

Fire-Resistant Resin Guide

Selecting the optimum technology



Two-Step Guide to Selecting Fire Resistant Resins

AOC offers a wide range of Firepel® resins that combine the cost/performance benefits of composite resins with fire retardant and smoke suppression technologies. The Firepel product line includes halogen-free and synergist-free technologies as well as traditional systems that use fillers to achieve certification.

To help users make cost-effective decisions, this guide breaks the selection process into two basic steps:

1. Choose the optimum resin chemistry.

Choose the resin chemistry – unsaturated polyester, methacrylate modified or vinyl ester – that most cost-effectively meets end-use performance requirements for such properties as strength, modulus, elongation, corrosion resistance and heat distortion temperature.

2. Find the Firepel product for the specification.

Within the selected resin chemistry category, start with the fire and/or smoke standard that is written in the specification to find the Firepel product or products that has been tested to that standard.

Users are encouraged to contact an AOC sales or technical service representative who can be the point person between the user and AOC's knowledgeable technology team. For more information contact the AOC Firepel resin advisor: firepel@aoc-resins.com



The information contained in the tables of this brochure is based on laboratory data, testing results, and field experience. We believe this information to be reliable, but AOC does not guarantee the applicability of such information to the user's process or that the user will be able to replicate such results in its own process. Further, AOC assumes no liability for occurrences arising out of the use of such information. The user, by accepting the products described herein, agrees to be solely responsible for thoroughly testing any application before committing to production. The only operative warranties with respect to any of the products contained herein shall be pursuant to AOC's standard terms and conditions associated with an executed invoice or purchase order or pursuant to an executed purchase agreement.



Vinyl Esters

Requirement	Test Method	Characteristic	Product
			Features
			Additional Ingredients
International Building Code	ASTM E 84	Flame Spread	
		Smoke Developed	
Underwriter's Laboratory	UL 94	Flammability Rating	
Federal Motor Vehicle Safety Standards	FMVSS 302	Burn Rate	
Miscellaneous	ASTM D 635	Rate of Burning	

Polyesters

Requirement	Test Method	Characteristic	Product
			Features
			Additional Ingredients
International Building Code	ASTM E 84	Flame Spread	
		Smoke Developed	
Docket 90A	ASTM E 162	Flame Spread	
	ASTM E 662 / NFPA 158	Smoke Developed	
Underwriter's Laboratory	UL 94	Flammability Rating	
Federal Motor Vehicle Safety Standards	FMVSS 302	Burn Rate	
Bombardier Specification	SMP 800	Toxic Gas Production	
Boeing Specification	BSS 7239	Toxic Gas Generation	
Miscellaneous	ASTM D 2863	Limited Oxygen Index	
	ASTM D 635	Rate of Burning	

Methacrylate Modified

Requirement	Test Method	Characteristic	Product
			Features
			Additional Ingredients
International Building Code	ASTM E 84	Flame Spread	
		Smoke Developed	
Docket 90A	ASTM E 162	Flame Spread	
	ASTM E 662 / NFPA 158	Smoke Developed	
Underwriter's Laboratory	UL 94	Flammability Rating	
Federal Motor Vehicle Safety Standards	FMVSS 302	Burn Rate	
Bombardier Specification	SMP 800	Toxic Gas Production	
Boeing Specification	BSS 7239	Toxic Gas Generation	
British Standards	BS 476 Part 6	Fire Propagation Index	
	BS 476 Part 7	Surface Spread of Flame	
	BS 6853 Annex D	Smoke Density	
	BS 6853 Annex B	Toxic Fume	
French Standards	NFF-16101	Reaction to Fire, M-Rating	
		Smoke and Toxicity, F-Rating	
European Consolidated Standard (ENN45545)	ISO 5658-2	Flame Spread	
	ISO 5659-2	Smoke Opacity and Gas Analysis	
	ISO 5660-1	Heat Release	
	ASTM D 2863	Limited Oxygen Index	
Miscellaneous	ASTM E 1354	Oxygen Consumption Calorimeter	
	ASTM D 635	Rate of Burning	

FIRE RESIST

K022-AA	K022-AC	K022-CC		K022-CN	K022-E	K023	K095
Highest FR Performance	Class I	Multipurpose		Contains Antimony	Infusion Grade	High Heat Distortion Temperature	Novolac
			1.5% ATO				
Class I	Class I	Class II	Class I	Class I	Class I	Class I	Class I
Class I							Class I
HB, V-0, 5V	HB, V-0, 5V						
					Self Extinguishing		

Notes:

The fire performance shown is indicative of a fully-cured composite and is dependent on part thickness and glass content. Please see the respective data sheet for post-cure and laminate construction.

