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Submitting Organization	OLIN CORP		
Contractor			
Document Title	INITIAL SUBMISSION: LETTER FROM OLIN CORP TO USEPA SUBMITTING PRODUCTION & PROCESSING, AND SAFETY & HANDLING DATA RE TRI- AND TETRAETHYLENE GLYCOL ETHERS W/ATTCHMTS, DATED 8/28/84		
Chemical Category	TRIETHYLENE GLYCOL ETHERS; TETRAETHYLENE GLYCOL		

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FYI. 0794.1042

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**Olin**

RESEARCH CENTER, 878 SOUTH WINCHESTER AVENUE, P.O. BOX 20478  
NEW HAVEN, CONNECTICUT 06511  
203-789-6191



FYI-94-001842  
INIT 87/14/94

August 28, 1984

Mr. Martin Greif  
Executive Secretary  
TSCA Interagency Testing Committee  
401 M Street, S.W.  
Washington, D.C. 20460

Confidential No. 617



04940000142

Dear Mr. Greif:

In response to a request from your technical contractor, Dynamac Corporation, Olin submits the attached data on the tri- and tetraethylene glycol ethers as indicated. The data include production figures for the year 1983. These figures are considered confidential business information by Olin. Therefore, we are responding to ITC directly rather than to Dynamac in order to assure protection of this information.

I trust that this information will prove useful to you. If there are any questions concerning this submittal, please contact me.

Very truly yours,

OLIN CORPORATION

*Nicholas J. Barone*

Nicholas J. Barone  
Manager,  
Regulatory Services

NJB:jl  
Attachment

cc: Mr. Louis Borghi - w/o att.  
Dynamac Corporation  
Rockville, MD

OLIN CORPORATION

RECEIVED  
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## PRODUCT DATA

# POLY-SOLV® Series of Triethylene Glycol Ether Solvents

### POLY-SOLV TM

Triethylene Glycol  
Monomethyl Ether

### POLY-SOLV TE

Triethylene Glycol  
Monoethyl Ether

### POLY-SOLV TB

Triethylene Glycol  
Monobutyl Ether

The triethylene glycol monoether Poly-Solv series contains both an ether and an alcohol group, and is particularly useful in formulating cleaners, cutting oils and hydraulic fluids.

This series is of interest when esterified, giving rise to plasticizers.

PRODUCT SPECIFICATIONS	POLY-SOLV TM	POLY-SOLV TE	POLY-SOLV TB
Specific gravity, 20/20 °C. ....	1.037-1.055	1.020-1.035	0.980-0.995
Color, APHA, max. ....	50	50	60
Acidity as acetic acid, % by wt., max. ....	0.01	0.01	0.01
Boiling range			
Initial B. P., min. ....	220°C.	225°C.	258°C.
5%, min. ....	230°C.	235°C.	270°C.
Suspended matter ....	Substantially free	Substantially free	Substantially free
Odor ....	Characteristic	Characteristic	Characteristic

#### Storage, Handling and Safety

The triethylene glycol monoethers are relatively easy and safe to handle. Storage in mild steel is satisfactory for a limited time. However, for extended storage, the use of lined tanks is preferable, especially where color requirements are critical. Good ventilation should be maintained in areas where these products are used.

Products of this series are considered irritants to the eyes and skin. Chemical safety goggles and adequate protective clothing are advisable when handling them. Breathing of their vapors and contact with skin should be avoided.

Storage tanks should be electrically grounded and equipped with a discharge having a conservation vent and flame arrester. A safety valve is also recommended.

#### Shipping Information

Containers: tank cars, tank trucks, 55-gallon (460 lbs. net for TM, 450 lbs. net for TE and TB), resinlined drums.

Technical Service is available to facilitate your further investigation of Olin glycol ethers. If you desire additional information, please write or call the nearest Olin sales office.

POLY-SOLV® TM, TE, TB

### District Sales Offices

Atlanta, Ga. 30341—1 Dunwoody Pk., (404) 458-6758  
Charlotte, N.C. 28202—1612 Baugh Bldg., (704) 333-1175  
Cincinnati, O. 45237—8075 Reading Rd., (513) 761-7112  
Cleveland, O. 44122—29425 Chagrin Blvd., (216) 292-3830  
Houston, Tex. 77008—3700 Buffalo Speedway, (713) 821-2782  
King of Prussia, Pa. 19406—210 Goddard Blvd., (215) 265-0800

New Orleans, La. 70130—1055 St. Charles Ave., (504) 528-5557  
New York, N.Y. 10017—280 Park Ave., (212) 661-7040  
Oak Brook, Ill. 60521—900 Jorie Blvd., (312) 325-2280  
Providence, R.I. 02903—735 Hospital Trust Bldg., (401) 421-2070  
St. Louis, Mo. 63105—7777 Bonhomme Ave., (314) 862-6705  
Whittier, Calif. 90602—13215 Penn St., (213) 945-1063

 **Olin CHEMICALS**

**OLIN CORPORATION**  
129 LONG RIDGE ROAD, STAMFORD, CONN. 06904

No warranty, expressed or implied, is made except that the product conforms to Olin's specifications. The technical data furnished is believed to be accurate and complete. Buyer assumes all risk of use, storage and handling of this product. Olin shall not be responsible for special or consequential damages. Nothing contained herein shall be construed as a permission or recommendation for the use of the product in the infringement of any existing patent.



EMERGENCY PHONE (203) 356-2345  
 Olin Corporation, 120 Long Ridge Road  
 Stamford, Conn. 06804

FLAMMABILITY



# MATERIAL SAFETY DATA

## SECTION I - IDENTIFICATION

CHEMICAL NAME & SYNONYMS <b>Tetraethylene glycol monomethyl ether</b>		
CHEMICAL FAMILY <b>Glycol ether</b>	FORMULA <b>C<sub>9</sub>H<sub>20</sub>O<sub>5</sub></b>	TRADE NAME <b>Poly-Solv<sup>®</sup> FM</b>
DESCRIPTION <b>Yellow liquid</b>		CAS NO. <b>23783-42-8</b>

## SECTION II - NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE <b>Do not get in eyes, on skin or on clothing. Do not take internally. Upon contact with skin, wash off with water. Do not breathe mist or vapor. Store in a cool, dry place.</b>	
CORROSIVE ACTION ON MATERIALS (Metals, Plastic, Rubber, Etc.)	
PROTECTIVE EQUIPMENT	VENTILATION REQUIREMENTS
Eyes <b>Goggles</b> Gloves <b>Not required</b> Other <b>Not required</b>	<b>Local exhaust or general ventilation required as dictated by airborne concentrations.</b>

## SECTION III - HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROX. %	OSHA PEL	LD 50	LC 50	SIGNIFICANT EFFECTS

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT METHOD <b>305°F COC</b>	OSHA CLASSIFICATION <b>Class IIIB Combustible liquid</b>	FLAMMABLE EXPLOSIVE LIMITS	LOWER	UPPER
EXTINGUISHING MEDIA <b>Water spray, dry chemical, alcohol foam or carbon dioxide.</b>				
SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES <b>Use NIOSH/MSHA approved self-contained breathing apparatus where this material is involved in a fire.</b>				

## SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	<b>None established.</b>
SYMPTOMS OF OVER EXPOSURE	<b>May cause eye irritation and mucous membrane irritation, lethargy, diarrhea.</b>
EMERGENCY FIRST-AID PROCEDURES	
SKIN	<b>None necessary.</b>
EYES	<b>Flush thoroughly with water.</b>
INGESTION	<b>None necessary.</b>
INHALATION	<b>None necessary.</b>

Chemical Poly-Solv<sup>®</sup> FM

CAS No. 23783-42-8

CHEMICAL NAME Poly-Soly<sup>R</sup> FM

**SECTION VI -- TOXICOLOGY (Product)**

ACUTE ORAL LD 50	14.0 g/kg (rat)	CARCINOGENIC	Not known to be carcinogenic.
ACUTE DERMAL LD 50	Greater than 2 g/kg (rabbit)	MUTAGENIC	Not known to be mutagenic.
ACUTE INHALATION LC 50	Greater than 200 mg/l of inspired air for 1 hour (rat)	EYE IRRITATION	Irritant
		PRIMARY SKIN IRRITATION	Not an irritant
PRINCIPAL ROUTES OF ABSORPTION			
Oral			
EFFECTS OF ACUTE EXPOSURE			
May cause eye irritation and mucous membrane irritation, lethargy, diarrhea.			
EFFECTS OF CHRONIC EXPOSURE			
None expected at industrial use levels.			

