



FIREBLOCK™

2330PAWK745 Flame-Retardant Gel Coat

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Description

FIREBLOCK™ 2330PAWK745 is an unpromoted flame-retardant gel coat formulated for use as an in-mold coating for composites manufacturing. FIREBLOCK™ 2330PAWK745, when used in combination with NORSODYNE™ FIREBLOCK™ resin products, allows manufacturers to fabricate composites parts that meet requirements for a variety of markets, including transportation, building, architecture and construction.

Features and Benefits

When used in combination with NORSODYNE™ H 81269 TF, FIREBLOCK™, meets the following:

- UL 94-2006 Plastics Flammability Standard, HB classification
- Docket 90A requirements for transportation applications, including ASTM E162-09 Surface Flammability, and ASTM E662-08 Smoke Generation
- ASTM E84-09 Class 1 for Building/Architecture/Construction
- No fillers or additives required to achieve flame-retardant or smoke properties

FIREBLOCK™ 2330PAWK745 provides the following features and benefits:

- Meets the EPA National Emission Standards for Hazardous Air Pollutants (NESHAP) for Boat Manufacturing and Reinforced Plastic Composites Production
- Meets SCAQMD 1162 requirements
- Compliant with the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2008 (RoHS Regulations)
- For interior use, non-water immersion applications
- Available in white and light pastel colors only
- Unpromoted and requires the addition of a promoter for proper cure

Typical Liquid Properties (77°F, 25°C)

Liquid properties of FIREBLOCK™ 2330PAWK745 are shown (below). These values may or may not be manufacturing control criteria. They should be used as a reference guide only. Particular batches will not conform exactly to the numbers listed because storage conditions, temperature changes, age, testing equipment (type and procedure) can each have a significant effect on the results. Products outside of these readings can perform acceptably. Final suitability of this product is in the end use performance.



Test	FIREBLOCK™ 2330PAWK745
Flash Point	88°F
Weight per Gallon	12.0
Viscosity ⁽¹⁾	13,000 cps
Thixotropic Index (2/20)	7.0
Gel Time ⁽²⁾	12 minutes
Sag Resistance	Good at 30 mils
Hide	Typically complete at 28 mils
Tack Free/Dull Gloss Time	60-90 minutes

⁽¹⁾ Brookfield RVF, spindle #4 @ 4 rpm

⁽²⁾ 100 gm mass, 0.09% Cobalt-12, 1.8% Arkema Luperox® DDM-9

Flammability Test Data

Flammability test results for FIREBLOCK™ 2330PAWK745 laminates are provided below. Test results for actual parts will vary depending on their structure and conditions of use. Each fabricator should verify the performance of FIREBLOCK™ 2330PAWK745 in their specific application to ensure compliance with applicable national and international industry codes and insurance standards

U.S. Standards

Test	FIREBLOCK™ 2330PAWK745						
UL 94 Standard Test for Flammability of Plastic Materials for Parts in Devices and Appliances—MB-349 ^{(1),(2)}	HB Rating						
ASTM E162-08 Surface Flammability of Materials using a Radiant Heat Energy Source—MB-350 ^{(1),(2)}	Flame Spread Index, I _s = 5.82						
ASTM E662 Optical Smoke Density—MB-350 ^{(1),(2)} Specific Optical Density (D _s) at 1.5 min Specific Optical Density (D _s) at 4.0 min	<table border="1"> <tr> <td>Flaming</td> <td>Non-Flaming</td> </tr> <tr> <td>D_s = 1</td> <td>D_s = 1</td> </tr> <tr> <td>D_s = 43</td> <td>D_s = 8</td> </tr> </table>	Flaming	Non-Flaming	D _s = 1	D _s = 1	D _s = 43	D _s = 8
Flaming	Non-Flaming						
D _s = 1	D _s = 1						
D _s = 43	D _s = 8						
ASTM E84 Standard Method of Test for Surface Burning Characteristics of Building Materials—MB-351 ^{(1), (2)}	Flame Spread – 20						
	Smoke Developed – 300						
	Rating - Class 1						

⁽¹⁾ Laminate configuration will affect test performance. Contact Polynt Composites for the specific laminate configurations used to generate these test results.

⁽²⁾ Sample preparation: NORSODYNE™ H 82169 TF FIREBLOCK™ resin; Arkema Luperox® DDM-9 MEKP peroxide (usage 1.5% based on resin); Polycor® 970C903 12% Cobalt Octate (0.075% based on resin); 4 plies of CCM2000 CSM 2.0 oz., 4 hours post-cure @ 150°F.



