

# Diethylene Glycol

## Product Guide



## INTRODUCTION

2	Precautions
2	About MEGlobal
2	Doing Business With Us
2	Service
2	Products and Applications
3	Diethylene Glycol – The Versatile Performer
4	Table 1: Applications
5	Responsible Care®
6	Non-supported Applications of MEGlobal Diethylene Glycol Products

## PROPERTIES

7	Table 2: Physical Properties of Diethylene Glycol
8	Table 3: Solubilities of Various Materials in Diethylene Glycol
9	Table 4: Diethylene Glycol Compatibility with Elastomeric Materials
10	Table 5: Constant Boiling Mixtures
11	Figure 1: Freezing Points of Aqueous Diethylene Glycol Solutions
12	Figure 2: Boiling Points vs. Composition of Aqueous Diethylene Glycol Solutions at Various Pressures
13	Figure 3: Condensation Temperatures vs. Composition of Aqueous Diethylene Glycol Solutions at Various Pressures
14	Figure 4: Vapor Pressures of Diethylene Glycol at Various Temperatures
15	Figure 5: Vapor Pressures of Aqueous Diethylene Glycol Solutions at Various Temperatures
16	Figure 6: Specific Gravities of Aqueous Diethylene Glycol Solutions
17	Figure 7: Viscosities of Aqueous Diethylene Glycol Solutions
18	Figure 8: Specific Heats of Aqueous Diethylene Glycol Solutions
19	Figure 9: Thermal Conductivities of Aqueous Diethylene Glycol Solutions
20	Figure 10: Dew Points of Aqueous Diethylene Glycol Solutions at Various Contact Temperatures
21	Figure 11: Comparative Hygroscopicities of Various Glycols at 70°F (21°C)
22	Figure 12: Surface Tensions of Pure Diethylene Glycol
23	Figure 13: Surface Tensions of Aqueous Diethylene Glycol Solutions at 77°F (25°C)
24	Figure 14: Electrical Conductivities of Aqueous Diethylene Glycol Solutions
25	Figure 15: Refractive Indices of Aqueous Diethylene Glycol Solutions at 77°F (25°C)
26	Health Effects
26	Environmental Information
26	Storage and Handling
26	Shipping Data for Diethylene Glycol
27	Product Safety
28	Emergency Service
29	Sales Office

## TABLE OF CONTENTS



## INTRODUCTION

### Precautions

Carefully review our current Safety Data Sheets.

### About MEGlobal

MEGlobal is a world leader in the manufacture and marketing of monoethylene glycol (MEG) and diethylene glycol (DEG), collectively known as EG. With a worldwide network, MEGlobal markets its projects throughout Asia, the Americas, Europe and the Middle East. MEGlobal embraces the principles of Responsible Care®, focusing on the safety of employees, neighbors, communities and the environment in every aspect of its operations. As a subsidiary of EQUATE Petrochemical Company (EQUATE), MEGlobal is part of the EQUATE Group, one of the world's largest suppliers of EG. Visit [www.equate.com](http://www.equate.com) for more information.

MEGlobal is committed to being the preferred and low cost supplier of MEG and DEG for customers worldwide. For more information visit [www.meglobal.biz](http://www.meglobal.biz).

### Doing Business With Us

We operate globally with offices and/or production facilities in North America, South America, the Middle East and Asia. Our knowledgeable, local professionals are native to the regions, so they speak your language, know your culture and understand your needs.

World-class technical service and support are available through our highly-trained sales representatives.

### Service

For solutions to problems or answers to questions, take advantage of MEGlobal's technical service and support, available through our trained sales representatives. Your order of diethylene glycol will be processed expertly and quickly when you place a call to one of our many helpful customer service representatives (see page 29).

### Products and Applications

MEGlobal's advanced manufacturing process is based on more than 70 years of experience, and is characterized by seamless integration, catalyst efficiency, and local access to feedstock. With our total approach to continuous improvement in Quality and Quality Systems, we fully meet the stringent ISO 9001 series of standards, allowing us to deliver the high-quality products you require.

Optimum performance demands a quality product, and that is what we deliver. Our vast distribution system of plants, terminals, tankers, barges, tankcars, and trucks helps to ensure delivery of ethylene glycol and diethylene glycol when and where you need it.

Our MEG can be used for applications that require chemical intermediates for resins, solvent couplers, freezing point depression, solvents, humectants, and chemical intermediates. These applications are vital to the manufacture of a wide range of products, including resins, deicing fluids, heat transfer fluids, automotive antifreeze and coolants, water-based adhesives, latex paints, and asphalt emulsions, electrolytic capacitors, textile fibers, paper and leather.

The characteristics of our DEG products supplement our MEG portfolio, augmenting our capabilities to include applications that require hygroscopicity, lubricants, and low volatility. Products that capitalize on these and other DEG properties include plasticizers; glass- and cement-grinding aids, printing ink, drywall joint compound, thermoplastic polyurethanes and emulsifiers.

For more information on our MEG products, please refer to our MEGlobal Ethylene Glycol Product Guide.

## Diethylene Glycol – The Versatile Performer

### Diethylene Glycol:



### CAS Registry Number:

111-46-6

### Synonyms:

DEG

Dihydroxyethyl ether

2,2'-Dihydroxyethyl ether

Glycol ethyl ether

Diglycol

Ethylene diglycol

3-Oxapentane-1,5-diol

2,2'-Oxydiethanol

Bis(beta-hydroxyethyl)ether

Bis(2-hydroxyethyl)ether

2-(2-hydroxyethoxy)ethanol

3-Oxapentamethylene-1,5-diol

Diethylene glycol is a colorless, low-volatility, low viscosity, hygroscopic liquid. Under normal conditions, diethylene glycol has no detectable odor; however, under high vapor concentrations, a slightly sweet odor may be detected. It is completely miscible with water and many organic liquids.

The hydroxyl groups on glycols undergo alcohol chemistry, thus providing opportunities for production of a wide variety of derivatives. Hydroxyls can be converted to aldehydes, alkyl halides, amines, azides, carboxylic acids, ethers, mercaptans, nitrate esters, nitriles, nitrite esters, organic esters, peroxides, phosphate esters and sulfate esters.

Because of its higher molecular weight, diethylene glycol is considerably less volatile than ethylene glycol and differs sufficiently in that it has specialized uses. The reactivity and solubility of diethylene glycol provide the basis for many applications. The end uses for diethylene glycol are numerous (see Table 1.)

Table 1: Applications

Properties/Characteristics	Applications/Uses
Hygroscopicity	<ul style="list-style-type: none"> <li>• Gas dehydration</li> <li>• Plasticizer for paper, composition cork, glues, adhesives, bookbinding and coatings</li> </ul>
Lubricant	<ul style="list-style-type: none"> <li>• Glass-grinding aids</li> <li>• Fiber-finish component</li> <li>• Cement-grinding aids</li> <li>• Mold release agent</li> </ul>
Solvent Coupler	<ul style="list-style-type: none"> <li>• Stabilizer for soluble oil dispersions</li> <li>• Compatibilizer for dye and printing ink components</li> </ul>
Solvent	<ul style="list-style-type: none"> <li>• Aromatic and paraffinic hydrocarbon separations</li> <li>• Printing ink/paint pigments/dyes</li> </ul>
Low Volatility	<ul style="list-style-type: none"> <li>• Binder for foundry sand-molding</li> </ul>
Freezing Point Depression	<ul style="list-style-type: none"> <li>• Latex paint antifreeze</li> <li>• Antifreeze</li> <li>• Deicing fluids</li> <li>• Heat transfer fluids</li> <li>• Drywall joint compound</li> <li>• Belt wetting agent</li> </ul>
Chemical Intermediate	<ul style="list-style-type: none"> <li>• Unsaturated polyester resin</li> <li>• Plasticizer intermediate for nitrocellulose lacquers, enamels and adhesives</li> <li>• Polyester polyols for urethane foam</li> <li>• Thermoplastic polyurethanes</li> <li>• Emulsifiers</li> <li>• Lubricants</li> <li>• Morpholine</li> </ul>

## Responsible Care®

MEGlobal embraces and advocates Responsible Care®, a voluntary industry-wide commitment to safely handle our chemicals from inception in the laboratory to ultimate disposal. We take this commitment very seriously since it encourages continuous improvement in health and safety, and environmental performance for the benefit of our employees, customers, and the public.

Our environmental, health and safety (EH&S) policies require, as a minimum, full compliance with all applicable laws and regulations.

MEGlobal's highest priority is safety and our employees are held to a rigid set of health and safety standards. They work to achieve zero personal safety incidents and leak-free facilities, and to proactively identify and resolve EH&S issues. This kind of serious accountability helps us ensure the highest possible level of EH&S performance throughout the company.

MEGlobal's products are easy to store and handle. We provide current Safety Data Sheets that contain complete safety information for all of our products, but we also supply vital health, safety and environmental information through presentations, literature, and access to a wide variety of other reference materials and information resources to give our customers the comprehensive knowledge they need.

Our Product Stewardship philosophy gives us a means to assess information on the potential health and environmental impacts of our products, helping us to take steps to protect our employees, customers, the public and the environment.



