEMPERATURE	
VAPOR PRESSURE	NEGLIGIBLE	
VAPOR DENSITY	NOT VOLATILE	
ODOR	NONE	
NFPA RATING	HEALTH	1
	FLAMMABILITY	1
	REACTIVITY	0
MELTING POINT	45 DEG. C.	

IV HAZARDOUS REACTIVITY

INCOMPATIBILITY INCOMPATIBLE WITH STRONG OXIDIZERS SUCH AS NITRIC ACID AND CONCENTRATED HYDROGEN PEROXIDE. DECOMPOSITION CAN RELEASE VERY FLAMMABLE TETRAHYDROFURAN, AND CARBON MONOXIDE.
POLYMERIZATION, POLYMERIZATION WILL NOT OCCUR

V FIRE AND EXPLOSION DATA

FLASH POINT	160 DEG. C.
FIRE HAZARDS	MUST BE HEATED TO AT LEAST 100 DEG. C. FOR IGNITION TO OCCUR
EXTINGUISHING MEDIA	WATER,FOAM, DRY CHEMICAL, CO2, DIRT, SAND
SPECIAL INSTRUCTIONS	WATER SPRAY OR DELUGE SHOULD BE USED TO COOL SPILLS ON FIBROUS INSULATION, ECT. OTHERWISE, ANY FIRE FIGHTING METHOD SUITABLE FOR OIL FIRES SHOULD BE USED

VI HEALTH HAZARD INFORMATION

MAY CAUSE SKIN AND EYE IRRITATION

ANIMAL DATA

INHALATION 4 HOUR LC50: >3.4 MG/L IN RATS

ORAL LD50 : >11,000 MG/KG IN RATS

HUMAN HEALTH EFFECTS

OVEREXPOSURE CHARACTERIZED BY SKIN IRRITATION WITH
DISCOMFORT OR RASH, OR EYE IRRITATION WITH DISCOMFORT,
TEARING OR BLURRING OF VISION.

NONE OF THE COMPONENTS IN THIS MATERIAL ARE LIST AS A
CARCINOGEN

SAFETY PRECAUTIONS: AVOID CONTACT WITH EYES, SKIN, OR CLOTHING.
WASH THOROUGHLY AFTER HANDLING

VII FIRST AID

INHALATION

IF AFFECTED BY INHALATION, REMOVE TO FRESH AIR. IF NOT BREATHING
GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE
OXYGEN

SKIN/EYE CONTACT

FLUSH WITH PLENTY OF WATER FOR AT LEAST 15 MINUTES WHILE
REMOVING ANY CONTAMINATED CLOTHING. CALL A PHYSICIAN.
IF MATERIAL IS HOT, TREAT FOR THERMAL BURNS.

INGESTION

IF SWALLOWED, NO HAZARDS ARE EXPECTED, HOWEVER IF SYMPTOMS
OCCUR, CONSULT A PHYSICIAN.

VIII PERSONAL PROTECTION

GOOD VENTILATION SHOULD BE MAINTAINED AS A PRECAUTION
WEAR SAFETY GLASSES WITH SIDE SHIELDS, AND IMPERVIOUS GLOVES
USE THERMAL RESISTANT GLOVES AS NEEDED

IX DISPOSAL INFORMATION

FOR SPILL CLEAN UP, USED APPROPRIATE PERSONAL PROTECTIVE
EQUIPMENT

FOR LARGE SPILLS, FLUSH WITH COLD WATER TO "FREEZE" MATERIAL
THEN SCOOP UP.

FOR SMALL SPILLS, SOAK UP WITH SAND EARTH OR "OIL DRY"

IN ALL CASES COMPLY WITH FEDERAL, STATE AND LOCAL REGULATIONS
FOR DISPOSAL AND REPORTING OF RELEASES.

X SHIPPING INFORMATION

NOT REGULATED AS A HAZARDOUS MATERIAL BY DOT OR IMO.

PREPARED BY : STEVE LONGACRE

APPROVED BY : WALTER SMITH

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ITWC INC.
P.O.Box 247
106 S. Main St.
Malcom IA 50157
515-528-3000

IV. FIRE & EXPLOSION DATA

POINT OF $^{\circ}\text{C}$: Decomposes @ 500°F (260°C) Pensky-Martens Clo
Cup

EXTINGUISHING MEDIA.....: Dry chemical (e.g. monoammonium phosphate,
sulfur dioxide, sodium sulfate, and potassium chloride), carbon dioxide, high expansion
(mechanical) chemical foam, water spray for large fires.

