



Code Compliance Research Report

Subject: International Fireproof Technology, Inc. (IFTI)
DC315 Fire Protective Coating

Date: October 20, 2015

Materials: DC315. Single-component, water-based fire protective coating for use over spray-applied polyurethane foam plastic insulation.

Test Standards:

<u>Property</u>	<u>Standard</u>
Solids Content by Volume	ASTM D2697
Density	ASTM D1475
Viscosity	ASTM D2196

Building Codes and Code References:

1. 2006, 2009, 2012, 2015 International Building Code (IBC)
2. 2006, 2009, 2012, 2015 International Residential Code (IRC)
3. AC456 Acceptance Criteria for Fire-Protective Coatings Applied to Spray-Applied Foam Plastic Insulation Installed without a Code-Prescribed Thermal Barrier, as approved by ICC-ES Committee, 10/2015.
4. AC377 Acceptance Criteria for Spray-Applied Foam Plastic Insulation, 5/2015.

Summary:

1. Based on the test data submitted and the reference documents, DC315 fire protective coating meets the requirements and intent of AC456. When used and tested as a component as part of an assembly with specific spray polyurethane foam (SPF) systems, that assembly does not require the thermal barrier specified in IBC Section 2603.2, IRC Section R326.4 or AC377 Section 3.2.3.2.
2. Specific DC315 / SPF assemblies, including minimum DC315 thicknesses and maximum SPF thicknesses, may be found in individual SPF evaluation reports based on AC377.

Labeling Requirements:

Containers of DC315 must be identified with the manufacturer's name (IFTI), address and telephone number; the name of the insulation product (DC315); date of manufacture; shelf life or expiration date; storage conditions; application instructions; and the name of the third-party inspection agency.

Discussion:

1. **Specific Spray Foam Systems:** DC315 is tested with specific spray polyurethane foam (SPF) systems as specific assemblies. DC315 application thickness will vary from one SPF to another. Fire test methods and test report requirements are provided in AC377. Recognition for specific assemblies with limits on DC315 and SPF thicknesses can be found in individual SPF evaluation reports based on AC377.
2. **Per Cent Solids by Volume:** For DC315, the per cent solids by volume (vol%) is 67%.
3. **Dry Film Thickness, Wet Film Thickness and Theoretical Application Rate:** Thicknesses and theoretical application rates for DC315 may be determined from the thicknesses reported in the respective fire test reports and the formulas listed in AC456, Appendix A. Based on a vol% content of 67%, Table 1 relates these relationships.

Table 1: Film Thicknesses and Theoretical Application Rates

WFT	DFT	TAR
Wet Film Thickness	Dry Film Thickness	Theoretical Application Rate
(mils)	(mils)	(gallons / 100 ft ²)
18	12.0	1.13
19	12.7	1.19
20	13.4	1.25
21	14.1	1.31
22	14.7	1.38

4. **Adjustments to Theoretical Application Rates (TAR):** Due to job conditions, TARs must be adjusted upward for estimating and application purposes. Factors that affect these adjustments include SPF surface texture, overspray, and miscellaneous losses (such as spills, material left in hoses or on brushes, etc). Refer to SPFA-121 “Spray Polyurethane Foam Estimating Reference Guide” for specific determination methods.
5. **Installation Instructions:** Specific installation instructions may be found in the DC 315Data Sheet and Application Guide.
 - a. **Surface inspection and preparation:** All surfaces to be coated must be clean, cured, firm, dry and free of dust, dirt, oil, wax, grease, mildew and efflorescence. Inspect and clean surfaces as required. Some SPF assemblies require the use of a primer (see individual SPF evaluation reports for details).
 - b. **Equipment and Settings:** DC315 may be applied using airless spray equipment, brush or roller. See DC 315Data Sheet and Application Guide for specific equipment recommendations and settings.

- c. Application Conditions: Apply DC315 when ambient temperature is between 50 and 90°F and relative humidity is between 50 and 75%.
 - d. Storage Conditions / Shelf Life: Do not store DC315 below 50°F. Shelf life of DC315 is one year from date of manufacture when stored in unopened containers between 50 and 80°F.
 - e. Mixing: DC315 must be mixed prior to application. Use a high-speed drill with a mixer sized for the specific container. Container contents should be stirred from the bottom up. Five-gallon pails should be mixed 4-5 minutes. See DC 315Data Sheet and Application Guide for additional information.
 - f. Multiple Coats: Maximum application thickness of DC315 in one coat is 24 mils WFT for both vertical and horizontal (overhead) applications. Allow two hours between multiple coating applications.
6. **Fire Tests and Recognized Assemblies:** Fire tests for recognizing DC315 / SPF assemblies are specified in AC377 with NFPA 286 being the more common. Specific assemblies with minimum DC315 thicknesses and maximum SPF thicknesses may be found in individual SPF evaluation reports.
 7. **Quality Control:** DC315 is manufactured under a quality control program supervised and inspected by Warnock Hersey/Intertek.

Conclusions:

DC315 fire protective coating meets the requirements and intent of the IBC and IRC, in combination with tested SPF systems, as alternate assemblies to the use of thermal barriers as specified and as limited in the Summary section above.

Respectfully submitted,
Deer Ridge Consulting, Inc.



