



ICC-ES Listing Report ESL-1296

Reissued November 2024

Revised January 2025

This listing is subject to renewal November 2025.

CSI: DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION
Section: 07 81 23—Intumescent Fire Protection

DIVISION: 09 00 00—FINISHES
Section: 09 96 46—Intumescent Painting

Product Certification System:

The ICC-ES product-certification system includes evaluated evidence in support of test data in accordance with the standard(s) listed below. The system also involves factory inspections, and assessment and surveillance of the listee's quality system.

Product: FLAME SEAL SC950

Listee: FLAME SEAL LLC

Evaluation: Flame Seal SC950 is a water-based intumescent coating and was evaluated based on testing of non-load bearing structural steel columns, structural steel W-shape beams (3-sided exposure), and a wood framed non-load bearing wall assembly consisting of building-material components described in the Design Listings, tested in accordance with the following standards:

- ASTM E119-18B, Standard Test Methods for Fire Tests of Building Construction and Materials, ASTM International.
- CAN/ULC-S101-14, Standard Methods of Fire Endurance Tests of Building Construction and Materials, ULC Standards.

Findings: Evaluation of Flame Seal SC950, as a component of the assembly, is based on testing in accordance with the applicable test method as referenced in each ICC Design No. and as a result from the recognized standards indicated above. Relevant code sections where the standards are referenced are listed below. Approval of the product's use and all other relevant code sections is the sole responsibility of the local code (building) official.

- 2021 *International Building Code*® (IBC)
Applicable Section: 703.2
- *National Building Code of Canada*® 2020
Applicable Section: Volume 1-Division B: Section 3.1.7

Identification:

1. The ICC-ES mark of conformity, electronic labeling, or the listing report number (ICC-ES [ESL-1296](#)), and when applicable, the ICC-ES Listing Mark, along with the name, registered trademark, or registered logo of the listee must be included in the product label.
2. In addition, Flame Seal SC950 is identified by a label that includes the product name, the name and address of the manufacturer (Flame Seal LLC) and the storage and shelf-life information.

3. The report holder's contact information is the following:

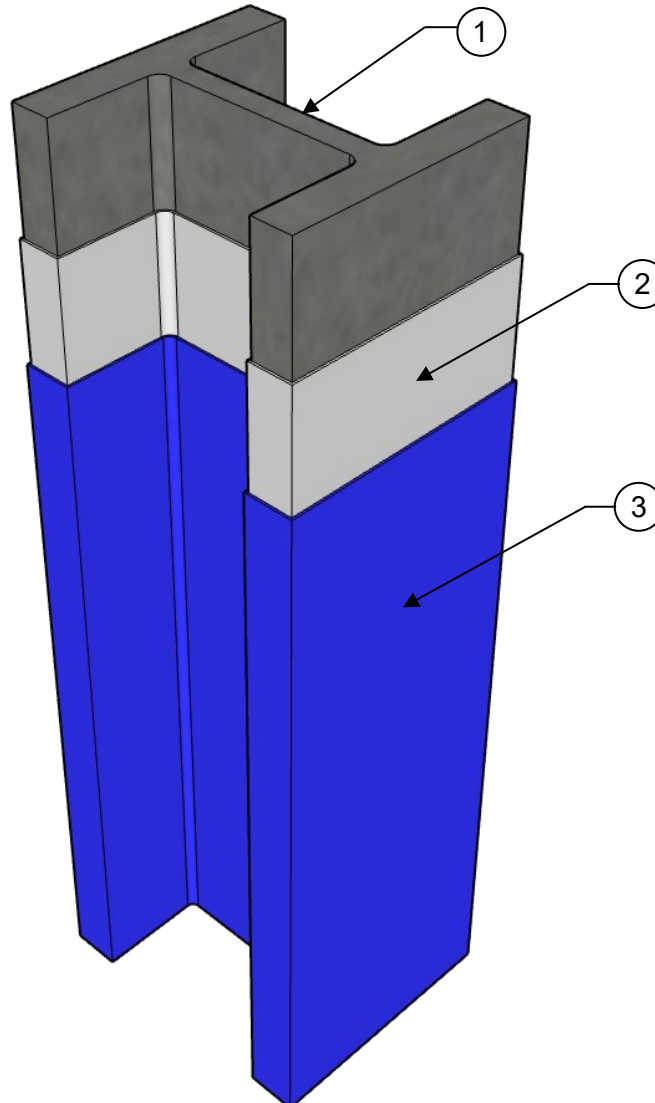
FLAME SEAL LLC
9420 KNIGHT RD
HOUSTON, TEXAS 77045
(713) 668-4291
www.flameseal.com