ADDITIONAL FIRE FIGHTING PROCEDURES/UNUSUAL FIRE OR EXPLOSION HAZARDS: Full
protective equipment with self-contained breathing apparatus and full
protective clothing should be worn by fire fighters. During a fire, MDI
and other irritating, highly toxic gases may be generated by the
combustion of combustion. (See Section VIII). At temperatures greater than
 200°F (204°C), polymeric MDI can polymerize and decompose which can
cause pressure build-up in closed containers. Explosive rupture is
possible. Therefore, use cold water to cool fire-exposed containers.

V. HUMAN HEALTH DATA

EXPOSURE ROUTE OF ENTRY.: Skin Contact from liquid and aerosols (spray
application). Inhalation. Although MDI is low in volatility, an
inhalation hazard can exist from MDI aerosols or vapors formed during
foaming, or spraying.

EFFECTS AND SYMPTOMS OF OVEREXPOSURE - Data has not been established
for this product. Data is listed for MDI.

ACUTE EXPOSURE:
Acute Exposure. MDI vapors or mist at concentrations above TLV cause
irritation (burning sensation) the mucous membranes in the respiratory tract
(throat, lungs) causing runny nose, sore throat, coughing, chest
discomfort, shortness of breath and reduced lung function (breathing
restriction). Persons with a preexisting, nonspecific bronchial
hyperactivity can respond to concentrations below the TLV with similar
symptoms as well as asthma attack. Exposure well above the TLV may lead to
bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These
symptoms are usually reversible. Chemical or hypersensitive pneumonitis
like symptoms (e.g., fever, chills) has also been reported. T
symptoms can be delayed up to several hours after exposure.

Chronic Exposure. As a result of previous repeated overexposures
to a large dose, certain individuals develop isocyanate sensitization
(allergic asthma) which will cause them to react to a later exposure to
isocyanate at levels well below the TLV. These symptoms; which can include
tightness, wheezing, cough, shortness of breath or asthma attack,
may be immediate or delayed (up to several hours after exposure).
In addition to many non-specific asthmatic responses, there are reports that
a sensitized individual can experience these symptoms upon exposure to
cold air or other irritants. This increased lung sensitivity
can last for weeks and in severe cases for several years. Overexposure
to isocyanate has also been reported to cause lung damage (including decreased
lung function) which may be permanent. Sensitization can either be
reversible or permanent.

ET:

Exposure. Isocyanates react with mucous membranes causing irritation which may include redness, scaling, or blistering.

Exposure. Prolonged contact with liquid, blisters, and in some cases, who have developed a skin rash as a result of contact with vapor. The result of exposure to vapor.

ET:
Exposure. Liquid, aerosols, and vapors cause irritation, reddening, and swelling. Skin injury is slow to heal.

See Section VI for treatment.

Exposure. None Found

Exposure. Can result in irritation of eye, nose, and throat. Eye irritation, and digestive tract irritation, pain, nausea, vomiting.

Exposure. None Found

CONDITIONS

CHRONIC EXPOSURE: Asthma, other respiratory conditions (bronchial hyperreactivity),

REGULATED BY OSHA: Neither MDI nor regulated by OSHA as carcinogen.

EXPOSURE LIMITS: Exposure limits have been established in the exposure limited list of 40 CFR Part 101.

.....: 0.02 ppm (0.005 ppm (MDI))

VI. EMERGENCY & FIRST AID

.....: Flush with water for at least 15 minutes. Seek medical attention.

.....: Remove contact lenses if possible. Wash with soap and water. Wash eyes.

.....: For severe exposures, get medical attention. If irritation develops or persists, get medical attention.

.....: Move to an area with fresh air. Administer oxygen or artificial respiration. Asthmatic-type symptoms may be delayed up to several hours.

V. HUMAN HEALTH DATA - Continued

GESTION.....: DO NOT INDUCE VOMITING. Give 1 to 2 cups of milk water to drink. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Consult physician.