## Non-supported Applications of MEGlobal Diethylene Glycol Products

The following list identifies end-use applications that are NOT supported by MEGlobal for ethylene glycol products, monoethylene glycol (MEG) and diethylene glycol (DEG) marketed by MEGlobal ("MEGlobal Ethylene Glycol Products"). These limitations include applications in which the use of MEGlobal Ethylene Glycol Products is restricted by law, applications in which the use of MEGlobal Ethylene Glycol Products may raise unacceptable risks, and other applications which MEGlobal has decided not to pursue for business reasons, including minimizing unnecessary risk and liabilities to the company. MEGlobal does not knowingly market MEGlobal Ethylene Glycol Products into these nonsupported applications, requests its distributors to refuse sales of MEGlobal Ethylene Glycol Products into these non-supported applications, and alerts its customers about the special risks associated with some of these non-supported applications. The following list of applications not supported by MEGlobal does not imply any MEGlobal warranty or MEGlobal support of uses in applications not covered by this list. This list is not all-inclusive, and MEGlobal reserves the right to modify the same at any time.

- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) in the production of tobacco and in the manufacture of tobacco products (including but not limited to additives, humectants, filters, inks, and paper) is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) for the generation of artificial smoke/theatrical fogs/mist is not supported by MEGlobal. This includes applications such as artificial/e-cigarettes.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) as ingredient in fuel for warming foods (Sterno™-like application) or in fuel for heating an enclosed space where human exposure is possible is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) in fire extinguishing sprinkler systems is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) in the manufacture of munitions is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) in the production of deicers for use on roadways, sidewalks and in aircraft lavatories is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) as a component of heat transfer fluids in systems where the heat transfer fluids could infiltrate (i.e., via an exchanger leak, backflow prevention failure, or other means) a potable water system is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) as a nonreacted component in a formulation for direct internal or external human/animal contact, including but not limited to ingestion, inhalation, and skin contact and in medical / veterinary devices and medical / veterinary applications is not supported by MEGlobal. (Examples of some such applications are uses as a direct component in foods, beverages, pharmaceuticals, cosmetics, or personal care products).
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) for consumer or hospital usage for deodorizing or air "purifying" purposes by spraying as an aerosol is not supported by MEGlobal.

- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) as a nonreacted component in adhesives, plasticizers, and softening agents for packaging that has direct contact with food or beverage is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) as a nonreacted component in the formulation of glues, pastes, ice/heat packs or other items where the potential for significant human contact and/or ingestion exists (including but not limited to children's school glue/paste or arts/craft glue/paste) is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) as a fluid for pressure testing piping is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG, DEG) as a nonreacted component in the production of freezer gel packs used in lunch boxes, thermal food carriers or other related applications which allows for the possibility glycol to be exposed to food products or available for ingestion is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG and DEG) for use in the treatment of wood rot and fungus in marine applications is not supported by MEGlobal.
- The use of MEGlobal Ethylene Glycol Products (MEG and DEG) in the production of burst protection fluids for use on any recreational vehicle tanks that could be used for potable water and sewage is not supported by MEGlobal.

To enter into new applications beyond the traditional standard industrial use applications supported by MEGlobal, contact your MEGlobal representative to review the specific application. MEGlobal has a risk assessment process whereby the application will be reviewed and a determination will be made as to whether the application meets MEGlobal's requirements and can therefore be supported by MEGlobal. Because use conditions and applicable laws may differ from one location to another and may change with time, when an application is supported by MEGlobal, MEGlobal does not warrant and is not responsible for the use in such applications.

NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ALL OTHER EXPRESS OR IMPLIED REPRESENTATIONS AND WARRANTIES PROVIDED BY STATUTE OR COMMON LAW ARE EXPRESSLY EXCLUDED.

Further, any violation of or failure to comply with the information contained in MEGlobal's Safety Data Sheet, Product Label, Product Information Guide, product literature or other product safety information is a misuse of MEGlobal Ethylene Glycol Products. These documents can be obtained by contacting your MEGlobal sales representative.

MEGlobal can not specify all circumstances in which MEGlobal Ethylene Glycol Products may be used in applications not supported by MEGlobal. Accordingly, you are strongly encouraged to immediately contact the MEGlobal Customer Service Group if you become aware that MEGlobal Ethylene Glycol Products may be or have been used in any such nonsupported application.

## PROPERTIES

Table 2: Physical Properties of Diethylene Glycol

	Scientific	Common
Autoignition Temperature	364°C @ 1013.25 hPa	687°F @ 760mm Hg
Critical Pressure	4,605 kPa	34,540.3 mm Hg
Critical Specific Volume	0.312 L/gmol	5.00 ft <sup>3</sup> /lbmol
Critical Temperature	406.85°C	764.33°F
Dielectric Constant	31.69	31.69
Electrical Conductivity at 20°C	0.42 x 10 <sup>-6</sup> mhos/cm	0.0042 micromhos/cm
Evaporation Rate (Butyl Acetate = 1)	<0.001	<0.001
Flammable Limits in Air, Upper	12.3%(V)	12.3%(V)
Flammable Limits in Air, Lower	2.0%(V)	2.0%(V)
Flash Point, Closed Cup	138°C @ 1013.25 hPa	280°F @ 760 mm Hg
Heat of Combustion at 25°C	-2,154.82 kJ/gmol	-8,730.4 Btu/lb
Heat of Vaporization at 1 atm	57.9 kJ/gmol	234.4 Btu/lb
Molecular Weight	106.12 g/mol	106.12 g/mol
Normal Boiling Point	244.9°C @ 1013.25 hPa	473°F @ 760 mm Hg
BP/ P (750 to 770 mm Hg)	0.052°C/mm Hg	
Normal Freezing Point	-6.5°C	20.3°F
Onset of Initial Decomposition	240°C	464°F
Refractive Index, n <sub>D</sub> , at 20°C	1.4472	1.4472
Solubility in Water at 20°C	100.0 wt%	100.0 wt%
Solubility of Water in Diethylene Glycol at 20°C	100.0 wt%	100.0 wt%
Specific Gravity (20/20°C)	1.1182	1.1182
Specific Gravity/ T(10 to 40°C)	0.00073/°C	0.00073/°C
Surface Tension at 25°C	44.8 mN/m	44.8 dynes/cm
Vapor Density (air = 1)	3.65	3.65
Vapor Pressure at 25°C	0.008 hPa	0.006 mm Hg
Dynamic Viscosity at 20°C	35.7 mPa s	35.7 cP

Note: These properties are laboratory results on pure compounds or typical of the product, but should not be confused with, or regarded as, specifications.



**Table 3: Solubilities of Various Materials in Diethylene Glycol\***

Solubility, g/100 mL of Diethylene Glycol at 25°C

Acetone	Completely Soluble	Lard Oil	Insoluble
Animal Glue (Dry)	Very Slightly Soluble	Linseed Oil	Insoluble
Benzene	45.5	Methanol	Completely Soluble
Carbon Tetrachloride	35.5	Methyl Orange	4.2
Castor Oil	0.1	Monoethanolamine	Miscible
Cellulose Acetate	Insoluble	Nitrocellulose	Soluble
Chlorobenzene	112.0	Olive Oil	Insoluble
Coconut Oil	Insoluble	o-Dichlorobenzene	93.6
Cottonseed Oil	Insoluble	Paraffin Oil	Insoluble
Dextrin (10% water)	Miscible	Perchloroethylene	12.0
Dextrin	Slightly Soluble	Phenol	Miscible
Dibutyl Phthalate	11.8	Pine Oil	Miscible
Dichloroethyl Ether	Soluble	Rosin	<2.0
Diethanolamine	Miscible	Shellac	Very Slightly Soluble
Ethyl Ether	19.5	Soya Bean Oil	Insoluble
Ethylene Glycol Distearate	Very Slightly Soluble	Sperm Oil	Insoluble
Gum Damar	Slightly Soluble	Tall Oil	3.1
Heptane	0.03	Toluene	20.7
Hydrogen Chloride at 60°C	27.83	Tung Oil	Insoluble
Hydrous Wool Fat	Slightly Soluble	Turkey Red Oil	6.3
Kauri Gum	Slightly Soluble	Urea	24.0

\* Some data reprinted by permission from *Glycols*, copyright 1952, by Reinhold Publishing Corporation, New York City

**Table 4: Diethylene Glycol Compatibility with Elastomeric Materials**

<b>Material</b>	<b>Temperature</b>		
	<b>25°C (77°F)</b>	<b>80°C (176°F)</b>	<b>160°C (320°F)</b>
Adiprene™ L-100	Good	Poor	Poor
Black Rubber 3773	Good	Poor	Poor
Buna N (or Buna 25)	Good	Good	
Buna S	Good	Fair	Poor
Butyl Rubber	Good	Good	
Compressed Asbestos	Good	Good	Fair
EPDM	Good	Good	Good
EPR Rubber	Good	Good	Good
Hycar™ D-24	Good	Fair	
Hypalon™	Good	Poor	Poor
Kalrez™	Good	Good	Good
Natural Rubber Gum	Good	Poor	Poor
Neoprene 7797	Good	Fair	
Red Rubber Number 107	Good	Poor	Poor
Saraloy™ 300	Good	Poor	Poor
Silicone No. 65	Good	Good	
Thiokol™ 3060	Good	Poor	Poor
Viton™ A	Good	Good	Poor

