

DERAKANE™ RESINS FOR FRP

CORROSION RESISTANCE FOR CHEMICAL PROCESSING



INEOS Composites



Assure plant reliability with Derakane™-based FRP (fiber reinforced polymer) equipment. Designed to combat corrosion in acidic and oxidizing environments.

Description

For more than 60 years, Derakane™ resins for FRP composites have been specified by process engineers to contain and handle corrosive materials associated with the chemical processing industry. Traditional materials of construction such as carbon steel, stainless steel and masonry are challenged in the presence of acids or oxidizing agents. FRP tanks, pipe and headers resist corrosion and provide extended service life in these harsh environments. Our scientists work closely with engineers to evaluate process temperatures and concentrations to assure proper material selection for their process conditions. With decades of proven performance, INEOS Composites' corrosion-resistant resins have been used to fabricate process equipment for a wide range of applications. In addition, we demonstrate our leadership and belief in this technology by using FRP in our own facilities around the globe.

Applications

- Chemical storage tanks
- Process vessels
- Process piping and headers
- Scrubbers and stacks
- Chlor-alkali cells and hoods
- Ducting and fans
- Pumps and valves
- Dual laminates and linings
- Cooling towers
- Stairs, grating and ladders
- Cladding, siding and roofing



FRP designed and fabricated with Derakane™ resins provides:

- Corrosion resistance
- Excellent resiliency and toughness
- Temperature resistance and flame retardance
- High strength-to-weight ratios
- Cost competitive when compared to metal alloys
- Good thermal and electrical insulation properties
- Low maintenance

DERAKANE™ EPOXY VINYL ESTER RESINS

FOR CHEMICAL PROCESSING

COOLING TOWERS

FRP structural members, cladding and louvers provide outstanding resistance to corrosion in cooling tower environments. FRP piping, stacks and fans are considerably more durable than carbon steel when exposed to cooling water chemicals and process water.

REAGENT STORAGE TANKS

Tanks specified with Derakane™ resins provide excellent corrosion resistance to a wide range of chemical reagents. FRP storage tanks are much lighter than metal and are less expensive than rubber lined steel or high nickel alloys.

PIPING

Piping specified with Derakane™ resins has excellent acid, caustic and abrasion resistance. Pipe made from these resins is significantly less expensive than rubber lined steel pipe and requires considerably less maintenance.

STAIRS, GRATING AND CABLE TRAY

Stairs, grating, railings and cable tray made with Derakane™ resins are much more resistant to chemical splash and spray zones than carbon steel or even stainless. Moreover, FRP is 30–35% lighter than steel for equivalent load-bearing capacity, saving costs in transport and erection.

DUCTING AND STACK LINERS

When corrosion resistance and flame retardancy are required for ducts, stack liners or fume handling equipment, Derakane™ 510A and Derakane™ 510B resins are often recommended. Properly fabricated laminates with these resins have met Class I ASTM E-84 flame and smoke requirements.

SCRUBBERS

Scrubber systems made from FRP based on Derakane™ resins have excellent resistance to wet acid gases and halogens recovered in the scrubbing process. FRP has proven to be more economical than specialty alloys used in corrosive, hot, wet scrubber environments.

PUMPS AND VALVES

Pumps and valves specified with Derakane™ resins deliver considerably longer life in corrosive environments. FRP's lighter weight makes it easier to transport and install. FRP's superior abrasion resistance makes it more durable than rubber lined alternatives.

FINISHED PRODUCT STORAGE TANKS

Tanks specified with Derakane™ resins provide excellent corrosion resistance to a wide range of finished chemicals. FRP made from select Derakane™ resins has also met food contact regulation.

BULK TANK TRUCKS

Bulk tank trailers fabricated with Derakane™ resins provide excellent corrosion resistance to a wide range of chemical reagents. FRP bulk tank trailers are much lighter than steel and less expensive than rubber lined steel or high nickel alloys.

CLADDING, ROOFING AND SIDING

Cladding, roofing and siding made with Derakane™ resins are much more resistant to incidental chemical exposure and spray zones than carbon steel or even stainless. Chemically resistant skylighting panels can also be made from FRP. Moreover, FRP is 30–35% lighter than steel for equivalent load-bearing capacity, saving costs in transport and erection.

PROCESS VESSELS

Process vessels and piping specified with Derakane™ resins deliver exceptional resistance to a wide variety of chemical intermediates and mixtures. Where acids, caustics or halogens are found, FRP is often your best bet.

CHLOR-ALKALI PROCESSES

Brine piping specified with Derakane™ resins provides outstanding service life in chlor-alkali processes. Polymer concrete electrolytic cells specified with Derakane™ resins set the standard for the industry. Cell covers and headers made with Derakane™ Momentum™ 470-300 resins deliver outstanding resistance to hot, wet chlorine environments.

WASTEWATER TREATMENT

Process water tanks and piping made from Derakane™ Momentum™ 411-350 resins and Derakane™ Signia™ 411 are very economical and can accommodate process water up to 80 °C.



