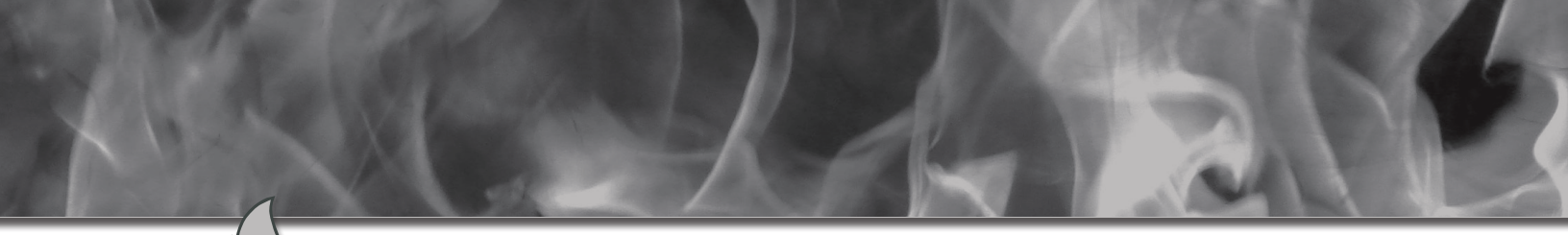

FIRESHELL®

IB4 Interior Ignition Barrier

Technical Data Sheet

FireShell® IB4 is a proprietary, water based, 1-part, non-flammable, intumescing coating complying with AC 377 ICC ES for interior use. This coating expands up to 2000% and provides oxygen starvation when in contact with fire. This barrier coating / ignition barrier comes in both insulating and fire extinguishing versions and is a non-toxic, no fuming, water-based coating. FireShell IB4 has low-viscosity for ease of application.

RECOMMENDED SUBSTRATE

- Walls, Attics, Crawl Spaces
- Open cell SPF insulation
- Closed cell SPF insulation

APPROVALS

FireShell IB4 passes NFPA complying with AC 377 ICC ES Appendix X over many SPF insulation systems and carries the following building code, industry, and environmental approvals:

- E84 Class 'A' Rated
- LEED Certified Green Product
- Meets EPA Low-VOC Standard

THICKNESS

Most SPF insulation systems can be coated in a single application to achieve building code compliance. Refer to TPR2 product matrix and SPF product ESR or other compliance reports for recommended coverage rates for your specific SPF insulation product.

Should your SPF product require more than one coat to comply with building code, individual coats of FireShell IB4 should be applied in perpendicular direction to the previous coat to achieve a crosshatching application.

The maximum single-pass application rate for FireShell IB4 is 12 wet mils.

The actual dry film thickness achieved in the field application is dependent upon many variables including method of application, and surface textures. It is the sole responsibility of the coating applicator to apply the proper amount of material required to achieve the minimum dry film thickness specified for the given requirements for the project.

To accurately achieve proper coverage applicator must check wet film thickness during application with a wet film gauge on multiple coupons evenly spaced throughout the project application area. Dry film thickness (DFT) is calculated from a measured wet film thickness (WFT) equation as follows:

DFT = WFT x % solids by volume

To calculate your Theoretical Application Rate (TAR) in gallons per 100 square feet, use the following equation:

TAR = (WFT)/16

DO NOT APPLY WHEN SUBSTRATE SURFACE IS BELOW 55 °F, OR WHEN WEATHER CONDITIONS WILL NOT ALLOW ADEQUATE CURING OF THE COATING. DO NOT APPLY IF RAIN, DEW, OR FREEZING TEMPERATURES ARE LIKELY TO OCCUR BEFORE PRODUCT CAN DRY AND CURE. DO NOT APPLY WHEN AMBIENT TEMPERATURE IS WITHIN 5 °F OF THE DEW POINT OR IS EXPECTED TO BE WITHIN 5 °F OF THE DEWPOINT WITHIN 24 HOURS FOLLOWING APPLICATION.

