DERAKANE 470-300 Epoxy Vinyl Ester Resin

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Epoxy Novolac-Based Vinyl Ester Resin

DERAKANE 470-300 resin is a novolac-based epoxy vinyl ester designed to provide exceptional mechanical properties at higher temperatures. This resin offers a high resistance to solvents and chemicals, good retention of strength and toughness at elevated temperatures, and excellent resistance to acidic oxidizing environments.

Typical Liquid Resin Properties

Property[1]	Value
Density, 25°C/77°F	1.08 g/mL
Dynamic Viscosity, 25°C/77°F	325 mPa·s
Kinematic Viscosity	300 cSt
Styrene Content	33%
Shelf Life[2], Dark, 25°C/77°F	4 months

(1) Typical property values only, not to be construed as specifications.
(2) Unopened drum with no additives, promoters, accelerators, etc. added. Shelf life specified from date of manufacture.

Applications and Fabrication Techniques

- Suitable for such applications as high temperature chlorination or caustic scrubbing and storage, industrial waste treatment facilities and solvent/extraction processes used in mining.
- Used for hydrochloric acid transport, tank, truck and railcar linings and gasohol storage.
- Recommended for most commercial FRP fabrication processes: hand lay-up, spray-up, pultrusion and resin transfer molding.
- Higher viscosity compared to DERAKANE 470-36 resin also facilitates filament winding and contact molding fabrications.
- For even higher temperature applications, DERAKANE 470HT-400 resin can be used.

Benefits

- An economical alternative to exotic alloys by allowing the use of lower-cost FRP over traditional materials.
- Resists solvents, chemicals, and acidic oxidizing environments to provide long lasting, reliable equipment for corrosive materials.
- Retains strength and toughness at elevated temperatures which enables users to operate the equipment in a variety of applications.
- Contains only 33 weight percent styrene, resulting in reduced styrene emissions and allows fabricators to meet California's South Coast Air Quality Management District Rule 1162.

Gel Time Formulations

The following table provides typical gel times for Cumene Hydroperoxide (CHP or CuHP). "Starting point" formulations for MEKP and BPO peroxides are available in separate product bulletins. These and other information are available at www.derakane.com.

MEKP Gel Time Table

Typical Gel Times(3) Using K-90 CHP(4) and Cobalt Naphthenate-6%(5)

Temperature	15 +/-5 Minutes	30 +/-10 Minutes	60 +/-15 Minutes
18°C/65°F		2.0 phr(6) CHP 0.30 phr CoNap6% 0.20 phr DMA	2.0 phr CHP 0.20 phr CoNap6% 0.05 phr DMA
24°C/75°F	1.5 phr CHP 0.30 phr CoNap6% 0.15 phr DMA	1.5 phr CHP 0.20 phr CoNap6% 0.05 phr DMA	1.0 phr CHP 0.20 phr CoNap6%
30°C/85°F	1.0 phr CHP 0.30 phr CoNap6% 0.10 phr DMA	2.0 phr CHP 0.10 phr CoNap6%	1.0 phr CHP 0.10 phr CoNap6%

(3) Thoroughly test any other materials in your application before full-scale use. Gel times may vary due to the reactive nature of these products. Always test a small quantity before formulating large quantities.
(4) Materials: Akzo Nobel K-90 CHP or equivalent peroxide system, Cobalt Naphthenate-6% (CoNap6%), Dimethylaniline (DMA), and 2,4-Pentanedione (2,4-P).
(5) Use of cobalt octoate, especially in combination with 2,4-P can result in 20-30% slower gel times.
(6) phr=parts per hundred resin molding compound

Casting Properties

Typical Properties(1) of Postcured(7) Resin Clear Casting

Property	SI	US Standard	Test Method
Tensile Strength	85 MPa	12,500 psi	ASTM D-638/ISO 527
Tensile Modulus	3.6 GPa	5.2 x 10^5 psi	ASTM D-638/ISO 527
Tensile Elongation, Yield	3-4%	3-4%	ASTM D-638/ISO 527
Flexural Strength	130 MPa	19,000 psi	ASTM D-790/ISO 178
Flexural Modulus	3.8 GPa	5.5 x 10^5 psi	ASTM D-790/ISO 178
Density	1.17 g/cm^3		ASTM D-792/ISO 1183
Volume Shrinkage	8.3%	8.3%	
Heat Distortion Temperature(8)	150°C	300°F	ASTM D-648 Method A/ISO 75
Glass Transition Temperature, Tg2	165°C	330°F	ASTM D-3419/ISO 11359-2
Barcol Hardness	40	40	ASTM D-2583/EN59

(1) Typical property values only, not to be construed as specifications. SI values reported to two significant figures; US standard values based on conversion.
(7) Cure schedule: 24 hours at room temperature; 2 hours at 120°C (250°F)
(8) Maximum stress: 1.8 MPa (264 psi)

Laminate Properties

Typical Properties[1] of Postcured[9] 6 mm (1/4") Laminate[10]

Property	SI	US Standard	Test Method
Tensile Strength	130 MPa	19,000 psi	ASTM D-3039/ISO 527
Tensile Modulus	12 GPa	1.7 x 10^6 psi	ASTM D-3039/ISO 527
Flexural Strength	210 MPa	30,000	ASTM D-790/ISO 178
Flexural Modulus	8.5 GPa	1.2 x 10^6 psi	ASTM D-790/ISO 178
Glass Content	40%	40%	ASTM D-2584/ISO 1172

(1) Typical property values only, not to be construed as specifications. SI values reported to two significant figures; US standard values based on conversion.
(9) Cure schedule: 24 hours at room temperature; 6 hours at 80°C (175°F)
(10) 6 mm (1/4") Construction – V/M/M/Wr/M/Wr/M
V = Continuous veil glass; M = Chopped strand mat, 450 g/m^2 (1.5 oz/ft^2);
Wr = Woven roving, 800 g/m^2 (24 oz/yd^2)

Safety and Handling Consideration

This resin contains ingredients which could be harmful if mishandled. Contact with skin and eyes should be avoided and necessary protective equipment and clothing should be worn.

Ashland maintains Material Safety Data Sheets on all of its products. Material Safety Data Sheets contain health and safety information for your development of appropriate product handling procedures to protect your employees and customers.

Our Material Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Ashland's products in your facilities.

Recommended Storage:

Drums - Store at temperatures below 27°C/80°F. Storage life decreases with increasing storage temperature. Avoid exposure to heat sources such as direct sunlight or steam pipes. To avoid contamination of product with water, do not store outdoors. Keep sealed to prevent moisture pick-up and monomer loss. Rotate stock.

Bulk - See Ashland's Bulk Storage and Handling Manual for Polyesters and Vinyl Esters. A copy of this may be obtained from Composite Polymers at 1.614.790.3333.

Product Name	Product Code	Standard Package*
470-300	536-007	55-Gal Drum, Net Weight 452 Lbs. 210 Liter, Net Weight 205 Kg *Non-Returnable

Responsible Care*

Ashland is committed to the continuous evolution of technology and service solutions that promote health, safety and environmental protection around the world.

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