TE TO PHYSICIAN.....: Eyes. Stain for evidence for corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors have produced reversible corneal epithelial edema impairing vision. Skin. This compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burns. If burned, treat as thermal burn. Ingestion. Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound. Respiratory. This compound is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

VII. EMPLOYEE PROTECTION RECOMMENDATIONS

E PROTECTION.....: Liquid chemical goggles or full-face shield. Contact lenses should not be worn.

IN PROTECTION.....: Chemical resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol). However, please note that PVA degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area covered by the cream to a minimum.

PIRATORY PROTECTION.: Concentrations greater than the TLV can occur when MDI is sprayed, heated or used in a poorly ventilated area. In such cases, or whenever concentrations of MDI exceed the TLV, respiratory protection must be worn. A supplied-air respirator or a self-contained breathing apparatus is recommended. In situations where MDI is not sprayed or heated and a supplied-air or self-contained apparatus is unavailable or its use impractical, at least an air purifying respirator equipped with a particulate filter must be worn. HOWEVER, THIS SHOULD BE PERMITTED ONLY FOR SHORT PERIODS OF TIME (LESS THAN ONE HOUR) AT RELATIVELY LOW CONCENTRATIONS (AT OR NEAR THE TLV). However, due to the poor warning properties of MDI, proper fit and timely replacement of filter elements must be ensured. Observe OSHA regulations for respirator use (29 CFR 10.134).

NTILATION.....: Local exhaust should be used to maintain levels below the TLV whenever MDI is processed, heated or spray applied. For spray applications, an air-supplied respirator must be worn. Standard reference sources regarding industrial ventilation (ie., ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation.

NITORING.....: MDI exposure levels must be monitored by accepted monitoring techniques to ensure that the TLV is not exceeded. For guidance-See Volume 1 (Chapter 17) and Volume 3 (Chapter 3) in Patty's Industrial Hygiene and Toxicology for sampling strategy.

VII. EMPLOYEE PROTECTION RECOMMENDATIONS - Continued

MEDICAL SURVEILLANCE...: Medical supervision of all employees who or come in contact with polymeric MDI is recommended. These should pre-employment and periodic medical examinations with respiratory tests (FEV, FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent eczema or sensitization should be excluded from working with MDI. If a person is diagnosed as sensitized to MDI, no further exposure can be permitted.

OTHER.....: Safety showers and eyewash stations should be available. Educate and train employees in safe use of product. Follow label instructions.

VIII. REACTIVITY DATA

STABILITY.....: Stable under normal conditions.

POLYMERIZATION.....: May occur if in contact with moisture or materials which react with isocyanates. May occur at temperatures above 400°F (204°C). See Section IV.

INCOMPATIBILITY

(MATERIALS TO AVOID): Water, amines, strong bases, alcohols. These may cause some corrosion to copper alloys and aluminum.

HAZARDOUS DECOMPOSITION

PRODUCTS.....: By high heat and fire: carbon monoxide, nitrogen, traces of HCN, MDI vapors or aerosols.

IX. SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate area; ventilate spill area; dike spill to prevent entry into water systems; wear full protective equipment, including respiratory equipment during clean-up. (See Section VII).

Major Spill: If temporary control of isocyanate vapor is required, a blanket of protein foam (available at most fire departments) may be used over the spill. Large quantities may be pumped into closed, but vented, sealed, container for disposal.

Minor Spill: Absorb isocyanates with sawdust or other absorbent, place into suitable unsealed containers, transport to well-ventilated area (outside) and treat with neutralizing solution: mixture of water (90%), non-ionic surfactant Tergitol TMN-10 (20%), or; water (90%), concentrated ammonia (3-8%) and detergent (2%). Add about 10 parts of neutralizing solution per part of isocyanate, with mixing. Allow to stand uncovered for 48 hours to let CO₂ escape.

Clean-up: Decontaminate floor with decontamination solution left for at least 15 minutes.

CERCLA (SUPERFUND) REPORTABLE QUANTITY: None Reported

IX. SPILL OR LEAK PROCEDURES - Continued

WASTE DISPOSAL METHOD: Waste must be disposed of in accordance with federal, state, and local environmental control regulations. Incineration is the preferred method. Empty containers must be handled with care due to product residue. Decontaminate containers prior to disposal. Empty decontaminated containers should be crushed to prevent reuse. DO NOT HEAT OR CUT EMPTY CONTAINER WITH ELECTRIC OR GAS TORCH. (See Sections IV and VIII). Vapors and gases may be highly toxic.