Table 5: Constant Boiling Mixtures

Components			Azeotrope					
	Specific Gravity at 20/20°C	Boiling Point at 760 mm Hg, °C	Boiling Point at 760 mm Hg, °C	Composition, % by Wt at 20°C			Relative Volume of Layers at 20°C, %	Specific Gravity at 20/20°C of Azeotrope or Layers
Diethylene Glycol Benzene	1.1184 0.8804	244.8 80.1	None					
Diethylene Glycol (5 mm Hg) Benzyl Ether	1.1184	116.4 <sup>(a)</sup>	Azeo <sup>(a)</sup>	40 60	3 97	84 16	U 55 L 45	
Diethylene Glycol (10 mm Hg) Butyl CARBITOL™ Solvent	1.1184 0.9536	129 <sup>(a)</sup> 109 <sup>(a)</sup>	None					
Diethylene Glycol CARBITOL™ Solvent	1.1184 0.9898	244.8 202.8	None					
Diethylene Glycol (2 mm Hg) Ethoxytriglycol	1.1184 1.0208	102 <sup>(a)</sup> 98 <sup>(a)</sup>	87 <sup>(a)</sup>	43 57				Homo
Diethylene Glycol (10 mm Hg) 2-Ethylhexyl Ether	1.1184 0.8121	129 <sup>(a)</sup> 135 <sup>(a)</sup>	114 <sup>(a)</sup>	(C)	(C)	(C)	U 70 L 30	Heter
Diethylene Glycol (50 mm Hg) Hexyl Ether	1.1184 0.7942	163 <sup>(a)</sup> 137 <sup>(a)</sup>	129.9 <sup>(a)</sup>	15.5 84.5	0.2 99.8	99.6 0.4	U 89.0 L 11.0	U 0.795 L 1.117
Diethylene Glycol Methyl CARBITOL™ Solvent	1.1184 1.0211	244.8 193.6	None					
Diethylene Glycol (4 mm Hg) Phenyl Ether	1.1184 1.0677 <sup>(b)</sup>	113 <sup>(a)</sup> 100 <sup>(a)</sup>	Azeo <sup>(a)</sup>	23 77	1 99	80 20	U 72 L 28	
Diethylene Glycol (3 mm Hg) Triethylene Glycol	1.1184 1.1255	108 <sup>(a)</sup> 135.3 <sup>(a)</sup>	None <sup>(a)</sup>					
Diethylene Glycol Water	1.1184 1.0000	244.8 100	None	30.0 70.0				
Diethylene Glycol (10 mm Hg) Water	1.1184 1.0000	129 <sup>(a)</sup> 11 <sup>(a)</sup>	None <sup>(a)</sup>					

(a) At the pressure investigated;

(b) At 30/20°C;

(c) Data not available.

Figure 1: Freezing Points of Aqueous  
Diethylene Glycol Solutions

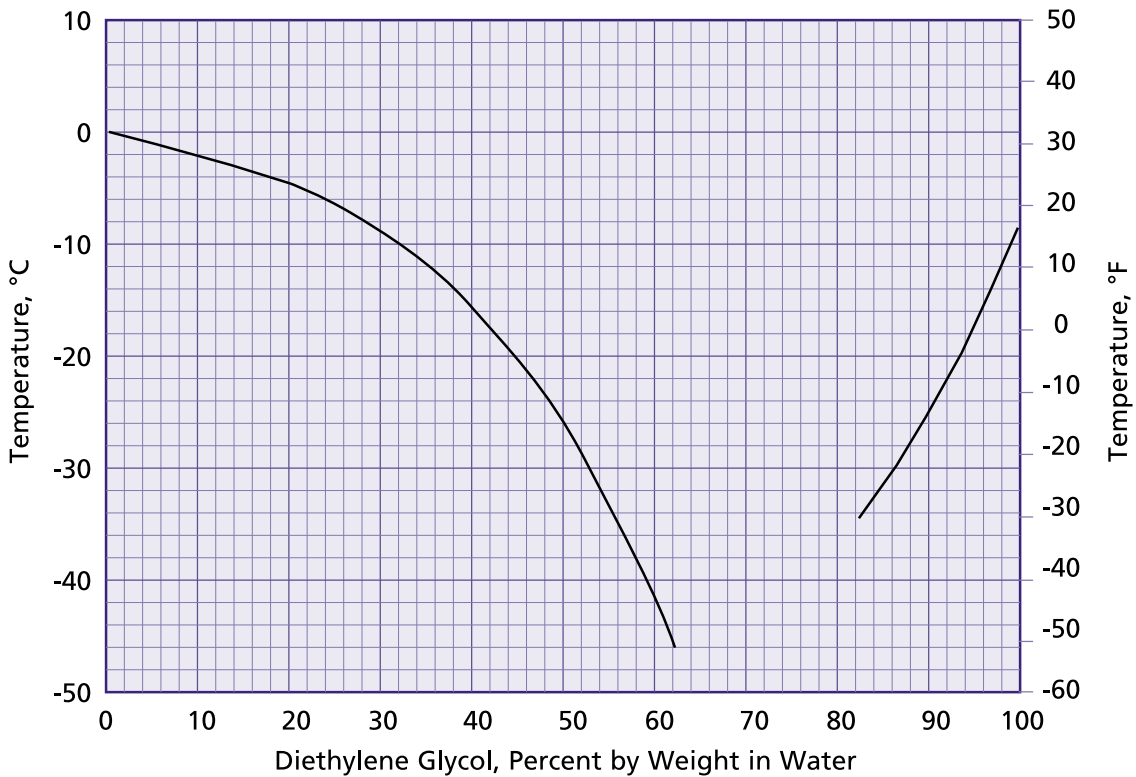
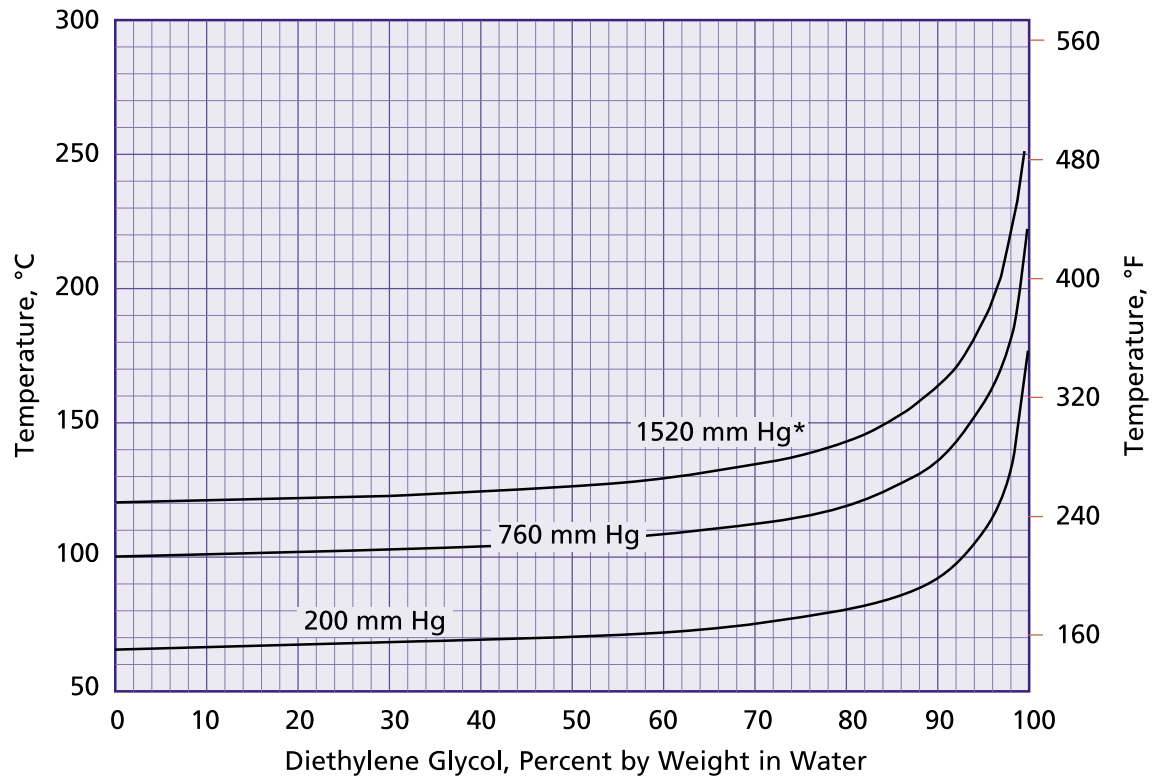
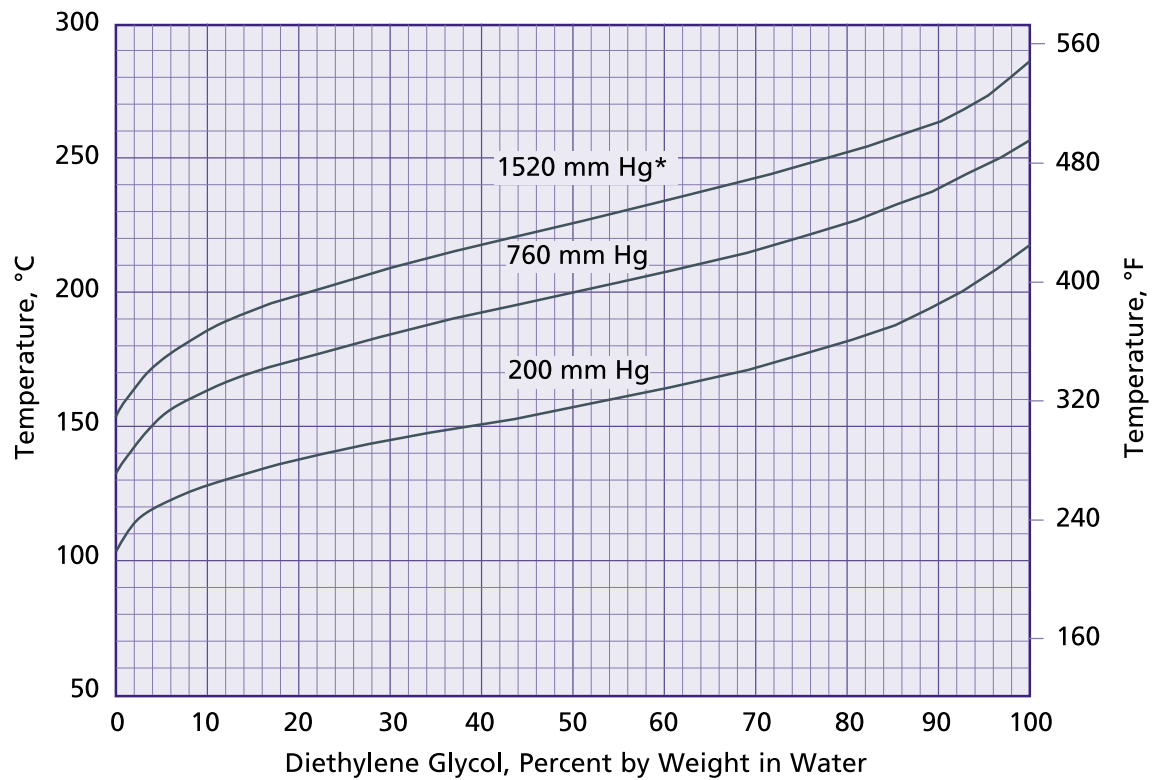