STORAGE, MIXING & THINNING

FireShell IB4 is available in ready-to-use, factory-sealed, standard-sized, five-gallon pails or fifty-five-gallon drums. Other container sizes may be available upon request.

DO NOT ALLOW MATERIAL TO FREEZE.

Storage at temperatures below acceptable minimum storage temperature may shorten shelf life. Product warranty is void if material is stored below or above recommended storage temperature.

DO NOT THIN.

Prior to use thoroughly mix FireShell IB4 with an air or electrically driven power mixer for a minimum of 2-4 minutes or until product color and viscosity is uniform. Mixer speed should be set fast enough to uniformly mix the entire container but not so fast as to introduce air into the coating while mixing. For five-gallon pails use a minimum 3" mixing blade, for drums use a minimum 6" mixing blade.

Previously opened containers, or containers that have been stored for an extended length of time, may develop a skin on top of or at the edges of the coating, which must be removed prior to mixing.

APPLICATION PROCEDURES

FireShell® IB4 should be installed only after SPF core temperature has assumed ambient temperature for 2 hours.

The successful installation and effectiveness of FireShell® IB4 will depend on many factors including the equipment capabilities & settings, the temperature of the coating in the container, ambient temperature & RH%, substrate temperature &

PROPERTIES	
Product Specifications	
Viscosity (ASTM D562)	110 – 120 KU
% Solids by Volume (ASTM D2697)	58% (+/- 0.3)
Weight per Gallon (ASTM D1475)	10.9 lbs/gal (+/- 0.3)
Flame Spread Index (ASTM E84)	< 25
Smoke Development (ASTM E84)	< 50
Shelf Life	1 year
VOC	< 50 g/L
Colors	White
Packaging	5 gallon pail 55 gallon drum
Storage Temperature	>45°F
Tack Free Time	60 – 90 minutes @ 77°F & 50% R.H.*
Full Cure Time	3 weeks
Sag Resistance	35 mils on walls 20 mils on ceilings*
Processing Pressure	>2200 PSI at the gun tip*
Minimum Material Temperature	>62°F
Ambient Temperature Range	55 – 95°F
Minimum Substrate Temperature	>55°F
Ambient RH% Range	40 – 60% (requires <70%)
Recommended Sprayer	Graco 695 or equivalent (>0.74 gpm delivery rate)
Recommended Gun	Graco HD Texture Gun or equivalent
Recommended Tip Size	.517 – .521 reversible, self-cleaning is recommended
Coverage	160 – 400 sq. ft. per gal**

ICP Construction, Inc.
150 Dascomb Road | Andover, MA 01810
866.667.5119 | www.icpgroup.com

IB4 Interior Ignition Barrier

Technical Data Sheet

APPLICATION PROCEDURES CON'T
moisture content, substrate type & condition. It is the responsibility of the applicator to take these factors into consideration prior to installation.

Cold material will develop higher viscosity which can cause problems during processing such as pump cavitation and poor pre-mixing material. If material appears thickened due to storage at cold temperatures, store material in a warm area prior to application to bring material temperature to > 62° F.

SURFACE PREP
SURFACE TEXTURE OF SPF WILL GREATLY AFFECT MATERIAL ADHESION, SAG RESISTANCE, AND COVERAGE RATE.

SPF surface should have a fine, orange-peel texture (or rougher), and be flat for optimum adhesion and material coverage. SPF surface that is bumpy, or significantly uneven will decrease coating coverage.

SPF that has a glossy or slick appearance may need to be abraded or "scuffed" to roughen the surface to promote adhesion of coating.

SPF surface must be clean, dry, and free of any mildew, oil, grease, dirt, or other foreign contaminants that would prevent proper adhesion. Any such contaminants must be removed from the application surface. For application in high humidity or low temperature environments apply product in thin passes to promote proper drying & curing.