**SECTION VII -- SPILL OR LEAKAGE PROCEDURES (Control Procedures)**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear goggles, coveralls, impervious gloves and boots. Add dry absorbent, shovel or sweep up. Place in an approved DOT container and seal. Flush any residual material with water. Wash all contaminated clothing before reuse.

In the event of a large spill use the emergency telephone number shown on the front of this sheet.

WASTE DISPOSAL METHOD

Dispose of contaminated product and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate federal, state and local regulatory agencies to ascertain proper disposal procedures.

**SECTION VIII -- REACTIVITY DATA**

STABLE <input checked="" type="checkbox"/>	UNSTABLE	AT _____ °C _____ °F	HAZARDOUS POLYMERIZATION	MAY OCCUR
CONDITIONS TO AVOID			WILL NOT OCCUR <input checked="" type="checkbox"/>	
INCOMPATIBILITY (Material To Avoid)				
HAZARDOUS DECOMPOSITION PRODUCTS				

**SECTION IX -- PHYSICAL DATA**

MELTING POINT -38°F	VAPOR PRESSURE Less than 0.1 @ STP	
BOILING POINT	SOLUBILITY IN WATER miscible	EVAPORATION RATE
SPECIFIC GRAVITY (H <sub>2</sub> O = 1) 1.0580 @ 25/25°C	pH 5 - 7	VAPOR DENSITY (Air = 1)

INFORMATION FURNISHED BY: **C. J. Michaels**      DATE **March 5, 1981**  
 Department of Environmental Hygiene and Toxicology

**Olin CORPORATION**  
 120 Long Ridge Road, Stamford, Connecticut 06904  
 EMERGENCY PHONE (203) 356-2345



EMERGENCY PHONE (203) 356-2345  
 Olin Corporation, 120 Long Ridge Road  
 Stamford, Conn. 06904

FLAMMABILITY



# MATERIAL SAFETY DATA

## SECTION I - IDENTIFICATION

CHEMICAL NAME & SYNONYMS <b>Tetraethylene glycol monoethyl ether</b>		
CHEMICAL FAMILY <b>Glycol ether</b>	FORMULA <b>C<sub>10</sub>H<sub>22</sub>O<sub>5</sub></b>	TRADE NAME <b>Poly-Solv<sup>R</sup> FE</b>
DESCRIPTION <b>Clear liquid</b>		CAS NO. <b>5650-20-4</b>

## SECTION II - NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE <b>Do not get in eyes, on skin or on clothing. Do not take internally. Upon contact with skin or eyes, wash off with water. Avoid breathing mist or vapor. Store in a cool, dry place.</b>	
CORROSIVE ACTION ON MATERIALS (Metals, Plastic, Rubber, Etc.)	
PROTECTIVE EQUIPMENT	VENTILATION REQUIREMENTS
Eyes <b>Not required</b> Gloves <b>Not required</b> Other <b>Not required</b>	<b>None beyond normal good room ventilation</b>

## SECTION III - HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROX. %	OSHA PEL	LD 50	LC 50	SIGNIFICANT EFFECTS

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT METHOD <b>310 °F COC</b>	OSHA CLASSIFICATION <b>Class IIIB Combustible liquid</b>	FLAMMABLE EXPLOSIVE LIMITS	LOWER	UPPER
EXTINGUISHING MEDIA <b>Water spray, dry chemical, alcohol foam or carbon dioxide</b>				
SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES <b>Use NIOSH/MSHA approved self-contained breathing apparatus where this material is involved in a fire.</b>				

## SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE <b>None established.</b>	
SYMPTOMS OF OVER EXPOSURE <b>Lethargy, muscular contraction</b>	
EMERGENCY FIRST-AID PROCEDURES	
SKIN	<b>None necessary.</b>
EYES	<b>None necessary.</b>
INGESTION	<b>None necessary.</b>
INHALATION	<b>None necessary.</b>

Chemical Poly-Solv<sup>®</sup> FE

CAS No. 5650-20-4

CHEMICAL NAME Poly-Solv<sup>R</sup> FE

**SECTION VI -- TOXICOLOGY (Product)**

ACUTE ORAL LD 50	10.4 g/kg (rat)	CARCINOGENIC	Not known to be carcinogenic
ACUTE DERMAL LD 50	Greater than 2 g/kg (rabbit)	MUTAGENIC	Not known to be mutagenic
ACUTE INHALATION LC 50	Greater than 200 mg/l inspired air for 1 hour (rat)	EYE IRRITATION	Not an irritant
		PRIMARY SKIN IRRITATION	Not an irritant
PRINCIPAL ROUTES OF ABSORPTION Oral, dermal, inhalation			
EFFECTS OF ACUTE EXPOSURE Lethargy, muscular contraction			
EFFECTS OF CHRONIC EXPOSURE None expected at industrial use levels			

**SECTION VII -- SPILL OR LEAKAGE PROCEDURES (Control Procedures)**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED
<p>Wear goggles, coveralls, impervious gloves and boots. Add dry absorbent, shovel or sweep up. Place in an approved DOT container and seal. Flush any residual material with water. Wash all contaminated clothing before reuse.</p> <p>In the event of a large spill use the emergency telephone number shown on the front of this sheet.</p>
WASTE DISPOSAL METHOD
<p>Dispose of contaminated product and materials used in cleaning up spills or leaks in a manner approved for this material. Consult appropriate federal, state and local regulatory agencies to ascertain proper disposal procedures.</p>

**SECTION VIII -- REACTIVITY DATA**

STABLE <input checked="" type="checkbox"/> UNSTABLE	AT _____ °C _____ °F	HAZARDOUS POLYMERIZATION	MAY OCCUR _____ WILL NOT OCCUR <input checked="" type="checkbox"/>
CONDITIONS TO AVOID			
INCOMPATIBILITY (Material To Avoid)			
HAZARDOUS DECOMPOSITION PRODUCTS			

**SECTION IX -- PHYSICAL DATA**

MELTING POINT	-11.5 °C	VAPOR PRESSURE	Less than 0.1 mmHg @ STP
BOILING POINT		SOLUBILITY IN WATER	miscible
SPECIFIC GRAVITY (H <sub>2</sub> O = 1)	1.0385	pH	5 - 7
	25/25 °C		VAPOR DENSITY (AIR = 1)

INFORMATION FURNISHED BY: **C. J. Michaels** DATE **March 5, 1981**  
 Department of Environmental Hygiene and Toxicology

**Olin CORPORATION**

120 Long Ridge Road, Stamford, Connecticut 06904  
 EMERGENCY PHONE (203) 356 - 2345



EMERGENCY PHONE (203) 366-2345  
 Olin Corporation, 120 Long Ridge Road  
 Stamford, Conn. 06904



# MATERIAL SAFETY DATA

## SECTION I - IDENTIFICATION

CHEMICAL NAME & SYNONYMS Triethylene glycol monomethyl ether: 2[2-(methoxyethoxy)ethoxy]ethanol		
CHEMICAL FAMILY Glycol ether	FORMULA $CH_3O(CH_2CH_2O)_3H$	TRADE NAME POLY-SOLV <sup>®</sup> TM
DESCRIPTION Clear colorless liquid		CAS NO. 112-35-6

## SECTION II - NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Do not get in eyes, on skin, or on clothing. Do not take internally. Avoid breathing mist or vapor. Upon contact with skin or eyes, wash off with water. Storage tanks should be electrically grounded and equipped with a conservation vent and flame arrestor.	
CORROSIVE ACTION ON MATERIALS (Metals, Plastic, Rubber, Etc.)	
PROTECTIVE EQUIPMENT	VENTILATION REQUIREMENTS
Eyes Not required. Gloves Not required Other Not required	None beyond normal good room ventilation.

