



3 March 2020

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Project Manager  
**Norkote**  
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Email: [luke@norkote.com](mailto:luke@norkote.com)

RE: Project: Killingsworth  
Location: Portland, OR  
Contractor: Norkote  
Isolatek Engineering Judgment: 01CS20044, dated: February 13, 2020  
Rating: 1-hour

Dear Luke:

We have received and reviewed the Engineering Judgment documentation, 01CS20044, prepared by Cole Swanson, Isolatek International Engineering Staff, dated 13 February 2020 regarding the use of CAFCO Spray Applied Fire Resistive Material (SFRM) on structural steel members at the above referenced project, along with all pertinent data. It is desired that the appropriate thickness of CAFCO SFRM be determined so that the required 1-hour fire-resistance rating of the structural steel members is provided in accordance with ASTM E119/UL 263, "Standard Test Methods for Fire Tests of Building Construction and Materials," as well as the 2014 Oregon Structural Specialty Code.

A listed fire resistance system has not been tested for this specific application. As a result, an Engineering Analysis per Item #4, Section 703.3 of 2014 Oregon Structural Specialty Code, is required in the form of an Engineering Judgment to address the fire resistance rating of this condition. Section 703.3 states that, "The application of any of the methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E119 or UL 263. The required fire resistance of a building element, component or assembly shall be permitted to be established by any of the following methods or procedures: 1) Fire-resistance designs documented in approved sources; 2) Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721; 3) Calculations in accordance with Section 722; 4) Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by test procedures set forth in ASTM E119 or UL 263; 5) Alternative protection methods as allowed by Section 104.11; 6) Fire-resistance designed certified by an approved agency."

It is standard industry practice to determine thickness based on calculated A/P and W/D ratios. These ratios are determined by dividing the weight, W, of the steel section in lbs./ft. (or the cross-sectional



area, A, of the steel member) by the heated perimeter, D (or P), of protection at the interface of the protection material through which heat is transferred to the steel, in inches. A/P ratio equation for steel members is provided in the Underwriters Laboratories, Inc. (UL) Directory. It is also standard industry practice to utilize column designs (X- or Y-Series UL designs) as a basis for determining thickness as these are more conservative due to the four-sided exposure, as opposed to a three-sided exposure. In addition, column tests do not account for the heat sink properties of a concrete floor. Thicknesses shown in the following table were determined based on the derived W/D ratio of the wide-flange steel member and the corresponding column design thickness from UL Design X829.

Steel Size	W/D, or A/P	Thickness	Rating	UL Design Basis
W12 x 35	0.70	11/16"	1-hour	X829

Limiting temperatures for beam evaluations are for a limiting average steel temperature of 1100°F, or a limiting individual steel temperature of 1200°F at any single measured point. Based on alternative methods of testing in accordance with ASTM E119, item #26 Conditions of Acceptance, the column thicknesses will provide limiting average steel temperatures of 1000°F, or a limiting individual steel temperature of 1200°F at any single measured point. These temperatures are more stringent than those required for beam evaluations.

Pursuant to our review of the evaluation presented, we find the report provides substantial justification to support the conclusions drawn that the required fire-resistance rating in accordance with ASTM E119 would be obtained, provided that the CAFCO SFRM is installed in accordance with manufacturer's written application installation instructions and methods.

This review is limited to those specific assemblies depicted and only for use as part of the above referenced project and cannot be extended to other assemblies or projects. The rating of the fireproofing system is dependent on the performance of the surrounding structure under fire exposure. The contractor is responsible for the compliant installation of the referenced engineering judgment.

Reviewed by: John D. Campbell, P.E.





