



ICC-ES Listing Report ESL-1296

Reissued November 2024

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 evaluating reports of tests of standard manufactured product, prepared by accredited testing laboratories and provided by the listee, to verify compliance with applicable codes and standards. 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, consisting of building-material components described in the Design Listing, tested in accordance with the following standards:

- ASTM E119-18B, Standard Test Methods for Fire Tests of Building Construction and Materials, ASTM International.

Findings: Flame Seal SC950, as a component of the assembly described in each ICC Design Listing, has met the performance criteria in accordance with ASTM E119, and as referenced in the applicable section of the following code edition:

- 2021 *International Building Code*® (IBC)
Applicable Section: 703.2

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

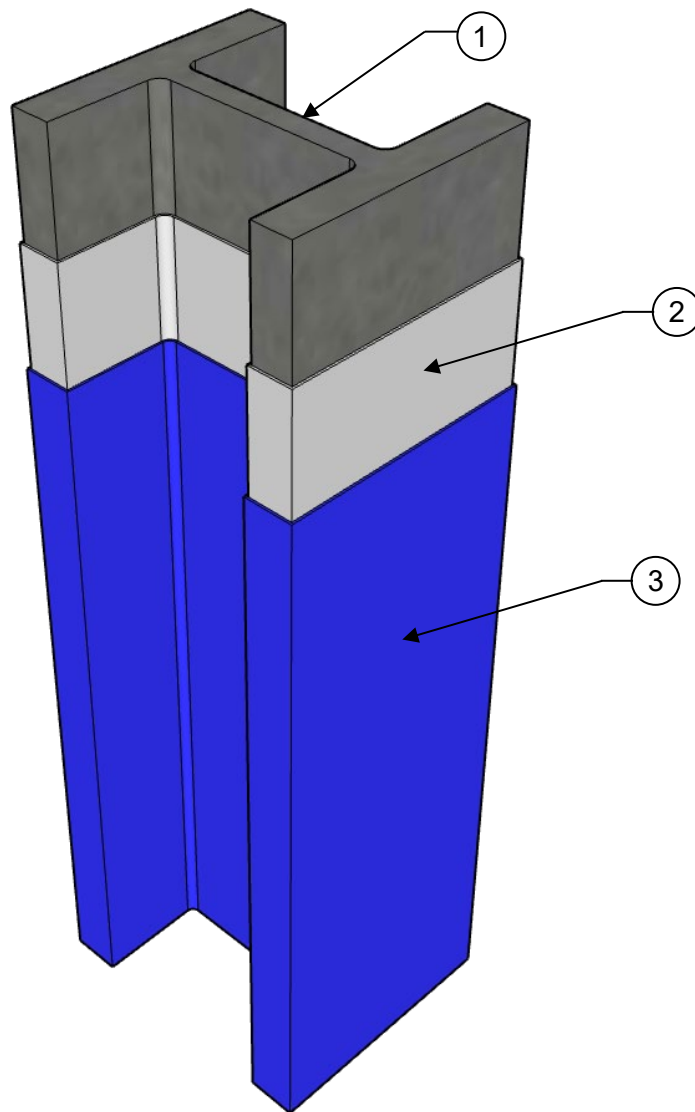
Product: FLAME SEAL SC950

Standard: ASTM E119

Structural

Shape: W-shape (H-section or I-section) Columns

IFRM = Intumescent Fire-Resistive Materials



COMPONENTS OF CONSTRUCTION:

Listings are not to be construed as representing aesthetics or any other attributes not specifically addressed, nor are they to be construed as an endorsement of the subject of the listing or a recommendation for its use. There is no warranty by ICC Evaluation Service, LLC, express or implied, as to any finding or other matter in this listing, or as to any product covered by the listing.

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.

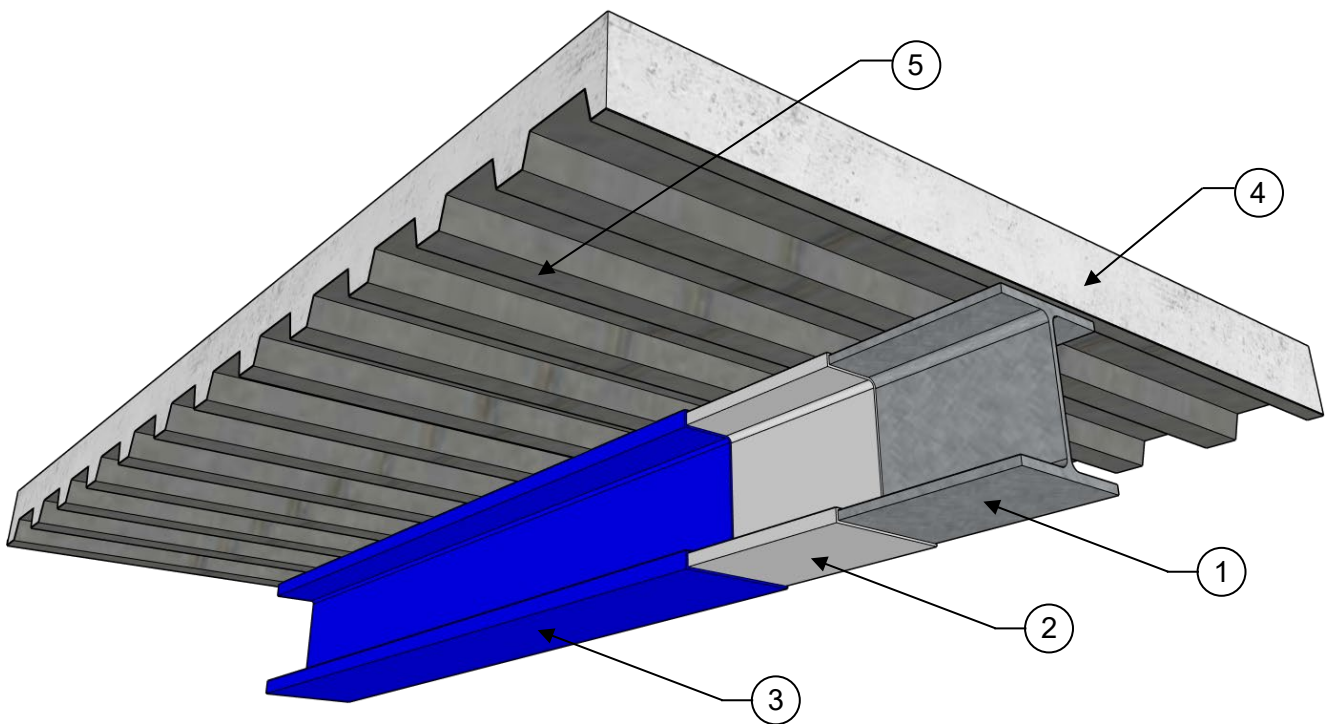
Applicant: FLAME SEAL LLC

Product: FLAME SEAL SC950

Standard: ASTM E119

Structural Shape: W-shape (H-section or I-section) Beams

IFRM = Intumescent Fire-Resistive Materials



COMPONENTS OF CONSTRUCTION:

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1. **Structural Steel Beams** – Wide flange steel beams (H-section or I-section) with Hp/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 with a; 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.