ATH = Aluminum Trihydrate (aka Aluminum Hydrate or Aluminum Hydroxide)
ATO = Antimony Trioxide

FDA = Ingredients comply with FDA Title 21 CFR, parts 170-199

* = Laminate tested with gel coat (see technical data sheet for details)

Class I Flame Rating ≤ 25 flame spread
Class II Flame Rating = 26 to 75 flame spread
Class I Smoke Rating ≤ 450 smoke developed

Exceeds requirement where applicable

Able to meet requirement but not tested

K130	K190-B	K320		K320-ATNG K320-ATSG	K733-A	K733-B	
General Purpose	Chlorendic	Halogen-Free		Halogen-Free Green Content	Corrosion Resistance		
	3% ATO	100 pph ATH	60 pph ATH*	60 pph ATH*			1.5% ATO
Class I	Class II	Class II			Class I	Class II	Class I
Class I	Class I	Class I					
		6	30	30			
HB, V-0, 5V		HB, V-0, 5V					
39							
Did Not Ignite							

K010-TB	K130-MAA				K130-MBA				K133	
Halogen-Free	Brominated Polyester				Brominated Polyester				Halogen-Free Polyester	
60 pph ATH*	50 pph ATH	100 pph ATH	150 pph ATH	50 pph ATH	100 pph ATH	150 pph ATH	150 pph ATH	150 pph ATH	300 pph ATH	
	Class I	Class I	Class I	Class I				Class I	Class I	
	Class I	Class I	Class I	Class I				Class I	Class I	
25								20		
									Class 0	
									Class I	
									1a	
					M2	M1	M1	M1	M1	
					F3	F3	F2	F1	F1	
	41		43	49	43	48	49	53		

ANT RESINS

FR Resin Applications, Manufacturers & Technologies



Arched lattice entranceway
RB Fiberglass
Vipel® K022



Architectural roof structure
BFG International Ltd. Bahrain
Firepel® K133



Food processing odor scrubber
Heil® Process Equipment
Vipel® K022-C



Chlorine header
Fibrex Corp.
Vipel® K190



HVAC ducting
Ram Fiberglass, Inc.
Vipel® K022AAA



Ducting
Bay Products Inc.
Vipel® K022



Theme park monster
Cinnabar
Vipel® K022



Car port louvers
Firepel® K130



Water treatment plant storage tanks
An-Cor Industrial Plastics
Vipel® K022
Vipel® F010



The World of AOC

AOC is a leading global supplier of resins, gel coats, colorants, additives and synergistic systems for composites and cast polymers. AOC products are manufactured in facilities strategically located in North America, Europe and Asia. AOC-owned manufacturing plants are ISO 9001:2008-certified, use proprietary technology to ensure resin batch-to-batch consistency, and follow Six Sigma-Lean principles for improved efficiency and quality. Whatever you are making or the manufacturing processes you use, discover AOC's innovative technology, process expertise and commitment to service by going to www.firepel.com on the Internet.

Sales Contacts

North America

Toll Free: +1 866 319 8827
Fax: +01 901 854 1183
northamerica@aoc-resins.com

Latin America

+01 863 815 5016
Fax: +01 863 815 4733
latinamerica@aoc-resins.com

Middle East

+44 1473 288997
Fax: +44 1473 216080
middleeast@aoc-resins.com

Europe

+44 1473 288997
Fax: +44 1473 216080
europe@aoc-resins.com

AOC UK Ltd.

+44 01206 390400
Fax: +44 01206 390409
salesUK@aoc-resins.com

India

+91 20 2547 2011
Fax: +91 22 6696 3120
india@aoc-resins.com

Asia/Australia

+44 1473 288997
Fax: +44 1473 216080
asia@aoc-resins.com

www.firepel.com