Figure 2: Boiling Points vs. Composition of Aqueous Diethylene Glycol Solutions at Various Pressures



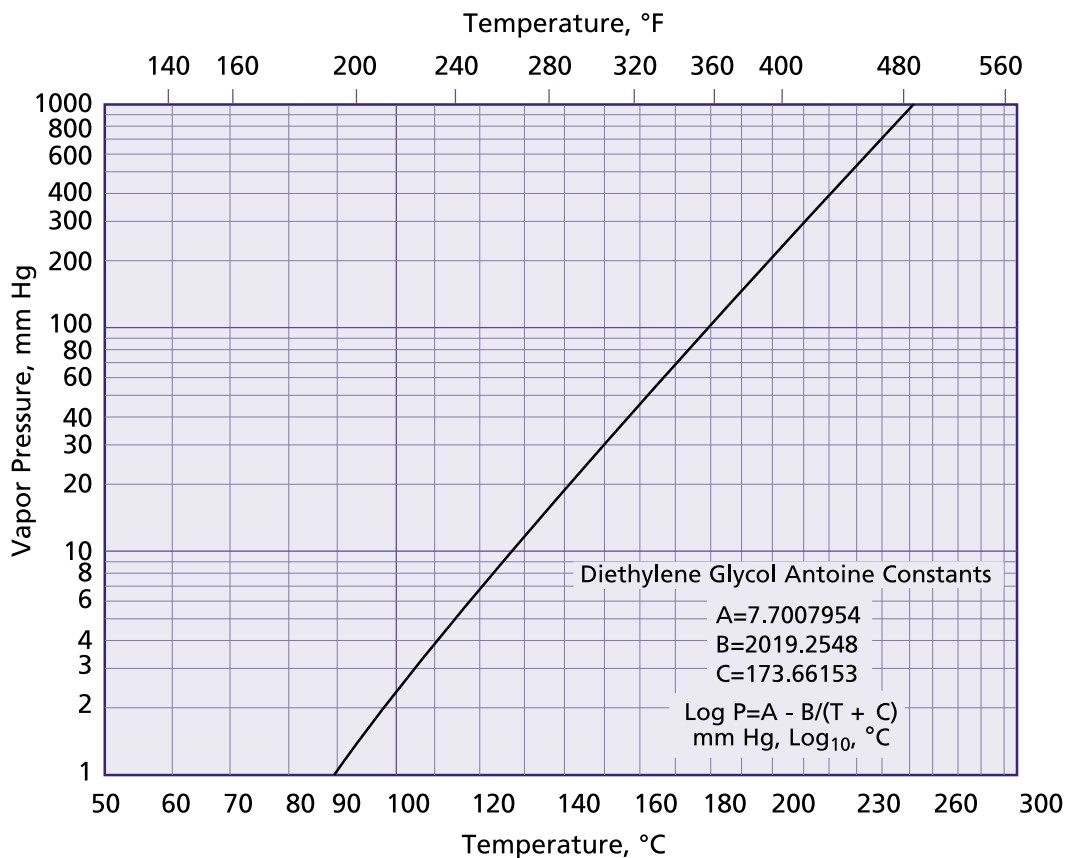
\*2 atmospheres absolute, 1 atmosphere gauge

Figure 3: Condensation Temperatures vs. Composition of Aqueous Diethylene Glycol Solutions at Various Pressures



\*2 atmospheres absolute, 1 atmosphere gauge

Figure 4: Vapor Pressures of Diethylene Glycol at Various Temperatures



### Diethylene Glycol Antoine Constants for Calculating Vapor Pressure

#### 3-Constant Equation

$$A = 7.7007954$$

$$B = 2019.2548$$

$$C = 173.66153$$

$$\text{Log}_{10}(P) = A - B/(T + C)$$

$$\text{Range} = 10 \text{ to } 250^{\circ}\text{C}$$

$$P = \text{mm Hg}$$

$$T = ^{\circ}\text{C}$$

#### 5-Constant Equation

$$A = 116.21594$$

$$B = 13273.461$$

$$C = 0.0$$

$$D = -12.665825$$

$$E = 5.9330303 \times 10^{-29}$$

$$N = 10$$

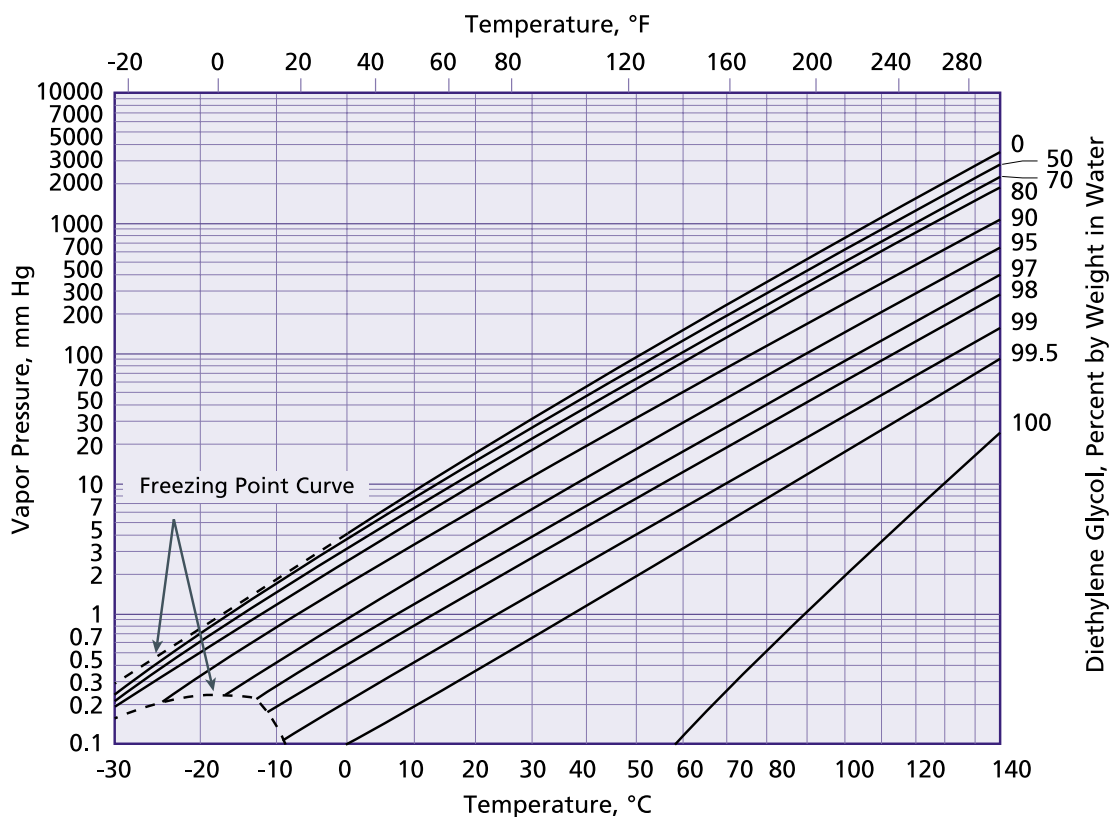
$$\ln(P) = A - B/(T + C) + D(\ln(T)) + ET^N$$

$$\text{Range} = 283 \text{ to } 523^{\circ}\text{K}$$

$$P = \text{Pa}$$

$$T = \text{Kelvin}$$

Figure 5: Vapor Pressures of Aqueous Diethylene Glycol Solutions at Various Temperatures



