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RESINS | GEL COATS | COLORANTS

## FIREPEL® K130 SERIES POLYESTER RESIN



# Product Information

## POLYESTER RESIN FOR FIRE RETARDANT APPLICATIONS

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

| Test                  | Unit of Measure | Nominal     | Test Method           |
|-----------------------|-----------------|-------------|-----------------------|
| Tensile Strength      | psi/MPa         | 10,700/73.8 | ASTM D638 / ISO 527-1 |
| Tensile Modulus       | psi/GPa         | 580,000/4.0 | ASTM D638 / ISO 527-1 |
| Tensile Elongation    | %               | 2.2         | ASTM D638 / ISO 527-1 |
| Flexural Strength     | psi/MPa         | 15,400/106  | ASTM D 790 / ISO 178  |
| Flexural Modulus      | psi/GPa         | 590,000/4.1 | ASTM D 790 / ISO 178  |
| Heat Distortion Temp. | °F/°C @264 psi  | 194/90      | ASTM D648 / ISO 75-A  |
| Barcol Hardness       |                 | 45          | ASTM D2583 / EN 59    |

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

| VERSIONS     | Viscosity cps    | Thix Index     | Gel Time Min    | Gel to Peak Min | Peak Exotherm (°F/°C) | Specific Gravity | Styrene Content, % |
|--------------|------------------|----------------|-----------------|-----------------|-----------------------|------------------|--------------------|
| K130-72      | 825 <sup>1</sup> | NA             | 5 <sup>2</sup>  | 7               | 375/190               | 1.51             | 28                 |
| K130-LCS-00  | 450 <sup>3</sup> | NA             | UV Cured        | UV Cured        | UV Cured              | 1.32             | 32                 |
| K130-NNP-08  | 150 <sup>9</sup> | NA             | 8 <sup>10</sup> | 9               | 338/170               | 1.28             | 34                 |
| K130-NNT-00  | 200 <sup>3</sup> | NA             | 15 <sup>6</sup> | 9               | 350/177               | 1.29             | 34                 |
| K130-PTA-15  | 375 <sup>3</sup> | 3              | 15 <sup>5</sup> | 9               | 347/175               | 1.29             | 33                 |
| K130-PTB-20  | 600 <sup>3</sup> | 3 <sup>4</sup> | 20 <sup>5</sup> | 10              | 338/170               | 1.3              | 32                 |
| K130-PTE-12  | 550 <sup>3</sup> | 3 <sup>4</sup> | 12 <sup>5</sup> | 10              | 374/190               | 1.29             | 33                 |
| K130-P TJ-15 | 425 <sup>3</sup> | 2.5            | 15 <sup>5</sup> | 12              | 320/160               | 1.29             | 33                 |
| K130-P TJ-20 | 400 <sup>3</sup> | 2 <sup>4</sup> | 20 <sup>5</sup> | 9               | 350/177               | 1.29             | 34                 |
| K130-P TJ-45 | 450 <sup>3</sup> | 2              | 45 <sup>8</sup> | 10              | 320/160               | 1.29             | 33                 |
| K130-PTL-20  | 575 <sup>9</sup> | 3              | 20 <sup>5</sup> | 13              | 320/160               | 1.28             | 32                 |
| K130-PTO-15  | 375 <sup>3</sup> | 3              | 15 <sup>5</sup> | 9               | 347/175               | 1.29             | 33                 |

NA—Not Applicable

- 77 °F/25 °C Brookfield RV viscosity spindle #3 at 20 rpm
- 180 °F/82 °C SPI Gel with 1.0% BPO
- 77 °F/25 °C Brookfield RV viscosity spindle #2 at 20 rpm
- 2/20 rpm Thix Index
- 77 °F/25 °C Gel time with 1.25% DDM-9
- 77 °F/25 °C Gel time with 0.25% Cobalt 6% & 1.25% DDM-9
- 77 °F/25 °C Gel time with 0.2% Cobalt 1.2% & 0.1% DEA
- 77 °F/25 °C Gel time with 2.0% DDM-9
- 77 °F/25 °C Brookfield LV Viscosity spindle #3 at 60 rpm
- 77 °F/25 °C Gel time with 1.5% DDM-9

### Flammability Properties (ASTM E-84 Tunnel Test)\*\* , \*\*\*

| Laminate Construction <sup>1</sup> | ASTM E 84<br>Flame Spread/Smoke Development <sup>2</sup> | UL 94     |            |           | ASTM D2863<br>Limited Oxygen Index |
|------------------------------------|--|-----------|------------|-----------|------------------------------------|
|                                    |  | HB Rating | V-o Rating | 5V Rating |                                    |
| 1 ply 1.5 oz                       | 25/135   | PASS      | PASS       | PASS      |                                    |
| 2 ply 2.0 oz                       | 15/650   |           |            |           | 39                                 |
| 7 ply 1.5 oz                       | 20/800   |           |            |           |                                    |

- Laminates were 30-32 percent glass and post cured for 3 hours at 212 °F/100 °C.
- Smoke development of less than 450 is required for Class 1 rating.

