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ICC-ES Evaluation Report

ESR-1092

Reissued December 1, 2008

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DIVISION: 07—THERMAL AND MOISTURE PROTECTION
Section: 07810—Applied Fireproofing

REPORT HOLDER:

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EVALUATION SUBJECT:

CAFCO SPRAYFILM®—WB 3 INTUMESCENT FIRE-RESISTIVE COATING

1.0 EVALUATION SCOPE

Compliance with the following codes:

- 2006 *International Building Code*® (IBC)
- 1997 *Uniform Building Code*™ (UBC)

Property evaluated:

Fire resistance

2.0 USES

CAFCO SprayFilm®—WB 3 is an intumescent fire-protection coatings that provides up to 4-hour fire-resistance ratings for interior structural steel members under the IBC and the UBC.

3.0 DESCRIPTION

CAFCO SprayFilm—WB 3 is a spray-applied, water-based intumescent coating that has a shelf life of 10 months when stored in unopened, sealed containers at temperatures between 50°F(10°C) and 100°F (38°C). This material has a Class A interior finish classification when tested in accordance with ASTM E 84 (IBC), and has a Class I interior finish classification and a smoke density no greater than 450 when tested in accordance with UBC Standard 8-1 (UBC).

4.0 INSTALLATION

4.1 Structural Steel Surface Conditions:

All structural steel to be coated with SprayFilm—WB 3 intumescent coating must be primed with a nominal 1-mil-thick (0.025 mm) layer of a phenolic modified alkyd resin primer that has been thinned with xylene at 5 percent by weight prior to its application. The primer must be recommended for use by Isolatek International in their published installation instructions. Primed surfaces must be free from any grease, oil, dirt, loose mill scale, rust or any other contaminant that would inhibit bonding of the SprayFilm coating to the primer.

4.2 Installation Site Conditions:

SprayFilm coating is applied when the ambient air temperature is between 50°F (10°C) and 100°F (38°C). A minimum substrate and ambient temperature of 50°F (10°C) must be maintained prior to, during and a minimum of 72 hours after application. The relative humidity of the air at the project site must not exceed 75 percent during application, and the steel surface temperature must be a minimum of 4°F (2°C) above the dew point.

4.3 Intumescent Material Application:

SprayFilm—WB 3 intumescent coating is spray-applied using a pneumatic, electric, or gas-powered airless spray pump operating with a minimum fluid pressure of 3,000 psi (211kg/cm^2). The SprayFilm coating is permitted to be brush-applied.

4.3.1 Thickness: Minimum average required dry-film thicknesses of the coating applied to structural steel members are listed in Tables 1 and 2. Thicknesses must be verified using a calibrated dry film thickness gauge.

4.3.2 Minus Thickness Tolerance: The thickness of the coating must be corrected by applying additional material at any location where the calculated average thickness of the material is less than that listed in this report, or where an individual measured thickness reading is less than 80 percent of the thickness specified in this report.

4.3.3 Positive Thickness Tolerance: An individual measured thickness of the coating exceeding the thickness specified in this report by 20 percent or more must be recorded as the thickness specified in the design plus 20 percent. The average thickness must not exceed by more than 10 percent the maximum listed thickness in Table 1A for wide flange columns protected with SprayFilm—WB 3 or Tables 1B and 1C for tube and pipe columns protected with SprayFilm—WB 3 or Table 2 for wide flange beams protected with SprayFilm—WB 3.

4.4 Protective Covering Applied over the Intumescent Material:

SprayFilm—WB 3 intumescent material installed on structural steel members must be protected with a minimum 6-mil-thick [0.006 inch (0.152 mm)] coat of an approved 30 percent silicone alkyd protective topcoat,

such as Sherwin-Williams Company's Steel Master 9500. A minimum of five days must be allowed for SprayFilm materials to fully dry prior to the application of the protective coating. Before application of the protective coating, the dry film thickness of the SprayFilm must be measured for compliance with the minimum required fire-resistive thickness. The surface of the dried SprayFilm must be clean, and free from condensation, grease or other surface contaminants that may interfere with the adhesion of the protective finish covering.