## SECTION III - HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROX. %	OSHA PEL	LD 50	LC 50	SIGNIFICANT EFFECTS

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT METHOD 2450F COC	OSHA CLASSIFICATION Class IIIB Combustible liquid	FLAMMABLE & EXPLOSIVE LIMITS	LOWER	UPPER
EXTINGUISHING MEDIA Water spray, dry chemical, alcohol foam, carbon dioxide.				
SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES Use NIOSH/MSHA approved self-contained breathing apparatus where this material is involved in a fire.				

## SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE None established.	
SYMPTOMS OF OVER EXPOSURE Lethargy, depression of the central nervous system, nausea.	
EMERGENCY FIRST-AID PROCEDURES	
SKIN	None necessary.
EYES	None necessary.
INGESTION	None necessary.
INHALATION	None necessary.

Chemical POLY-SOLV<sup>®</sup> TM

CAS No. 112-35-6

CHEMICAL NAME POLY-SOLV<sup>®</sup> TM

**SECTION VI -- TOXICOLOGY (Product)**

ACUTE ORAL LD 50	12.6 g/kg (rat)	CARCINOGENIC	Not known to be carcinogenic
ACUTE DERMAL LD 50	> 2 g/kg (rabbit)	MUTAGENIC	Not known to be mutagenic
ACUTE INHALATION LC 50	> a nominal concentration of 200 mg/l of inspired air for 1 hour.	EYE IRRITATION	Not an irritant
		PRIMARY SKIN IRRITATION	Not an irritant
PRINCIPAL ROUTES OF ABSORPTION			
Oral			
EFFECTS OF ACUTE EXPOSURE			
Lethargy, depression of central nervous system, nausea.			
EFFECTS OF CHRONIC EXPOSURE			
None expected at industrial use levels.			

**SECTION VII -- SPILL OR LEAKAGE PROCEDURES (Control Procedures)**

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Wear goggles, coveralls and impervious gloves and boots. Add dry absorbent and shovel or sweep up. Place in an approved DOT container and seal. Flush any remaining material with water. Wash all contaminated clothing before reuse.

In the event of a massive spill, use the emergency phone number on the front of this sheet.

WASTE DISPOSAL METHOD

Dispose of clean-up debris, contaminated material and residues in a manner approved for this material. Consult appropriate Federal, State and local regulatory agencies to ascertain proper disposal procedures.

**SECTION VIII -- REACTIVITY DATA**

STABLE	<input checked="" type="checkbox"/>	UNSTABLE	AT	_____ °C	_____ °F	HAZARDOUS POLYMERIZATION	MAY OCCUR
							WILL NOT OCCUR
CONDITIONS TO AVOID							
INCOMPATIBILITY (Material To Avoid)							
HAZARDOUS DECOMPOSITION PRODUCTS							

**SECTION IX -- PHYSICAL DATA**

MELTING POINT	-67°F	VAPOR PRESSURE	< 0.01 mm Hg @ 20°C	VOLATILES
BOILING POINT	480°F	SOLUBILITY IN WATER	Miscible	EVAPORATION RATE
SPECIFIC GRAVITY (H <sub>2</sub> O = 1)	1.050 @ 20/20°C	pH		VAPOR DENSITY (AIR = 1)

INFORMATION FURNISHED BY: C. J. Michaels DATE 6/25/80

Department of Environmental Hygiene and Toxicology

**Olin CORPORATION**

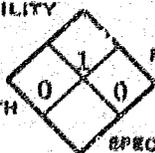
120 Long Ridge Road, Stamford, Connecticut 06904

EMERGENCY PHONE (203) 353-2345



EMERGENCY PHONE (203) 356-2345  
 Olin Corporation, 120 Long Ridge Road  
 Stamford, Conn. 06904

FLAMMABILITY



REACTIVITY

HEALTH

HAZARD RATING

SPECIAL

# MATERIAL SAFETY DATA

## SECTION I - IDENTIFICATION

CHEMICAL NAME & SYNONYMS Triethylene glycol monoethyl ether; 2-[2-(2-ethoxyethoxy)ethoxy]ethanol		
CHEMICAL FAMILY Glycol ether	FORMULA C <sub>2</sub> H <sub>5</sub> O(CH <sub>2</sub> CH <sub>2</sub> O) <sub>3</sub> H	TRADE NAME POLY-SOLV® TE
DESCRIPTION Clear colorless liquid		CAS NO. 112-50-5

## SECTION II - NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE  Do not get in eyes, on skin or on clothing. Do not take internally. Avoid breathing mist or vapor. Upon contact with skin or eyes, wash off with water. Storage tanks should be electrically grounded and equipped with a conservation vent and a flame arrestor.	
CORROSIVE ACTION ON MATERIALS (Metals, Plastic, Rubber, Etc.)	
PROTECTIVE EQUIPMENT	VENTILATION REQUIREMENTS
Eyes Not required Gloves Not required Other Not required	None beyond normal good room ventilation.

## SECTION III - HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROX. %	OSHA PEL	LD 50	LC 50	SIGNIFICANT EFFECTS

## SECTION IV - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT METHOD 275°F COC	OSHA CLASSIFICATION Class IIIB Combustible liquid	FLAMMABLE EXPLOSIVE LIMITS	LOWER	UPPER
EXTINGUISHING MEDIA Water spray, dry chemical, alcohol foam, carbon dioxide				
SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES Use NIOSH/MSHA approved self-contained breathing apparatus where this material is involved in a fire.				

## SECTION V - HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE None established	
SYMPTOMS OF OVER EXPOSURE Lethargy, depression of central nervous system, nausea.	
EMERGENCY FIRST-AID PROCEDURES	
SKIN	None necessary
EYES	None necessary
INGESTION	None necessary
INHALATION	None necessary

Chemical POLY-SOLV® TE

CAS No. 112-50-5

CHEMICAL NAME POLY-SOLV® TE

**SECTION VI -- TOXICOLOGY (Product)**

ACUTE ORAL LD 50	8.5g/kg (rat)	CARCINOGENIC	Not known to be carcinogenic
ACUTE DERMAL LD 50	>2g/kg (rabbit)	MUTAGENIC	Not known to be mutagenic
ACUTE INHALATION LC 50	>a nominal concentration of 200 mg/liter of inspired air for 1 hour (rat)	EYE IRRITATION	Not an irritant
PRINCIPAL ROUTES OF ABSORPTION		PRIMARY SKIN IRRITATION	Not an irritant
Oral			
EFFECTS OF ACUTE EXPOSURE Lethargy, depression of central nervous system, nausea.			
EFFECTS OF CHRONIC EXPOSURE None expected at industrial use levels.			

**SECTION VII -- SPILL OR LEAKAGE PROCEDURES (Control Procedures)**

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED**  
Wear goggles, coveralls and impervious gloves and boots. Add dry absorbent and shovel or sweep up. Place in an approved DOT container and seal. Flush and remaining material with water. Wash all contaminated clothing before reuse.