EQUIPMENT
FireShell IB4 is applied with airless spray equipment.

When using airless spray equipment ensure the equipment has a volume output not less than 0.74 gpm (gallons per minute) and an operating pressure of 3300 psi. The sprayer should be equipped with a filter screen 30-mesh. To ensure proper pressure and delivery to the spray gun use the following rules for hose diameter &
length:

- Min. 3/8" ID up to 75'
- Min 1/2" ID up to 200'
- Min 3/4" ID greater than 200'
- Min 3/8" ID & Max 6' L for whip hose

Always use larger diameter hose sections nearest the pump.

We recommend using a Graco Reverse-A-Clean (RAC) X gun tip with no internal diffuser and an orifice size of .517 - .521.

ALWAYS USE EQUIPMENT AND COMPONENTS WITH THE PROPER PRESSURE AND MATERIAL DELIVERY RATINGS THAT ARE IN GOOD WORKING ORDER.
A natural bristle brush or a medium nap roller can be used for touch-up and edge work, or for small areas that are not practical for spray application.

SAFETY & ENVIRONMENTAL
FireShell IB4 is installed by independent contractors. It is recommended that building owners verify that your contractor maintains proper credentials, insurance, licenses, and is properly trained to safely install coatings.

FireShell IB4 achieves a Class A Fire rating. It is formaldehyde-free, halogen-free, low-VOC, HFCfree, and PBDE-free.

Always read and follow all job site safety requirements as set forth by state and federal safety regulatory agencies such as OSHA and NIOSH.

Always read and follow all Material Safety Data Sheets provided with all shipments. Additional copies are available upon request from TPR2 or your technical representative.

Basic PPE safety equipment is required for personal protection including, but not limited to: long-sleeve chemically resistant overalls, rubber gloves, splash shield or safety glasses with splash guards, rubber or leather boots w/ covers.

DO NOT USE NEAR HIGH HEAT OR OPEN FLAME.

DO NOT TAKE INTERNALLY AND PREVENT CONTACT WITH SKIN OR EYES.
KEEP OUT OF THE REACH OF CHILDREN.

CURE TIME & RECOAT
FireShell coatings are latex based. To ensure that successive coats are applied properly, it is important to understand how they dry and cure. As the coating dries, the liquid components evaporate. As liquid evaporates from the coating it becomes cured while the evaporated liquid becomes water vapor suspended in the air surrounding the coating.

The drying time between coats is normally longer than simply "dry to touch" or "tack-free", especially with thicker coating applications. "Dry to touch" or "tack-free" means you can touch a coated surface without getting paint on your hand. While this is a stage in the curing process, this indicates that the liquids have evaporated only from the surface of the paint, and does not mean that the coating is dry enough to add a second coat without creating significantly longer drying time.

Building a thick coating, intentionally or unintentionally, or spraying the coating over an uncured substrate may create problems in the drying and curing process. Until all the liquids have completed evaporated, the coating is not cured. Normal full cure time is 2-4 weeks. Once cured the coating becomes a durable and inert fire protective finish. Even under adverse application conditions, the coating will eventually cure; however, the noncompliant application procedure may affect adhesion quality, lingering odors, drying time, and the warranty of the coating.

ENVIRONMENTAL CONDITIONS & DRYING
Proper ambient air-movement, proper substrate and coating temperatures, and low humidity are necessary for proper adhesion and drying of the coating. The following example illustrates the drying potential of 10,000 ft.3 of air at various temperatures:

- 90°F air can evaporate 2.6 gal of water
- 40°F air can evaporate 0.5 gal of water

FireShell coatings are approximately 68% solids which mean each five-gallon pail of coating contains roughly 1.5 gallons of water that must be evaporated from for the coating to dry and cure.