### DESCRIPTION

Firepel K130 series resins are designed for fire resistant applications where ASTM E 84 Class I flame is required. Flammability of composite parts is dependent on the geometry of the part, degree of cure, reinforcement content, types of reinforcement, etc. It is the end user's responsibility to ensure that finished parts meet the required specifications. Published flammability properties should be used for comparison purposes only.

Firepel K130-72 is the concentrated highly brominated base resin that is used to manufacture the other versions.

### APPLICATION

Suitable for various fabricating methods such as hand lay-up, spray-up, filament winding, etc.

### BENEFITS

#### Fire Retardant

Firepel K130 PT, NN and TT series meet ASTM E 84 Class I flame spread requirements without the addition of fillers or antimony.

Certain laminate constructions can meet Class I smoke requirements. See "Flammability Property Table".

#### Low VOC

All Firepel K130 versions contain less than 35% styrene.

#### Versatile

The Firepel K130 series molecular architecture provides an excellent balance of fire retardant, physical properties and cost.

\*\* The degree of fire resistance of a cured resin is characterized by the ASTM E 84 test. This test is performed under strictly controlled conditions where a flame spread rating is assigned according to comparisons with test set-point materials. The behavior of the end-users composite cured under controlled condition can vary significantly in an actual fire situation due to the large number of unpredictable variables associated with actual fire situations.

\*\*\*Tests on K130-PT, NN and TT

Typical properties are not to be construed as specifications.

# FIREPEL®

## K130 SERIES POLYESTER 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 time and will help the fabricator make a high quality part.

### 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 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.

*Despite the general flame retardancy of this series of products, any laminate or other products made with fire retardant resins will burn if subject to an environment with a sufficient amount of heat and oxygen.*

### APPLICATION GUIDELINES

A. 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 Firepel K130 Series resins for outdoor applications.

B. Due to the curing characteristics of the Firepel K130 Series resins, it is desirable to complete all secondary bonding as soon as possible. Exposure of the laminate to sunlight will result in severe secondary bonding, especially if the surface of the laminate has been allowed to become resin rich. Low fiberglass content and resin puddling should be avoided with this product. To assure adequate bonding to gel coats, fabricators should pre-wet the gel coat surface with a thin pass of catalyzed resin prior to lamination.

C. Chemical resistance studies have indicated the dicyclopentadiene resins such as Firepel K130 Series resins have inferior resistance to certain hydrophobic liquids such as hydrocarbons. Fuel storage tanks should not be produced with the Firepel K130 Series resins.

If your manufacturing needs require a more corrosion resistant resin, please contact your AOC representative for information or technical assistance on AOC's line of isophthalic or vinyl ester resins.

### 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 Firepel K130 base resin 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 1.0% MEKP, 0.10% Cobalt 12%, post cured for 5 hours at 212°F/100°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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**AOC World Headquarters**  
955 Highway 57 East, Collierville, TN 38017

+01 901.854.2800  
[AOC-Resins.com](http://AOC-Resins.com)

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### SALES CONTACTS

**NORTH AMERICA**  
Toll free: +1 866 319 8827  
[northamerica@aoc-resins.com](mailto:northamerica@aoc-resins.com)

**LATIN AMERICA**  
+01 863 815 5016  
[latinamerica@aoc-resins.com](mailto:latinamerica@aoc-resins.com)

**MIDDLE EAST**  
+44 1206 390415  
[middleeast@aoc-resins.com](mailto:middleeast@aoc-resins.com)

**EUROPE**  
+44 1206 390415  
[europa@aoc-resins.com](mailto:europa@aoc-resins.com)

**AOC UK LTD.**  
+44 01206 390400  
[salesUK@aoc-resins.com](mailto:salesUK@aoc-resins.com)

**INDIA**  
+44 1206 390415  
[india@aoc-resins.com](mailto:india@aoc-resins.com)

**ASIA/AUSTRALIA**  
+44 1206 390415  
[asia@aoc-resins.com](mailto:asia@aoc-resins.com)

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