Installation: Flame Seal SC950 must be installed in accordance with Flame Seal LLC's published installation instructions and applicable codes.

Conditions of Listing:

1. The listing report addresses only conformance with the standards and code sections noted above.
2. Approval of the product's use is the sole responsibility of the local code official.
3. The listing applies only to the materials tested and as submitted for review by ICC-ES.
4. Flame Seal SC950 described in this listing report is produced under a quality control program with inspections by ICC-ES.

Applicant: FLAME SEAL LLC
Product: FLAME SEAL SC950
Standard: ASTM E119 / CAN/ULC-S101
Structural Shape: W-shape (H-section or I-section) Columns
IFRM = Intumescent Fire-Resistive Materials



COMPONENTS OF CONSTRUCTION:

1. **Structural Steel Column** – Wide flange steel columns (H-section or I-section) with H_p/A or W/D section factors based on exposure on four sides. Columns shall be free of dirt, loose scale, and oil before application of metal alkyd primer.
2. **Primer Coating** – Structural steel to be primed with a layer of an alkyd metal primer with an average applied dry film thickness of 4.2 mils (0.11 mm). Primed surface should be cleaned, dried, and free of dirt, loose scale, grease, oil, and any contaminant that would inhibit bonding of intumescent coating to the primer.
3. **Intumescent Coating** – Flame Seal SC950 applied in accordance with manufacturer's instructions to the minimum dry film thicknesses shown in IFRM-1296-01 Table 1, based on the column section factor and fire resistance period. Coating thicknesses may be interpolated between section factors. Extrapolation beyond the minimum and maximum section factors is not permitted.

