ULC Evaluation Report

ULC ER39793-01-REV20190712

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UL Category Code: ULFE7

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DIVISION: 07 00 00 THERMAL AND MOISTURE PROTECTION
Sub-level 2: 07 80 00 – Fire and Smoke Protection
Sub-level 3: 07 81 00 – Applied Fireproofing
Sub-level 4: 07 81 23 – Intumescent Fireproofing

COMPANY:

INTERNATIONAL FIREPROOF TECHNOLOGY INC
17528 VON KARMAN AVE
IRVINE, CA 92614-6208
United States

1. SUBJECT

DC 315 Intumescent Coating

2. SCOPE OF EVALUATION

- Compliance with the flashover requirements of CAN/ULC-S145:2018, Standard Method of Test for the Evaluation of Protective Coverings for Foamed Plastic Insulation - Full-Scale Room Test, First Edition (dated June 2018), section 7.2.

- Compliance with the following Articles of the National Building Code of Canada 2010:
  - Clause 1.2.1.1.(1)(b) of Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
    - Clause 3.1.4.2.(1), Protection of Foamed Plastics
    - Sentence 3.1.5.12.(2), Combustible Insulation and its Protection

2. SCOPE OF EVALUATION (continued)

- Compliance with the following Articles of the National Building Code of Canada 2015:
  - Clause 1.2.1.1.(1)(b) of Division A, as an alternative solution that achieves at least the minimum level of performance required by Division B in the areas defined by the objectives and functional statements attributed to the following applicable acceptable solutions:
    - Clause 3.1.4.2.(1), Protection of Foamed Plastics
    - Sentence 3.1.5.15.(2), Foamed Plastic Insulation

3. USES

The product is a spray-applied, protective coating for spray polyurethane foam insulation.

4. PRODUCT DESCRIPTION

4.1 General:

The product is a white, liquid coating that is spray applied by authorized installers to spray polyurethane foam insulation. The coating intumesces upon exposure to fire to insulate and protect the polyurethane foam insulation from fire.

The coating system consists of two components:

- "Sherwin Williams DTM Bonding Primer", and
- "DC 315 Intumescent Coating"

The components are installed separately and are not mixed.

"DC 315 Intumescent Coating" shall be labelled "ULC ER39791-01".

5. INSTALLATION

The spray polyurethane foam shall be applied in accordance with the current edition of CAN/ULC-S705.2.

The coating and primer system shall be applied to spray polyurethane foam insulation when fully cured. Refer to the spray polyurethane foam insulation manufacturer's documentation for foam cure time.

Prior to application of "DC 315 Intumescent Coating", the foam surface is required to be primed with "Sherwin Williams DTM Bonding Primer". The primer shall be allowed to cure for a minimum of four hours prior to application of "DC 315 Intumescent Coating". "DC 315 Intumescent Coating" shall be allowed to cure for a minimum of three weeks in order to achieve the appropriate classification.

The minimum wet film thicknesses (measured at the time of application) required for both the primer and the coating are given in Table 6.1.

6. CONDITIONS OF USE

The determination of the required duration of protection of foamed plastic of 10 min. or 20 min. time without flashover is to be determined by the authority having jurisdiction.

6.1 General:

Table 6.1 Foam and Coating Application Thicknesses for Time without Flashover

	10 min without flashover[a]	20 min without flashover[a]
Spray Polyurethane Foam	50 mm 38.4 kg/m³	100 mm 38.4 kg/m³
Primer Wet Film Thickness	0.076 mm (3 mil)	0.076 mm (3 mil)
DC 315 Wet Film Thickness	0.508 mm (20 mil)	0.640 mm (25 mil)

[a]Evaluated only to flashover time in accordance with CAN/ULC-S145, section 7.2.

Table 6.2 CAN/ULC-S102 Surface burning Characteristics of DC 315

	Flame Spread Rating	Smoke Developed Classification
Intumescent Coating "DC 315", applied to 9.5 mm thick OSB at 0.3 mm wet film thickness	0	25

7. SUPPORTING EVIDENCE

International Fireproof Technology Inc has submitted technical documentation for ULC's review. In addition to the National Research Council of Canada testing laboratories, testing was conducted at laboratories recognized as ISO 17025 compliant. The test data submitted for this product is summarized below.

7.1 Performance Requirements and Test Results

Table 7.1 Test Results of DC 315 for Time without Flashover[a]

	10 min without flashover[b]		20 min without flashover[b]	
	Requirement	Test Result	Requirement	Test Result
Floor level heat flux	≤ 20 kW/m²	< 2 kW/m²	≤ 20 kW/m²	9 kW/m²
Average upper layer temperature	≤ 600°C	< 600°C	≤ 600°C	450°C
Heat release rate	≤ 1MW	< 0.2 MW	≤ 1MW	< 0.45 MW
Visible flames exit doorway	No	No	No	No

[a]Evaluated only to flashover time in accordance with CAN/ULC-S145, section 7.2 and CAN/ULC-9705.
[b]Flashover is defined in CAN/ULC-S145 as failing to satisfy any two or more of the four requirements.