International Standards – FIREBLOCK™ 2330PAWK745

Country	Standard	FIREBLOCK™ Performances
European Union	EN 45545	HL3
United Kingdom	BS 47 6, Part 6 • BS 476, Part 7 • BS6853	Class 0 • Class 1 • Cat. 2
France	NF P 92-507 • NF F 16-101	M1 • F1
Spain	UNE 23727	M1 • F1
Germany	DIN 5510	S4 • SR2 • ST2
America	ASTM E84	Class 1

Application

FIREBLOCK™ 2330PAWK745 must be mixed prior to use. Ingredients in the FIREBLOCK™ 2330PAWK745 will settle during storage. Failure to thoroughly reincorporate these ingredients will compromise the flame-retardant properties of the end product. Use mixing equipment with sufficient horsepower (relative to container size) to achieve thorough circulation from top to bottom and out to the sides of the container. The agitator must be properly sized for the container and must allow for uniform mixing regardless of the liquid level in the container. Scrape the bottom of the container to ensure that all ingredients are being pulled into the mix. After settled materials have been reincorporated, mixing once a day for 10 minutes is typically sufficient.

Air bubbling should not be used for mixing. It is not effective and only serves as a potential source of water or oil contamination. Do not overmix FIREBLOCK™ 2330PAWK745. Overmixing can break down the resin viscosity increasing the tendency to sag.

FIREBLOCK™ 2330PAWK745 is un-promoted. Promoter must be added for the product to cure properly.

	Gel Time ⁽¹⁾
Formula Ingredient	12 minutes
POLYCOR® 970C903 ⁽²⁾	0.09%
Luperox® DDM-9	1.8%

⁽¹⁾ Gel time data is for 100 g mass samples at 77°F.

⁽²⁾ Cobalt solutions having concentrations of 6% or 12% may be substituted for POLYCOR® 970C903. When using a 6% cobalt solution, you must double the recommended level of POLYCOR® 970C903.

Once the promoter has been added, the mix should be used within the same day. After 24 hours, the mix may have extended gel times and may not cure correctly. This could compromise the flame-retardant properties.

The cure rate of polyester resins depends on a number of factors including the product's age, temperature, catalyst type, catalyst level and ambient humidity. For these reasons, we recommend that customers check the cure rate in their plant.



All data referencing gel or cure refers specifically to Arkema Luperox® DDM-9 catalyst. United Initiators Norox® MEKP-9 and Norox® MEKP-9H, Akzo Nobel CADOX L-50a and CADOX D-50 are expected to yield similar performance. Arkema Luperox® DHD-9, United Initiators Norox® MEKP-925 and Norox® MEKP-925H, and Pergan HP-90 may yield slightly shorter gel and cure times.

To adjust for varying conditions the catalyst level can be varied. The catalyst level should not exceed 2.4% or fall below 0.9% for proper cure. A catalyst level of 1.8% at 77°F is considered ideal. This product should not be used when temperature conditions are below 60°F, as curing may be adversely affected.

FIREBLOCK™ 2330PAWK745 is formulated for spray application. Brushing or rolling is not recommended. To maximize the performance of this coating, the spray equipment must be well maintained and regularly calibrated. Application procedure recommendations should be followed carefully. Poorly maintained equipment or poor application will quickly negate the beneficial properties of this gel coat. Refer to Polynt's Composites Applications Guide ("Cookbook") for equipment and application recommendations.

Polynt Composites does not recommend fluid lines longer than 50 feet, or pumps smaller than 20:1 ratio. Polynt Composites recommends a gel coat delivery rate of no more than 2.5 pounds per minute with conventional air atomized equipment, and no more than 4 pounds per minute with airless equipment. To avoid tip plugging Polynt Composites recommends using 0.026 spray tips or larger.

For optimum results, uniform catalyst mix must be achieved. Even with the equipment properly calibrated, potential problems can occur due to poorly atomized catalyst, surging problems (FIREBLOCK™ 2330PAWK745 or catalyst), poor tip alignment (catalyst to FIREBLOCK™ 2330PAWK745 mix), contamination, and poor application procedures, which will quickly negate all benefits of calibration. The equipment (and application procedures) must be monitored on a routine basis to ensure proper application and cure of the gel coat. Inquire about and adhere to all equipment manufacturers' recommendations.