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## Design No. X829 BXUV.X829 Fire-resistance Ratings - ANSI/UL 263

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### Design/System/Construction/Assembly Usage Disclaimer

- Authorities Having Jurisdiction should be consulted in all cases as to the particular requirements covering the installation and use of UL Certified products, equipment, system, devices, and materials.
- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

### BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

### BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

[See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States](#)  
[Design Criteria and Allowable Variances](#)

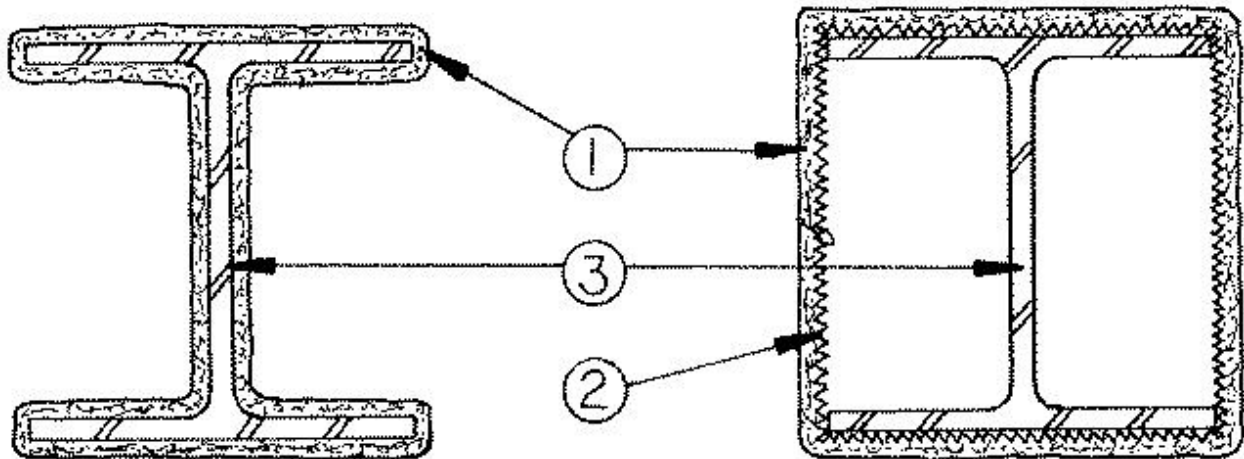
[See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada](#)  
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## Design No. X829

May 03, 2018

Ratings — 1/2, 1, 1-1/2, 2, 3, 4 Hr

\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.



1. **Spray-Applied Fire Resistive Materials\*** — Applied by spraying with water, in one or more untamped coats at the thickness shown in the table below to steel surfaces which are free of dirt, oil or scale. Use of adhesive is optional. Minimum average untamped density is 13 pcf with minimum ind untamped density of 11 pcf for Types II, II HS, and D-C/F. Min avg and min ind untamped densities of 22 and 19 pcf, respectively, for Type HP. Tamping is optional. For method of density determination refer to Design Information Section.

The thickness of Spray-Applied Fire Resistive Materials (Item 1) required for rating periods of 1 h, 1-1/2 h, 2 h, 3 h, 4 h of contour sprayed columns may be determined by the equation:

$$h = \frac{R}{1.01 (W/D) + 0.66}$$

Where:

h=Protection material thickness in the range 0.375-3.75 in.

R=Fire resistance rating in hours (1-4 h).

D=Heated perimeter of steel column in inches.

W=Weight of steel column in lbs per foot.

W/D=0.55 to 7.0

The thickness of Spray-Applied Fire Resistive Materials in the range of 0.375-3.75 in. required for rating periods of 1 h, 1-1/2 h, 2 h, 3 h, 4 h of contour sprayed columns with W/D=0.30-0.55 may be determined by the equation:

$$h = \frac{R}{0.95 (W/D) + 0.45}$$

As an alternative to the equations, the minimum thickness of protection Material required for various fire resistance ratings of contour or box sprayed columns may be determined from the table below:

