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RESINS | GEL COATS | COLORANTS

**VIPEL® F013-P SERIES  
BISPHENOL-A EPOXY  
VINYL ESTER RESIN**



## Product Information

### CORROSION RESISTANT BISPHENOL A EPOXY VINYL ESTER RESINS

#### Typical Cast Mechanical Properties <sup>1</sup>

Test	Unit of Measure	Nominal	Test Method
Tensile Strength	psi/MPa	12,800/88	ASTM D638
Tensile Modulus	psi/GPa	470,000/3.2	ASTM D638
Tensile Elongation	%	6.6	ASTM D638
Flexural Strength	psi/MPa	21,800/150	ASTM D 790
Flexural Modulus	psi/GPa	530,000/3.7	ASTM D 790
Heat Distortion Temp.	°F/°C@264 psi	232/111	ASTM D648
Barcol Hardness	934	34	ASTM D2583

#### Typical Liquid Properties<sup>2</sup>

VERSIONS	Viscosity, cps	Thix Index	Gel Time, min	Gel to Peak Exotherm	Peak Exotherm (°F/°C)	Specific Gravity	Styrene Content, %
F013-PAA-30	400	NA	30 <sup>4</sup>	13	350/177	1.05	45
F013-PAB-30	450 <sup>1</sup>	2.5	30 <sup>2</sup>	22	322/161	1.04	48
F013-PAB-35	450 <sup>1</sup>	2.5	35 <sup>2</sup>	23	320/160	1.04	48
F013-PAC-18	500 <sup>1</sup>	2.0	18 <sup>2</sup>	18	350/177	1.05	45
F013-PTA-25	700 <sup>1</sup>	3.0	25 <sup>3</sup>	18	320/160	1.03	42

NA- Not applicable

1) 77 °F/25 °C Brookfield LV viscosity spindle 3 at 60 rpm

2) 2) 77 °F/25 °C Gel time with 1.25% MEKP 925H

3) 3) 77 °F/25 °C Gel time with 1% MEKP 925H

4) 4) 77 °F/25 °C Gel time with 2.0% MEKP 925H

\*Typical properties are not to be construed as specifications.

#### DESCRIPTION

AOC's Vipel F013-P Series is a bisphenol A epoxy-based vinyl ester resin dissolved in styrene. The Vipel F013-P Series is ideally suited for use in hand lay-up, spray-up, filament winding and pultrusion processes where outstanding mechanical properties and excellent resistance to chemicals and heat are required.

#### BENEFITS

##### Versatile

Unique composition produces a tough and versatile resin with excellent crack and craze resistance in molded parts. Vipel F013-P Series is suitable for moldings that are subjected to particularly high static or dynamic loads, such as pipe, tanks, duct work and flooring applications. Vinyl ester resins have excellent resistance to sustained heat.

##### Corrosion Resistant

Refer to AOC for corrosion resistance information or for questions regarding suitability of a resin to any particular chemical environment. F013-P Series resins contain thixotropic additives. Contact with alkaline media or sodium hypochlorite is not recommended

##### Food and Drug

All resins in this datasheet are manufactured from raw materials that are listed in FDA regulation Title 21 CFR 177.2420. It is the fabricator's responsibility to also be sure that the final composite is well cured. All composites used for FDA applications should be post cured at 180 °F/82 °C for at least 4 hours. After post curing it should be washed with soap and water and rinsed.

# VIPEL®

## F013-P SERIES BISPHENOL A EPOXY VINYL ESTER RESIN



### PERFORMANCE GUIDELINES

A. Keep full strength catalyst levels between 1.0% - 2.0% of the total resin weight.

B. Maintain shop temperatures between 65°F/18°C and 90°F/32°C and humidity between 40% and 90%. Consistent shop conditions contribute to consistent gel times and will help the fabricator make a high quality part.

C. Finished part surfaces that have been cured at room temperature in contact with air should be relatively tack free. They may not, however, be fully cured and are thus not as resistant to chemicals as a fully cured part. If no further laminating is planned, a 10% solution of 5% paraffin wax solution (MP 115-118°F/46-48°C) in styrene may be added to the last resin layer to provide a tack free surface.

D. Optimum cure and performance may be obtained by post curing room temperature cured laminates for two hours at 158-212°F/70-100°C.

E. Room temperature curing by means of cobalt acceleration should be completed with low hydrogen peroxide content MEKP catalyst to minimize foaming.

### STORAGE STABILITY

This product is stable for seven months from the date of manufacture when stored in the original containers, away from direct sunlight or other UV light sources and at or below 77°F/25°C.

After extended storage, some drift may occur in the product viscosity and gel time.

### SAFETY

See the appropriate Material Safety Data Sheet for guidelines.

### ISO 9001:2008 CERTIFIED

The Quality Management Systems at every AOC manufacturing facility have been certified as meeting ISO 9001:2008 standards. This certification recognizes that each AOC facility has an internationally accepted model in place for managing and assuring quality. We follow the practices set forth in this model to add value to the resins we make for our customers.

### FOOTNOTES

(1.) Based on tests of F013-AAA-00 at 77°F/25°C and 50% relative humidity. All thixotropic resins should be mixed well prior to use. All tests on unreinforced cured resin. Castings were prepared using 1% BPO and post cured 1 hour at 93°C, 1 hour at 116°C, and 2 hours at 138°C.

(2.) The gel times shown are typical but may be affected by catalyst, promoter, inhibitor concentration, resin, mold, and shop temperature. Variations in gelling characteristics can be expected between different lots of catalysts and at extremely high humidities. Pigment and/or filler can retard or accelerate gelation. It is recommended that the fabricator check the gelling characteristics of a small quantity of resin under actual operating conditions prior to use.



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