Roger V. Morrison, PE, RRC
President

Reference Documents:

1. 2006, 2009, 2012 and 2015 International Building Code: Sections 803.1.2.1; 2603.
2. 2006, 2009, 2012 and 2015 International Residential Code: Sections R302.9.4; R316.
3. AC456 Acceptance Criteria for Fire-Protective Coatings Applied to Spray-Applied Foam Plastic Insulation Installed without a Code-Prescribed Thermal Barrier, as approved by ICC-ES Committee, 10/2015.
4. AC377 Acceptance Criteria for Spray-Applied Foam Plastic Insulation, 5/2015.
5. DC 315Data Sheet and Application Guide.
6. SPFA-121 "Spray Polyurethane Foam Estimating Reference Guide."
7. PRI Construction Materials Technologies, Test Report No. CAW-002-02-01, March 24, 2015 (Percent Solids by Volume).



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SECTION: 09 96 43—FIRE-RETARDANT COATINGS

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EVALUATION SUBJECT:

DC 315 COATING



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 Section: 09 96 43—Fire-Retardant Coatings

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EVALUATION SUBJECT:
DC 315 COATING
1.0 EVALUATION SCOPE
Compliance with the following codes:

- 2015, 2012, 2009 and 2006 *International Building Code*® (IBC)
- 2015, 2012, 2009 and 2006 *International Residential Code*® (IRC)

Property evaluated:

- Application without a prescriptive thermal barrier
- Physical properties

2.0 USES

DC315 is a liquid-applied coating intended for application over the surface of spray-applied foam plastic insulation recognized in an ICC-ES evaluation report as complying with ICC-ES Acceptance Criteria for Spray-applied Foam Plastic Insulation (AC377). The coated assembly may be left exposed to the interior of the building without the application of a code-prescribed 15-minute thermal barrier when installed as described in this report.

3.0 DESCRIPTION

DC315 is a single-component, water-based, liquid-applied intumescent coating. The coating is supplied in 5-gallon (19 L) pails and 55-gallon (208 L) drums and has a shelf life of one (1) year when stored in factory-sealed containers at temperatures between 50° and 80°F (10 and 27°C).

4.0 DESIGN AND INSTALLATION
4.1 Installation – General:

DC 315 must be applied in accordance with the manufacturer's published application instructions and this

report. A copy of the instructions must be available on the job site at all times.

DC 315 must be mechanically mixed prior to application. The coating is applied to the required thickness using spray equipment, a brush or a roller having a medium nap. Surfaces to be coated must be inspected in accordance with the manufacturer's published installation instructions and must be dry, clean, and free of dirt, loose debris and other substances that could interfere with the adhesion of the coating. The coating must not be applied when the ambient or surface temperature is below 50°F (10°C) or above 90°F (32° C) and relative humidity of not more than 65%. The manufacturer must be consulted for specific application conditions.

The DC 315 coating may be applied over spray-applied foam plastic insulation without covering the coated assembly with the 15-minute thermal barrier prescribed in the IBC Section 2603.4 and IRC Section R316.4 (2006 IRC Section R314.4).

5.0 CONDITIONS OF USE

The DC 315 coating described in this report complies with, or is a suitable alternative to what is specified in, those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 Application must comply with this report, the manufacturer's published installation instructions, and the applicable code. A copy of the installation instructions must be on the job site during application of the coating. In the event of a conflict, this report and the code govern.
- 5.2 The application of additional interior finishes over the coating is outside the scope of this report.
- 5.3 Recognition in this report is for the specific assemblies and spray-applied foam plastic insulations described in Table 1. The spray-applied foam plastic insulation must be installed in accordance with the requirements set forth in the specific ICC-ES evaluation report noted.
- 5.4 The coating is manufactured in Taoyuan, Taiwan and Irvine, California, under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Reports of testing in accordance with AC456, including room corner fire testing in accordance with NFPA 286.

7.0 IDENTIFICATION

All containers of DC 315 coating must be labeled with the manufacturer's name (International Fireproof Technology Inc. / Paint to Protect Inc.) and address; the product name; the date of manufacture, the shelf life or expiration date;

the manufacturer's instructions for application, and the evaluation report number (ESR-3702).

The spray-applied foam plastic insulations must be labeled in accordance with the applicable evaluation report (see Table 1).

TABLE 1—USE OF INSULATION WITHOUT A PRESCRIPTIVE THERMAL BARRIER

INSULATION TYPE	MAXIMUM THICKNESS (in.) (Vertical Surfaces)	MAXIMUM THICKNESS (in.) (Overhead Surfaces)	DC 315 COATING MINIMUM THICKNESS ¹ (Applied to all Foam Surfaces)	MINIMUM THEORETICAL APPLICATION RATE OF COATING ²	TEST METHOD
BASF Spraytile 158 (See ESR-2642)	5½	7½	13 mils DFT 20 mils WFT	1.25 gal / 100 ft ²	NFPA 286
JM Corbond® oc (See ESR-3776)	7½	11½	12 mils DFT 18 mils WFT	1.125 gal / 100 ft ²	

For SI: 1 inch = 25.4 mm; 1 mil = 0.0254 mm; 1 gallon = 3.38 L; 1 ft² = 0.93 m².

Notes:

¹DFT = Dry Film Thickness; WFT = Wet Film Thickness

²As reported in the manufacturer's application instructions. Actual application rate, based upon specific project conditions, must be in accordance with the manufacturer's application instructions.