



## Glycol Ether & Solvents Selection Guide

For Home and Institutional Care Applications

### Description

Dow has one of the world's largest glycol ether solvent portfolios for use in home and institutional care applications. This guide is intended to provide you with a means of determining which of these Dow glycol ether solvents is best matched to your formulation objectives. For examples, fast evaporators are good for window cleaners, slow evaporators are better for fragrance release and very slow evaporators work well in oven cleaners.

### P-Series Glycol Ethers

P-Series glycol ethers are propylene oxide-based, more hydrophobic, have lower surface tension and lower toxicity, and work well in higher pH systems.

Product	Chemical Nomenclature	VOC Exempt (vapor pressure <0.1 mm Hg @ 20°C)	Vapor Pressure (mm Hg @ 20°C)	Evaporation Rate (nBU/ Ac=1)	Flash Point (°F/°C)	Surface Tension (dynes/cm)	Hansen Solubility Parameters (J/cm <sup>3</sup> ) <sup>1/2</sup>			Solubility in water (wt. %)	US EPA Listing
							delta d	delta p	delta h		
DOWANOL™ DPnP Glycol Ether	Dipropylene Glycol n-Propyl Ether	YES	0.08	0.014	190/88	27.8	15.0	2.9	9.2	19.6	
DOWANOL™ DPnB Glycol Ether	Dipropylene Glycol n-Butyl Ether	YES	0.04	0.006	212/100	28.4	14.8	2.5	8.7	4.5	Non-food use
DOWANOL™ PnB Glycol Ether	Propylene Glycol n-Butyl Ether	NO	0.85	0.093	145/63	27.5	14.5	4.2	10.5	5.5	
DOWANOL™ PnP Glycol Ether	Propylene Glycol n-Propyl Ether	NO	1.5	0.21	118/48	25.4	15.3	4.9	11.2	∞	
	<b>Applications</b>	Air fresheners and fragrances, cleaner formulations such as glass cleaners, hard surface cleaners, floor cleaners, rust removers, industrial cleaners, and metal cleaners									
DOWANOL™ TPnB Glycol Ether	Tripropylene Glycol n-Butyl Ether	YES	0.002	0.0004	259/126	29.7	14.8	1.7	7.9	4.5	
DOWANOL™ PPh Glycol Ether	Propylene Glycol Phenyl Ether	YES	0.01	0.002	247/119	38.1	17.4	5.3	11.5	1.5	Non-food use
DOWANOL™ DiPPH Glycol Ether	Dipropylene Glycol Phenyl Ether	YES	<0.002	0.0002	280/138	37.7	17.6	5.9	10.7	1.0	
	<b>Applications</b>	Cleaner formulations such as glass cleaners, hard surface cleaners, floor cleaners, rust removers, industrial cleaners, and metal cleaners									
PROGLYDE™ DMM Glycol Ether	Dipropylene Glycol Dimethyl Ether	NO	0.55	0.13	149/65	26.3	14.9	2.1	3.8	35.0	
	<b>Applications</b>	Hard surface/bleach (sodium hypochlorite based) containing cleaners, compatible over wide pH range, and fragrances and air fresheners									

## P-Series Glycol Ethers (cont'd)

Product	Chemical Nomenclature	VOC Exempt	Vapor	Evaporation Rate	Flash Point	Surface Tension	Hansen Solubility Parameters (J/cm <sup>3</sup> ) <sup>1/2</sup>			Solubility in water (wt. %)	US EPA Listing
		(vapor pressure <0.1 mm Hg @ 20°C)	Pressure (mm Hg @ 20°C)				(nBU/ Ac=1)	delta d	delta p		
DOWANOL™ PM Glycol Ether	Propylene Glycol Methyl Ether	NO	8.7	0.62	88/31	27.7	15.6	7.2	13.6	∞	Non-food use
DOWANOL™ PMA Glycol Ether	Propylene Glycol Methyl Ether Acetate	NO	2.8	0.33	108/42	28.9	15.6	5.6	9.8	16.0	
<b>Applications</b>		Glass cleaners, hard surface cleaners, degreasers, floor cleaners, rust removers, industrial cleaners, and metal cleaners									
DOWANOL™ DPM Glycol Ether	Dipropylene Glycol Methyl Ether	NO	0.28	0.035	167/75	28.8	15.5	4.0	10.3	∞	Non-food use
DOWANOL™ DPMA Glycol Ether	Dipropylene Glycol Methyl Ether Acetate	YES	0.08	0.015	187/86	27.3	16.3	4.9	8.0	16.0	
DOWANOL™ TPM Solvent	Tripropylene Glycol Methyl Ether	YES	0.01	0.0026	250/121	30.0	15.1	2.5	8.7	∞	Non-food use
<b>Applications</b>		Air fresheners and fragrances, and hard surface cleaners									

## Performance Series Glycol Ethers

Performance Series Glycol Ethers and are ethylene oxide-based, more water soluble and are slightly stronger solvents.

