

Product Information

Vipel® Fire Retardant Epoxy Novolac, Vinyl Ester Resin

TYPICAL CAST MECHANICAL PROPERTIES* (1) see back page

| Test | Unit of Measure | Nominal | Test Method |
|-----------------------------|-----------------|-------------|-------------|
| Tensile Strength, | psi/Mpa | 13,400/92.4 | ASTM D 638 |
| Tensile Modulus | psi/Gpa | 540,000/3.7 | ASTM D 638 |
| Elongation | % | 3.6 | ASTM D 638 |
| Flexural Strength | psi/Mpa | 23,000/159 | ASTM D 790 |
| Flexural Modulus, | psi/Gpa | 570,000/3.9 | ASTM D 790 |
| Heat Distortion Temperature | °F/°C | 289/143 | ASTM D 648 |
| Barcol Hardness | | 42 | ASTM D 2583 |

*Typical properties are not to be construed as specifications.

TYPICAL LIQUID RESIN PROPERTIES of Vipel K095-AAA-00* (2) see back page

| Versions | Viscosity, cps | Thix Index | Gel Time, Min | Gel To Peak, Min | Peak Exotherm, °F/°C | Specific Gravity | Styrene Content, % |
|-------------|------------------|------------|-----------------|------------------|----------------------|------------------|--------------------|
| K095-AAA-00 | 250 ¹ | NA | 30 ² | 9 | 395/202 | 1.17 | 32 |

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%, 0.025% DMA and 1.25% MEKP

*Typical properties are not to be construed as specifications.

FLAMMABILITY PROPERTIES (ASTM E-84 TUNNEL TEST)

| % Antimony Trioxide | Flame Spread | Smoke Developed |
|---------------------|--------------|-----------------|
| - | 25 | 300 |

**Laminate Construction

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

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



DESCRIPTION

The Vipel K095-AAA-00 is a fire retardant epoxy novolac vinyl ester resin dissolved in styrene. Vipel K095-AAA-00 is ideally suited for use in hand lay-up, spray-up, and filament winding processes where outstanding mechanical properties and resistance to solvents, oxidizing environments, chemicals and good thermal mechanical properties is required.

BENEFITS

Corrosion

The epoxy novolac-based backbone chemistry provides resistance to organic solvents and good resistance to acids and alkalis. 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.

Fire Retardancy

Vipel K095-AAA-00 meets ASTM E 84 class I requirements for flame spread and smoke development neat.

Heat Temperature Resistance

Vipel K095-AAA-00 has excellent thermal mechanical properties.

Processability

Vipel K095-AAA-00 is suitable for filament winding and hand lay up processes.

CHP* GEL TIMES FOR NON PROMOTED VIPEL® K095-A SERIES RESINS

| | 10 - 20 Minutes | | | 20 - 40 Minutes | | | 40 - 60 Minutes | | |
|-------------------------|-----------------|-------------|-------------|-----------------|-------------|-------------|-----------------|-------------|-------------|
| Temperature, °F/°C | 65/18 | 77/25 | 95/35 | 65/18 | 77/25 | 95/35 | 65/18 | 77/25 | 95/35 |
| Cobalt-6%, % | | 0.4 | 0.3 | 0.4 | 0.3 | 0.2 | 0.3 | 0.2 | 0.2 |
| DMA | | 0.1 | 0.05 | 0.2 | 0.05 | 0 | 0.05 | 0 | 0 |
| 2,4 - Pentanedione | | 0 | 0 | 0 | 0 | 0.05 | 0 | 0 | 0.1 |
| CHP, % | | 1.50 | 1.50 | 2.00 | 1.50 | 1.00 | 1.50 | 1.00 | 1.00 |
| Gel Time, minutes | | 20 | 16 | 35 | 30 | 30 | 49 | 45 | 49 |
| Total Time, minutes | | 34 | 25 | 53 | 48 | 54 | 83 | 85 | 78 |
| Peak Temperature, °F/°C | | 391/ 199 | 409/ 209 | 383/ 195 | 378/ 192 | 373/ 189 | 359/ 182 | 346/ 174 | 369/ 187 |

*90% Active CHP was used.

| Mechanical Properties of Vipel Laminates at Different Temperatures | | | | |
|--|---------------------------|--------------------------|----------------------------|---------------------------|
| Temperature, °F/°C | Tensile Strength, psi/MPa | Tensile Modulus, psi/GPa | Flexural Strength, psi/MPa | Flexural Modulus, psi/GPa |
| 77/25 | 23,500/162 | 1,860,000/12.8 | 30,000/207 | 1,600,000/11 |
| 200/93 | 24,500/169 | 1,660,000/11.4 | | |
| 250/121 | 22,000/152 | 1,560,000/10.8 | 26,000/179 | 1,100,000/7.6 |
| 300/149 | 20,000/138 | 1,100,000/7.6 | 15,000/103 | 700,00/4.8 |
| 350/177 | 12,600/87 | 943,000/6.5 | 4,500/31 | 400,000/2.8 |
| Laminate construction: VMMRMRM V-glass veil, M-chopped strand mat 1.5 oz per square foot (450 g/m ²), R-Woven Roving 24 oz per square yard (814 g/m ²). Laminates were 0.25 inches (6.4 mm) thick and post cured at 212°F (100°C) for 5 hours. | | | | |

Vipel® K095-AAA-00 Epoxy Novolac Vinyl Ester Resin

PERFORMANCE GUIDELINES

A. Keep full strength catalyst levels between 1.0% - 2.0% 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 (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.

STORAGE STABILITY

This product is stable for six 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 appropriate Material Safety Data Sheet for guidelines.

APPLICATION GUIDELINES

Halogen containing resins are generally less resistant to UV light than general purpose resins. Fabricators are advised to conduct their own tests to determine the suitability of using Vipel K095-AAA-00 resins for outdoor applications.

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 Vipel K095-AAA-00 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 were post cured.

(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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