Column Size	W/D	Min Thkns In.				
		1 Hr	1-1/2 Hr	2 Hr	3 Hr	4 Hr
W8X10	0.33	1-1/4	1-13/16	2-5/16	3-9/16	—
*W6X16	0.57	11/16	1-1/8	1-9/16	2-7/16	3-1/4
W8X28	0.68	11/16	1-1/8	1-7/16	1-7/8	2-5/16
W10X49	0.83	11/16	1	1-1/4	1-11/16	2-1/8
W12X106	1.46	7/16	3/4	1	1-7/16	1-15/16
W14X233	2.52	5/16	1/2	1/2	15/16	1-5/16
W14X730	6.68	3/8	3/8	3/8	3/8	9/16
* = A 1/2 Hour Rating may be obtained on a minimum W6x16 column with a minimum 3/8 in. of material.						
The thicknesses of protection material contained in the table below are applicable when the protection of the contour sprayed column's flange tips are reduced to one-half.						
W8X10	0.33	1-3/8	2	2-5/8	—	—
W6X16	0.57	13/16	1-5/16	1-3/4	2-3/4	3-11/16
W8X28	0.68	13/16	1-5/16	1-11/16	2-9/16	3-7/16
W10X49	0.83	13/16	1-1/8	1-7/16	1-15/16	2-7/16
W12X106	1.46	1/2	13/16	1-1/8	1-5/8	2-3/16
W14X233	2.52	7/16	9/16	9/16	1-1/16	1-1/2
W14X730	6.68	3/8	3/8	3/8	1/2	11/16

**ISOLATEK INTERNATIONAL** — Type D-C/F, HP, II, or II HS. Type D-C/F, HP or II investigated for exterior use. Type EBS or Type X adhesive/sealer optional.

2. **Metal Lath** — (Optional for contour application) — 3.4 lb/sq yd galvanized or painted expanded steel lath. Lath shall be lapped 1 in. and tied together with No. 13 SWG galvanized steel wire spaced vertically 6 in. O.C. or alternately, attached with No. 24 MSG spring clips, 1/2 in. wide, pushed onto column flanges, vertically spaced 6 in. O.C.

3. **Steel Column** — Min. sizes as shown above in Item 1.

