AOC®
World Leader in Resin Technology

Firepel® K320-A Series Polyester Resin

Firepel 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-ATN-20	150[1]	N/A	16 [2]	5	225	1.1	38
K320-ATS-40	130[3]	NA	40[4]	5	216	1.1	37
K320-ATT-10	190[3]	NA	10[2]	5	218	1.11	36

NA- Not applicable
1) 25°C Brookfield RV viscosity spindle 2 at 20 rpm
2) 25°C Gel time with 1.25% MEKP
3) 25°C Brookfield LV viscosity spindle 3 at 60 rpm
4) 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. Firepel K320-ATS-40 was blended 50/50 with ATH. Fiberglass content - 20%

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 (SO2 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 w eight	19.57	19.04	
Final w eight (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 CO_2 generated by the test flame.

DESCRIPTION

AOC's Firepel K320-A series are 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.

Firepel K320-A series resins are 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

Fire Resistance

Firepel K320-A series resins are designed for use in filled applications where fire retardancy and low smoke emissions are required.

Toxicity

Composites made with Firepel K320-A series resins have low toxicity values due to the absence of halogens.

Firepel® K320-A Series
Polyester Resin

FLAME RETARDANT & SMOKE DEVELOPOMENT DATA (See note below)						
NFPA 158 Smoke Development (ASTM E 662-97 NBC Smoke Density Chamber)			Flame Spread Rating (ASTM E 162-98)	UL 94		
	Flaming	Non-Flaming		HB Rating	V-O Rating	5V Rating
D_m	248	309	6	Pass	Pass	Pass
D_s 1.5	57	1				
D_s 4.0	194	35				

ASTM E 84 TEST	Flame Spread	Smoke Developed
	48	339

The above laminates were made with 2 ply of 1.5 oz. chopped strand mat (450 gram per square meter) The Firepel 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	<10	<10	-
at 4.0 minutes	678	<10	-
at maximum	2165	43	3500
Carbon Dioxide (CO_2 ppm)			
at 1.5 minutes	<50	<50	-
at 4.0 minutes	5550	<50	-
at maximum	45800	<50	90,000
Nitrogen Oxides (as NO_2 ppm)	3	1	100
Sulfur Dioxide (SO2 ppm)	2	4	100
Hydrogen Chloride (HCl ppm)	16	3	500
Hydrogen Fluoride (HF ppm)	8	3	100
Hydrogen Bromide (HBr ppm)	2	2	100
Hydrogen Cyanide (HCN ppm)	<1	<1	100
Original weight	50.2	47.7	
Final weight (g)	11.1	40.9	
Weight loss (g)	39.2	6.8	
Weight loss (%)	78.0	14.2	
Time to Ignition (s)	8	Did not ignite	-
Burning Duration (s)	1192	-	-

FLAME RETARDANT & SMOKE DEVELOPOMENT DATA (See note above)			
NFPA 158 Smoke Development (ASTM E 662-97 NBC Smoke Density Chamber)			Flame Spread Rating (ASTM E 162-98)
	Flaming	Non-Flaming	
D_m	345	475	30
D_s 1.5	13	1	
D_s 4.0	148	11	

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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 9001:2000 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 Firepel K320-A 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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