Table 7.2 Test Results of 12.5 mm Regular Gypsum Wallboard[a] for Time without Flashover[b]

	10 min without flashover[c]		20 min without flashover[c]	
	Requirement	Test Result	Requirement	Test Result
Floor level heat flux	≤ 20 kW/m²	< 2 kW/m²	≤ 20 kW/m²	< 8 kW/m²
Average upper layer temperature	≤ 600°C	--	≤ 600°C	--
Heat release rate	≤ 1MW	< 0.2 MW	≤ 1MW	< 0.6 MW
Visible flames exit doorway	No	No	No	No

[a]Gypsum wallboard installed as protection over nominally 50 mm thick spray polyurethane foam with a density of 33.6 kg/m³.
[b]Evaluated only to flashover time in accordance with CAN/ULC-S145, section 7.2 and CAN/ULC-9705.
[c]Flashover is defined in CAN/ULC-S145 as failing to satisfy any two or more of the four requirements.

Table 7.3 Test Results of DC 315 for Paint Performance Requirements

Property	Test Method	Requirement	Result
Flashpoint (Pensky-Martens closed cup) [°C]	Section 3.1 of CGSB 1-GP-71	> 35	> 100
Consistency [Kerbs]	Section 4.5 of CGSB 1-GP-71	> 85	850-1700
Drying time [hours]	Section 5.1 of CGSB 1-GP-71 or ASTM D 7488	Report value	To reapply: 6h min. Full cure: 24 h min.
Solid content [%]	Section 2.2 of CGSB 1-GP-71 or ASTM D 2697	> 40%	67%
Lead content [ppm]	Health Canada Method C02	< 100	Pass
Phthalates content [%]	Health Canada Method C34	< 1	Pass
Volatile organic compound (VOC) [g/l]	ASTM D 2369	< 50	47

Table 7.4 Test Results of DC 315 for Environmental Durability Requirements

Property	Test Method	Requirement	Result
Flexibility	ASTM D 522	No cracking or peeling on a 12.5-mm mandrel	Pass
Adhesion to substrate (with primer)	ASTM D 3359, Method A	Min. adhesion rating: 4A	5A
Adhesion to substrate (with primer) under high humidity	ASTM D 3359, Method A after conditioning	Min. adhesion rating: 4A	5B
Adhesion – pull off strength	ASTM D 4541	Report value	344.8 kPa
Moisture resistance	ASTM D 4585 Moisture Protocol	No blistering, wrinkling or loss of adhesion (Adhesion ASTM D 3359)	Pass
Fungal/mildew resistance	ASTM D 5590	No more fungal growth than control specimen	Pass
Water Vapor permeance	ASTM E 96/E 96M-13 (Desiccant Method)	Report value	977 ng/(Pa·s·m²)

8. BUILDING CODE COMPLIANCE

The use of foamed plastics in combustible and non-combustible construction poses a significant fire risk. To mitigate this risk, Clauses 3.1.4.2.(1) and 3.1.5.12.(2) of the 2010 National Building Code of Canada and Clauses 3.1.4.2.(1) and 3.1.5.15.(2) of the 2015 National Building Code of Canada require the foamed plastic to be protected by a thermal barrier. Depending on the location of installation, thermal barrier can be defined as mechanically fastened 12.7 mm thick gypsum wallboard or any thermal barrier that meets the requirements of classification B when tested in accordance with CAN/ULC-S124.

The test method described in CAN/ULC-S124, utilizes the time-temperature fire exposure required for fire resistance testing in CAN/ULC-S101. It limits the interface temperature between the foamed plastic insulation and the protective material to predetermined values traditionally used as indicators of the prevention of ignition of combustible material based on duration and maximum temperature rise. It evaluates the thermal protection provided to the foamed plastic insulation. The test method's temperature failure criteria are intended to demonstrate that performance of a thermal barrier will limit the contribution of the foam plastic insulation to fire growth, by limiting the temperature rise at the interface between the protection and the foamed plastic insulation to a level at which the foamed plastic insulation is not likely to contribute to an ambient fire.

The test method in CAN/ULC-S145, is also a performance-based approach to evaluating, and limiting, the contribution of foamed plastic insulation together with the method of protection, to fire growth. This test method monitors floor head flux, room temperature, overall heat release rate, and the visual appearance of flames exiting the doorway to determine the contribution to flashover by the foam system and protective covering. The fire performance characteristics are similar to those found in CAN/ULC-9705.

Although the method is fundamentally different from CAN/ULC-S124, both test methods can provide safe solutions to ensuring the foamed plastic insulation does not contribute to early fire growth.

The CAN/ULC-S145 test data provided demonstrate that "DC 315 Intumescent Coating" applied to spray polyurethane foam does not contribute to flashover within the 20 minute test period, comparable to the performance of 12.5 mm gypsum wallboard, and can be used to satisfy Sections 3.1.4.2.(1) and 3.1.5.12.(2) of the 2010 National Building Code of Canada and Sections 3.1.4.2.(1) and 3.1.5.15.(2) of the 2015 National Building Code of Canada.

9. IDENTIFICATION

The “DC 315 Intumescent Coating” described in this evaluation report are identified by a marking bearing the report holder’s name (International Fireproof Technology Inc), the plant identification, and the evaluation report number ULC ER39793-01. The validity of the evaluation report is contingent upon this identification appearing on the product.

9.1 Manufacturing Locations:

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10. USE OF ULC EVALUATION REPORT

10.1 The approval of building products, materials or systems is under the responsibility of the applicable authorities having jurisdiction.

10.2 ULC Evaluation Reports shall not be used in any manner that implies an endorsement of the product, material or system by UL.

10.3 The current status of this report, as well as a complete directory of ULC Evaluation Reports may be found at UL.com via our On-Line Certifications Directory:

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