Technical Datasheet

Ashland Performance Materials

DERAKANE® EPOXY VINYL ESTER

DERAKANE® MOMENTUM 510 C-350 Epoxy Vinyl Ester Resin

DERAKANE MOMENTUM® 510 C-350 is a brominated epoxy vinyl ester resin that offers a high degree of fire retardance while providing excellent chemical resistance and toughness. Optimum fire retardance is achieved when antimony compounds are added to the resin. Laminates made with DERAKANE MOMENTUM 510 C-350 resin have met ASTM E-84 Flame Spread "Class 2" rating (less than 75). With the use of antimony synergists, "Class 1" ratings can be achieved.(1) .

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 resin's improved reactivity properties often permit an increase in lay-up thickness wet on wet. The superior stability also provides additional storage and handling flexibility for the fabricator. DERAKANE MOMENTUM 510 C-350 resin contains only 35 weight % styrene, resulting in reduced styrene emissions.

Equipment fabricated with DERAKANE MOMENTUM 510 C-350 resin offer excellent corrosion resistance to a wide range of acids, alkalis, bleaches and organic compounds and retains its strength, heat and chemical resistant properties when exposed to hot gases and flamable liquids (please contact us before using thixotropic agents and fillers. Addition of thixotropic agents and fillers can compromise corrosion resistance).

(1) The fire retardancy and flame spread data were obtained from controlled and/or small scale bench tests and the results apply specifically to the specimens tested, in the manner tested. They are not necessarily perdictive of product performance in a real fire situation. DERAKANE resins are organic materials and the fabricated products constructed from them will burn under the right conditions of heat and oxygen supply. This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

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

APPLICATIONS AND USE

DERAKANE MOMENTUM 510 C-350 resin is designed for ease of fabrication using hand lay-up, spray-up, filament winding, compression molding, resin transfer molding and pultrusion techniques. This resin is used extensively in FRP duct work, stacks and stack-liner applications. It is also suitable for equipment handling mixtures of air and hot gases, building panels and flooring compounds where a degree of ignition inhibiting properties are needed. DERAKANE MOMENTUM 510 C-350 resin resists mechanical and chemical damage enabling use in various caustic environments such as sodium hypochlorite, chlorine dioxide and alkaline hydrogen peroxide.

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

Responsible Care*

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TYPICAL LIQUID RESIN PROPERTIES

Property[2] at 25°C / 77F	Value	Unit
Dynamic viscosity	420	mPas
Kinematic viscosity	370	cSt
Styrene content	35	%
Density	1.140	g/ml

(2) 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 table provides typical geltimes for MEKP. "Starting point" formulations for MEKP, non-foaming MEKP alternatives and BPO peroxides are available in separate product bulletins. These 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.

Typical[2] geltimes[3] using NOROX[4] MEKP-925H catalyst (MEKP) and Cobalt Naphthenate or Octoate-6% (Cobalt6%)[5], Diethylaniline (DEA)[7] and 2,4-Pentanedione (2,4-P).

Geltime at 15°C (59° F)	MEKP (phr)[6]	Cobalt6% (phr)	DEA (phr)
15 +/- 5 Minutes	1.50 phr	0.30 phr	1.25 phr
30 +/- 5 Minutes	1.50 phr	0.12 phr	-
60 +/- 5 Minutes	1.25 phr	0.05 phr	-

Geltime at 20°C (68°F)	MEKP (phr)	Cobalt6% (phr)	2,4-P (phr)
15 +/- 5 Minutes	1.25 phr	0.20 phr	-
30 +/- 5 Minutes	1.25 phr	0.05 phr	-
60 +/- 5 Minutes	1.25 phr	0.10 phr	0.03 phr

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Geltime at 25°C (77°F)	MEKP (phr)	Cobalt6% (phr)	2,4-P (phr)
15 +/- 5 Minutes	1.00 phr	0.10 phr	-
30 +/- 5 Minutes	1.00 phr	0.05 phr	0.01 phr
60 +/- 5 Minutes	1.00 phr	0.05 phr	0.025 phr