#### Diethylene Glycol Antoine Constants for Calculating Vapor Pressure

3-Constant Equation

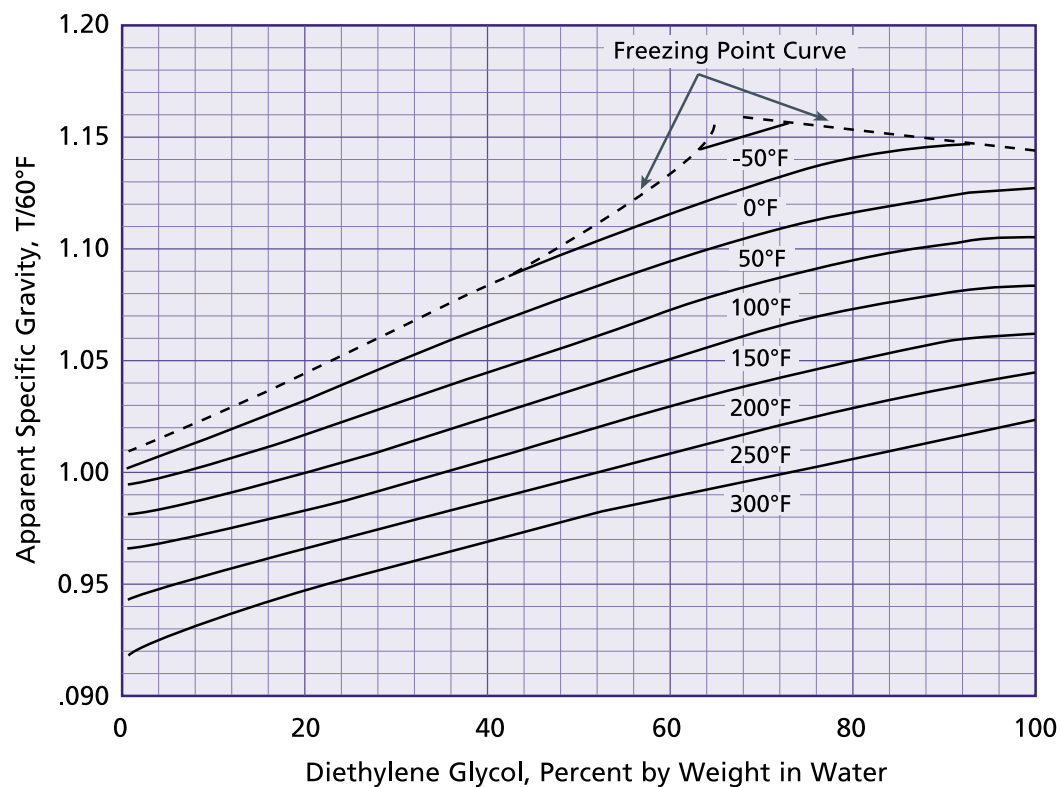
$$\log_{10} (P) = A - B/(T + C)$$

P = mm Hg, T = °C

DEG, Wt%	A	B	C
0	7.95 9199	1663.545	227.575
50	7.84 9221	1646.755	226.918
70	7.72 0100	1632.771	226.643
80	7.60 5747	1630.455	227.213
90	7.41 1919	1649.970	229.847
95	7.24 6397	1699.218	233.944
97	7.23 4579	1813.670	243.670
98	7.29 9095	1951.128	254.593
99	7.62 6717	2329.389	281.281
99.5	8.40 5776	3045.472	325.327
100	7.70 0795	2019.255	173.622



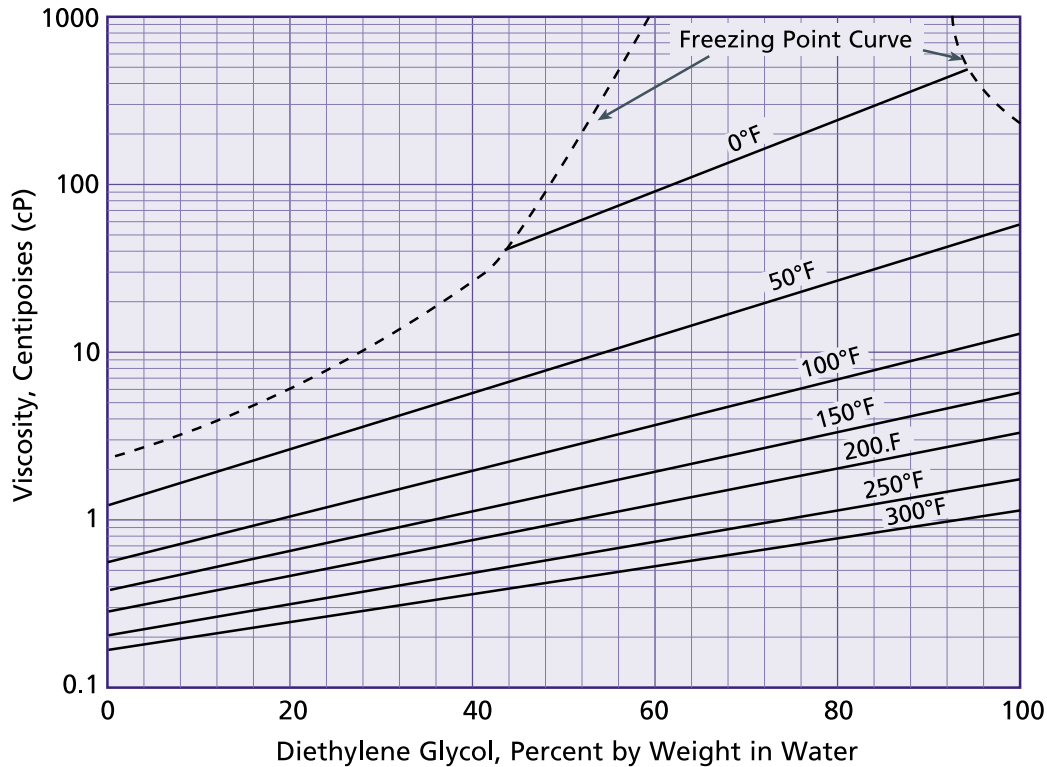
Figure 6: Specific Gravities of Aqueous Diethylene Glycol Solutions



Specific Gravity at T/60°F = A + Bx + Cx<sup>2</sup> + Dx<sup>3</sup>  
x = Weight % Diethylene Glycol

T, °F	A	B	C	D
-50	0.9425	4.6965E <sup>-3</sup>	-2.4525E <sup>-5</sup>	0.0
0	1.0243	1.0989E <sup>-3</sup>	1.5571E <sup>-5</sup>	-1.4375E <sup>-7</sup>
50	1.0003	1.5391E <sup>-3</sup>	5.0834E <sup>-6</sup>	-7.9514E <sup>-8</sup>
100	0.9937	9.3622E <sup>-4</sup>	1.2942E <sup>-5</sup>	-1.1238E <sup>-7</sup>
150	0.9805	7.2146E <sup>-4</sup>	1.4022E <sup>-5</sup>	-1.0949E <sup>-7</sup>
200	0.9653	6.3159E <sup>-4</sup>	1.2845E <sup>-5</sup>	-9.4444E <sup>-8</sup>
250	0.9425	1.0286E <sup>-3</sup>	3.0120E <sup>-6</sup>	-3.3681E <sup>-8</sup>
300	0.9168	1.6114E <sup>-3</sup>	-1.0211E <sup>-5</sup>	4.5860E <sup>-8</sup>

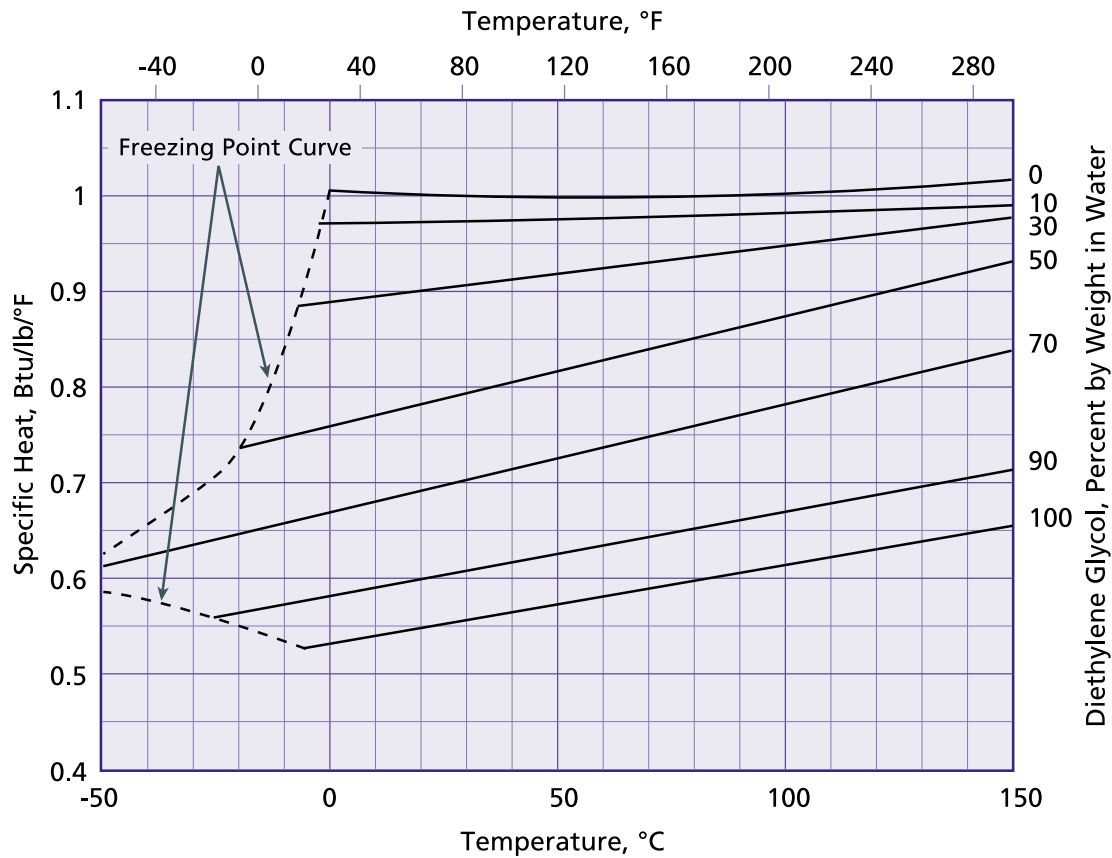
Figure 7: Viscosities of Aqueous Diethylene Glycol Solutions



