



DERAKANE 8084

Epoxy Vinyl Ester Resin

High Elongation, Tough Epoxy Vinyl Ester Resin

DERAKANE* 8084 Epoxy Vinyl Ester Resin is an elastomer modified resin designed to offer increased adhesive strength, superior resistance to abrasion and severe mechanical stress, while giving greater toughness and elongation.

DERAKANE 8084 and DERAKANE 8090 Resins are the only epoxy vinyl esters available that offer this exceptional combination of properties.

Typical Liquid Resin Properties

Property ⁽¹⁾	Value
Density, 25 °C / 77 °F	1.02 g/mL
Dynamic Viscosity, 25 °C / 77 °F	360 mPa·s
Kinematic Viscosity	350 cSt
Styrene Content	40%
Shelf Life ⁽²⁾ , Dark, 25 °C / 77 °F	6 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

- DERAKANE* 8084 Resin is the resin of choice as a primer resin to prepare a substrate surface (steel or concrete) for application of a corrosion resistant lining.
- DERAKANE 8084 Resin can be use for RTM, hand-lay, spray-up, filament winding and other industrial FRP applications.
- For applications requiring even higher elasticity and impact resistance, DERAKANE 8090 Resin can be used.

Benefits

- DERAKANE 8084 Resin has exhibited chemical resistance across a broad range of acids, bases and organic chemicals.
- Resin of choice as a primer to prepare a substrate surface for application of a corrosion resistant lining. It exhibits outstanding adhesive strength on different types of steel, aluminum and concrete.
- Superior elongation and toughness provides FRP equipment with better impact resistance and less cracking due to cyclic temperature, pressure fluctuations, and mechanical shocks providing a safety factor against damage during process upsets or during shipping and installation.
- Has exhibited superior property retention under dynamic fatigue conditions.
- Approved for use in the manufacture of ships under a DNV (Det Norske Veritas) certificate.

Gel Time Formulations

The following table provides typical gel times for MEKP. "Starting point" formulations for non-foaming MEKP alternatives 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 Norox MEKP-925H^(4, 5) and Cobalt Naphthenate-6%⁽⁶⁾

Temperature	15 +/- 5 Minutes	30 +/- 10 Minutes	60 +/- 15 Minutes
18 °C / 65 °F	3.0 phr MEKP 0.6 phr CoNap6% 0.3 phr DMA	3.0 phr MEKP 0.4 phr CoNap6% 0.2 phr DMA	2.5 phr MEKP 0.4 phr CoNap6% 0.1 phr DMA
24 °C / 75 °F	2.0 phr MEKP 0.5 phr CoNap6% 0.3 phr DMA	2.0 phr MEKP 0.4 phr CoNap6% 0.2 phr DMA	1.5 phr MEKP 0.3 phr CoNap6% 0.05 phr DMA
30 °C / 85 °F	2.0 phr MEKP 0.3 phr CoNap6% 0.2 phr DMA	1.5 phr MEKP 0.3 phr CoNap6% 0.05 phr DMA	1.5 phr MEKP 0.3 phr CoNap6% 0.025 phr DMA

(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) phr = parts per hundred resin

(5) Materials: Norac Norox MEKP-925H Methyl ethyl ketone peroxide (MEKP) or equivalent low hydrogen peroxide content MEKP, Cobalt Naphthenate-6% (CoNap6%), Dimethylaniline (DMA), and 2,4-Pentanedione (2,4-P). Use of other MEKP or other additives may result in different gel time results.

(6) Use of cobalt octoate, especially in combination with 2,4-P, can result in 20 to 30 % slower gel times.

Casting Properties

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

Property	SI	US Standard	Test Method
Tensile Strength	76 MPa	11,000 psi	ASTM D-638; ISO 527
Tensile Modulus	2.9 GPa	4.2 x10 ⁵ psi	ASTM D-638; ISO 527
Tensile Elongation, Yield	8 to 10%	8 to 10%	ASTM D-638; ISO 527
Flexural Strength	130 MPa	19,000 psi	ASTM D-790; ISO 178
Flexural Modulus	3.3 GPa	4.8 x10 ⁵ psi	ASTM D-790; ISO 178
Density	1.14 g/cm ³		ASTM D-792; ISO 1183
Volume shrinkage	8.2%	8.2%	
Heat Distortion Temperature, HDT ⁽⁸⁾	82°C	180°F	ASTM D-648 Method A; ISO 75
Glass Transition Temperature, Tg ₂	115°C	239°F	ASTM D-3419; ISO 11359-2
IZOD Impact (unnotched)	480 J/m	8.9 ft.lbf/inch	ASTM D-256
Barcol Hardness	30	30	ASTM D-2583; EN 59

Laminate Properties

Typical Properties⁽¹⁾ of Postcured⁽⁹⁾ 6 mm (¼ in) Laminate⁽¹⁰⁾

Property	SI	US Standard	Test Method
Tensile Strength	200 MPa	29,000 psi	ASTM D-3039, ISO 527
Tensile Modulus	9.8 GPa	14.0 x10 ⁵ psi	ASTM D-3039, ISO 527
Flexural Strength	190 MPa	28,000 psi	ASTM D-790, ISO 178
Flexural Modulus	7.8 GPa	11.0 x10 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.