In the event of a massive spill use the emergency phone number on the front of this sheet.

**WASTE DISPOSAL METHOD**

Dispose of clean-up debris, contaminated material and residues, in a manner approved for this material. Consult appropriate Federal, State and Local regulatory agencies to ascertain proper disposal procedures.

**SECTION VIII -- REACTIVITY DATA**

STABLE <input checked="" type="checkbox"/>	UNSTABLE	AT _____ °C _____ °F	HAZARDOUS POLYMERIZATION	MAY OCCUR	WILL NOT OCCUR <input checked="" type="checkbox"/>
CONDITIONS TO AVOID					
INCOMPATIBILITY (Material To Avoid)					
HAZARDOUS DECOMPOSITION PRODUCTS					

**SECTION IX -- PHYSICAL DATA**

MELTING POINT	-6°F	VAPOR PRESSURE	<0.01 @ 20°C	VOLATILES
BOILING POINT	492°F	SOLUBILITY IN WATER	Miscible	EVAPORATION RATE
SPECIFIC GRAVITY (H <sub>2</sub> O = 1)	1.022 @ 20/20°C	pH		VAPOR DENSITY (AIR = 1)

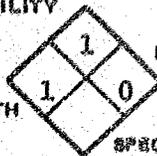
INFORMATION FURNISHED BY: **C. J. Michaels** DATE **October 30, 1979**  
Department of Environmental Hygiene and Toxicology

**Olin CORPORATION**  
120 Long Ridge Road, Stamford, Connecticut 06904  
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 Olin Corporation, 120 Long Ridge Road  
 Stamford, Conn. 06904

FLAMMABILITY



REACTIVITY

HEALTH

HAZARD RATING

SPECIAL

# MATERIAL SAFETY DATA

## SECTION I -- IDENTIFICATION

CHEMICAL NAME & SYNONYMS Triethylene glycol, monobutyl ether; 2-[2-(2-butoxyethoxy)ethoxy]ethanol		
CHEMICAL FAMILY Glycol ether	FORMULA $C_4H_9O(CH_2CH_2O)_3H$	TRADE NAME POLY-SOLV® TB
DESCRIPTION Clear colorless liquid		CAS NO. 143-22-6

## SECTION II -- NORMAL HANDLING PROCEDURES

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE Do not get in eyes, on skin or on clothing. Do not take internally. Avoid breathing mist or vapor. Upon contact with skin wash off with water. Storage tanks should be electrically grounded and equipped with a conservation vent and a flame arrestor.	
CORROSIVE ACTION ON MATERIALS (Metals, Plastic, Rubber, Etc.)	
PROTECTIVE EQUIPMENT	VENTILATION REQUIREMENTS
Eyes Goggles Gloves None required Other None required	None beyond normal good room ventilation.

## SECTION III -- HAZARDOUS INGREDIENTS

BASIC MATERIAL	APPROX. %	OSHA PEL	LD 50	LC 50	SIGNIFICANT EFFECTS

## SECTION IV -- FIRE AND EXPLOSION HAZARD DATA

FLASH POINT METHOD	2900°F COC	OSHA CLASSIFICATION Class IIIB Combustible Liquid	FLAMMABLE EXPLOSIVE LIMITS	LOWER	UPPER
EXTINGUISHING MEDIA Water spray, dry chemical, alcohol foam, carbon dioxide					
SPECIAL FIRE HAZARD & FIRE FIGHTING PROCEDURES Use NIOSH/MSHA approved self-contained breathing apparatus where this material is involved in a fire.					

## SECTION V -- HEALTH HAZARD DATA

THRESHOLD LIMIT VALUE	None established
SYMPTOMS OF OVER EXPOSURE	Irritation of eyes and upper respiratory tract
EMERGENCY FIRST-AID PROCEDURES	
SKIN	None necessary
EYES	Flush with water for 15 minutes. Call a physician.
INGESTION	None necessary
INHALATION	None necessary

Chemical POLY-SOLV® TB

CAS No.

143-22-6

CHEMICAL NAME POLY-SOLV® TB

**SECTION VI -- TOXICOLOGY (Product)**

ACUTE ORAL LD 50 5.3g/kg (rat)	CARCINOGENIC Not known to be carcinogenic
ACUTE DERMAL LD 50 >2g/kg (rabbit)	MUTAGENIC Not known to be mutagenic
ACUTE INHALATION LC 50 >a nominal concentration of 200 mg/liter of inspired air for 1 hour (rat)	EYE IRRITATION Irritant
PRINCIPAL ROUTES OF ABSORPTION Oral	PRIMARY SKIN IRRITATION Not an Irritant
EFFECTS OF ACUTE EXPOSURE Irritation of eyes and upper respiratory tract.	
EFFECTS OF CHRONIC EXPOSURE None expected at industrial use levels	

**SECTION VII -- SPILL OR LEAKAGE PROCEDURES (Control Procedures)**

<p>STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED</p> <p>Wear goggles, coveralls and impervious gloves and boots. Add dry absorbent, shovel or sweep up and place in an approved DOT container and seal. Flush any remaining material with water. Wash all contaminated clothing before reuse.</p> <p>In the event of a massive spill use the emergency phone number on the front of this sheet.</p>
<p>WASTE DISPOSAL METHOD</p> <p>Dispose of clean-up debris, contaminated material and residues, in a manner approved for this material. Consult appropriate Federal, State and Local regulatory agencies to ascertain proper disposal procedures.</p>

**SECTION VIII -- REACTIVITY DATA**

STABLE <input checked="" type="checkbox"/> UNSTABLE AT _____ °C _____ °F	HAZARDOUS POLYMERIZATION	MAY OCCUR
CONDITIONS TO AVOID		WILL NOT OCCUR <input checked="" type="checkbox"/>
INCOMPATIBILITY (Material To Avoid)		
HAZARDOUS DECOMPOSITION PRODUCTS		

**SECTION IX -- PHYSICAL DATA**

MELTING POINT -41.8°F	VAPOR PRESSURE 0.01mmHg@20°C	VOLATILES
BOILING POINT	SOLUBILITY IN WATER Soluble	EVAPORATION RATE
SPECIFIC GRAVITY (H <sub>2</sub> O=1) 0.992 @ 20/20°C	pH	VAPOR DENSITY (Air = 1)

INFORMATION FURNISHED BY: C. J. Michaels DATE October 30, 1979  
 Department of Environmental Hygiene and Toxicology



**Olin CORPORATION**  
 120 Long Ridge Road, Stamford, Connecticut 06904  
 EMERGENCY PHONE (203) 356-2345

# INTRODUCTION

Olin began producing Poly-Solv<sup>®</sup> glycol ethers over 25 years ago at our organic chemicals plant at Doe Run, in Brandenburg, Kentucky. Today we are one of the largest merchant marketers of glycol ethers in the United States.

## Dependable Production and Delivery

Glycol ethers are produced by reacting an alcohol with an alkyl oxide, usually ethylene or propylene oxide. These two oxides, in fact, are the starting points for the entire Olin line of Polyganics<sup>™</sup> organic derivatives, including our 12 Poly-Solv<sup>®</sup> glycol ethers.

We produce our own ethylene oxide from natural gas, right at our Doe Run plant. Our propylene oxide is made for us, under long-term contract. And much of the energy for our plant is derived from abundant, low-cost coal from deposits close by.

Our plant is located on the Ohio River, some 40 miles downstream from Louisville. That of course puts us near the Coal Belt, and a natural gas pipeline. It also puts us near our customers, allowing us to reach the Midwest, Southeast and Northeast with almost equal ease.