Product	Chemical Nomenclature	VOC Exempt	Vapor	Evaporation Rate	Flash Point	Surface Tension	Hansen Solubility Parameters (J/cm <sup>3</sup> ) <sup>1/2</sup>			Solubility in water (wt. %)	US EPA Listing
		(vapor pressure <0.1 mm Hg @ 20°C)	Pressure (mm Hg @ 20°C)				(nBU/ Ac=1)	delta d	delta p		
HEXYL CELLOSOLVE™ Solvent	Ethylene Glycol Hexyl Ether	YES	0.038	<0.01	198/92	27.7	16.0	6.9	10.9	0.88	Non-food use
HEXYL CARBITOL™ Solvent	Diethylene Glycol Hexyl Ether	YES	0.001	<0.01	275/135	29.2	16.0	6.0	10.0	2.0	
Propyl CELLOSOLVE™ Solvent	Ethylene Glycol Propyl Ether	NO	1.6	0.2	124/51	26.3	16.1	8.0	13.1	∞	
DOWANOL™ DiEPh Solvent	Diethylene Glycol Phenyl Ether	YES	<0.002	0.0002	280/138	37.7	16.4	6.7	11.6	4.0	
DOWANOL™ EPh Solvent	Ethylene Glycol Phenyl Ether	YES	0.004	0.001	250/121	42.0	17.8	5.7	14.3	2.5	
DOWANOL™ EPh6 Solvent	Poly(oxy-1,2-ethanediyl), alpha-phenyl- omega-hydroxy	YES	<0.0001	<0.0001	>300/>149	45.2	17.4	6.6	10.6	∞	
<b>Applications</b>		Used in a variety of cleaning applications such as household cleaners, industrial cleaners, laundry prewash stain removers, metal cleaners and rust removers									

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## E-Series Glycol Ethers

E-Series glycol ethers are ethylene oxide-based, more water soluble, and slightly stronger solvents.

Product	Chemical Nomenclature	VOC Exempt	Vapor	Evaporation Rate	Flash Point	Surface Tension	Hansen Solubility Parameters (J/cm <sup>3</sup> ) <sup>1/2</sup>			Solubility in water (wt. %)	US EPA Listing
		(vapor pressure <0.1 mm Hg @ 20°C)	Pressure (mm Hg @ 20°C)				(nBU/ Ac=1)	delta d	delta p		
CARBITOL™ Solvent (DE)	Diethylene Glycol	YES	0.09	0.013	205/96	31.8	16.1	9.2	12.2	∞	40 CFR 180.940*
	Ethyl Ether										
Butyl CARBITOL™ Solvent (BuCb)	Diethylene Glycol n-	YES	<0.028	0.004	210/99	30.0	16.0	7.0	10.6	∞	Non-food use
	Butyl Ether										
Butyl CELLOSOLVE™ Solvent (BuCs)	Ethylene Glycol n-	NO	0.66	0.079	149/65	27.4	16.0	7.6	12.3	∞	40 CFR 180.940*
	Butyl Ether										

**Applications** Used as solvent and coupling agents in household and industrial cleaners. This coupling ability can help enhance product performance and shelf life

\* 180.940 tolerance exemptions for active and inert ingredients for use in antimicrobial formulations (food contact surface sanitizing solutions). Also approved for non-food contact.

These properties are typical but do not constitute specifications. For product specifications, please contact Customer Information Group (CIG) of The Dow Chemical Company: <http://www.dow.com/assistance/dowcig.htm>.

## Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

## Safety Data Sheet

Before using this product, consult the Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

## Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations.

Contact your Dow Technical Representative for more information.

## Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products—from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

## Medical Applications Policy

NOTICE REGARDING MEDICAL APPLICATION RESTRICTIONS: Dow will not knowingly sell or sample any product or service ("Product") into any commercial or developmental application that is intended for:

- long-term or permanent contact with internal body fluids or tissues. "Long-term" is contact which exceeds 72 continuous hours;
- use in cardiac prosthetic devices regardless of the length of time involved ("cardiac prosthetic devices" include, but are not limited to, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass-assisted devices);
- use as a critical component in medical devices that support or sustain human life; or
- use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

Dow requests that customers considering use of Dow products in medical applications notify Dow so that appropriate assessments may be conducted. Dow does not endorse or claim suitability of its products for specific medical applications. It is the responsibility of the medical device or pharmaceutical manufacturer to determine that the Dow product is safe, lawful, and technically suitable for the intended use. DOW MAKES NO WARRANTIES, EXPRESS OR IMPLIED, CONCERNING THE SUITABILITY OF ANY DOW PRODUCT FOR USE IN MEDICAL APPLICATIONS.

## Regulatory Information

If your application includes a sensitive application such as food contact or drinking water requirements or if you need other regulatory information, please contact your local Dow representative.

## Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including Safety Data Sheets, should be consulted prior to use of Dow products. Current Safety Data Sheets are available from Dow.

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