**\* Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

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## X829

### Wide Flange Structural Steel Columns

#### CAFCO® BLAZE-SHIELD® II, HP & ISOLATEK® Type II, HP

ASTM Desig.	W/D	Metric Desig.	M/D	Hp/A	1-Hour	1-1/2 Hour	2-Hour	3-Hour	4-Hour
W14 x 120	1.42	W360 x 179	83.8	94.4	1/2	3/4	1	1-7/16	1-15/16
109	1.29	162	76.1	103.9	9/16	13/16	1-1/16	1-9/16	2-1/16
99	1.18	147	69.6	113.5	9/16	13/16	1-1/8	1-5/8	2-1/8
90	1.08	134	63.7	124.1	5/8	7/8	1-3/16	1-11/16	2-1/8
82	1.23	122	72.6	108.9	9/16	13/16	1-1/16	1-5/8	2-1/8
74	1.12	110	66.1	119.6	9/16	7/8	1-1/8	1-11/16	2-1/8
68	1.04	101	61.4	128.8	5/8	15/16	1-3/16	1-11/16	2-1/8
61	0.92	91	54.3	145.6	11/16	1	1-1/4	1-11/16	2-1/8
53	0.91	79	53.7	147.2	11/16	1	1-1/4	1-11/16	2-1/8
48	0.83	72	49.0	161.4	11/16	1-1/16	1-3/8	1-7/8	2-5/16
43	0.75	64	44.3	178.6	11/16	1-1/16	1-7/16	1-7/8	2-5/16
38	0.7	57	41.3	191.4	11/16	1-1/8	1-7/16	1-7/8	2-5/16
34	0.63	51	37.2	212.7	11/16	1-1/8	1-9/16	2-3/8	3-1/8
30	0.56	45	33.0	239.3	7/8	1-1/4	1-11/16	2-1/2	3-5/16
26	0.55	39	32.5	243.6	7/8	1-1/4	1-11/16	2-1/2	3-5/16
22	0.47	33	27.7	285.1	1-1/8	1-11/16	2-1/4	3-3/8	NR
W12 x 336	4.06	W310 x 500	239.5	33.0	3/8	3/8	7/16	11/16	7/8
305	3.76	454	221.8	35.6	3/8	3/8	1/2	11/16	15/16
279	3.5	415	206.5	38.3	3/8	3/8	1/2	3/4	1
252	3.2	375	188.8	41.9	3/8	7/16	1/2	13/16	1-1/16
230	2.96	342	174.6	45.3	3/8	7/16	1/2	7/8	1-1/8
210	2.73	313	161.1	49.1	3/8	1/2	1/2	15/16	1-3/16
190	2.5	283	147.5	53.6	3/8	1/2	11/16	1	1-5/16
170	2.26	253	133.3	59.3	3/8	9/16	11/16	1-1/16	1-3/8
152	2.04	225	120.4	65.7	3/8	9/16	3/4	1-1/8	1-1/2
136	1.86	202	109.7	72.0	7/16	5/8	13/16	1-3/16	1-5/8
120	1.65	179	97.4	81.2	7/16	11/16	7/8	1-5/16	1-3/4
106	1.47	158	86.7	91.1	7/16	3/4	15/16	1-7/16	1-7/8
96	1.34	143	79.1	100.0	1/2	3/4	1	1-1/2	2
87	1.22	129	72.0	109.8	9/16	13/16	1-1/16	1-5/8	2-1/8
79	1.11	117	65.5	120.7	9/16	7/8	1-1/8	1-11/16	2-1/8
72	1.02	107	60.2	131.4	5/8	15/16	1-3/16	1-11/16	2-1/8
65	0.92	97	54.3	145.6	11/16	1	1-1/4	1-11/16	2-1/8
58	0.92	86	54.3	145.6	11/16	1	1-1/4	1-11/16	2-1/8
53	0.85	79	50.2	157.6	11/16	1	1-1/4	1-11/16	2-1/8
50	0.9	74	53.1	148.9	11/16	1	1-1/4	1-11/16	2-1/8
45	0.82	67	48.4	163.4	11/16	1-1/16	1-3/8	1-7/8	2-5/16
40	0.73	60	43.1	183.5	11/16	1-1/8	1-7/16	1-7/8	2-5/16
35	0.7	52	41.3	191.4	11/16	1-1/8	1-7/16	1-7/8	2-5/16
30	0.6	45	35.4	223.3	11/16	1-1/8	1-9/16	2-3/8	3-3/16
26	0.53	39	31.3	252.8	1-1/16	1-5/8	2-1/8	3-3/16	NR
22	0.56	33	33.0	239.3	7/8	1-1/4	1-11/16	2-1/2	3-5/16
19	0.48	28	28.3	279.1	1-1/8	1-11/16	2-1/4	3-5/16	NR
16	0.41	24	24.2	326.8	1-1/4	1-13/16	2-5/16	3-9/16	NR
14	0.36	25	21.2	372.2	1-1/4	1-13/16	2-5/16	3-9/16	NR
W10 x 112	1.81	W250 x 167	106.8	74.0	7/16	5/8	13/16	1-1/4	1-5/8
100	1.64	149	96.8	81.7	7/16	11/16	7/8	1-5/16	1-3/4

Note: Increased thicknesses may be applied when thickness applied to lower flange tips is reduced by one-half. Refer to alternate thickness tables.

### DESCRIPTION

CAFCO BLAZE-SHIELD II is an inorganic, Portland cement based Spray-Applied Fire Resistive Material (SFRM) designed to provide fire protection for structural steel and concrete in commercial construction. CAFCO BLAZE-SHIELD II is an excellent choice for concealed environments and can be applied directly to decks, steel beams, columns or concrete surfaces. Tested and classified by UL as "investigated for exterior use", CAFCO BLAZE-SHIELD II can be left exposed to weather conditions during the construction cycle.

In addition to fire resistance, CAFCO BLAZE-SHIELD II also provides thermal and acoustical benefits. As a thermal insulator, it is effective in reducing heat loss, particularly when applied to the underside of a roof deck. The R-value added by CAFCO BLAZE-SHIELD II may also allow a reduction in roof insulation. As an efficient sound absorbing material, it adds value to the fire protection application in areas where high noise levels are anticipated.

With it's high recycled content, no pre-mixing, and reduced labor costs to install, CAFCO BLAZE-SHIELD II continues to be the most cost effective SFRM in the world.