Geltime at 30°C (86°F)	MEKP (phr)	Cobalt6% (phr)	2,4-P (phr)
15 +/- 5 Minutes	1.00 phr	0.05 phr	-
30 +/- 5 Minutes	1.00 phr	0.05 phr	0.02 phr
60 +/- 5 Minutes	1.00 phr	0.05 phr	0.04 phr

Geltime at 35°C (95°F)	MEKP (phr)	Cobalt6% (phr)	2,4-P (phr)
15 +/- 5 Minutes	1.00 phr	0.05 phr	0.02 phr
30 +/- 5 Minutes	1.00 phr	0.05 phr	0.04 phr
60 +/- 5 Minutes	1.00 phr	0.05 phr	0.07 phr

(3) Thoroughly test any other materials in your application before full scale use. Gel times may vary due to the reactive nature of these materials. Always test a small quantity before formulating large quantities.
(4) Registered trademark of Norac Inc. Norox MEKP-925H or equivalent low hydrogen peroxide content MEKP. Use of other MEKP catalysts or additives may result in different geltimes.
(5) Use of Co-octoate, especially in combination with 2,4 Pentanedione can result in 20-30% longer geltimes.
(6) phr = parts per hundred
(7) 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.

TYPICAL MECHANICAL PROPERTIES

Casting Properties

Property[2] or clear casting[8] at 25°C (77°F)	Value (SI)	Method	Value (US)	Method
Tensile strength	86 MPa	ISO 527	12000 psi	ASTM D638
Tensile modulus	3200 MPa	ISO 527	460 kpsi	ASTM D638
Elongation, Yield	5-6%	ISO 527	5-6%	ASTM D638
Flexural strength	150 MPa	ISO 178	22000 psi	ASTM D790
Flexural modulus	3400 MPa	ISO 178	490 kpsi	ASTM D790
Heat distortion temperature	105°C	ISO 75	220°F	ASTM D648
Glass transition temperature, Tg2	120°C	ISO 11357	250°F	ASTMD3418

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Volume shrinkage	7.8 %		7.8 %	
Barcol Hardness	35	EN 59	35	ASTMD2583

(8)The properties in the table are measured from a clear resin casting which is postcured for 24h at room temperature and 2 hours at 120 °C / 250 F. (The SI values are reported to two significant figures and US standard values based on conversion.)

Laminate Properites

Property[2] of 6mm (¼ in.) laminate[9] at 25°C (77°F)	Value (SI)	Method	Value (US)	Method
Tensile strength	150 MPa	ISO 527	22000 psi	ASTM D3039
Tensile modulus	12000 MPa	ISO 527	1700 kpsi	ASTM D3039
Flexural strength	210 MPa	ISO 178	30000 psi	ASTM D790
Flexural modulus	8100 MPa	ISO 178	1200 kpsi	ASTM D790
Glass content	40%	ISO 1172	40%	ASTM D2584

(9)Laminate postcured 24 hours at room temperature and 6 hours at 80 °C (175 F). Laminate construction is V/M/M/Wr/M/Wr/M where V=Continuous veil glass, M=Chopped strand mat 450 g/m2 (1.5 oz/ft2) and Wr=Wowen roving 800 g/m2 (24 oz/yd2).(The SI values are reported to two significant figures and US standard values are based on conversion).

CERTIFICATES AND APPROVALS

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

STANDARD PACKAGE

210 Liter (55 Gallon) Non-Returnable Drum
Net Wt. 205 kgs (452 lbs)
DoT Label Required: Flammable Liquid

STORAGE

Drums - Store at temperatures below 25°C (77°F). Storage life decreases with increasing storage temperature. Avoid exposure to heat sources such as direct sunlight or steam pipes. To avoid contamination with water, do not store outdoors. Keep sealed to prevent moisture pick-up and monomer loss. Rotate stock.

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

All other conditions being equal, higher storage temperatures will reduce product stability and lower storage temperatures will extand product stability.

COMMERCIAL WARRANTY

Twelve months from the 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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