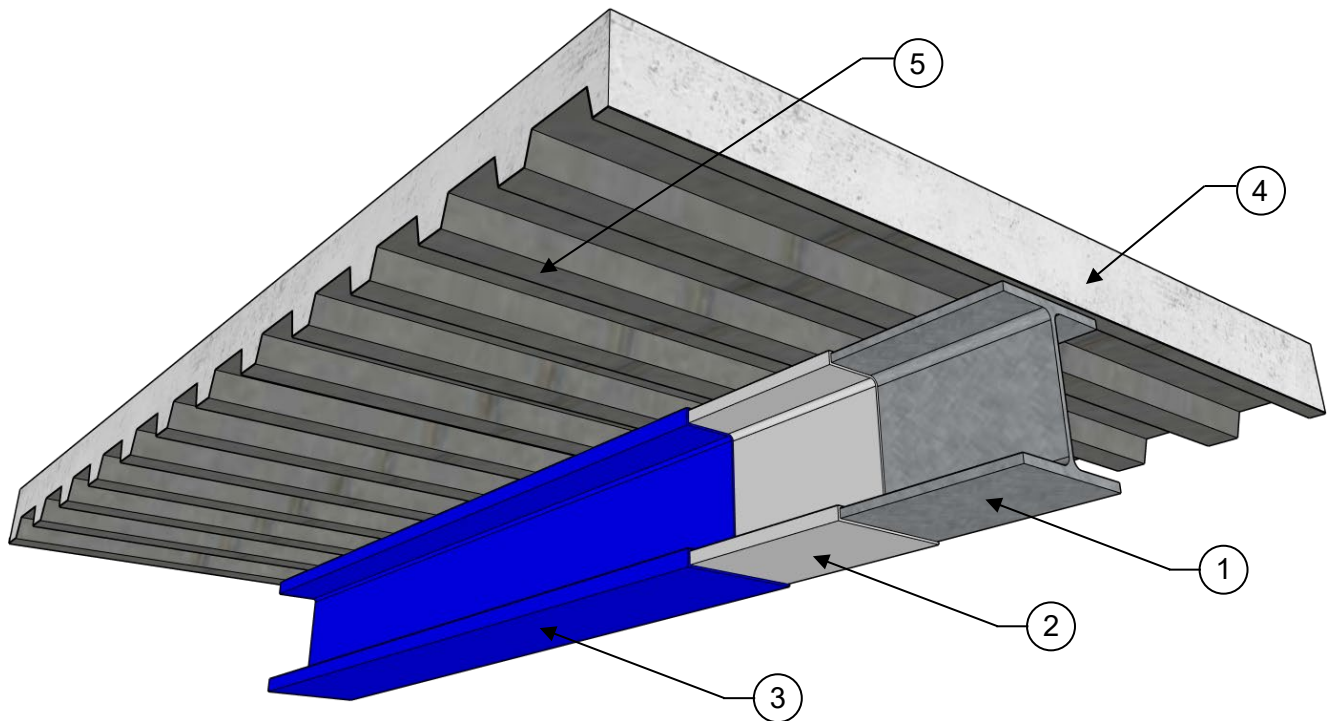
**IFRM-1296-01 TABLE 1 – MINIMUM COATING THICKNESS FOR A W-SHAPE (H- OR I-SECTION)
COLUMN SECTION FACTOR TO ACHIEVE ESTIMATED FIRE RESISTANCE PERIOD**

Section Factor		Fire Resistance Period (min)					
Hp/A	W/D	60		90		120	
(m ⁻¹)	(lbs./in)	Thickness in mm (mils)					
70	1.91	0.6	(24)	0.8	(32)	1.8	(70)
75	1.79	0.6	(24)	0.9	(34)	1.8	(70)
80	1.67	0.6	(24)	0.9	(36)	1.8	(70)
85	1.58	0.6	(24)	1.0	(38)	1.8	(70)
90	1.49	0.6	(24)	1.0	(39)	1.8	(70)
95	1.41	0.6	(24)	1.0	(41)	1.8	(70)
100	1.34	0.6	(24)	1.1	(43)	1.8	(70)
105	1.28	0.6	(24)	1.1	(45)	1.8	(70)
110	1.22	0.7	(27)	1.2	(48)	1.9	(76)
115	1.16	0.8	(30)	1.3	(51)	2.1	(83)
120	1.12	0.8	(33)	1.4	(55)	2.3	(89)
125	1.07	0.9	(36)	1.5	(59)	2.4	(96)
130	1.03	1.0	(39)	1.6	(63)	2.6	(103)
135	0.99	1.1	(41)	1.7	(67)	2.8	(109)
140	0.96	1.1	(44)	1.8	(71)	2.9	(116)
145	0.92	1.2	(47)	1.9	(75)	3.1	(122)
150	0.89	1.3	(50)	2.0	(80)	3.3	(129)
155	0.86	1.3	(53)	2.2	(85)	3.4	(136)
160	0.84	1.4	(56)	2.3	(91)	3.6	(142)
165	0.81	1.5	(58)	2.4	(96)	-	(-)
170	0.79	1.6	(61)	2.6	(102)	-	(-)
175	0.77	1.6	(64)	2.8	(109)	-	(-)
180	0.74	1.7	(67)	2.9	(116)	-	(-)
185	0.72	1.8	(70)	3.1	(123)	-	(-)
190	0.71	1.8	(73)	3.3	(131)	-	(-)
195	0.69	1.9	(75)	3.5	(139)	-	(-)
200	0.67	2.0	(78)	3.8	(149)	-	(-)
205	0.65	2.1	(81)	4.0	(158)	-	(-)
210	0.64	2.1	(84)	4.3	(169)	-	(-)
215	0.62	2.2	(87)	4.6	(181)	-	(-)
220	0.61	2.3	(90)	4.9	(194)	-	(-)
225	0.60	2.4	(93)	5.3	(208)	-	(-)
230	0.58	2.7	(106)	-	(-)	-	(-)
235	0.57	3.0	(119)	-	(-)	-	(-)
240	0.56	3.4	(132)	-	(-)	-	(-)
245	0.55	3.7	(145)	-	(-)	-	(-)
250	0.54	4.2	(164)	-	(-)	-	(-)
255	0.53	4.7	(183)	-	(-)	-	(-)
260	0.52	5.1	(202)	-	(-)	-	(-)
265	0.51	5.6	(221)	-	(-)	-	(-)
270	0.50	6.1	(240)	-	(-)	-	(-)
275	0.49	6.6	(259)	-	(-)	-	(-)
280	0.48	7.0	(277)	-	(-)	-	(-)

