

Product Information

EcoTek® Polyester Resin for Filled Fire Retardant Applications



TYPICAL CAST MECHANICAL PROPERTIES* (1) see back page

| Test | Unit of Measure | Nominal | Test Method |
|-----------------------------|-----------------|---------|-------------|
| Tensile Strength | MPa | 62.8 | ISO 527-1 |
| Tensile Modulus | GPa | 3.7 | ISO 527-1 |
| Tensile Elongation, | % | 2.1 | ISO 527-1 |
| Flexural Strength | MPa | 95.2 | ISO 178 |
| Flexural Modulus | GPa | 4.1 | ISO 178 |
| Heat Distortion Temperature | | | |
| @ 264 psi | °C | 128 | ISO 75-A |
| Barcol Hardness | | 45 | ISO EN 59 |

TYPICAL LIQUID RESIN PROPERTIES* (2) see back page

| Versions | Viscosity, cps | Thix Index | Gel Time, Min | Gel To Peak, Min | Peak Exotherm, °C | Specific Gravity | Styrene Content, % |
|--------------|------------------|------------|-----------------|------------------|-------------------|------------------|--------------------|
| K320-ATSG-40 | 130 ¹ | NA | 40 ² | 5 | 216 | 1.1 | 37 |

NA- Not applicable

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

2) 25°C Gel time with 1.0% MEKP

*Typical properties are not to be construed as specifications.

LAMINATE CONSTRUCTION

2 plies of 1.0 ounce per square foot (300 grams per square meter) fiber glass chopped strand mat. EcoTek K320-ATS-40 was blended 50/50 with ATH. Fiberglass content - 20%

DESCRIPTION

AOC's EcoTek K320-ATSG is promoted, non thixotropic resins specifically designed to be blended with alumina trihydrate (ATH) to provide fire retardant properties. ATH is needed to provide fire retardant properties.

The EcoTek K320-ATSG resin is used for mass transit applications. 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.

BENEFITS

The combined renewable bio-derived content and/or recycled content of EcoTek K320-ATSG is 24%

Fire Resistance

The EcoTek K320-ATSG resin is designed for use in filled applications where fire retardancy and low smoke emissions are required.

Toxicity

Composites made with the EcoTek K320-ATSG resin has low toxicity values due to the absence of halogens.

TOXICITY DATA (Bombardier SMP 800:Toxic Gas Production)

| TOXIC GAS | Flaming Mode | Non-Flaming Mode | Specified Maximum |
|--|--------------|------------------|-------------------|
| Carbon Monoxide (CO ppm) | | | |
| at 1.5 minutes | 85 | <10 | - |
| at 4.0 minutes | 648 | <10 | - |
| at maximum | 1295** | 185 | 3500 |
| Carbon Dioxide (CO ₂ ppm) | | | |
| at 1.5 minutes | 150 | <100 | - |
| at 4.0 minutes | 8050 | <100 | - |
| at maximum | 18,550*** | 200 | 90,000 |
| Nitrogen Oxides (as NO ₂ ppm) | 1 | <1 | 100 |
| Sulfur Dioxide (SO ₂ ppm) | <1 | <1 | 100 |
| Hydrogen Chloride (HCl ppm) | 7 | <1 | 500 |
| Hydrogen Fluoride (H F ppm) | <1 | <1 | 100 |
| Hydrogen Bromide (H Br ppm) | 9 | 25 | 100 |
| Hydrogen Cyanide (H C N ppm) | <1 | <1 | 100 |
| Original weight | 19.57 | 19.04 | |
| Final weight (g) | 10.84 | 13.54 | |
| Weight loss (g) | 8.73 | 5.5 | |
| Weight loss (%) | 44.6 | 28.9 | |
| Time to Ignition (s) | 15 | Did not ignite | - |
| Burning Duration (s) | 305 | - | - |