Poly-Solv glycol ethers are shipped in tank trucks, tank cars and 55-gallon drums from Doe Run. For even better service, tank truck deliveries are made from Olin bulk facilities in Bayonne, N.J.; Chicago, Ill.; Houston, Tex.; and Los Angeles, Cal. Poly-Solv glycol ethers are also shipped in drums from our terminal in Joliet, Ill. And for LTL orders, a network of more than 175 distributors ensures fast, local delivery anywhere in the United States.

Olin is one of the few suppliers to offer the option of full load mixed shipments. One type of glycol ether may be combined with other types, or with polyglycols, surfactants, TDI and inorganic chemicals. So even if a full load of glycol ethers isn't needed, it's often possible to build up a full load and realize substantial freight savings.

## Research and Technical Service

Excellence in research and development is a prime reason for the high quality of Poly-Solv<sup>®</sup> glycol ethers. Olin's main

research center, in New Haven, Connecticut, is one of the country's best-equipped industrial laboratories. Our Technical Center at the Doe Run plant includes complete laboratory and pilot plant facilities. We can thus work on product and process technology on the spot, to safeguard both the continued high quality and availability of our products.

We also provide our customers with application, formulation and technical assistance. Olin Technical Service experts can help evaluate customer processes and products, and assist with plant or equipment startups. They can give information on storage, handling and use of our products. And they can be consulted about applications of Olin products subject to the jurisdiction of the Environmental Protection Agency and the Food and Drug Administration.

## How to Order

To place orders for delivery in the U.S. or Canada and to get fast answers on order status or product availabilities, call our toll-free number: 800-243-9171. (From Connecticut, call 324-7024, collect. From Canada, call 203-324-7024, collect.)

After your first order, you'll be assigned your own personal Olin Customer Service Representative. When you call back, simply ask for your Customer Service Representative by name. If you call evenings (after 5:30 Eastern time) or on weekends or holidays, your message will be recorded and your Representative will contact you at the beginning of the next business day.

For written inquiries about orders, and to place confirmations, we've set up a special box number for you. Just address your envelope to: Olin Chemicals, P.O. Box 10007, Stamford, CT 06904.

## Information and Assistance

This brochure contains basic technical and application data on all Poly-Solv<sup>®</sup> glycol ethers. For additional information, contact your nearest Olin Sales Office. Or call or write: Marketing Manager, Olin Chemicals, 120 Long Ridge Road, Stamford, CT 06904, 203-356-2887.

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## GENERAL INFORMATION

Poly-Solv<sup>®</sup> glycol ethers are colorless liquids having mild, characteristic odors. They are miscible with water and numerous organic solvents, and they are strong solvents for many substances, both polar and non-polar.

There are three families of ethylene-based Poly-Solv glycol ethers, based on either methyl, ethyl or butyl alcohol. An additional group of propylene-based Poly-Solv glycol ethers is made with methyl alcohol.

### Ethylene glycol ethers

#### The methyl family:

Poly-Solv EM  $\text{CH}_3(\text{OC}_2\text{H}_4)_1\text{OH}$

Poly-Solv DM  $\text{CH}_3(\text{OC}_2\text{H}_4)_2\text{OH}$

Poly-Solv TM  $\text{CH}_3(\text{OC}_2\text{H}_4)_3\text{OH}$

#### The ethyl family:

Poly-Solv EE  $\text{C}_2\text{H}_5(\text{OC}_2\text{H}_4)_1\text{OH}$

Poly-Solv DE  $\text{C}_2\text{H}_5(\text{OC}_2\text{H}_4)_2\text{OH}$

Poly-Solv TE  $\text{C}_2\text{H}_5(\text{OC}_2\text{H}_4)_3\text{OH}$

#### The butyl family:

Poly-Solv EB  $\text{C}_4\text{H}_9(\text{OC}_2\text{H}_4)_1\text{OH}$

Poly-Solv DB  $\text{C}_4\text{H}_9(\text{OC}_2\text{H}_4)_2\text{OH}$

Poly-Solv TB  $\text{C}_4\text{H}_9(\text{OC}_2\text{H}_4)_3\text{OH}$

### Propylene glycol ethers

#### The methyl family:

Poly-Solv MPM  $\text{CH}_3(\text{OC}_3\text{H}_6)_1\text{OH}$

Poly-Solv DPM  $\text{CH}_3(\text{OC}_3\text{H}_6)_2\text{OH}$

Poly-Solv TPM  $\text{CH}_3(\text{OC}_3\text{H}_6)_3\text{OH}$

### Nomenclature

The letters following the trademark, "Poly-Solv<sup>®</sup>", in each of our glycol ethers have a meaning that permits ready identification of the product's chemical composition.

The first letter in each ethylene oxide series stands for the number of moles of EO used, expressed as ethylene glycol.

Thus:

E = (mono)ethylene glycol

D = diethylene glycol

T = triethylene glycol

The second letter represents the alcohol used. It is expressed as a monoether:

M = monomethyl ether

E = monoethyl ether

B = monobutyl ether

Similarly, in the PO-based glycol ethers, the first two letters express the moles of propylene oxide as propylene glycol while the third represents the alcohol:

MP = monopropylene glycol

DP = dipropylene glycol

TP = tripropylene glycol

Therefore, Poly-Solv EE is ethylene glycol monoethyl ether; Poly-Solv TB, triethylene glycol monobutyl ether; Poly-Solv MPM, monopropylene glycol monomethyl ether; and DPM, dipropylene glycol monomethyl ether.

For corresponding Chemical Abstract names and numbers, see Table 1.

The only variation in the Olin nomenclature system concerns Poly-Solv DE, which is offered in two grades. The regular, or high-gravity grade, Poly-Solv DE, HG, is a mixture of

Table 1  
Chemical Abstract Index Names and Service Numbers

Poly-Solv <sup>®</sup> Glycol Ether	CA Index Name	CAS' Number
EM	Ethanol, 2-methoxy-	109-86-4
EE	Ethanol, 2-ethoxy-	110-80-5
EB	Ethanol, 2-butoxy-	111-76-2
DM	Ethanol, 2-(2-methoxyethoxy)-	111-77-3
DE	Ethanol, 2-(2-ethoxyethoxy)-	111-90-0
DB	Ethanol, 2-(2-butoxyethoxy)-	112-34-5
TM	Ethanol, 2-(2-methoxyethoxy) ethoxy]-	112-35-6
TE	Ethanol, 2-(2-ethoxyethoxy) ethoxy]-	112-50-5
TB	Ethanol, 2-(2-butoxyethoxy) ethoxy]-	143-22-6
MPM	2-Propanol, 1-methoxy-	107-98-2
DPM	2-Propanol, (2-methoxy-methylethoxy)-	34590-94-8
TPM	2-Propanol, 1-2-(2-methoxy-1-methyl ethoxy)-1-methylethoxy-	20324-33-8

<sup>1</sup>Chemical Abstract Service, American Chemical Society

about 75% diethylene glycol monoethyl ether and 25% ethylene glycol. The low-gravity grade, Poly-Solv DE, LG, is essentially 100% diethylene glycol monoethyl ether.

### Chemistry

Because Poly-Solv<sup>®</sup> glycol ethers contain both ether and hydroxyl groups, they will undergo reactions characteristic of both groups. The ether groups can be cleaved by acids, and will form peroxides with oxygen. The hydroxyls can be reacted with hydrogen halides, phosphorous trihalides, acids and active metals. They can also be oxidized to aldehydes or acids.

## APPLICATIONS

Olin's complete line of Poly-Solv® glycol ethers has been developed in response to the needs of many industries. Their principal applications are in brake fluids, hard-surface cleaners, leather dyeing, paints and coatings, printing, and textiles.