Viscosity, Centipoises (cP) =  $A \times 10^{Bx}$   
 $x$  = Weight % Diethylene Glycol

T, °F	A	B
50	1.18800	1.6907E <sup>-2</sup>
100	0.57407	1.3693E <sup>-2</sup>
150	0.37471	1.1817E <sup>-2</sup>
200	0.27736	1.0474E <sup>-2</sup>
250	0.21936	9.4432E <sup>-3</sup>
300	0.18051	8.6163E <sup>-3</sup>

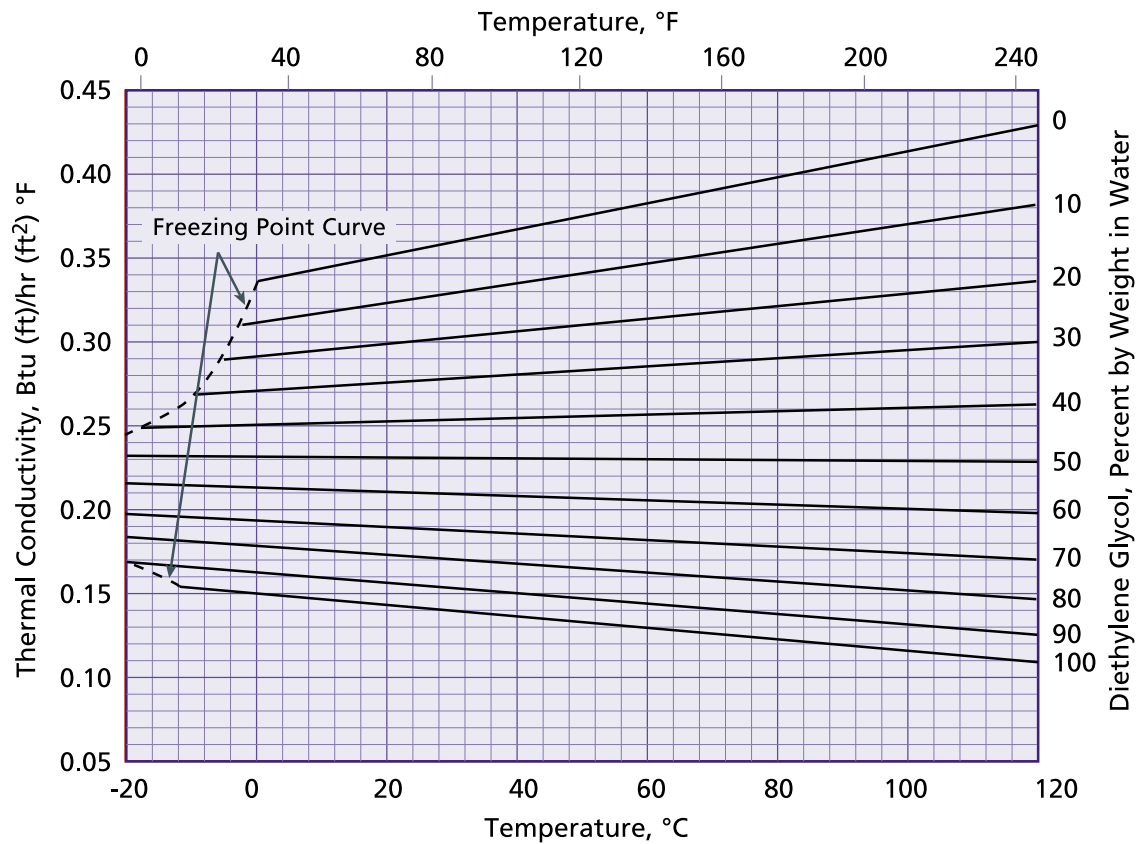
Figure 8: Specific Heats of Aqueous Diethylene Glycol Solutions



**Specific Heat = A + BT**  
**T = Temperature, °C**

DEG, Wt%	A	B
10	0.97005	1.3337E <sup>-4</sup>
30	0.88588	5.9290E <sup>-4</sup>
50	0.76730	1.1530E <sup>-3</sup>
70	0.67050	1.1569E <sup>-3</sup>
90	0.58960	8.7088E <sup>-4</sup>
100	0.53375	8.1244E <sup>-4</sup>

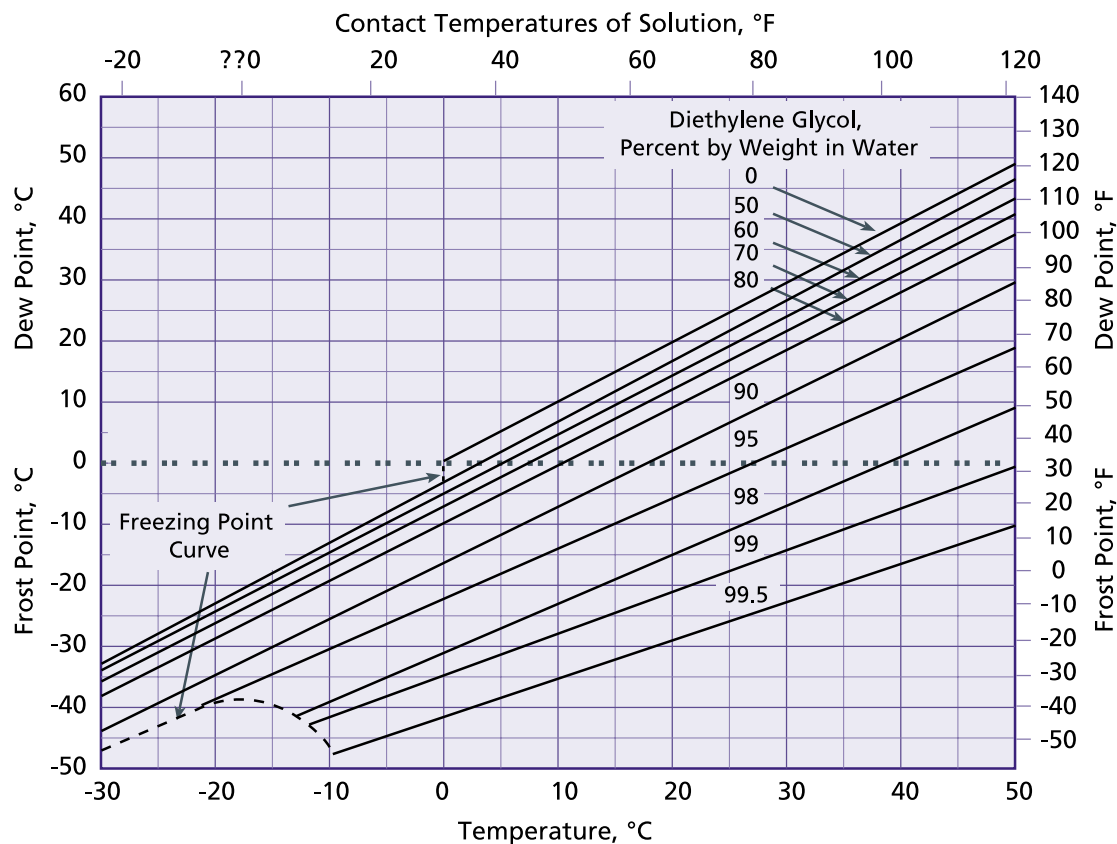
Figure 9: Thermal Conductivities of Aqueous Diethylene Glycol Solutions



**Thermal Conductivity = A + BT**  
**T = Temperature**

DEG, Wt%	A	B
0	0.33767	7.6667E <sup>-4</sup>
10	0.31233	5.8333E <sup>-4</sup>
20	0.29200	4.0000E <sup>-4</sup>
30	0.27133	2.3333E <sup>-4</sup>
40	0.25100	1.0000E <sup>-4</sup>
50	0.23133	-1.6667E <sup>-5</sup>
60	0.21233	-1.1667E <sup>-4</sup>
70	0.19500	-2.0000E <sup>-4</sup>
80	0.17933	-2.6667E <sup>-4</sup>
90	0.16433	-3.1667E <sup>-4</sup>
100	0.15100	-3.5000E <sup>-4</sup>

Figure 10: Dew Points of Aqueous Diethylene Glycol Solutions at Various Contact Temperatures



Dew or Frost Point = A + BT  
T = Temperature, °C

DEG, Wt%	A	B
0	0.00 00	0.99 202
50	-3.1 257	1.00 710
60	-5.0 603	0.97 853
70	-7.1 426	0.964 26
80	-10. 127	0.95 719
90	-16. 857	0.9357 2
95	-22. 731	0.82 862
98	-31. 334	0.80 003
99	-35. 064	0.69 450
99.5 -41.845	0.62 866	

Figure 11: Comparative Hygroscopicities of Various Glycols at 70°F (21°C)