** Includes approximately 160 ppm CO generated by the test flame.

*** Includes approximately 7700 ppm CO₂ generated by the test flame.



| FLAME RETARDANT & SMOKE DEVELOPMENT DATA (See note below) | | | | | | |
|--|---------|-------------|-------------------------------------|-----------|------------|-----------|
| NFPA 258 Smoke Development (ASTM E 662-97 NBC Smoke Density Chamber) | | | Flame Spread Rating (ASTM E 162-98) | UL 94 | | |
| | Flaming | Non-Flaming | 6 | HB Rating | V-O Rating | 5V Rating |
| D _m | 248 | 309 | | Pass | Pass | Pass |
| D _s 1.5 | 57 | 1 | | | | |
| D _s 4.0 | 194 | 35 | | | | |

| ASTM E 84 TEST | Flame Spread | Smoke Developed |
|----------------|--------------|-----------------|
| | | 48 |

The above laminates were made with 2 ply of 1.5 oz. chopped strand mat (450 gram per square meter) The EcoTek K320-A/ATH ratio was 50/50.

Laminate Construction

General Purpose gelcoat backed up with resin (K320-ATN-20)/ATH in a 65/35 ratio.
The reinforcement is 1 ply of 1.5 oz. chopped strand mat (450 gram per square meter) and 1 layer 18 ounce roving

| TOXICITY DATA (Bombardier SMP 800:Toxic Gas Production) | | | |
|---|--------------|------------------|-------------------|
| TOXIC GAS | Flaming Mode | Non-Flaming Mode | Specified Maximum |
| Carbon Monoxide (CO ppm) | | | |
| at 1.5 minutes | 85 | <10 | - |
| at 4.0 minutes | 648 | <10 | - |
| at maximum | 1295** | 185 | 3500 |
| Carbon Dioxide (CO ₂ ppm) | | | |
| at 1.5 minutes | 150 | <100 | - |
| at 4.0 minutes | 8050 | <100 | - |
| at maximum | 18,550*** | 200 | 90,000 |
| Nitrogen Oxides (as NO ₂ ppm) | 1 | <1 | 100 |
| Sulfur Dioxide (SO ₂ ppm) | <1 | <1 | 100 |
| Hydrogen Chloride (HCl ppm) | 7 | <1 | 500 |
| Hydrogen Fluoride (H F ppm) | <1 | <1 | 100 |
| Hydrogen Bromide (H Br ppm) | 9 | 25 | 100 |
| Hydrogen Cyanide (H C N ppm) | <1 | <1 | 100 |
| Original weight | 19.57 | 19.04 | |
| Final weight (g) | 10.84 | 13.54 | |
| Weight loss (g) | 8.73 | 5.5 | |
| Weight loss (%) | 44.6 | 28.9 | |
| Time to Ignition (s) | 15 | Did not ignite | - |
| Burning Duration (s) | 305 | - | - |

| NFPA 258 Smoke Development (ASTM E 662-97 NBC Smoke Density Chamber) | | | Flame Spread Rating (ASTM E 162-98) |
|--|---------|-------------|-------------------------------------|
| | Flaming | Non-Flaming | 30 |
| D _m | 345 | 475 | |
| D _s 1.5 | 13 | 1 | |
| D _s 4.0 | 148 | 11 | |

EcoTek® K320-ATSG 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 18°C and 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 25°C. Storage stability of two months or less should be anticipated if the storage temperature exceeds 30°C.

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

SAFETY

See appropriate Material Safety Data Sheet for guidelines.

ISO 9001:2008 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 EcoTek K320-ATSG base resin with 36% styrene at 25°C and 50% relative humidity. Tests performed on unreinforced cured resin. Thixotropic components, if applicable, are excluded. Castings are 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.



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The information contained in this data sheet is based on laboratory data and field experience. We believe this information to be reliable, but do not guarantee its applicability to the user's process or assume any liability for occurrences arising out of its use. The user, by accepting the products described herein, agrees to be responsible for thoroughly testing each such product before committing to production.

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