When establishing the fan pattern for the spray equipment, use the lowest pump pressure needed to achieve a good fan pattern (no fingers or tails, uniform particle size of about 1/16"). Use of higher pressures can lead to a porosity or excessive overspray. Overspray can result in a leathery or chicken skin texture if it falls on the part surface. To minimize overspray that falls onto the mold, plan the spray pattern so that the beginning is closest to the vapor/air exhaust and progresses to the opposite mold end. The spray pattern should also allow for a wet line to be maintained.

A spray distance of 18 to 36 inches is recommended. Closer spray distances can result in blowing of the film or air entrapment. Spraying at distances greater than 4 feet will increase orange peel and porosity. For deep channels, recessed, and hard-to-spray areas, an extension nozzle is highly recommended.

For best overall end performance properties, a wet film thickness of 16 to 20 mils is recommended. The film should be applied in multiple passes with each pass having a thickness of 6 mils. More rapid film build could result in some sag and porosity. Films less than 12 mils may not cure properly, may be hard to patch, have more print-through, and be more susceptible to water blisters. Films above 24 mils may pre-release, trap porosity, crack and are more subject to weathering discoloration.

To avoid pre-release Polynt Composites recommends that manufacturers use paste-wax mold release and apply the backup laminate as soon as possible after the FIREBLOCK™ 2330PAWK745 becomes tack-free.



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Related Products

POLYCOR® 970C903 Promoter Solution

NORSODYNE™ H 81269 TF FIREBLOCK™ – Nonhalogenated Fire-Retardant Laminating Resin

NORSODYNE™ I 181268 F FIREBLOCK™ – Nonhalogenated Fire-Retardant RTM Resin

Related Documents

See NORSODYNE™ H 81269 TF FIREBLOCK™ TDS.

Caution

Do not add any material, other than the recommended promoters and methyl ethyl ketone peroxide, to this product without the advice of a representative of Polynt Composites.

Storage Limitations

FIREBLOCK™ 2330PAWK745 has a shelf life of 120 days from the date of manufacture when stored at 73°F or below in a closed, factory-sealed, opaque container, and out of direct sunlight. The shelf life will be cut in half for every 20°F over 73°F.

SDS / Data Sheets

SDS and data sheets can be obtained by contacting your Polynt representative or Polynt Customer Service at 800-322-8103.

POLYNT SAFETY INFORMATION

All sales of products manufactured by Polynt Composites USA Inc. and described herein, are made solely on condition that Polynt Composites USA customers comply with applicable health and safety laws, regulations and orders relating to the handling of our products in the workplace. Before using, read the following information, and both the product label and Safety Data Sheet pertaining to each product.

Most products contain styrene. Styrene can cause eye, skin and respiratory tract irritation. Avoid contact with eyes, skin and clothing. Impermeable gloves, safety eyewear and protective clothing should be worn during use to avoid skin and eye contact. Wash thoroughly after use.

Styrene is a solvent and may be harmful if inhaled. Reports have associated repeated and prolonged occupational overexposure to solvents with permanent brain and nervous system damage. Extended exposure to styrene at concentrations above the recommended exposure limits may cause central nervous system depression causing dizziness, headaches or nausea and, if overexposure is continued indefinitely, loss of consciousness, liver and kidney damage.

Do not ingest or breathe vapor, spray mists or dusts caused by applying, sanding, grinding and sawing products. Wear an appropriate NIOSH/MSHA approved and properly fitted respirator during application and use of these products until vapors, mists and dusts are exhausted, unless air monitoring demonstrates vapors, mists and dusts are below applicable exposure limits. Follow respirator manufacturer's directions for respirator use.

The 12th Report on Carcinogens issued by the National Toxicology Program lists styrene as a "reasonably anticipated" carcinogen, but the Report cautions that the NTP listing does not mean that styrene presents a risk to persons in their daily lives. The Styrene Information and Research Center does not agree with the classification as it did not include a review of all available data. SIRC states: "HHS included styrene in the 12th RoC despite the fact that European Union regulators have determined styrene does not represent a human cancer concern. E.U. scientists reviewed the full styrene database, weighing all of the available data in reaching their conclusion."

The International Agency for Research on Cancer (IARC) reclassified styrene as Group 2B, "possibly carcinogenic to humans." This revised classification was not based on new health data relating to either humans or animals, but on a change in the IARC classification system. The Styrene Information and Research Center does not agree with the reclassification and published the following statement: Recently published studies tracing 50,000 workers exposed to high occupational levels of styrene over a period of 45 years showed no association between styrene and cancer, no increase in cancer among styrene workers (as opposed to the average among all workers), and no increase in mortality related to styrene.