For SI: 1 inch = 25.4 mm

Footnote: Empty cells (“-”) indicate unknown performance of coating thickness.

Applicant: FLAME SEAL LLC
Product: FLAME SEAL SC950
Standard: ASTM E119 / CAN/ULC-S101
Structural Shape: W-shape (H-section or I-section) Beams
IFRM = Intumescent Fire-Resistive Materials



COMPONENTS OF CONSTRUCTION:

1. **Structural Steel Beams** – Wide flange steel beams (H-section or I-section) with H_p/A or W/D section factors based on exposure on three sides. Beams shall be free of dirt, loose scale, and oil before application of metal alkyd primer.
2. **Primer Coating** – Structural steel to be primed with a layer of an alkyd metal primer with an average applied dry film thickness of 2.3 mils (0.06 mm). Primed surface should be cleaned, dried, and free of dirt, loose scale, grease, oil, and any contaminant that would inhibit bonding of intumescent coating to the primer.
3. **Intumescent Coating** – Flame Seal SC950 applied in accordance with manufacturer's instructions to the minimum dry film thicknesses shown in IFRM-1296-02 Tables 1 and 2 based on the beam section factor (exposure on three sides) and fire resistance period. Extrapolation beyond the minimum and maximum section factors and fire resistance periods is not permitted.
4. **Concrete** – Minimum thickness from the top plane of the steel deck and form unit crests must be 2 ½-inch-thick (63.5 mm) and have a minimum 3,000 psi (20.7 MPa) compressive strength and unit weight of 145 ± 3 lbs./ft³ (2323 ± 48 kg/m³).
5. **Steel Deck or Floor Units** – Minimum 2-inch (50.8 mm) deep, minimum 22-gauge thick galvanized fluted units; welded to the structural steel beam.
6. **Shear Stud Connectors (Not Shown)** – (Optional) Headed type or equivalent per AISC Specification. Connectors must be welded to the top flange of the structural steel beam through the steel decking. Studs shall be designed and installed in accordance with AISC guidelines to provide composite action (between structural steel beam and concrete deck), as required.
7. **Mineral Wool Insulation (Not Shown)** – Flute spaces between the structural steel beam and the steel deck shall be completely filled with mineral wool insulation having a minimum density of 4 lbs./ft³ (64.1 kg/m³). Mineral wool insulation is not required when the top flange of the beam is protected with intumescent coating at the same minimum dry film thickness shown in IFRM-1296-02 Tables 1 and 2.

IFRM-1296-02 TABLE 1 – MINIMUM COATING THICKNESS FOR A W-SHAPE (H- OR I-SECTION) BEAM SECTION FACTOR TO ACHIEVE ESTIMATED FIRE RESISTANCE PERIOD (UNRESTRAINED BEAM RATING).

