Technical Datasheet

INEOS Composites

DERAKANE™ 510 N Epoxy Vinyl Ester Resin

DERAKANE 510N resin is a brominated novolac epoxy vinyl ester resin that offers a moderate degree of fire retardance(1). It is the preferred resin in the DERAKANE resin portfolio for strong oxidizers, such as chlorine and chlorine dioxide. It is also useful in hot, wet flue gas environments where thermal upsets can occur and where fire retardance is desired. It exhibits a corrosion resistance similar to DERAKANE 470 resin in most environments.

When fabricated correctly, laminates made with DERAKANE 510N resin are capable of meeting ASTM E84 Class II flame spread rating without antimony trioxide. With the addition of 3% antimony trioxide to the resin, laminates are capable of meeting ASTM E84 Class I flame spread.

Equipment fabricated with DERAKANE 510N resin retains its strength and toughness at elevated temperatures which enables users to operate the equipment in a variety of applications

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

APPLICATIONS AND USE

DERAKANE 510N resin is used extensively in FRP ductwork, stacks, and stack liner applications, equipment specified to handle mixtures of air and hot gases or potentially flammable and corrosive liquids, and flooring compounds where heat and/or fire retardance is required.

DERAKANE 510N resin is recommended for most FRP fabrication processes including filament winding, hand lay-up, spray-up, pultrusion and resin transfer molding.

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

(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 predictive 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.

INEOS Composites is committed to the continuous evolution of technology and service solutions that promote health, safety and environmental protection around the world.
* Registered service mark of the American Chemistry Council. ® Registered trademark and ™ trademark of INEOS Composites*

Technical Datasheet

INEOS Composites

DERAKANE™ 510 N Epoxy Vinyl Ester Resin

TYPICAL LIQUID RESIN PROPERTIES

Property[2] at 25°C (77°F)	Value	Unit
Dynamic Viscosity	275	mPas (cps)
Kinematic Viscosity	240	cSt
Styrene Content	37	%
Density	1.15	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 tables provide typical geltimes with MEKP. This and other information are available at www.derakane.com.

MEKP Cure System

Typical geltimes[3] using NOROX[4] (ME)KP-925H catalyst (MEKP) and Cobalt Naphthenate-6%[5] (Co-nap6%), Dimethylaniline (DMA) and 2,4-Pentanedione (2,4-P).

Geltime at 18°C (65°F)	MEKP (phr)[6]	Co-nap6% (phr)	DMA (phr)
15 +/- 5 minutes	2.50	0.30	0.20
30 +/- 10 minutes	2.00	0.20	0.05
50 +/- 5 minutes	1.25	0.20	0.025

Geltime at 24°C (75°F)	MEKP (phr)	Co-nap6% (phr)	DMA (phr)	2,4-P (phr)
15 +/- 5 minutes	2.00	0.30	0.05	-
30 +/- 10 minutes	1.25	0.20	0.025	-
50 +/- 5 minutes	1.25	0.20	0.025	0.075

INEOS Composites is committed to the continuous evolution of technology and service solutions that promote health, safety and environmental protection around the world.
* Registered service mark of the American Chemistry Council. ® Registered trademark and ™ trademark of INEOS Composites*

Technical Datasheet

INEOS Composites

DERAKANE™ 510 N Epoxy Vinyl Ester Resin

Geltime at 30°C (86°F)	MEKP (phr)	Co-nap6% (phr)	DMA (phr)	2,4-P (phr)
15 +/- 5 minutes	1.50	0.20	0.025	-
30 +/- 10 minutes	1.25	0.20	-	0.05
50 +/- 5 minutes	1.25	0.20	-	0.075

(3) Thoroughly test any other materials in your applications before full-scale use. Geltimes may vary due to the reactive nature of these materials. Always test a small quantity before formulating large quantities.
(4) Registered trademark of United Initiators; NOROX(ME)KP-925H. (ME) only used in NA name, but not elsewhere. NOROX(ME)KP-925H or equivalent low hydrogen peroxide content MEKP. Use of other MEKP catalysts or additives may result in different gel times.
(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