RCRA STATUS: MDI is not listed as a hazardous waste. To the best of our knowledge, MDI does not meet the criteria of a hazardous waste if discarded in its purchased form. However, under RCRA, it is the responsibility of the user of products to determine, at the time of disposal, whether a product meets any of the criteria for a hazardous waste. This is because product uses, transformations, mixtures, processes, etc., may render the resulting material hazardous, under the criteria of ignitability, corrosivity, reactivity, and EP toxicity (40 Code of Federal Regulations 261.20-24).

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT (SARA), TITLE III:

Section 302 - Extremely Hazardous Substances: None

Section 313 - Toxic Chemicals: 4,4'-Diphenylmethane Diisocyanate
(CAS# 101-68-8) - 38-40%

X. SPECIAL PRECAUTIONS & STORAGE DATA

STORAGE TEMPERATURE

(MIN./MAX.).....: Ambient/90°F (32°C)

AVERAGE SHELF LIFE.....: 6 months

SPECIAL SENSITIVITY

(HEAT, LIGHT, MOISTURE: If container is exposed to high heat, 400°F (204°C) it can be pressurized and possibly rupture. MDI reacts slowly with water to form CO₂ gas. This gas can cause sealed containers to expand and possibly rupture.

PRECAUTIONS TO BE TAKEN

IN HANDLING & STORAGE.: Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. Avoid contact with skin and eyes. Do not breathe aerosols or vapors. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent chronic overexposure from inhalation. This material can produce asthmatic sensitization upon either single inhalation exposure to a relatively high concentration or upon repeated inhalation exposure to lower concentrations. Exposure to vapors of heated MDI can be extremely dangerous. Employee education and training in the safe use and handling of this compound are required under the OSHA Hazard Communication Standard.

XI. SHIPPING

D.O.T. SHIPPING NAME...: None
 TECHNICAL SHIPPING NAME: Modified Diphe
 Prepolymer
 D.O.T. HAZARD CLASS....: Non-Regulated
 UN/NA NO.....: None
 PRODUCT REPORTABLE QTY.: None
 D.O.T. LABELS REQUIRED.: None
 D.O.T. PLACARDS.....: None
 FREIGHT CLASS BULK....: Chemicals, NO1
 FREIGHT CLASS PKG.....: Chemicals, NO1
 PRODUCT LABEL.....: QZ-22 Product

XII. ANIMAL TO

ACUTE TOXICITY - Data has not been estab
 listed is for MDI.

ORAL, LD50.....: Greater than
 DERMAL, LD50.....: Greater than
 INHALATION, LC50.....: Approximately
 polymer MDI (Rat) > An LC₅₀ (2 hr)
 determined on a dust of monomeric M
 EYE EFFECTS.....: Slightly irr
 irritation score for a polymeric M
 This score is fairly typical for a
 SKIN EFFECTS.....: Slight to mod
 irritation scores are typically be
 SENSITIZATION.....: Has been show
 in guinea pigs, rabbits, and dogs.
 experimental animals models, MDI i
 dermal sensitization in humans. It
 to suggest that cross-sensitization
 diisocyanates may occur.

SUBCHRONIC/CHRONIC TOXICITY: Pulmonary
 upper respiratory tract are the primary
 exposures to aerosols or vapors of MDI,
 A 90-day inhalation study in rats of a
 delivered as an aerosol (6 hr/dy. 5 dy-
 hyperplastic-inflammatory lesions of th
 exposures of 8 mg/m³ and greater. Thes
 the NOEL is around 2.2 mg/m³

XII. ANIMAL TOXICITY DATA

OTHER

CARCINOGENICITY:.....: The International Is sponsoring a lifetime inhalation study on study is currently underway.

MUTAGENICITY.....: Monomeric MDI is pos hepatic microsomal activation). However, vivo-vitro micronucleus assay.

AQUATIC TOXICITY.....: LC₅₀ - 24 hr (static for Daphnia magna, Limnea stagnalis, and Zebra both polymeric and monomeric MDI.

XXI. APPROVALS

PREPARED BY: STEVE LONGACRE

APPROVED BY: WALTER SMITH

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