Unrestrained Beam Rating							
Section Factor		Fire Resistance Period (min)					
Hp/A (m ⁻¹)	W/D (lbs./in)	60		90		120	
		Thickness in mm (mils)					
70	1.91	2.1	(82)	2.1	(82)	4.0	(156)
80	1.67	2.1	(82)	2.1	(82)	4.0	(156)
90	1.49	2.1	(82)	2.1	(82)	4.0	(156)
100	1.34	2.1	(82)	2.1	(82)	4.0	(156)
110	1.22	2.1	(82)	2.1	(82)	4.0	(156)
120	1.12	2.1	(82)	2.1	(82)	4.0	(156)
130	1.03	2.1	(82)	2.1	(82)	4.0	(156)
140	0.96	2.1	(82)	2.1	(82)	4.0	(156)
150	0.89	2.1	(82)	2.1	(82)	4.0	(156)
160	0.84	2.1	(82)	2.1	(82)	4.0	(156)
165	0.81	2.1	(82)	2.1	(82)	4.0	(156)

For SI: 1 inch = 25.4 mm, 1 inch = 1000 mils

Footnotes:

¹ The design loads used for testing the steel beam assemblies are based on the worst-case flexural design load of the structural steel beam in accordance with AISC (Specification for Structural Steel Buildings), unless noted otherwise. Both Allowable Strength Design (ASD) and Load Resistance Factor Design (LRFD) methods were considered.

IFRM-1296-02 TABLE 2 – MINIMUM COATING THICKNESS FOR A W-SHAPE (H- OR I-SECTION) BEAM SECTION FACTOR TO ACHIEVE ESTIMATED FIRE RESISTANCE PERIOD (RESTRAINED BEAM RATING).

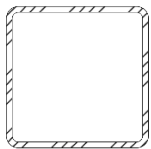
Restrained Beam Rating							
Section Factor		Fire Resistance Period (min)					
Hp/A (m ⁻¹)	W/D (lbs./in)	60		90		120	
		Thickness in mm (mils)					
70	1.91	2.1	(82)	2.1	(82)	4.0	(156)
80	1.67	2.1	(82)	2.1	(82)	4.0	(156)
90	1.49	2.1	(82)	2.1	(82)	4.0	(156)
100	1.34	2.1	(82)	2.1	(82)	4.0	(156)
110	1.22	2.1	(82)	2.1	(82)	4.0	(156)
120	1.12	2.1	(82)	2.1	(82)	4.0	(156)
130	1.03	2.1	(82)	2.1	(82)	4.0	(156)
140	0.96	2.1	(82)	2.1	(82)	4.0	(156)
150	0.89	2.1	(82)	2.1	(82)	4.0	(156)
160	0.84	2.1	(82)	2.1	(82)	4.0	(156)
165	0.81	2.1	(82)	2.1	(82)	4.0	(156)

For SI: 1 inch = 25.4 mm, 1 inch = 1000 mils

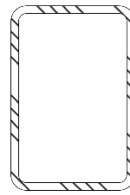
Footnotes:

¹ The design loads used for testing the steel beam assemblies are based on the worst-case flexural design load of the structural steel beam in accordance with AISC (Specification for Structural Steel Buildings), unless noted otherwise. Both Allowable Strength Design (ASD) and Load Resistance Factor Design (LRFD) methods were considered.

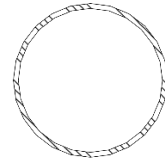
Applicant: FLAME SEAL LLC
Product: FLAME SEAL SC950
Standard: ASTM E119 / CAN/ULC-S101
Structural Shape: Steel Tube and Pipe Columns
IFRM = Intumescent Fire-Resistive Materials