TYPICAL MECHANICAL PROPERTIES

Casting Properties

Property(2) of clear casting(7) at 25°C (77°F)	Value (SI)	Method	Value (US)	Method
Tensile Strength	76 MPa	ISO 527	10,500 psi	ASTM D638
Tensile Modulus	3400 MPa	ISO 527	500 kpsi	ASTM D638
Tensile Elongation at Yield	3-4%	ISO 527	3-4%	ASTM D638
Flexural Strength	138 MPa	ISO 178	19,000 psi	ASTM D790
Flexural Modulus	3600 MPa	ISO 178	530 kpsi	ASTM D790
Heat Distortion Temperature(8)	121°C	ISO 75	250°F	ASTM D648
Volume Shrinkage	8.4%		8.4%	
Barcol Hardness	40	EN 59	40	ASTM D2583
Density	1.25 g/cm3	ISO 1183		ASTM D792

(7) Cure schedule: 24 hours at room temperature and 2 hours at 120°C (250°F).
(8) Maximum stress: 1.8 MPa (264 psi)

INEOS Composites is committed to the continuous evolution of technology and service solutions that promote health, safety and environmental protection around the world.
* Registered service mark of the American Chemistry Council. ® Registered trademark and ™ trademark of INEOS Composites*

Technical Datasheet

INEOS Composites

DERAKANE™ 510 N Epoxy Vinyl Ester Resin

Laminate Properties

Property[2] of 6 mm (1/4 in.) laminate[9] at 25°C (77°F)	Value (SI)	Method	Value (US)	Method
Tensile Strength	145 MPa	ISO 527	21,000 psi	ASTM D3039
Tensile Modulus	9500 MPa	ISO 527	1380 kpsi	ASTM D3039
Flexural Strength	172 MPa	ISO 178	25,000 psi	ASTM D790
Flexural Modulus	7900 MPa	ISO 178	1140 kpsi	ASTM D790
Glass Content	40%	ISO 1172	40%	ASTM D2584

(9) Cure schedule: 24 hours at room temperature and 6 hours at 80°C (175°F).
(10)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=Wowen roving 800 g/m^2 (24 oz/yd^2).

CERTIFICATES AND APPROVALS

The manufacturing, quality control and distribution of products, by INEOS Composites, comply with one or more of the following programs or standards: ISO 9001, ISO 14001 and OHSAS 18001.

STANDARD PACKAGE

208 Liter (55 Gallon) Non-Returnable Drum
Net Wt. 205 Kgs (452 Lbs.)
DOT Label Required: Flammable Liquid

STORAGE

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.

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. Rotate stock.

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

INEOS Composites is committed to the continuous evolution of technology and service solutions that promote health, safety and environmental protection around the world.
* Registered service mark of the American Chemistry Council. ® Registered trademark and ™ trademark of INEOS Composites*

Technical Datasheet

INEOS Composites

DERAKANE™ 510 N Epoxy Vinyl Ester Resin

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

COMMERCIAL WARRANTY	Six months from date of manufacture, when stored in accordance with the conditons 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 INEOS Composites assumes legal responsibility. Any warranties, including warranties of merchantability, fitness for use 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 INEOS Composites, INEOS Composites makes no warranty or representation regarding the results which may be obtained by the user. It shall be the sole responsibility of the user to determine the suitability of any of the products mentioned for the user's specific application.

INEOS Composites requests that the user reads, understands and complies with the information contained herein and the current Material Safety Data Sheet.

INEOS Composites is committed to the continuous evolution of technology and service solutions that promote health, safety and environmental protection around the world.
* Registered service mark of the American Chemistry Council. ® Registered trademark and ™ trademark of INEOS Composites*