

DERAKANE 470-36 Epoxy Vinyl Ester Resin

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Epoxy Vinyl Ester Resin

DERAKANE 470-36 epoxy vinyl ester resin is an epoxy novolac-based resin designed to provide exceptional thermal and chemical resistance 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	240 mPa·s
Kinematic Viscosity	220 cSt
Styrene Content	36%
Commercial Warranty ⁽²⁾ , Dark, 25°C/77°F	3 months

- (1) Typical property values only, not to be construed as specifications.
 (2) When stored in accordance with the recommended storage, Ashland warrants this product to remain within specifications for three months from date of manufacture. All things being equal, higher storage temperatures will reduce product stability and lower storage temperatures will extend product stability.

Applications and Fabrication Techniques

- Suitable for such applications as high temperature flue gas desulphurization processes, industrial waste treatment facilities, metal pickling and solvent extraction processes used in mining.
- Recommended for most FRP fabrication processes: hand lay-up, spray-up, pultrusion, infusion and resin transfer molding. If a higher viscosity is needed, DERAKANE MOMENTUM™ 470-300 resin can be used.
- For applications where additional heat resistance is required, a DERAKANE 470HT-400 resin can be considered.

Benefits

- Provides an economical alternative to exotic alloys by allowing the use of lower-cost FRP over traditional materials.
- Resists solvents, chemicals and acidic environments to provide long lasting, reliable equipment for corrosive materials.
- Retains strength and toughness at elevated temperatures, enabling users to operate equipment in a variety of applications.
- Backed by many years of successful use in heavy duty industrial applications.
- Low viscosity makes it suitable for use in vacuum infusion processes.



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Gel Time Formulations

The following table provides typical gel times for cumene hydroperoxide (CHP). "Starting point" formulations for methylethylketone peroxides (MEKP) or benzoyl peroxides (BPO) may be available at www.derakane.com.

CHP Gel Time Table

Typical Gel Times⁽³⁾ Using Cumyl Hydroperoxide⁽⁴⁾ and Cobalt Naphthenate-6%⁽⁵⁾

Temperature	15 +/-5 Minutes	30 +/-10 Minutes	50 +/-10 Minutes
15°C/59°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
25°C/77°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	1.5 phr CHP 0.20 phr CoNap6%
30°C/86°F	1.0 phr CHP 0.30 phr CoNap6% 0.10 phr DMA	2.0 phr CHP 0.10 phr CoNap6%	1.5 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: TRIGONOX⁽⁷⁾ K-80 cumyl hydroperoxide (CHP) or equivalent, cobalt naphthenate-6% (CoNap6%), dimethylaniline (DMA), and 2,4-pentanedione (2,4-P). Use of other peroxides or other additives may result in different gel time results.
- (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
- (7) Registered trademark of Akzo Chemie

Casting Properties

Typical Properties⁽¹⁾ of Postcured⁽⁸⁾ Resin Clear Casting

Property	SI	US Standard	Test Method
Tensile Strength	90 MPa	13,000 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	160 MPa	23,000 psi	ASTM D-790/ISO 178
Flexural Modulus	3.8 GPa	5.5 x 10 ⁵ psi	ASTM D-790/ISO 178
Density	1.15 g/cm ³		ASTM D-792/ISO 1183
Volume Shrinkage	8.9%	8.9%	
Heat Distortion Temperature ⁽⁹⁾	145°C	295°F	ASTM D-648 Method A/ISO 75
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.
- (8) Cure schedule: 24 hours at room temperature; 2 hours at 155°C (300°F)
- (9) Maximum stress: 1.8 MPa (264 psi)



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Laminate Properties

Typical Properties⁽¹⁾ of Postcured⁽¹⁰⁾ 6 mm (1/4") Laminate⁽¹¹⁾

Property	SI	US Standard	Test Method
Tensile Strength	120 MPa	17,000 psi	ASTM D-3039/ISO 527
Tensile Modulus	11 GPa	1.6 x 10 ⁵ psi	ASTM D-3039/ISO 527
Flexural Strength	165 MPa	24,000	ASTM D-790/ISO 178
Flexural Modulus	8.6 GPa	1.2 x 10 ⁵ 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.

(10) Cure schedule: 24 hours at room temperature; 6 hours at 80°C (175°F)

(11) 6 mm (1/4") Construction – V/M/M/Wr/M/Wr/M
 V = Continuous veil glass; M = Chopped strand mat, 450 g/m² (1.5 oz/ft²);
 Wr = Woven roving, 800 g/m² (24 oz/yd²)

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
470-36

Product Code
536-017

Standard Package*
55-Gal Drum, Net Weight 452 Lbs.
210 Liter, Net Weight 205 Kg
*Non-Returnable



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