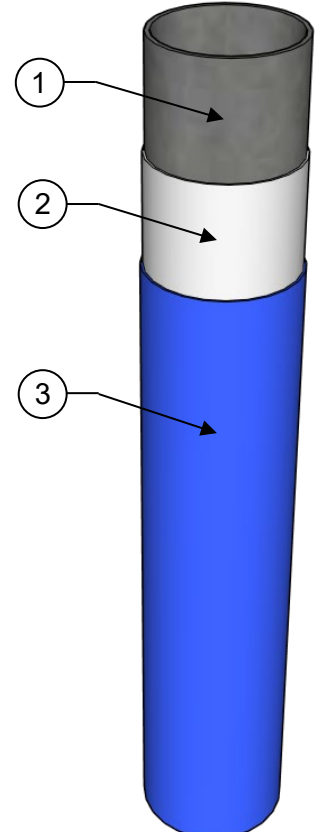
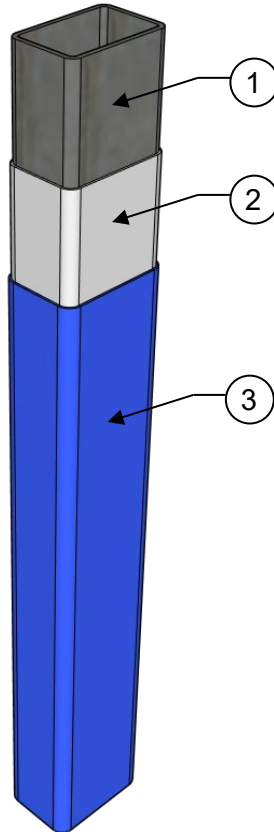
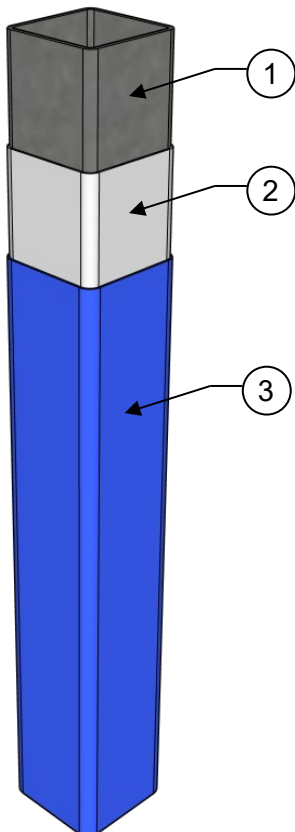
(Square Tube)



(Rectangular Tube)



(Circular Pipe)



COMPONENTS OF CONSTRUCTION:

1. **Structural Steel Column** – Square tube, rectangular tube, or circular pipe steel columns with Hp/A or A/P section factors based on exposure on four sides. Columns shall be free of dirt, loose scale, and oil before application of metal alkyd primer.
2. **Primer Coating** – Structural steel to be primed with a layer of an alkyd metal primer with an average applied dry film thickness of 5.0 mils (0.13 mm). Primed surface should be cleaned, dried, and free of dirt, loose scale, grease, oil, and any contaminant that would inhibit bonding of intumescent coating to the primer.
3. **Intumescent Coating** – Flame Seal SC950 applied in accordance with manufacturer's instructions to the minimum dry film thicknesses shown in IFRM-1296-03 Table 1, based on the column section factor and fire resistance period. Coating thicknesses may be interpolated between section factors at the same fire resistance period. Extrapolation beyond the minimum and maximum section factors and fire resistance periods is not permitted.

IFRM-1296-03 TABLE 1 – MINIMUM COATING THICKNESS FOR A STEEL TUBE OR PIPE COLUMN SECTION FACTOR TO ACHIEVE ESTIMATED FIRE RESISTANCE PERIOD