### PRODUCT ADVANTAGES

- UL "Investigated for exterior use"
- Inorganic Portland cement based formulation
- Highest recycled content for commercial SFRMs (67% pre-consumer)
- Easy application and fast clean up

### Thermal Performance

Product	Conductivity(k)*	Resistance (R/inch)
BLAZE-SHIELD II	0.30 BTU in/hr ft² °F @ 75°F (0.043 W/mK @ 24°C)	3.33

\*When tested in accordance with ASTM C518

### Physical Performance

Characteristic	ASTM Method	Industry Standard Performance*	Laboratory Tested Performance**
Density	E605	15 pcf (240 kg/m³)	16 pcf (256 kg/m³)
Combustibility	E136	Noncombustible	Noncombustible
Cohesion/Adhesion	E736	150 psf (7.2 kPa)	375 psf (18.0 kPa)
Deflection	E759	No Cracks or Delaminations	No Cracks or Delaminations
Bond Impact	E760	No Cracks or Delaminations	No Cracks or Delaminations
Compressive Strength	E761	1,440 psf (68.9 kPa)	2,380 psf (114 kPa)
Air Erosion Resistance	E859	Less than 0.025 g/ft² (0.27 g/m²)	0.000 g/ft² (0.000 g/m²)
Corrosion Resistance	E937	Does Not Promote Corrosion of Steel	Does Not Promote Corrosion of Steel
Fungal Resistance	G21	No Growth After 28 Days	Passed

\* Standard performance based on MasterSpec®, Section 078100 APPLIED FIREPROOFING. Refer to UL design for density requirement.

\*\* Values represent independent laboratory tests under controlled conditions.

### FIRE TEST PERFORMANCE

CAFCO BLAZE-SHIELD II has been extensively tested for fire resistance and is rated for up to 4 hours for floor assemblies, beams, joists, columns, roof assemblies and walls and partitions.

- Classified by UL in accordance with ANSI/UL 263 (ASTM E119)
- Classified by UL in accordance with CAN/ULC-S101 (ASTM E119)

CAFCO BLAZE-SHIELD II has also been tested for surface burning characteristics in accordance with ASTM E84 and is rated Class A.

Flame Spread.....	0
Smoke Developed.....	0

### CODE COMPLIANCES

CAFCO BLAZE-SHIELD II satisfies the requirements of the following:

- IBC® - INTERNATIONAL BUILDING CODE®
- City of Los Angeles (LADBS, Category 1 Material)
- NBC - National Building Code of Canada
- ICC-ES, AC208 and AC108 Requirements (UL E119)

### MAJOR SPECIFICATIONS

CAFCO BLAZE-SHIELD II complies with the requirements of the following specifications:

- MasterSpec®, Section 078100 APPLIED FIREPROOFING (AIA)
- MasterFormat® 2014, Section 07 81 00 Applied Fireproofing (CSC, CSI)
- Unified Facilities Guide Specification, UFGS 07 81 00 Spray-Applied Fireproofing (USACE, NAVFAC, AFCEC, NASA)
- Master Construction Specifications, Number 07 80 10 Applied Fireproofing (VA)
- Code of Federal Regulations, Title 40 Protection of the Environment (EPA)
- PBS-P100 Facilities Standards for the Public Buildings Services (GSA)

### Acoustical Performance

Product	Thickness	Base	NRC Rating*
BLAZE-SHIELD II	1/2 inch (13 mm)	Deck & Beam	0.75
BLAZE-SHIELD II	1 inch (25 mm)	Solid	0.75

\*When tested in accordance with ASTM C423



# CAFCO BLAZE-SHIELD II Guide Specification

## SECTION 078100 - APPLIED FIREPROOFING

The following is an outline/short language specification. Complete specifications for Spray-Applied Fire Resistive Materials are available on various media upon request.

### PART 1 – GENERAL

#### 1.1 Work included

1.1.1 Provide all labor, materials, equipment and services necessary for, and incidental to, the complete and proper installation of all sprayed fire protection and related work as shown on the drawings or where specified herein, and in accordance with all applicable requirements of the Contract Documents.

1.1.2 The material and installation shall conform to the applicable building code requirements of all authorities having jurisdiction.

#### 1.2 Quality Assurance

1.2.1 Work shall be performed by a firm with expertise in the installation of fire protection or similar materials. This firm shall be recognized or otherwise approved by the spray-applied fire resistive material manufacturer.