4.5 Special Inspection:

Application of SprayFilm as described in this report requires special inspection as described in IBC Section 1704.11 or UBC Section 1701.4, as applicable. The special inspector must verify the cleanliness of the substrate, site conditions, product designation, application procedures, and applied material thickness. The thickness of the intumescent mastic coating must be determined using the methods prescribed in Technical Manual 12-B (First Edition), Standard Practice for the Testing and Inspection of Field Applied Thin-film Intumescent Fire-resistive Materials: An Annotated Guide, Association of the Wall and Ceiling Industries—International (AWCI). The special inspector must verify that the application complies with the manufacturer's published installation instructions and this report.

5.0 CONDITIONS OF USE

The SprayFilm®—WB 3 Intumescent Fire-Resistive Coatings 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 Installation complies with this report and the manufacturer's published installation instructions. In the event of a conflict, this report governs.

5.2 Application is limited to interior locations.

5.3 Minimum fire-protection material thickness complies with this report.

5.4 Special inspection is required as set forth in the applicable code and Section 4.5 of this report.

6.0 EVIDENCE SUBMITTED

Data in accordance with the ICC-ES Acceptance Criteria for Spray-applied Fire-protection Materials (AC23), dated June 2004 (editorially revised January 2008).

7.0 IDENTIFICATION

Containers of the intumescent materials must bear the company name, Isolatek International; product name, CAFCO SprayFilm®—WB 3; storage and shelf life information; and the ICC-ES evaluation report number (ESR-1092).

TABLE 1—MINIMUM AVERAGE THICKNESS OF CAFCO SPRAYFILM—WB 3 APPLIED TO STEEL COLUMNS[1,2,3]

A. Wide-flange Steel Columns: Minimum fire-protection material dry thickness (mils)
A1. Fire protection material: SprayFilm—WB 3

COLUMN SIZE	W/D RATIO	4-HOUR	3-HOUR[4]	2-HOUR[5]	1-HOUR
W14×283	3.00	193	115	50	23
W14×257	2.75	NP	126	54	23
W14×233	2.49	NP	139	60	23
W14×211	2.28	NP	152	65	23
W14×193	2.10	NP	165	71	23
W14×176	1.93	NP	179	77	25
W14×159	1.75	NP	188	85	28
W12×120	1.62	NP	188	91	30
W14×132	1.52	NP	200	97	31
W10×88	1.43	NP	213	103	33
W16×100	1.36	NP	224	108	35
W10×77	1.26	NP	242	117	38
W18×97	1.21	NP	252	122	40
W10×68	1.13	NP	269	130	42
W14×90	1.06	NP	287	139	45
W8×48	0.99	NP	308	149	48
W16×57	0.95	NP	321	155	50
W10×45	0.87	NP	350	169	55
W10×49	0.83	NP	367	177	58
W10×39	0.76	NP	401	194	63
W8×35	0.73	NP	417	202	66
W8×28	0.67	NP	454	213	71
W14×34	0.63	NP	483	213	75
W8×24	0.58	NP	504	213	75
W6×16	0.57	NP	504	258	84
W4×13	0.54	NP	NP	272	89
W10×22	0.52	NP	NP	283	92
W8×15	0.48	NP	NP	307	100
W6×12	0.43	NP	NP	342	111
W12×16	0.41	NP	NP	NP	117
W12×14	0.36	NP	NP	NP	133
W8×10	0.33	NP	NP	NP	145

B. Pipe Steel Columns: Minimum fire-protection material dry thickness (mils)
B1. Fire protection material: SprayFilm—WB 3

COLUMN SIZE	A/P RATIO	3-HOUR	2-HOUR	1-HOUR
8" dia×0.875"	0.79	NP	120	97
8" dia×0.50"	0.47	NP	202	97
4" dia×0.313"	0.29	NP	NP	117

C. Tube Steel Columns: Minimum fire-protection material dry thickness (mils)
C1. Fire protection material: SprayFilm—WB 3

COLUMN SIZE	A/P RATIO[6]	3-HOUR	2-HOUR	1-HOUR
8×8×$^{1}/_{2}$	0.47	327	164	74
5×3×$^{1}/_{2}$	0.44	NP	207	74
8×6×$^{7}/_{16}$	0.41	NP	244	78
8×6×$^{3}/_{8}$	0.35	NP	280	91
5×3×$^{5}/_{16}$	0.29	NP	353	106
5×3×$^{1}/_{4}$	0.23	NP	400	124
3.5×3.5×$^{3}/_{16}$	0.18	NP	NP	197

For **SI:** 1 mil = 0.001 inch = 0.0254 mm.