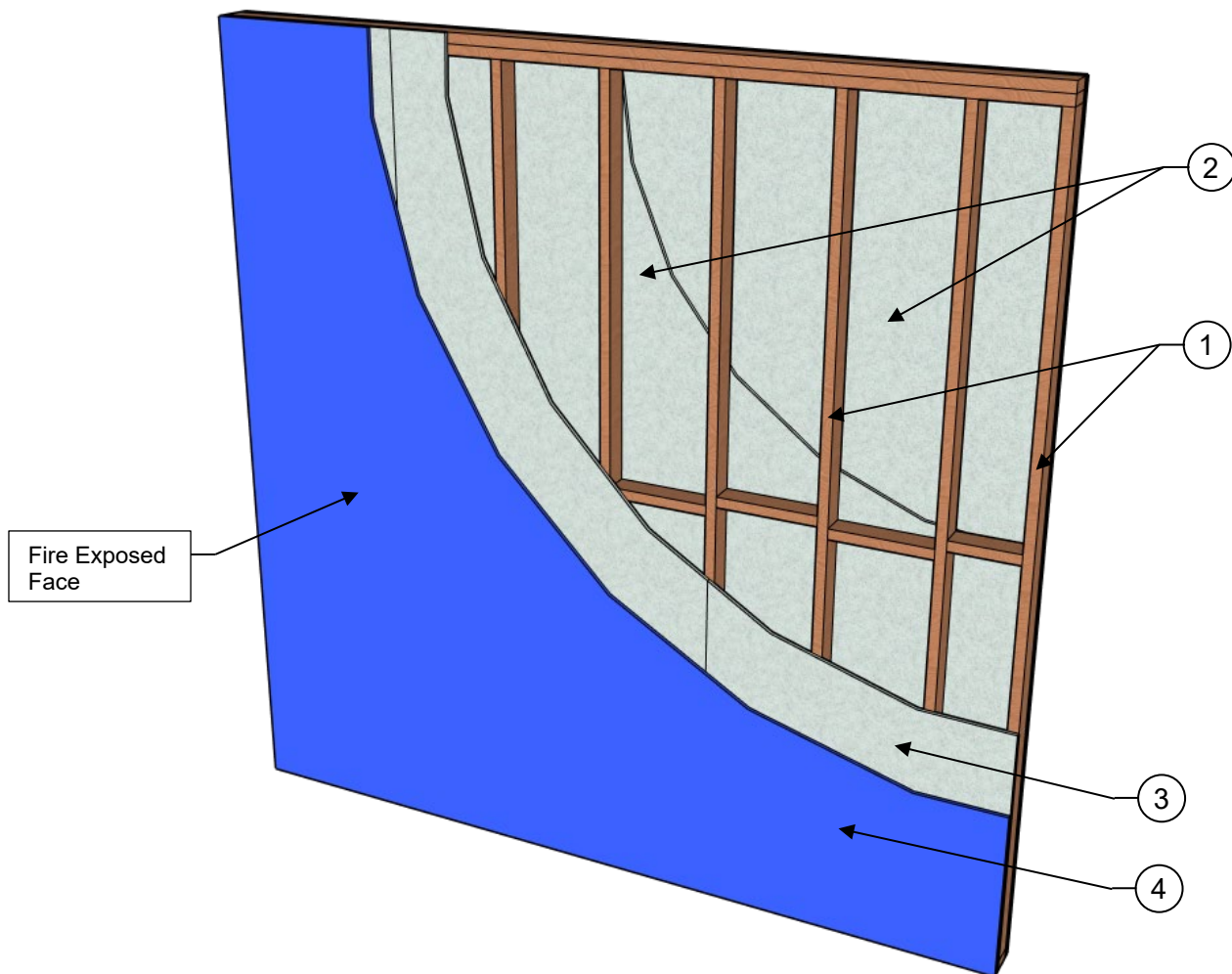
Section Factor		Fire Resistance Period (min)			
Hp/A (m^{-1})	A/P (in)	60		90	
		Thickness in mm (mils)			
75	0.52	2.1	(82)	3.9	(155)
80	0.49	2.2	(88)	4.2	(164)
85	0.46	2.4	(93)	4.4	(173)
90	0.44	2.5	(99)	4.6	(183)
95	0.41	2.6	(104)	4.9	(192)
100	0.39	2.8	(109)	5.1	(201)
105	0.37	2.9	(115)	5.3	(210)
110	0.36	3.1	(120)	5.6	(219)
115	0.34	3.2	(126)	5.8	(229)
120	0.33	3.3	(131)	6.0	(238)
125	0.31	3.5	(137)	6.3	(247)
130	0.30	3.6	(142)	-	(-)
135	0.29	3.7	(148)	-	(-)
140	0.28	3.9	(153)	-	(-)
145	0.27	4.1	(160)	-	(-)
150	0.26	4.3	(167)	-	(-)
155	0.25	4.4	(175)	-	(-)
160	0.25	4.6	(182)	-	(-)
165	0.24	4.8	(189)	-	(-)
170	0.23	5.0	(196)	-	(-)
175	0.22	5.2	(203)	-	(-)
180	0.22	5.3	(211)	-	(-)