Styrene is classified by OSHA and the Department of Transportation as a flammable liquid. Flammable products should be kept away from heat, sparks, and flame. Lighting and other electrical systems in the workplace should be vapor-proof and protected from breakage.

Vapors from styrene may cause flash fire. Styrene vapors are heavier than air and may concentrate in the lower levels of molds and the work area. General clean air dilution or local exhaust ventilation should be provided in volume and pattern to keep vapors well below the lower explosion limit and all air contaminants (vapor, mists and dusts) below the current permissible exposure limits in the mixing, application, curing and repair areas.

Some products may contain additional hazardous ingredients. To determine the hazardous ingredients present, their applicable exposure limits and other safety information, read the Safety Data Sheet for each product (identified by product number) before using. If unavailable, these can be obtained, free of charge, from your Polynt Composites representative or from: Polynt Composites USA Inc., 99 East Cottage Avenue, Carpentersville, IL 60110, 800-322-8103.

FIRST AID: In case of eye contact, flush immediately with plenty of water for at least 15 minutes and get medical attention; for skin, wash thoroughly with soap and water. If affected by inhalation of vapors or spray mist, remove to fresh air. If swallowed, get medical attention.

Those products have at least two components that must be mixed before use. Any mixture of components will have hazards of all components. Before opening the packages read all warning labels. Observe all precautions.

Keep containers closed when not in use. In case of spillage, absorb with inert material and dispose of in accordance with applicable regulations. Emptied containers may retain hazardous residue. Do not cut, puncture or weld on or near these containers. Follow container label warnings until containers are thoroughly cleaned or destroyed.

FOR INDUSTRIAL USE AND PROFESSIONAL APPLICATION ONLY. KEEP OUT OF REACH OF CHILDREN.

LIMITED WARRANTY AND LIMITATION OF LIABILITY

LIMITED WARRANTY.

Seller warrants that: (i) Buyer shall obtain good title to the product sold hereunder, (ii) at shipment such product shall conform to Seller's specifications for the product; and (iii) the sale or use of such product will not infringe the claims of any U.S. patent covering the product itself, but Seller does not warrant against infringement which might arise by the use of said product in any combination with other products or arising in the operation of any process. **SELLER MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE, EVEN IF THAT PURPOSE IS KNOWN TO SELLER. ANY ADDITIONAL REPRESENTATIONS OR SUGGESTIONS REGARDING THE PRODUCT OR ITS POSSIBLE USES ARE BASED UPON SELLER'S GOOD FAITH OPINION AND BELIEF, BUT ARE NOT TO BE CONSTRUED AS AFFIRMATIONS OF FACT, PROMISES, OR DESCRIPTIONS, AND SHALL IN NO WAY BE DEEMED PART OF THE SALE OF PRODUCT.** In particular, and without limiting the foregoing, because of environmental and use conditions beyond Seller's control, Seller offers no warranty and makes no promise concerning the results that may be obtained by the Buyer (or the Buyer's customer) with the product or the performance of the product. Each user should satisfy itself, by adequate testing, of the suitability of the product for its particular application.

LIMITATION OF LIABILITY.

- (a) Seller's total liability for any claim arising out of or in connection with this contract, including for breach of contract, warranty, statutory duty, or for other tort, including seller's negligence, shall not exceed the purchase price of such product as to which such liability arises. Seller shall not be liable for any injury, loss or damage, resulting from the handling or use of the product shipped hereunder whether in the manufacturing process or otherwise. **IN NO EVENT SHALL SELLER BE LIABLE FOR SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION LOSS OF PROFITS, CAPITAL OR BUSINESS OPPORTUNITY, DOWNTIME COSTS, OR CLAIMS OF CUSTOMERS OR EMPLOYEES OF BUYER, WHETHER IN AN ACTION UNDER CONTRACT, NEGLIGENCE OR ANY OTHER THEORY, ARISING OUT OF OR IN CONNECTION WITH THIS CONTRACT, OR THE USE, INABILITY TO USE, OR PERFORMANCE OF THE PRODUCT.**
- (b) If Seller furnishes technical or other advice to Buyer, whether or not at Buyer's request, with respect to processing, further manufacture, other use or resale of the products, Seller shall not be liable for, and Buyer assumes all risk of, such advice and the results thereof.

The information provided is believed to be accurate at the time of preparation, or prepared from sources believed to be reliable, but it is the responsibility of user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use.