Tanks

Storage tanks for reagents, chemical intermediates or finished goods specified with Derakane™ epoxy vinyl ester resins demonstrate:

- The ability to handle a wide range of corrosive chemicals
- Outstanding resistance to caustics and acids
- No corrosion under insulation (CUI) issues
- Excellent resiliency and toughness
- Chemically resistant interiors and exteriors
- Good abrasion resistance
- Easy installation — lightweight
- Low maintenance costs

Piping

Piping specified with Derakane™ epoxy vinyl ester resins delivers:

- Resistance to a wide range of corrosive chemicals
- Excellent resiliency and toughness
- Superior abrasion resistance
- Excellent for filament wound or hand lay-up piping

Derakane™ 411 series resins have been specified for both subsurface and aboveground process piping. These resins offer excellent resistance to both acid and caustic environments. These resins also can be specified for fittings, valves, pumps and pump bases.

Chlor-alkali Processes

Headers, cell covers, piping and storage tanks in chlor-alkali processes specified with Derakane™ resins demonstrate:

- Excellent resistance to hot, wet chlorine, caustic, sodium hypochlorite, hydrochloric acid and brine
- Outstanding compatibility with dual laminate designs

Scrubbers, Ducting and Fume Handling Equipment

Equipment specified with Derakane™ 470 epoxy vinyl ester resin provides:

- Excellent corrosion resistance
- Excellent heat resistance — properly fabricated laminates can be used in ducting and stacks up to 350 °F (117 °C) with occasional upsets up to 600 °F (315 °C).
- Excellent resistance to oxidizing acid environments

When corrosion resistance and flame retardancy are required for ducts, scrubbers or fume handling equipment, Derakane™ 510A, Derakane™ 510B, Derakane™ 510C and Derakane™ 510N resins are recommended.

Process Equipment, Covers, Building Panels and Grating

Equipment specified with Derakane™ resins demonstrates:

- Excellent weathering properties
- High strength-to-weight ratios
- Outstanding corrosion resistance
- Very good flame retardance
- Easy installation and low maintenance

INEOS Derakane™ resins include:

Epoxy Vinyl Ester Resin Series	Characteristics ¹	Suggested Application ²
Derakane™ 411 Derakane™ Momentum™ 411 Derakane™ Signia™ 411	Corrosion resistant to both strong acids and bases Inherent toughness and high tensile elongation provide fabrication advantages and resistance to impact and thermal-shock damage	Equipment where strong acids and bases are encountered and where toughness is needed
Derakane™ 441	More heat resistant and often more corrosion-resistant than Derakane™ 411	Equipment where even more temperature and/or chemical resistance is needed versus Derakane™ 411
Derakane™ 451	Outstanding thermal and chemical resistance to strong oxidizing acids	Equipment where high temperature resistance and improved resistance to oxidizing environments are needed Best hot water resistance of the epoxy vinyl ester resins
Derakane™ 455	Outstanding thermal and chemical resistance to strong oxidizing acids Higher heat distortion temperature compared to Derakane™ 451 Contains less than 35% styrene	Equipment where higher temperature resistance and improved resistance to oxidizing environments are needed
Derakane™ 470 Derakane™ Momentum™ 470	Exceptional thermal and chemical resistance High retention of strength and toughness at elevated temperatures	Equipment where high temperature resistance and improved resistance to oxidizing environments are needed Best solvent resistance of the epoxy vinyl ester resins
Derakane™ 510 Derakane™ Momentum™ 510C	Flame-retardant version of the Derakane™ 411 series Class I or Class II flame retardance can be achieved	Equipment requiring corrosion resistance and toughness, plus flame retardance
Derakane™ 515	Class I flame retardance can be achieved without antimony synergist	Equipment requiring higher heat resistance, corrosion resistance and toughness versus Derakane™ 411, plus flame retardance

¹ Consult technical data sheets for each resin's flame spread rating
² Consult the Derakane™ Resin Selection Guide for temperature and concentration limits for your specific environment

Consult the Derakane™ Resin Selection Guide for temperature and concentration limits for your specific environment.

INEOS Derakane™ Resins

No single FRP resin can handle every kind of corrosion problem. That's why INEOS has the largest variety of premium, corrosion-resistant resins in the industry.

INEOS is a leading, global supplier of corrosion-resistant resins for fiber reinforced plastics. We offer the most comprehensive line of heat-resistant and flame-retardant resins on the market today.

Reinforced plastic composites are used for chemical containment in many types of chemical processing operations. Each environment requires a specific type of resin to handle the corrosive conditions.

Please email derakane@ineos.com for information, advice, and the correct resin recommendation for your specific application. More detailed application information is available from the Derakane™ Resin Selection Guide available at INEOS.com/Derakane.

WORLDWIDE TECHNICAL SERVICE:
derakane@ineos.com

GLOBAL PRESENCE

Global Headquarters **INEOS Composites**

North America
Dublin, OH USA
Tel: +1 614 790 9299
Americascustomer.composites@INEOS.com

Regional Centers

Asia Pacific
Shanghai, P.R. China
Tel: +86 21 2402 4688
ASIACustomer.composites@INEOS.com

Europe
Barcelona, Spain
Tel: +34 93 206 5120
EMEAcustomer.composites@INEOS.com

India
Mumbai
Tel: +91 22 6148 9696
EMEAcustomer.composites@INEOS.com

Latin America
Araçariquama, São Paulo, Brazil
Tel: +55 11 4136 6477
Americascustomer.composites@INEOS.com

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