For SI: 1 inch = 25.4 mm

Footnote: Empty cells (“-”) indicate unknown performance of coating thickness.

Applicant: FLAME SEAL LLC
Product: FLAME SEAL SC950
Standard: ASTM E119 / CAN/ULC-S101
Assembly Rating: 2-Hour from the Fire Exposed Face Only (Asymmetrical Wall Assembly)
Load: Non-loadbearing

IFRM = Intumescent Fire-Resistive Materials



COMPONENTS OF CONSTRUCTION:

1. **Wood Framing** – Nominal 2-inch by 4-inch (50.8 mm x 101.6 mm) wood studs, spaced maximum 16 inches (406.4 mm) on center, are secured to top and bottom plates with 3-inch (76.2 mm) long x 0.131-inch (3.33 mm) diameter smooth shank framing nails. A double top plate is secured to the first top plate with 3-inch (76.2 mm) long x 0.131-inch (3.33 mm) diameter nails spaced 16 inches (406.4 mm) on center. Full-depth blocking is installed between each stud at mid-height of the wall assembly, secured with 3-inch (76.2 mm) long x 0.131-inch (3.33 mm) diameter nails.
2. **Wall Sheathing (Unexposed Face)** – Two layers of nominal $\frac{5}{8}$ -inch (15.9 mm) thick Type X gypsum wallboard, complying with ASTM C1396, are secured directly to the framing, on the unexposed side of the wall assembly. The base layer must be secured to the framing using 1 $\frac{5}{8}$ -inch (41.3 mm) long Type W screws spaced at 8 inches (203.2 mm) on center along the perimeter and in the field of the panel. Gypsum wallboard must be installed vertically to the studs. All vertical seams must fall on studs and must be staggered from one side of the assembly to the opposite side of the assembly. The face layer, with vertical panel joints staggered from the base layer, must be secured to the framing using 2 $\frac{1}{2}$ -inch (63.5 mm) long Type W screws spaced at 8 inches (203.2 mm) on center along the perimeter and in the field, with the face layer screws staggered 4 inches (101.6 mm) from the base layer screws. Face layer must be installed vertically to the studs. All vertical seams must fall on studs and must be staggered from one side of the assembly to the opposite sides of the assembly by a minimum of one stud cavity. All face layer edge joints and fastener heads must receive a Level 2 finish complying with ASTM C840 or GA-216.
3. **Wall Sheathing (Exposed Face)** – One layer of nominal $\frac{5}{8}$ -inch (15.9 mm) thick Type X gypsum wallboard, complying with ASTM C1396, must be secured directly to the framing, on the fire exposed side of the wall assembly, using 1 $\frac{5}{8}$ -inch (41.3 mm) long Type W screws spaced at 8 inches (203.2 mm) on center along the perimeter and in the field of the panel. All vertical seams must fall on studs and must be staggered from one side of the assembly to the opposite side of the assembly by a minimum of one stud cavity. Gypsum wallboard edge joints and fastener heads must receive a Level 2 finish complying with ASTM C840 or GA-216.
4. **Intumescent Coating (Exposed Face)** – Flame Seal SC950 must be applied over the wall sheathing at a minimum 41 mils (1.04 mm) dry film thickness (DFT) on the fire exposed face of the wall assembly. Application must be in accordance with the manufacturer's published instructions.