Technical Datasheet

Ashland Performance Materials

DERAKANE® EPOXY VINYL ESTER

DERAKANE® MOMENTUM 470-300 Epoxy Vinyl Ester Resin

DERAKANE MOMENTUM 470-300 resin is a novolac-based 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. DERAKANE MOMENTUM resins are a new generation of resins that can be used to improve fabrication efficiency and product quality. Their lighter color makes defects easier to see and correct while the resin is still workable. The longer stability provies additional flexibility to fabricators in storage and handling.

DERAKANE MOMENTUM 470-300 resin offers an economical alternative to exotic alloys by allowing the use of lower-cost FRP over traditional materials. This resin resists solvents, chemicals, and acidic oxidizing environments to provide long lasting, reliable equipment for corrosive materials (please contact us before using thixotropic agents and fillers. Addition of thixotropic agents and fillers can compromise corrosion resistance).

DERAKANE MOMENTUM 470-300 resin retains strength and toughness at elevated temperatures which enables users to operate the equipment in a variety of applications. It 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.

Note: Contact us before using thixotropic agents and fillers. Addition of thixotropic agents and fillers can compromise corrosion resistance.

APPLICATIONS AND USE

DERAKANE MOMENTUM 470-300 resin is suitable for applications involving high temperature chlorination or caustic scrubbing and storage, industrial waste treatment facilities and solvent extraction processes used in mining. It is also used for hydrochloric acid transport, tank, truck and railcar linings, and gasohol storage.

DERAKANE MOMENTUM 470-300 is recommended for most commercial FRP fabrication processes including hand lay-up, spray-up, pultrusion and resin transfer molding. The higher viscosity of MOMENTUM DERAKANE 470-300 resin facilitates filament winding and contact molding applications.

DERAKANE 470HT-400 resin can be used for even higher temperature applications.

Recommendations for specific services and environments can be provided by contacting us at derakane@ashland.com.

TYPICAL LIQUID RESIN PROPERTIES

Property[1] at 25°C (77°F)	Value	Unit
Dynamic Viscosity	325	mPa·s (cps)

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Kinematic Viscosity	300	cSt
Styrene Content	33	%
Density	1.08	g/ml

(1) Properties are typical values, based on material tested in our laboratories. Results may vary from sample to sample. Typical values should not be construed as a guaranteed analysis of any specific lot or as specification items.

TYPICAL CURING CHARACTERISTICS

The following tables provide typical(1) geltimes using TRIGONOX(2) 239A catalyst(3) or equivalent non-foaming MEKP alternative peroxide system, cobalt naphthenate or octoate-6%(4) (Cobalt6%) and 2,4-pentanedione (2,4-P). For pre-acceleration for prolonged storage (e.g. formulation of lining or flooring systems) either avoid DMA or DEA, or use DEAA (DiEthyl-AcetoAcetamide). For further information, please contact ASHLAND. This and other information are available at www.derakane.com.

Warning: Addition levels of less than 0.05% cobalt 6% may cause undercure under certain conditions. Please contact Ashland Technical Service for further details or if such low levels are envisaged.

Geltime at 15°C (59°F)	Trigonox 239A (phr)(5)	Cobalt6% (phr)
15 +/- 5 minutes	1.50	0.25
30 +/- 10 minutes	1.50	0.12
60 +/- 15 minutes	1.50	0.07

Geltime at 20°C (68°F)	Trigonox 239A (phr)	Cobalt6% (phr)
15 +/- 5 minutes	1.25	0.20
30 +/- 10 minutes	1.00	0.10
60 +/- 15 minutes	1.00	0.06

Geltime at 25°C (77°F)	Trigonox 239A (phr)	Cobalt6% (phr)	2,4-P (phr)
15 +/- 5 minutes	1.00	0.15	---
30 +/- 10 minutes	1.00	0.07	---
60 +/- 15 minutes	1.00	0.05	0.01

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Geltime at 30°C (86°F)	Trigonox 239A (phr)	Cobalt6% (phr)	2,4-P (phr)
15 +/- 5 minutes	1.00	0.10	---
30 +/- 10 minutes	1.0	0.05	0.01
60 +/- 15 minutes	1.0	0.05	0.04

Geltime at 35°C (95°F)	Trigonox 239A (phr)	Cobalt6% (phr)	2,4-P (phr)
15 +/- 5 minutes	1.00	0.05	---
30 +/- 10 minutes	1.00	0.05	0.02
60 +/- 15 minutes	1.00	0.05	0.07

(2) Registered trademark of Akzo Chemie Nederland B.V.
(3) "Catalyst" is TRIGONOX 239A, NOROX(6) CHM-50, SUPEROX(7) 763, or CHP-5.
(4) Use of cobalt octoate, especially in combination with 2,4-P can result in 20-30% slower gel times.
(5) phr = parts per hundred resin
(6) Registered trademark of Norac, Inc.
(7) Registered trademark of Syrgis Performance Initiators, Inc.

