

## Product Information

# Vipel® Fire Retardant High Cross-Linked, Bisphenol A, Epoxy Vinyl Ester Resin

### TYPICAL CAST MECHANICAL PROPERTIES \* (1) see back page

Test	Unit of Measure	Nominal	Test Method
Tensile Strength,	psi/MPa	13,200/91.0	ASTM D 638
Tensile Modulus,	psi/GPa	540,000/3.7	ASTM D 638
Tensile Elongation,	%	4.3	ASTM D 638
Flexural Strength,	psi/MPa	17,500/121	ASTM D 790
Flexural Modulus,	psi/GPa	600,000/4.1	ASTM D 790
Heat Distortion Temperature °F/°C @ 264 psi		265/129	ASTM D 648
Barcol Hardness		46	ASTM D 2583

### TYPICAL LIQUID RESIN PROPERTIES\* (2) see back page

VERSIONS	Viscosity, cps	Thix Index	Gel Time, min	Gel to Peak, min	Peak Exotherm, °F/C°	Specific Gravity	Styrene Content %
K023-AAA-00	250 <sup>1</sup>	NA	24 <sup>2</sup>	7	383/195	1.29	28

NA- Not applicable

1) 77°F/25°C Brookfield RV viscosity spindle 2 at 20 rpm

2) 77°F/25°C Gel time with 0.2% Cobalt 6%, 0.05% DMA and 1.25% MEKP

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

### FLAMMABILITY PROPERTIES (ASTM E-84 TUNNEL TEST)\*\*

Version	ASTM E 84			Class
	% Antimony Trioxide	Flame Spread	Smoke Developed	
K023-A Series	-	15	550	I

#### \*\*Laminate Construction

2 Plies of 2.0 ounce per square foot (600 grams per square meter) fiber glass chopped stand mat. Fiberglass content-30%.

Laminates were post cured at 212°F/100°C for 3 hours.

#### DESCRIPTION

AOC's Vipel® K023 series is a fire retardant, high cross-linked bisphenol A epoxy vinyl ester resin dissolved in styrene. AOC's Vipel K023 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.

AOC's Vipel® K023-AAA series resins are un-promoted and non-thixotropic resins.



#### BENEFITS

##### Heat Resistance

Vipel® K023 has a high heat distortion temperature.

##### Fire Retardant

The Vipel® K023-AAA-00 requires no antimony trioxide spread to meet ASTM E 84 Class I flame spread requirements.

##### Mechanical Properties

Vipel® K023 is suitable for moldings that are subjected to particularly high static or dynamic loads. Vinyl ester resins have excellent resistance to sustained heat.

##### Versatile

Wide formulating capabilities allow for use in many processes and for optimization of cost/performance.

##### Corrosion Resistance

Vipel® K023 is highly resistant to a number of chemical environments. Refer to AOC's "Corrosion Resistant Resin Guide" for corrosion resistance information or for questions regarding suitability of a resin to any particular chemical environment contact AOC.

# Vipel® K023 Series Epoxy Vinyl Ester Resin

## PERFORMANCE GUIDELINES

**A.** Keep full strength catalyst levels between 1.0%-2.5% of the total resin weight.

**B.** Maintaining shop temperatures between 65°F/18°C and 90°F/32°C and humidity between 40% and 90% will help the fabricator make a high quality part. 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 (MP115-118°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 three 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 25°C (77°F). Storage stability of two months or less should be anticipated if the storage temperature exceeds 30°C (86°F).

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

## SAFETY

See appropriate Material Safety Data Sheet for guidelines.

## ISO 9001:2000 CERTIFIED

The Quality Management Systems at every AOC manufacturing facility have been certified as meeting ISO 9001:2000 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 Vipel® K023-AAA at 77°F/25°C and 50% Relative humidity. All tests performed on unreinforced cured resin castings. Thixotropic components, if applicable, are excluded from casting samples. Castings prepared using 1% BPO and cured for 4 hours at 160°F, 1 hour at 200°F, 1 hour at 240°F and 2 hours at 280°F.

### (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 fillers 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.



### Global Contacts

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