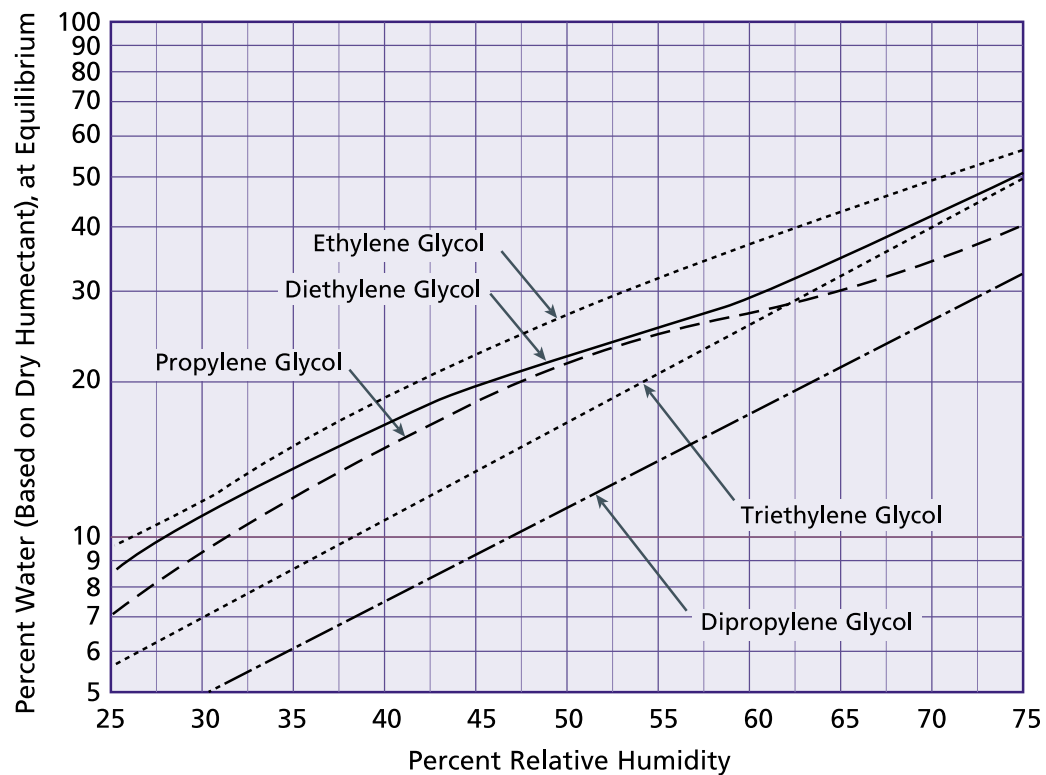
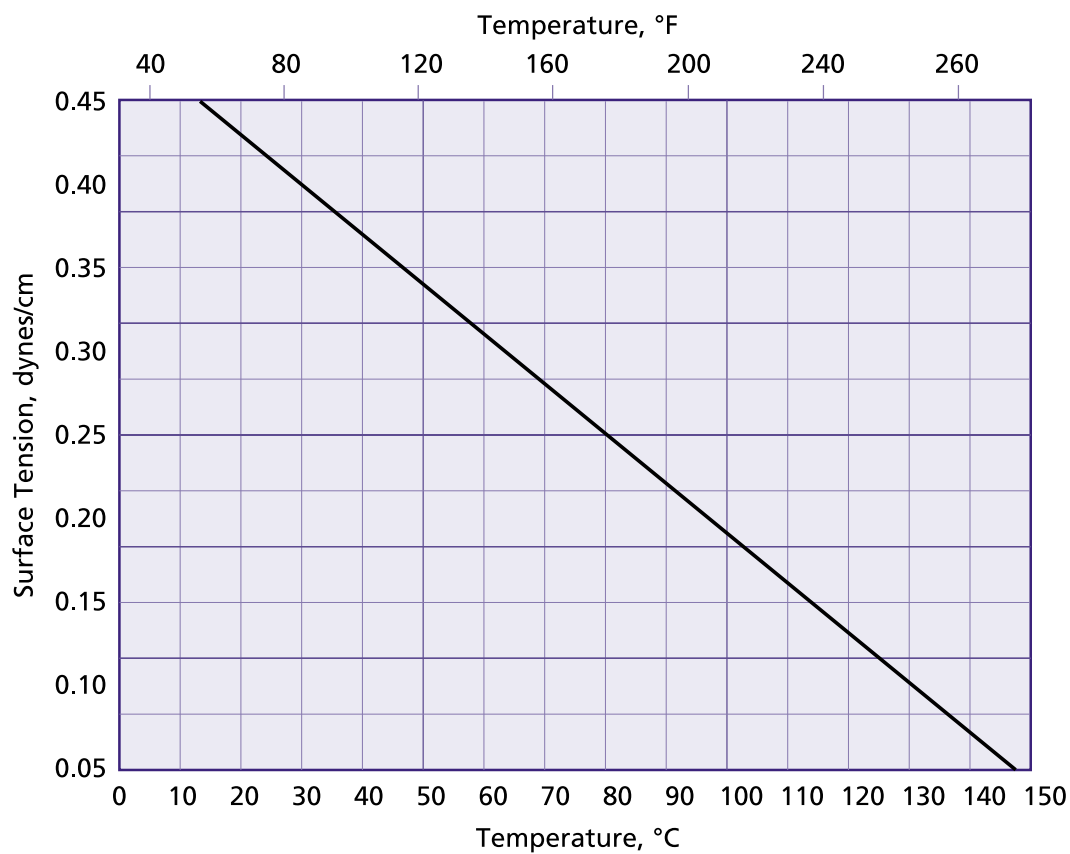


Figure 12: Surface Tensions of Pure Diethylene Glycol



Surface Tension, dynes/cm =  $46.97 - 0.088T$   
 T = Temperature, °C

Figure 13: Surface Tensions of Aqueous Diethylene Glycol Solutions at 77°F (25°C)

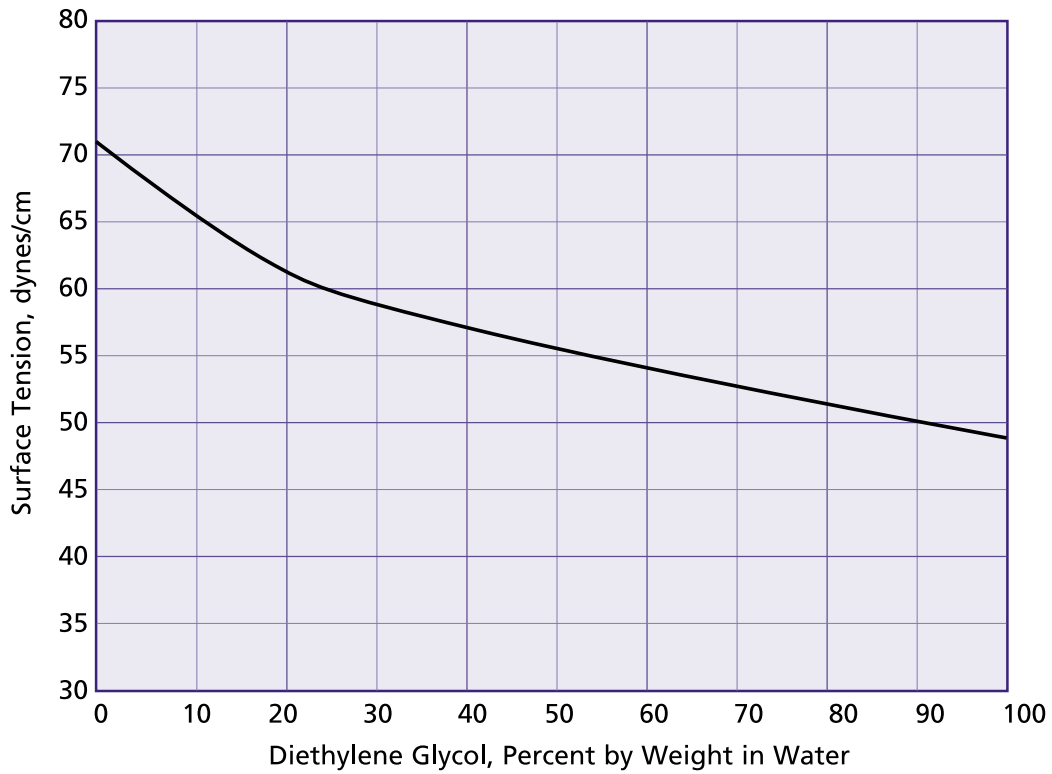
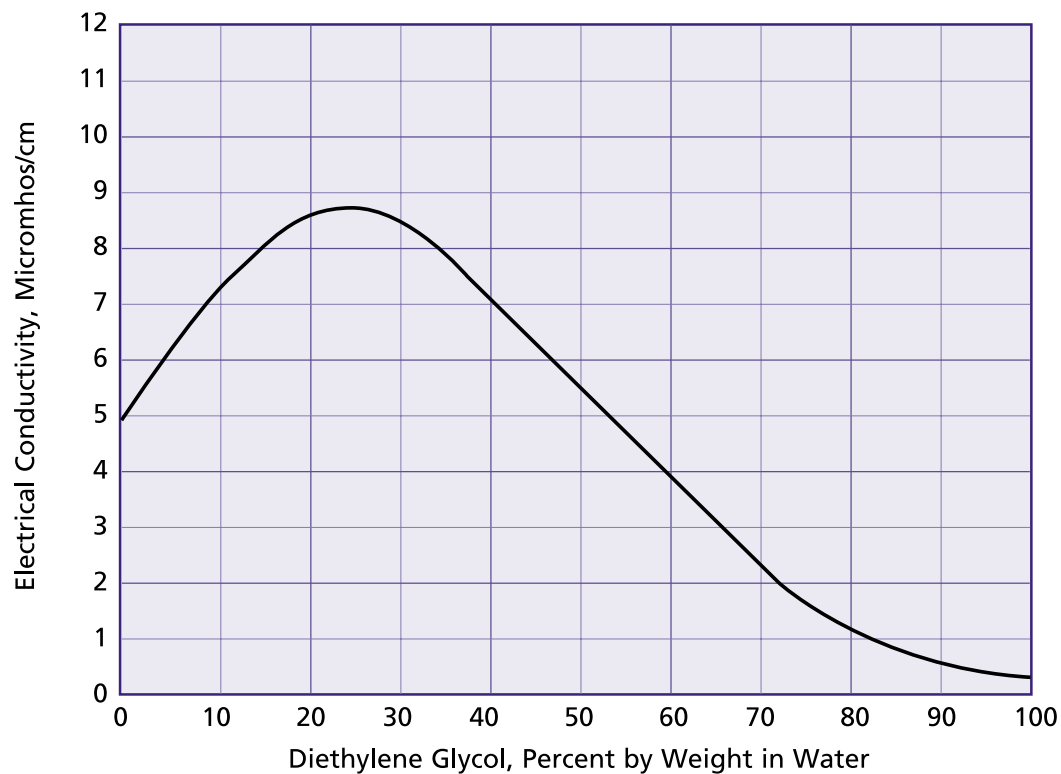