Here's a summary of the major roles these products play:

### Brake Fluids

Glycol ethers are major components in most DOT 3 and DOT 4 brake fluids, primarily because of their high boiling points, compatibility with other components and ability to absorb water. Poly-Solv® TM, TB, DM, DE and DB are the glycol ethers most often used.

### De-icers

Poly-Solv® glycol ethers can be used in jet fuel system icing inhibitors. Poly-Solv EM meets MIL-I-27686E for use in the JP-4 fuel system, and Poly-Solv DM meets MIL-I-85470 for use in the JP-5 fuel system. Poly-Solv TM, TE and TB are additives in de-icing compounds.

### Hard-Surface Cleaners

The most common solvent for cleaning is water. But water must be modified in some way if it is to do a thorough job of cleaning. So such diverse compounds as phosphates, acids, caustics, surfactants and organic solvents are mixed with water, producing many different types of cleaners.

When solvents are used in hard-surface cleaners, glycol ethers are often the choice because they are soluble in water, and can dissolve or remove oils or other non-polar solvents at the same time.

Some types of cleaning compounds that have glycol ethers in their formulations include removers (rust, carbon and others); degreasers; cleaners (glass, chrome, aluminum and copper) and strippers (wax and paint). Poly-Solv EB is the glycol ether usually employed; Poly-Solv MPM and DPM are also used occasionally.

### Leather Dyeing

Dye formulations for leather are composed of a pigment or dye, a carrier (e.g. nitrocellulose), and a solvent. Glycol ethers such as Poly-Solv® EM or EE are popular dye solvents. They give good penetration, aid in levelling and permit controlled evaporation rates.

### Paints and Coatings

Poly-Solv® glycol ethers are used extensively as solvents in both solvent-based and water-based paints. They are also components in lacquers, varnishes and thinners.

In paints, Poly-Solv glycol ethers are active solvents. They dissolve the resin components, while having a high tolerance for latent solvents.

Poly-Solv glycol ethers can impart many advantages to coating systems. They can give improved gloss and levelling, and can reduce or eliminate "orange peel." They can improve bonding to substrates. They can permit incorporation of higher levels of latent solvents. They can reduce viscosity (which permits increased resin loading, if desired). And, in water-based systems, they can keep binder particles soft until the paint coalesces into a smooth, continuous film.

In lacquers and varnishes, Poly-Solv glycol ethers eliminate resin blush, improve levelling and reduce the possibility

of crazing. Non-grain-raising wood stains use glycol ethers not only because they're good solvents for the stain, but also because they lower surface tension. The lower surface tension allows fast, deep penetration by the stain, without causing the wood grain to swell. In contrast, water- and oil-type stains expand wood grain, which means sanding will be necessary.

All Poly-Solv mono- and diglycol ethers are used in paints and coatings.

### Printing

In ink formulations, Poly-Solv® glycol ethers are active solvents that dissolve the resins and keep the formulation fluid. Because they lower surface tension, they increase ink penetration and bonding to the selected surface.

Poly-Solv EB or DPM serve as co-solvents for nitrocellulose, acrylics and chlorinated rubber resins used for flexographic and gravure inks. Poly-Solv glycol ethers are also components in ink formulations used in ball point pens, stamp pads and felt markers.

In addition, Poly-Solv glycol ethers are frequently contained in solvent formulations for press cleanup.

### Textiles

Poly-Solv® glycol ethers are used in vat dyeing and textile printing.

In vat dyeing, they solubilize the dyes. They also lower surface tension, assisting the dyes in penetrating the fabric, and thus tending to even the shade.

In textile printing, Poly-Solv glycol ethers are solvents for the components of paste ink formulations. They promote ink penetration of the fabric by lowering surface tension and viscosity.

Poly-Solv DM, DE, DB, DPM and TPM are all used by the textile industry.

### Miscellaneous

Glycol ethers are also used, or have been suggested for use, as:

- Plasticizers (by reaction with fatty acids)
- Extraction and crystallization solvents
- Vinyl chloride dispersants
- Solvent component in adhesives
- Adhesive for sealing cellophane on cigarette packages
- Low-temperature antifreeze
- Crankcase decontaminants
- Solvents in carburetor cleaners
- Coupling solvents in agricultural sprays
- Solvents in insect repellents
- Charcoal lighter fluid
- Solvents in floor waxes or polishes
- Couplers and mutual solvents in cosmetic preparations
- Solvents in odorless nail polish

Table 1. Typical Properties

	EM	EE	EB	DM	DE (High Gravity)	DE (Low Gravity)
Molecular Weight	76.09	90.12	110.17	120.15	—	134.17
Specific Gravity @ 20/20°C	0.966	0.931	0.903	1.024	1.0253	0.989
Boiling Point (°C)						
@ 760 mm Hg	124	135	171	194	195	202
@ 50 mm	55	64	94	115	105	121
@ 10 mm	—	35	61	82	50	87
Flash Point						
TCC (°C)	41	45	63	87	—	65
(°F)	106	113	145	188	—	165
COC (°C)	—	—	—	—	96	—
(°F)	—	—	—	—	205	—
Freezing Point (°C)	-85	-70	-70	-85	-75	-76
Refractive Index, n <sub>D</sub>						
@ 20°C	1.4021	1.4076	1.4193	1.4263	1.4297	1.4273
@ 25°C	—	—	—	—	—	—
Vapor Pressure						
@ 20°C (mm Hg)	6.2	3.8	0.6	0.2	0.05	0.1
Viscosity @ 20°C (cp)	1.7	2.1	3.4	3.9	6.9	4.5
Solubility Parameter	10.8	9.9	8.9	9.6	11.5	9.6
Weight @ 23°C (lb/gal)	8.05	7.76	7.52	8.51	8.53	8.24
Net Contents, 55 gal drum (lb)	440	420	410	470	470	430

Table 2. Specifications (Subject to change without notice)

	EM	EE	EB	DM	DE (High Gravity)	DE (Low Gravity)
Specific Gravity						
@ 20/20°C	0.964-0.967	0.929-0.931	0.900-0.904	1.024-1.031	1.024-1.030	0.989-0.993
Color, APHA, max	10	10	10	15	10	10
Acidity, as acetic acid, max (%)	0.01	0.005	0.01	0.01	0.01	0.01
Distillation Range						
@ 760 mm Hg						
IBP, min (°C)	123.5	134	167	189	190	195
5%, min (°C)	—	—	—	—	—	—
95%, max (°C)	—	—	—	—	200	—
DP, max (°C)	125.5	136	173	195	205	210
Water, max (%)	0.05	0.1	0.15	0.1	0.2	0.1
Suspended Matter	—	—	—	—	—	—

°C/25/59°C

DB	TM	TE	TD	MPM	DFM	YPM
162.23	164.20	170.23	200.23	90.12	140.20	205.28
0.955	1.040	1.020	0.988	0.923	0.954	0.969
230	249	256	Decomposes	121	107	242
145	152	153	120	51	110	162
109	126	130	140	23	60	122
---	---	---	---	36	76	---
---	---	---	---	97	169	---
116	110	124	143	---	---	121
240	245	255	290	---	---	250
-68	-55	-21	-41	-96	-83	-78
1.4316	1.4381	1.4376	1.4394	1.4036	---	---
---	---	---	---	---	1.419	1.428
0.02	<0.01	<0.01	<0.01	8.4	0.4	0.02
6.5	7.5	7.8	10.9	1.9	3.9	6.1
8.9	10.8	10.2	9.4	10.4	9.6	9.1
7.95	8.74	8.50	8.23	7.68	7.94	8.05
440	460	450	450	420	440	440

DB	TM	TE	TD	MPM	DFM	YPM
0.953-0.956	1.037-1.055	1.020-1.035	0.980-0.995	0.922-0.925	0.953-0.957	0.964-0.957
40	50	50	50	10	15	15
0.01	0.01	0.01	0.01	0.01	0.01	0.01
220	220	225	258	119	180	230
224	230	235	270	---	---	---
222	---	---	---	---	---	---
255	---	---	---	125	186	251
0.15	0.15	0.1	0.15	0.1	0.1	---

## FORMULATIONS

Poly-Solv® glycol ethers can be incorporated into many types of products. The formulations presented here are general, intended as starting-point guidelines only. Additional suggestions and technical service are available from Olin.