(7) Cure schedule: 24 hours at room temperature; 2 hours at 99 °C (210 °F)

(8) Maximum stress: 1.82 MPa (264 psi)

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

(10) 6 mm (¼ in) Construction – V/M/MWr/MWr/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 Considerations

Material Safety Data Sheets: MSDS for DERAKANE* and DERAKANE* MOMENTUM* Epoxy Vinyl Ester Resins are available from Dow from the contact information below. The MSDS should be read and utilized to help users meet their own handling needs and those required by OSHA or other government agencies. The following comments pertain to all DERAKANE and DERAKANE MOMENTUM Resin products and are general guidelines only.

Personnel Protection: When using DERAKANE Resins, minimize human contact with resins, initiators, and other modifiers. Appropriate eye and skin/body protection should be worn to avoid contact as detailed in the MSDS. Use sufficient ventilation to control styrene monomer vapors below the applicable government regulated levels. For exposures above the regulated levels, air purifying respirators or self-contained breathing apparatus should be worn. DERAKANE Resins that are completely cured are considered to be toxicologically inert and to present no handling hazards. The finished parts may represent a health hazard from dust inhalation due grinding or machining, especially if they contain glass, silica or metal oxide powders and therefore appropriate respiratory protection should be used.

Spills: Trained personnel, properly protected from skin and eye contact and breathing vapors, should perform cleanup tasks. Prior to any cleanup, any possible sources of ignition should be removed. For smaller spills apply sand or other absorbent material onto the resin and shovel the mixture into a container. Larger spills should be contained with a dike and the excess resin collected in containers. Any residue resin should be removed from the floor with hot, soapy water. CAUTION: The use of solvents in the final cleanup can pose unnecessary hazards from breathing vapors and possible ignition.

Fires: DERAKANE Resins are classified as flammable materials under NFPA 30, so they must be stored and handled properly to prevent ignition. Fires can be extinguished by conventional means, including foam, dry chemical, and carbon dioxide but water is not normally effective.

NFPA Rating: Health=2 ; Flammability=3 ; Reactivity=1

Disposal: Any disposal practice must be in compliance with all federal, state/provincial, and local laws and regulations. State / provincial and local requirements for waste disposal may be more restrictive or different from federal laws and regulations. The preferred waste management option for unused, uncontaminated, unformulated, unaltered DERAKANE Resins is to send them to a licensed or permitted recycler, reclaimer, or incinerator. The same waste management options are recommended for used or contaminated material, although additional evaluation is required. DERAKANE Resins that are fully polymerized are considered to be toxicologically and ecologically inert and should be disposed of properly.

Resin Storage: DERAKANE Resins are stable for the shelf-life period stated on the label when stored in original, unopened containers at temperatures between 10-25 °C (50-75 °F) and in a dry place out of direct sunlight. Resins should be used within the shelf life stated on the drum label. Dow cannot honor any claims for credit on resin that has been stored beyond its stated shelf life or outside the recommended storage guidelines.

Customer Notice

Dow encourages its customers and potential users of Dow products to review their applications of such products from the standpoint of human health and environmental quality. To help ensure that Dow products are not used in ways for which they are not intended or tested, Dow personnel will assist customers in dealing with ecological and product safety considerations. Your Dow sales representative can arrange the proper contacts. Dow product literature, including Material Safety Data sheets, should be consulted prior to use of Dow products. These may be obtained from the Dow sales representative, by writing The Dow Chemical Company, or by calling one of the numbers listed below.

Contact Information:

North America: 800-441-4369
989-832-1426
Fax: 989-832-1465
Mexico: 95-800-441-4369
Latin America: 55-11-5188-9222
Fax: 55-11-5188-9749
Europe: 800-3-694-6367
32-3-450-2240
Fax: 32-3-450-2815
Pacific: 800-7776-7776
60-3-7958-3392
Fax: 60-3-7958-5598
China: 800-600-0015
Fax: 800-600-0017

<http://www.derakane.com>

Notice: No freedom from any patent owned by Dow or others is to be inferred. Dow assumes no obligation or liability for the information in this document. The information provided herein is presented in good faith and is based on the best of Dow's knowledge, information, and belief. Since use conditions at non-Dow facilities are beyond Dow's control and governmental regulations may differ from one location to another and may change with time, it is solely the Buyer's responsibility to determine whether Dow's products are appropriate for the Buyer's use, and to assure the Buyer's workplace, use, and disposal practices are in compliance with laws, regulations, ordinances, and other governmental enactments applicable in the jurisdiction(s) having authority over Buyer's operations. Consequently, Dow assumes no obligation or liability for use of these materials and makes no warranty, express or implied. The user of the information provided is solely responsible for compliance with any applicable federal, state, provincial, and local laws. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