TYPICAL MECHANICAL PROPERTIES

Typical properties(1) of a cured casting(8) at 25°C (77°F).

Property of casting	Value (SI)	Method	Value (US)	Method
Tensile Strength	85 MPa	ISO 527	12,500 psi	ASTM D638
Tensile Modulus	3600 MPa	ISO 527	5.2 x 10^5 psi	ASTM D638
Tensile Elongation at Yield	3-4%	ISO 527	3-4%	ASTM D638
Flexural Strength	130 MPa	ISO 178	19,000 psi	ASTM D790
Flexural Modulus	3800 MPa	ISO 178	5.5 x 10^5 psi	ASTM D790
Density	1.17 g/cm³	ISO 1183		ASTM D792
Volume Shrinkage	8.3%		8.3%	
Heat Distortion Temperature(9)	150°C	ISO 75	300°F	ASTM D648
Glass Transition Temperature, Tg^2	165°C	ISO 11357	330°F	ASTM D3418
Barcol Hardness	40	EN 59	40	ASTM D2583

(8) Cure schedule: 24 hours at room temperature and 2 hours at 155°C (310°F).
(9) Maximum stress: 1.8 MPa (264 psi). HDT is measured on fully cured resin. Full cure may be achieved

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in different ways. One example is listed under footnote 8. In certain cases a higher post cure temperature or an adjusted curing formulation may be required.

Typical properties(1) of a postcured 6 mm (1/4") laminate(10) at 25°C (77°F).

Property of laminate	Value (SI)	Method	Value (US)	Method
Tensile Strength	130 MPa	ISO 527	19,000 psi	ASTM D3039
Tensile Modulus	12,000 MPa	ISO 527	1700 kpsi	ASTM D3039
Flexural Strength	210 MPa	ISO 178	30,000 psi	ASTM D790
Flexural Modulus	8500 MPa	ISO 178	1200 kpsi	ASTM D790
Glass Content	40%	ISO 1172	40%	ASTM D2584

(10) Cure schedule: 24 hours at room temperature and 6 hours at 80°C (175°F). Laminate construction of 6mm (1/4") is V/M/M/Wr/M/Wr/M where V=Continuous veil glass, M=Chopped strand mat 450 g/m^2 (1.5 oz/ft^2) and Wr=Woven roving 800 g/m^2 (24 oz/yd^2).

CERTIFICATES AND APPROVALS

The manufacturing, quality control and distribution of products, by Ashland Performance Materials, comply with one or more of the following programs or standards: Responsible Care, ISO 9001, ISO 14001 and OHSAS 18001.

STANDARD PACKAGE

Non-Returnable Drum with Net Wt. 205 Kg (452 Lb.)
DOT Label Requirement: Flammable Liquid

STORAGE

Drums - It is highly recommended that all material is stored at stable temperatures below 25°C (77°F). 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. Mild mixing is recommended after prolonged storage. Rotate stock.

Bulk - See Ashland's Bulk Storage and Handling Manual for Polyesters and Vinyl Esters. A copy of this may be obtained from Ashland at +1.614.790.3333 or 800.523.6963.

All things being equal, higher storage temperature will reduce product stability and lower storage temperature will extend product stability.

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COMMERCIAL WARRANTY	Ten months from date of manufacture, when stored in accordance with the conditions stated above.
Notice	All information presented herein is believed to be accurate and reliable, and is solely for the user's consideration, investigation and verification. The information is not to be taken as an express or implied representation or warranty for which Ashland assumes legal responsibility. Any warranties, including warranties of merchantability or non-infringement of intellectual property rights of third parties, are herewith expressly excluded. Since the user's product formulations, specific use applications and conditions of use are beyond the control of Ashland, Ashland makes no warranty or representation regarding the results which may be obtained by the user. It shall be the responsibility of the user to determine the suitability of any of the products mentioned for the user's specific application. Ashland requests that the user reads, understands and complies with the information contained herein and the current Material Safety Data Sheet.

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