<b>All-Purpose Household Cleaner (Pine Scented)</b>	<b>Wt. %</b>
Sodium xylene sulfonate	6
Trisodium phosphate	5
Poly-Solv® EB or DPM glycol ether	3-5
Poly-Tergent® SL-62 surfactant	3
Pine oil	2
Water	Balance
<b>Aluminum Brightener</b>	
Phosphoric acid, 85%	49
Poly-Solv® EB glycol ether	25
Poly-Tergent® B-300 surfactant	10
Water	12
<i>o</i> -Dichlorobenzene	4
<b>Auto Window Cleaner (Squashed Bugs &amp; Exhaust Film Remover)</b>	
Ethylene glycol	8
Sodium dodecylbenzenesulfonate	6
Poly-Solv® EE glycol ether	5
Coconut diethanolamide	1
Urea	1
Water	Balance
(Pressurize with 6% butane)	
<b>Auto Windshield Washer (All-Seasons)</b>	
Isopropyl alcohol	40
Ethylene glycol	7
Poly-Solv® MPM glycol ether	2.5
Poly-Tergent® B-300 surfactant	0.5
Water	50
(Can be diluted 4:1 for summer use)	
<b>Concrete Floor and Surface Cleaner (Liquid)</b>	
Poly-Solv® EB or DPM glycol ether	8-10
Poly-Tergent® B-300 surfactant	8-10
Trisodium phosphate, crystalline	5-8
Sodium silicate, liquid	2-3
Water	Balance
<b>Copper Cleaner (Paste Type)</b>	
Phosphoric acid, 85%	43
Poly-Solv® TPM glycol ether	23
Poly-Tergent® B-200 surfactant	9.5
Diatomaceous earth	24.5
(Caution: mixing acid is exothermic)	

<b>Engine Degreaser (Liquid Formula)</b>	<b>Wt. %</b>
Poly-Tergent® B-150 surfactant	15-20
Poly-Solv® EB glycol ether	5-10
Kerosene	70-75
<b>Light Duty Spray Cleaner (Pump Dispersed)</b>	
Poly-Solv® EB glycol ether	2.5-3
Poly-Tergent® SL-62 surfactant	2-3
Sodium acid pyrophosphate	2.5
Water	Balance
<b>Liquid Soap</b>	
Potassium oleate	22
Glycerine	20
Poly-Solv® DPM glycol ether	5
Water	Balance
<b>Oven Cleaner (Non-Aerosol)</b>	
Sodium hydroxide	10
Poly-Solv® EB glycol ether	1.5-2
Poly-Tergent® SL-62 surfactant	1.5
Carboxymethylcellulose	Desired thickness
Water	Balance
<b>Spot Remover (Emulsion Type)</b>	
Triethanolamine oleate	57
Perchloroethylene	21
Poly-Solv® EB glycol ether	12
Sodium hydroxide	4
Water	6
<b>Spray and Wipe Household Cleaner</b>	
Poly-Solv® EB glycol ether	5
Tetrapotassium pyrophosphate	2.5
Poly-Tergent® SL-42 surfactant	1
Water	Balance
(For use dilute 4:1 with water)	
<b>Steam Cleaner</b>	
Poly-Solv® EB glycol ether	6
Trisodium phosphate	4
Poly-Tergent® B-500 surfactant	2-3
Poly-Tergent® B-150 surfactant	1
Water	Balance
<b>Wax Stripper</b>	
Poly-Tergent® B-350 surfactant	8
Poly-Solv® MPM glycol ether	2.5
Trisodium phosphate	2.5
Water	Balance

# TOXICOLOGICAL PROPERTIES

The toxicological properties of Poly-Solv® glycol ethers have been evaluated by standard methods.

Poly-Solv glycol ethers have a low single dose oral toxicity. The undiluted products are moderately painful and mildly irritating if splashed into the eyes. Eye injury is transient; complete healing should occur within several days.

Skin irritation can result from prolonged and/or repeated contact with the undiluted products (except Poly-Solv DE, DPM and TE). Although it is unlikely that a toxic amount of any of these glycol ethers would be absorbed through the skin during industrial operations, it should be recognized that prolonged, extensive contact of large areas even of intact skin with large quantities of these compounds may cause adverse effects from absorption.

Toxicological studies in rabbits, rats and mice to evaluate the effects of glycol ethers on reproduction have indicated the ability to produce adverse effects. These effects, exhibited with ethylene glycol monomethyl ether (Poly-Solv EM), include fetal malformations and testicular damage via inhalation at levels near the current TLV. The assessment of the reproductive and teratogenic potential of Poly-Solv EE is cur-

rently under study. The current TLV's\* may be revised for Poly-Solv EM and EE, based on these data.

Toxicological profiles of individual products are given in Table 4.

The importance of avoiding skin contact and inhalation of vapors is re-emphasized. Safety practices should ensure no skin contact and reduction of inhalation exposures.

\*Current OSHA PEL's are 25 ppm for Poly-Solv EM and 200 ppm for Poly-Solv EE. ACGIH TLV's are 25 ppm for Poly-Solv EM and 50 ppm for Poly-Solv EE.

**Table 4 Toxicological Properties**

	Oral LD <sub>50</sub> (rat)	Dermal LD <sub>50</sub> (rabbit)	Inhalation Toxicity	Primary Skin Irritation (rabbit)	Eye Irritation (rabbit)
Poly-Solv® EM	0.75 g/kg	2 g/kg	LC <sub>50</sub> (mouse) 1480 ppm for 7 hrs.	mild	moderate
Poly-Solv® EE	5.5 g/kg	3.6 ml/kg	LC <sub>50</sub> (mouse) 1820 ppm for 7 hrs.	mild	mild
Poly-Solv® EB	2.5 g/kg	0.45 ml/kg	LC <sub>50</sub> (mouse) 700 ppm for 7 hrs.	mild	moderate
Poly-Solv® DM	6.5 ml/kg	20 ml/kg	No toxic effect to rats exposed to saturated atmosphere for 7 hrs.	mild	mild
Poly-Solv® DE	8.6 g/kg	8.5 ml/kg	No toxic effect from saturated atmosphere.	mild	mild
Poly-Solv® DB	5.6 ml/kg	4 g/kg	No toxic effect to rats exposed to saturated atmosphere for 7 hrs.	mild	moderate
Poly-Solv® TM	6.3 ml/kg	20 ml/kg	---	mild	mild
Poly-Solv® TE	10.6 g/kg	8 ml/kg	---	none	none
Poly-Solv® TB	---	---	---	---	---
Poly-Solv® MPM	6.8 g/kg	14 g/kg	LC <sub>50</sub> (rat) 9.0 ppm at 1000 ppm	mild	mild
Poly-Solv® DPM	5.5 ml/kg	20 ml/kg	No toxic effect to rats exposed to saturated atmosphere for 7 hrs.	mild	mild
Poly-Solv® TMA	7 ml/kg	20 ml/kg	---	---	---

\*This compound does not irritate by repeated or prolonged contact with skin and respiratory tract. Irritation results only from direct contact with undiluted liquid.