As a reference, an attic in a 1,600 ft.2 house with a gable roof that has an 8/12 pitch will have an attic volume of approximately 10,600 ft.3. Based on the above illustrations, conditions in this attic would need to be extremely dry with an interior temperature more than 90 °F prior to coating application to be assured of proper drying of one five-gallon pail of coating.

Low temperatures or humidity over 70% RH in the attic prior, during, or after application can hinder drying of the coating and can produce lingering odors due to the slow evaporation of the liquid components.

Odors emitted from the coating as it dries should be like those found in low-odor latex paint. Under proper drying conditions these odors should quickly dissipate and not cause any lingering issues.

To avoid problems associated with improper drying of the coating always observe Application Procedures and product recommendations.

FIRESHELL®

IB4 Interior Ignition Barrier

Technical Data Sheet

PRODUCT LIMITATIONS

FireShell IB4 should not be used for exterior applications. It should not be used where it will stay submerged in water or below grades where back-fill material will be in permanent contact with the coating.

FireShell IB4 should not be used in areas that are or will be subjected to extreme temperature or humidity conditions such as swimming pool rooms, hot yoga studios, spas, hot tubs, saunas, coldstorage, or other areas where temperatures or humidity levels may be abnormally high or low under normal use. Contact your TPR2
representative if you have questions regarding other extreme use applications.

Installation must comply with all applicable building codes.

VENTILATION

Closed areas, such as unvented attics, will require mechanical, negative-pressure, cross ventilation during the spraying and drying period. Mechanical, negative-pressure, cross ventilation is the ONLY effective method of ventilating closed or confined spaces where coatings must be applied to ensure proper drying.

For ventilation, it is important to ensure you create negative pressure (vacuum) in the enclosed spray area to evacuate water vapor and any off-gassed components of either the SPF insulation system or coating to exterior, unoccupied space. This can be achieved using a whole-house ventilation technique outlined below:

- Review and observe all application parameters, product limitations & recommendations on the technical data sheet to ensure the work environment is suitable for the application of coating.
- Inspect the foam substrate to ensure it is dry, clean, and secured to its substrate.
- Use a “supply” blower to draft fresh exterior air to one end of the enclosed space via a hose from the non-occupied exterior.
- Ensure the supply air flows across the immediate vicinity of the spray operation.
- Use an “exhaust” blower to evacuate the stale, moisture laden air from the opposite end of the enclosed space through a hose to the exterior of the building.
- The exhaust blower must have a larger air volume output than the supply blower to ensure the enclosed space is maintained at a negative pressure in relationship to the surround area.
- Do not arrange the ends of the hoses where the supply air is drafting air from the exhaust hose.
- Do not exhaust the stale air into any living space or garage area. It must be exhausted to a safe uninhabited open area.
- Place a filter over the exhaust hose to avoid spreading overspray.
- Ensure the lengths of supply and exhaust hoses and filter do not restrict the air movement.
- Constant monitoring of humidity and temperature is necessary until coating has dried thoroughly to ensure the spray environment remains within the application parameters specified on the coating technical data sheet. If the humidity exceeds 70% RH during the drying period while using mechanical, negative pressure, cross-ventilation, then mechanical dehumidification may be required as supplementary drying aid until the coating is thoroughly dry.

DO NOT USE PROPANE, KEROSENE, OR DIESEL COMBUSTION HEATERS TO HEAT A CLOSED SPACE.

Burning fuels like this in a confined space depletes oxygen and can create a dangerous buildup of toxic gasses including CO and CO2. Always observe OSHA and NIOSH regulations for using heaters in confined or closed spaces.

In addition, the process of burning fuels such as kerosene, propane, or diesel adds significant amounts of water vapor to the environment, which furthers hinders the evaporative drying process.

DISPOSAL & CLEANUP

Consult Safety Data Sheets (SDS) prior to handling and disposal. Cured product may be disposed of without restriction. Product containers that are “drip free” may be disposed of according to local, state, and federal laws. Spills or overspray during application can be cleaned/removed with soap and water for uncured material.