

P-3500 LCD MB

UDEL polysulfone is a tough, rigid, high-strength thermoplastic suitable for continuous use up to 150°C. UDEL grade P-3500 LCD MB is well suited for the fabrication of porous membranes. Typical membrane forms include hollow fibers, tubes, and flat sheets. These are used in a variety of filtration applications, such as treating water, purifying pharmaceuticals, separating gases, processing blood, and processing dairy or food products. Several molecular weight variants of this material are available.

This resin is soluble in commercially available, water-miscible, dipolar, aprotic solvents, like dimethylacetamide (DMAC), dimethylformamide (DMF), and N-methylpyrrolidone (NMP). This material offers membrane producers very good control of pore size and pore size distribution, high membrane strength, and good film-forming properties.

The advantages of UDEL P-3500 LCD MB are attributed to the lower level of cyclic dimer present in the polymer. Cyclic dimer, normally produced during the manufacturing of polysulfone, can

lead to 'scaling' within the vessels and pipes used in the membrane manufacturing process. This build-up can cause disruptions in operations since equipment may need to be shut down and cleaned. UDEL P-3500 LCD MB can improve the stability and shelf life of the dope solution used during solution processing, which may translate to greater efficiencies in the overall fabrication process.

In addition, this resin offers higher fiber strength and fewer surface defects, leading to less fiber breakage and more consistent filtration. These factors improve membrane-production yield and membrane performance.

The resultant membranes have excellent hydrolytic stability and are compatible with pH's ranging from 2 to 13. They tolerate a variety of cleaning methods, including hydrochloric acid or sodium hydroxide. The resin has a T_g of 185°C indicating high thermal resistance.

Typical Properties of UDEL P-3500 LCD MB Resin

Properties	ASTM Test Method	Typical Values ⁽¹⁾			
		U.S. Customary units		SI units	
		Value	Units	Value	Units
General					
Specific Gravity	D 792	1.24		1.24	
Water Absorption, 24 hours	D 570	0.30	%	0.30	%
Mechanical					
Tensile Strength	D 638	10.2	kpsi	70.3	MPa
Tensile Modulus	D 638	360	kpsi	2.48	GPa
Tensile Elongation at Break	D 638	50-100	%	50-100	%
Flexural Strength	D 790	15.4	kpsi	106.2	MPa
Flexural Modulus	D 790	390	kpsi	2.69	GPa
Tensile Impact Strength	D 1822	200	ft-lb/in ²	420	kJ/m ²
Impact Strength- Notched Izod	D 256	1.3	ft-lb/in	69	J/m
Thermal					
Deflection Temperature at 264 psi (1.8 MPa)	D 648	345	°F	174	°C
Coefficient of Thermal Expansion	D 696	31	µin/in°F	56	µm/m°C
Chemical Resistance		Rating	Key to Ratings		
n-Butane		G	E = Excellent, no change in properties.		
Benzene/Toluene		SA	G = Good, minor attack, no serious loss of properties.		
Ethanol		G	F = Fair, some attack, some useful properties retained.		
Methyl Ethyl Ketone		SA	SA = Severe attack or rupture.		
1,1,1-Trichloroethane		SA	D = Dissolves.		
Hydrochloric Acid (20%)		E			
Sodium Hydroxide (10%)		E			
N-methylpyrrolidone		D			

⁽¹⁾ Actual properties of individual batches will vary within specification limits.

Drying

UDEL P-3500 polysulfones may be dried before preparing solutions. Pellets can be dried in a circulating hot air oven, by spreading the pellets on trays to a 1-2 inch depth and drying for 3.5 hours at 275° to 325°F (135° to 163°C).

Solution Processing

UDEL P-3500 LCD MB resin can be dissolved in dipolar aprotic solvents such as dimethylformamide (DMF), dimethylacetamide (DMAC), and N-methylpyrrolidone (NMP).

The resulting viscous solutions can then be used in the production of coatings, films, and membranes. Additives, such as polyvinyl pyrrolidone, polyethylene glycol, and butanol can be easily incorporated into these solutions.

Standard Packaging and Labeling

UDEL P-3500 LCD MB polysulfone resin is packaged in multiwall paper bags containing 55.115 pounds (25 kg) of material. Special packaging can be supplied upon request. Individual packages will be plainly marked with the product number, the color, the lot number, and the net weight.

Precautionary Labeling

On the basis of the toxicological, physical, and chemical properties of UDEL P-3500 LCD MB polysulfone resin, labeling used on containers is as follows:

Caution! Handling and/or processing this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose, and throat.

Product Safety and Emergency Service

For product safety information or a Material Safety Data Sheet on a product of Solvay Advanced Polymers

1 (800) 621-4557
1 (770) 772-8880 outside of U.S.

For information or help in an emergency such as a spill, leak, fire or explosion, call day or night:

Emergency Health Information

1 (800) 621-4590
1 (770) 772-5177 outside of U.S.

Emergency Spill Information

CHEMTREC 1 (800) 424-9300
1 (703) 527-3887 outside of U.S.
collect calls accepted

For Additional Information

Technical Service

1 (800) 621-4557

Customer Service

1 (800) 848-9744

UDEL is a registered trademark of Solvay Advanced Polymers, L.L.C.

To our actual knowledge, the information contained herein is accurate as of the date of this document. However, neither Solvay Advanced Polymers, L.L.C. nor any of its affiliates makes any warranty, express or implied, or accepts any liability in connection with this information or its use. This information is for use by technically skilled persons at their own discretion and risk and does not relate to the use of this product in combination with any other substance or any other process. This is not a license under any patent or other proprietary right. The user alone must finally determine suitability of any information or material for any contemplated use, the manner of use and whether any patents are infringed. This information gives typical properties only and is not to be used for specification purposes. Solvay Advanced Polymers, L.L.C. reserves the right to make additions, deletions, or modifications to the information at any time without prior notification.