## PERSONNEL PROTECTION

Do not get liquids or vapors in eyes, on skin or on clothing. Do not breathe vapors. Do not take internally. Wear goggles, coveralls and impervious gloves and boots when handling. Wash all contaminated clothing before re-use.

### First Aid

**Skin Contact:** Flush thoroughly with cold running water for 15 minutes.

**Eye Contact:** Wash with lukewarm flowing water for 15 minutes.

**Ingestion:** If a large amount is swallowed, induce vomiting. Call a physician.

## STORAGE AND HANDLING

Poly-Solv® glycol ethers are relatively easy to handle under ordinary commercial conditions.

Usual equipment requirements for bulk storage and handling include unloading equipment, storage tanks, pumps and piping.

### Unloading Equipment

Unloading equipment from tank cars will require a permanent stainless steel pump or an epoxy resin lined pump. The suction side of the pump is attached to the bottom of the tank car with a flexible stainless steel hose. Standard 4-inch tank car couplings are available from equipment suppliers.

Tank trucks are lined and are not nitrogen padded. They are equipped with an unloading pump having a capacity of approximately 100 gpm and a 3- or 4-inch discharge hose. A 3-inch valve with a 3-inch male quick coupler should be installed close to the bottom of the storage tank. Facilities for draining the discharge hose must be provided by the receiving station.

### Storage Tanks

The recommended materials of construction for bulk storage of Poly-Solv® glycol ethers are stainless steel or resin lining on steel (Lithcote® #73 or equivalent). The storage tank should be of a standard size capable of storing 1½ times the volume of Poly-Solv to be received. The minimum capacity and the specific gravity of the Poly-Solv glycol ether should be specified to the tank supplier. The storage tank should have:

- Draw-off sump
- Flanged manhole (center should be 30 inches from bottom of tank)
- Flanged 3-inch inlet-outlet nozzle
- Float type automatic level gage
- Roof manhole, 20-inch diameter
- Roof gauging and sample hatch
- Nitrogen inlet, top ¾-inch
- Top vent (3-inch)

To protect product quality, the tank vent should include a pressure conservation vent valve to contain the nitrogen pad. Settings of 2 inches of water for both pressure and vacuum

Lithcote® 73 is a registered trademark of Lithcote Corporation, Cherry Hill, New Jersey.

are adequate. A flame arrester is also required.

Aluminum storage tanks and equipment should not be used with glycol ethers.

### Pumps

For pumps, stainless steel is recommended. Centrifugal pumps are satisfactory and should be equipped with a drain valve.

### Piping

Piping includes pipe, valves and fittings. The pipe size is determined by the desired flow-rate and allowable pressure drop.

Stainless steel or epoxy-lined steel pipe can be used. Stainless steel valves are suggested.

### Spill or Leak Procedures

Wear a NIOSH/MSHA approved respirator suitable for the Poly-Solv® glycol ether spilled. Follow OSHA regulations for respirator use. (See Title 29, Section 1910.134 *Code of Federal Regulations*.) Wear goggles, coveralls and impervious gloves and boots. Add dry absorbent, then shovel or sweep up and place in an approved DOT container and seal. Flush any remaining material with water. Wash all contaminated clothing before reuse.

### Disposal

Dispose of unused product in a manner approved for this material. Consult the appropriate Federal, state and local regulatory agencies to ascertain proper disposal procedures.

### Shipping

Poly-Solv® glycol ethers are shipped in tank cars, tank trucks and 55-gallon resin-lined drums, DOT-type 17E. DOT labels are not required.

### In Case of Emergency

For help with safety or health emergencies involving Olin products, we have developed OPES, the Olin Product Emergency Service. Speedy advice from experts can be received twenty-four hours a day by dialing: 203-356-2345.

You will be asked to leave your name and phone number and to give a brief description of the emergency. Shortly, you will receive a return call from someone who is experienced with Poly-Solv glycol ethers and knows their properties and characteristics. He will be able to advise you on immediate action to be taken and on how to deal with almost any emergency.

In addition, the Chemical Manufacturers Association has established CHEMTREC to give advice on emergencies involving transportation and transportation equipment. The CHEMTREC number is 800-424-9300\*.

If the product is an Olin product, CHEMTREC will also advise OPES.

\*In the District of Columbia call 483-7616.

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## A word about Olin Corporation

Olin ranks high in Fortune Magazine's directory of leading U.S. industrial companies. It has sales of \$2 billion, over 20,000 employees, 36 plants in 22 states and 16 manufacturing operations in 16 foreign countries.

But we're more than just numbers, and we'd like you to understand us better. You know of Olin Chemicals. And though you may not realize it, you've probably met our other five operating groups -- Consumer Products, Brass, Ecusta Paper and Film, Winchester and Olin-American -- through some of the things they make or do. For example:

Our Consumer Products Group makes Omalon® carpet foundation, Olin® skis, and signal flares, plus HTH® and Pace® swimming pool sanitizing chemicals. HTH is the largest-selling brand of pool water sanitizer in the world.

Our Brass Group produces brass, bronze and copper sheet and strip. It is the largest supplier of coin material to the U.S. Mint.

Our Ecusta Paper and Film Group is a major producer of cigarette papers, and one of only two U.S. suppliers of cellophane.

Our Winchester Group makes world-famous Winchester Western® sporting ammunition, as well as ammunition for national defense.

Olin-American is our real estate subsidiary, building homes and commu-

nity developments across the nation.

In addition, Olin produces Ramset® powder-actuated tools, Weaver® scopes for sporting arms and proprietary seeds.

### The Olin Chemicals Group

Taken alone, this Group could well be a major U.S. corporation. In 1981 Olin's sales of chemical products exceeded \$1 billion.

Olin is a major producer of commodity inorganic chemicals. In fact, of the ten chemicals most widely used in industry, Olin makes nine.

Olin also produces more specialized organic and inorganic chemicals. We're a leader in sodium phosphates, fluorides and chlorite used for treating industrial and municipal water supplies. Olin is the only U.S. manufacturer of synthetic sodium nitrate and sodium chlorite. We're the largest U.S. producer of ring-fluorinated aromatic derivatives.

We're the nation's largest marketer of hydrazine, the propellant that put our lander on the moon, and is helping to make the space shuttle a reality. On earth, hydrazine and its derivatives have important though less esoteric uses, like keeping industrial boilers from rusting, making soap more slippery, and protecting crops from weeds.

Olin is one of the largest marketers of ethylene and propylene glycol ethers in

the U.S. They're used in such diverse products as solvents, paints, household cleaners, insecticides and functional fluids.

You'll find our products on the farm. Our ammonia and urea go into fertilizers that help raise crops. Our Terracolor® and Terrazole® fungicides protect them during growth.

You'll find our products in the home. Olin urethanes go into upholstered furniture and refrigerator insulation. Our blowing agents are used to make vinyl flooring. Your shampoo may contain our Omadine® antimicrobial agent, the active ingredient in most anti-dandruff shampoos throughout the world. Your household detergents may contain our sodium phosphates and Poly-Tergent® surfactants.

You'll find our products used in your clothes. Our Reductone® sodium hydrosulfite and Dyetone® sodium bromate are basic chemicals for textile dyeing. And we supply key intermediates for dyestuffs.

You'll find our products in your car. Olin is one of three primary manufacturers of brake fluid in the U.S. And Olin urethane chemicals are used to make everything from seat cushions to impact-resistant bumper systems.

In fact, wherever you live, however you travel, whatever you do, chances are your life is touched in some way by the chemical products made by Olin.

### Sales Offices

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Oak Brook, IL 60521-2301 W. 22nd St., Suite 209, (312) 325-2280

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Stamford, CT 06904-3 Landmark Square, Suite 205, (203) 356-3000  
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