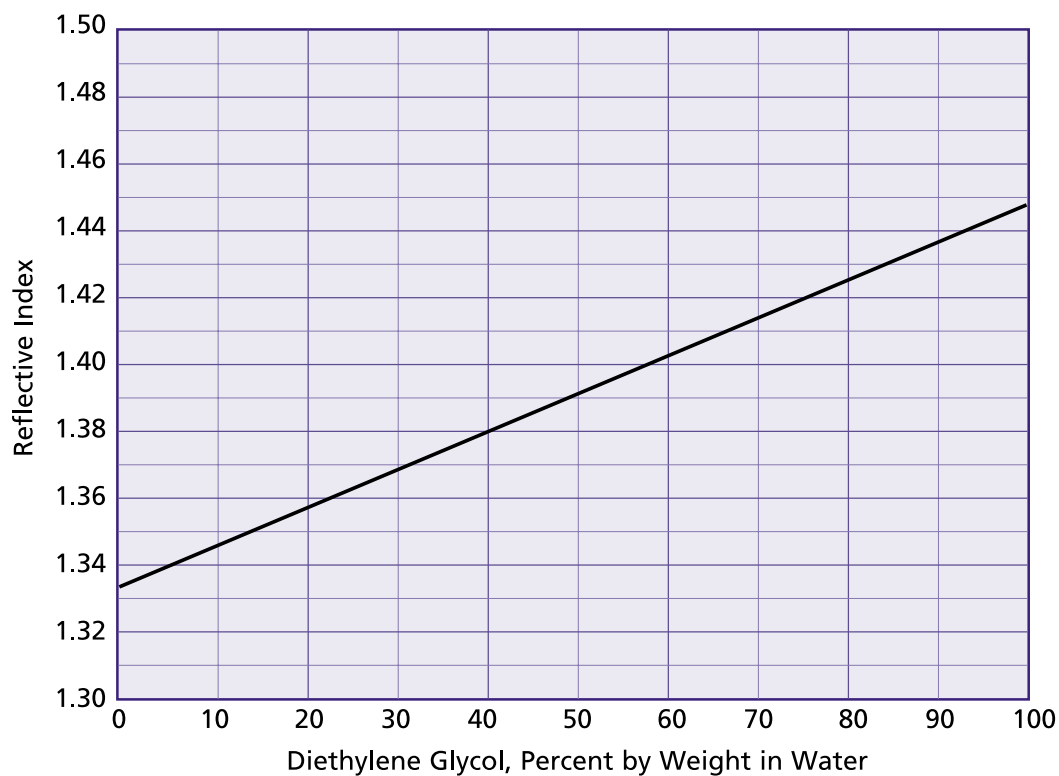


Figure 14: Electrical Conductivities of Aqueous Diethylene Glycol Solutions



Note: The quality of water used for dilution can significantly affect the electrical conductivity.

Figure 15: Refractive Indices of Aqueous Diethylene Glycol Solutions at 77°F (25°C)



Refractive Index, 77°F (25°C) =  $1.3326 + 0.0011572x$   
x = Weight % Diethylene Glycol

## Health Effects

Diethylene glycol can be harmful or fatal if misused. See our Safety Data Sheet for exposure limits, health, first aid and toxicology information..

## Environmental Information

See our current Safety Data Sheet for toxicity information.

## Biodegradation

For information concerning the biodegradability of diethylene glycol, please refer to the latest Safety Data Sheet.

## Storage and Handling

This information is offered as a guide in planning bulk storage facilities for glycols. Glycols are generally considered to be stable, non-corrosive chemicals with high flash points. Under ordinary conditions, all of these chemicals can be stored in mild steel vessels. For long-term storage, or if trace iron contamination and the development of color are objectionable in any of the glycols, a storage vessel lined with a baked-phenolic resin, an air-drying epoxy-phenolic resin or a vinyl resin, or a stainless steel or aluminum tank is suggested. Zinc or galvanized iron is not recommended and copper or copper alloys may cause product discoloration.

It is not general practice to use an inert gas in the vapor space of glycol storage tanks because all chemicals in this family have high boiling points and the vapors in the tanks are relatively non-flammable. However, if extremely low water content is required, consistent with a long storage period, a nitrogen blanket can be used on all storage tanks to protect product quality, specifically, the moisture content. If steel tanks are used for storage, the tank should be sand blasted and maintained under a nitrogen blanket. Blanketing with nitrogen will also minimize low-level oxidation. The inert gas minimizes air oxidation to maintain product within acidity specifications. Increased acidity enhances iron pickup from steel vessels. Alternatively, a desiccant unit can be installed on the tank vent line to dry incoming air.

If above-ground outside storage is planned, it may be necessary to install provisions for heating tanks and lines. Many glycols have a moderately high freezing point or become relatively viscous at severe winter temperatures. However, excessive temperatures can cause undesirable degradation of glycols. Automatic controls are suggested to limit the temperature of the contents to 120°F (49°C).

In cold climates, it is generally desirable to make provisions for draining the pump and the transfer lines if they are outside the building. If this is not feasible, it may be necessary to insulate and steam trace or otherwise heat the transfer lines to prevent freezing of the product. Care must be taken in such an application because continued exposure of glycols to high temperatures (greater than 120°F [49°C]) will result in product degradation. Transfer piping of mild steel is generally used.

## Shipping Data for Diethylene Glycol

Weight per Gallon at 20°C	9.31 lb
Coefficient of Expansions at 55°C	0.00067
Flash Point, Pensky-Martens Closed Cup	310°F

## Net Contents and Type of Container

1-Gallon Tin Can	9.0 lb
5-Gallon DOT 17E, Pail	47 lb
55-Gallon DOT 17E, Drum	520 lb

Diethylene glycol is not regulated by the U.S. Department of Transportation, therefore, it does not have a DOT shipping name, hazard classification, DOT warning label, or identification number.

## Product Safety

When considering the use of diethylene glycol in a particular application, review and understand our current Safety Data Sheet for the necessary safety and environmental health information. For Safety Data Sheets and other product safety information on MEGlobal products, contact the MEGlobal sales office nearest you or visit [www.meglobal.biz](http://www.meglobal.biz). Before handling any products mentioned in this booklet, you should obtain the available product safety information from the suppliers of those products and take the necessary steps to comply with all precautions regarding the use of diethylene glycol.

No chemical should be used as, or in, a food, drug, medical device or cosmetic, or in a product process in which it may come in contact with a food, drug, medical device or cosmetic until the user has determined the suitability of the use. Because use conditions and applicable laws may differ from one location to another and may change with time, the customer is responsible for determining whether products and the information in this document are appropriate for the customer's use and for ensuring that workplace and disposal practices are in compliance with applicable laws and other governmental enactments.

MEGlobal requests that the customer read, understand and comply with the information contained in this publication and the current Safety Data Sheet(s). The customer should furnish the information in this publication to its employees, contractors and customers, or any other users of the product(s), and request that they do the same.

## Emergency Service

MEGlobal maintains around-the-clock emergency services for its products through organizations such as The American Chemistry Council (CHEMTREC), Transportation Canada (CANUTEC) and the other Chemical Emergency Agency service providers (INFOTRAC, NRCC, CLEAN HARBORS, SGS).

Location	MEGlobal Products
United States	Phone CHEMTREC: +1 800-424-9300
Canada and Latin America	Phone CHEMTREC: +1 703-527-3887
Mainland China	NRCC: +86-532-8388-9090
	Asia Pacific (Excluded China) +65-3165-2217
Continental Europe, Middle East, Turkey, India and Asia Pacific (excluding China)	Europe, Turkey, Middle East +44-1865-407333  Korea +65-3158-1285  Taiwan +886-2-8793-3212
If you are at sea	Radio U.S. Coast Guard, who can directly contact CHEMTREC: +1 800-424-9300



**DO NOT WAIT. Phone if in doubt. You will be referred to a specialist for advice.**

## Sales Office

For additional information, contact our Customer Service Center:

## Customer Service

Geographical Area	Phone
North and South America	+1 844-634-5622
Asia	+65 6303-8946
Europe	+31 20-209-1522
Middle East India Pakistan	+965-2393-5744

NOTICE: No freedom from any patent owned by Seller or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.