TABLE 1—MINIMUM AVERAGE THICKNESS OF CAFCO SPRAYFILM—WB 3 APPLIED TO STEEL COLUMNS[1,2,3]—(Continued)

[1]SprayFilm fire-resistive material protection must be applied directly to exposed column contour.
[2]NP = Not permitted.
[3]Columns must be primed with a phenolic modified alkyd primer at a thickness of 1 mil. The intumescent coating must be spray- or brush-applied over the primer in accordance with the manufacturer's instructions and this evaluation report at the minimum dry thickness as shown in the table. The tabulated thicknesses include the primer thickness.
[4]As an alternate to the 3-hour fire-resistance-rated columns listed in Table 1A, the thickness of the intumescent fireproofing applied to wide-flange steel columns, having a W/D ratio from 0.57 to 1.62, may be determined on the basis of the following equation:

$h = 0.3045/(W/D)$

where:

h = Thickness of intumescent coating in the range of 188 to 504 mils.
W = Weight of steel column (pounds per lineal foot).
D = Heated perimeter (inches).

[5]As an alternate to the 2-hour fire-resistance-rated columns listed in Table 1A, the thickness of the intumescent fireproofing applied to wide-flange steel columns, having a W/D ratio from 0.43 to 1.62, may be determined on the basis of the following equation:

$h = 0.1471/(W/D)$

where:

h = Thickness of intumescent coating in the range of 91 to 342 mils.
W = Weight of steel column (pounds per lineal foot).
D = Heated perimeter (inches).
[6]The fire resistance of the column assemblies is a function of the thickness of fire-resistive intumescent coating, the weight (W) or cross-sectional area (A) of steel column, and the heated perimeter (D or P) of steel columns. As used in this table, W is the average weight of a structural steel column in pounds per linear foot and A is the cross-sectional area of a structural steel column in square inches. The heated perimeter (D or P) is the inside perimeter of the fire-resistive material in inches.

TABLE 2—MINIMUM AVERAGE THICKNESS OF CAFCO SPRAYFILM—WB 3 FIRE-PROTECTION MATERIAL APPLIED TO UNPROTECTED FLOOR ASSEMBLIES

A. General Description: Steel beams supporting a steel floor deck with no fireproofing materials applied to the deck soffit.
1. Steel deck metal thickness minimum gage: Fluted 22 MSG
2. Normal-weight fire-resistive concrete slab.[1] Minimum $2^1/_2$ inches of concrete over the top flute, with 6×6 - W1.4×W1.4 welded wire fabric for the beam condition. Thickness for the assembly rating is a separate consideration.[2]

B. Unrestrained Floor Beams Supporting Unprotected Floor Deck: Minimum intumescent fireproofing material thickness (mils).[3,4]

PRODUCT	BEAM SIZE	MAXIMUM *W/D* RATIO	3-HOUR	2-HOUR	1-HOUR
SprayFilm—WB 3	W6×12	0.51	NP[5]	171[6]	73[6]
SprayFilm—WB 3	W8×24	0.70	NP	115[6]	53[6]

For **SI:** 1 mil = 0.001 inch = 0.0254 mm, 1 pcf = 16 kg/m^3.

[1]Normal-weight concrete must have a minimum compressive strength of 3,500 psi and a minimum unit weight of 148 pcf, and utilize either carbonate or siliceous aggregates. Concrete must encapsulate 6×6 - W1.4×W1.4 welded wire fabric.
[2]Minimum concrete fill thickness must be recognized under a current ICC-ES evaluation report for the floor assembly and fire-resistive rating desired.
[3]Intumescent fire-resistive protection material must be applied to exposed beam contour.
[4]Beams must be primed with a phenolic modified alkyd primer at a thickness of 1 mil. The intumescent coating must be spray- or brush-applied over the primer in accordance with the manufacturer's instructions and this evaluation report at the minimum dry thickness as shown in the table. The tabulated thicknesses include the primer thickness.
[5]NP = Not permitted.
[6]The flutes of the steel deck over the beams may be packed with mineral wool insulation having a nominal density of 4 pcf; or, when mineral wool is not used, the top surface of the top flange must be protected with the intumescent coating material at the same minimum dry thickness.