1.2.2 Before proceeding with the fire protection work, approval of the proposed material thicknesses and densities shall be obtained from the architect and other applicable authorities having jurisdiction.

#### 1.3 Related Sections

1.3.1 SECTION 051200 – STRUCTURAL STEEL FRAMING

1.3.2 SECTION 053100 – STEEL DECKING

1.3.3 SECTION 072100 – THERMAL INSULATION

1.3.4 SECTION 078123 – INTUMESCENT FIREPROOFING

1.3.5 SECTION 078443 – JOINT FIRESTOPPING

#### 1.4 References

- A. ASTM E84 – Surface Burning Characteristics of Building Materials.
  - B. ASTM E119 – Fire Tests of Building Construction and Materials.
  - C. ASTM E136 - (Noncombustibility) Behavior of Materials in a Vertical Tube Furnace at 750°C.
  - D. ASTM E605 – Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - E. ASTM E736 – Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - F. ASTM E759 – Effect of Deflection of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - G. ASTM E760 – Effect of Impact on Bonding of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - H. ASTM E761 – Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - I. ASTM E859 – Air Erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.
  - J. ASTM E937 – Corrosion of Steel by Sprayed Fire-Resistive Materials Applied to Structural Members.
  - K. CAN / ULC-S101 – Standard Methods of Fire Tests of Building Construction and Materials.
  - L. CAN / ULC-S102 – Steiner Tunnel Test.
  - M. CAN4-S114 Standard Test Method for Determination of Noncombustibility in Building Materials.
- 1.4.1 Underwriters Laboratories (UL) Fire Resistance Directory.

1.4.2 Underwriters Laboratories of Canada (ULC) List of Equipment and Materials.

1.4.3 IBC® INTERNATIONAL BUILDING CODE® CHAPTER 17 STRUCTURAL TESTS AND SPECIAL INSPECTIONS, Section 1704 Special Inspections.

1.4.4 AWC Publication: Technical Manual 12-A Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials; an Annotated Guide.

#### 1.5 Submittals

1.5.1 Manufacturer's Data: Submit Manufacturer's specification, including certification as may be required to show material compliance with Contract Documents.

1.5.2 Test Data: Independent laboratory test results shall be submitted for all specified performance criteria.

#### 1.6 Delivery, Storage and Handling

1.6.1 Deliver materials to the project in manufacturer's unopened packages, fully identified as to trade name, type and other identifying data. Packaging shall bear the UL labels for fire hazard and fire-resistance classifications.

1.6.2 Store materials above ground, in a dry location, protected from the weather. Damaged packages found unsuitable for use should be rejected and removed from the project.

#### 1.7 Project Conditions

1.7.1 When the prevailing outdoor temperature at the building is less than 40° F (4°C), a minimum substrate and ambient temperature of 40° F (4°C) shall be maintained prior to, during, and a minimum of 24 hours after application of spray-applied fire resistive material. If necessary for job progress, General Contractor shall provide enclosures and heat to maintain proper temperatures and humidity levels.

1.7.2 General Contractor shall provide ventilation to allow proper drying of the sprayed fire protection during and subsequent to its application.

1.7.2.1 Ventilation must not be less than 4 complete air exchanges per hour until the material is dry. When spraying in enclosed areas such as basements, stairwells, shafts, and small rooms, additional air exchanges may be necessary.

#### 1.8 Sequencing/Scheduling

1.8.1 All fire protection work on a floor shall be completed before proceeding to the next floor.

1.8.2 The Contractor shall cooperate in the coordination and scheduling of fire protection work to avoid delays in job progress.

### PART 2 – PRODUCTS

#### 2.1 Acceptable Manufacturers

2.1.1 The spray-applied fire resistive material shall be manufactured under the CAFCO® brand name, by authorized producers.

#### 2.2 Materials

2.2.1 Materials shall be CAFCO BLAZE-SHIELD II, (UL/ ULC designation: Type II) applied to conform to the drawings, specifications and following test criteria:

2.2.1.1 Deflection: When tested in accordance with ASTM E759, the material shall not crack or delaminate when the non-concrete topped galvanized deck to which it is applied is subjected to a one time vertical centerload resulting in a downward deflection of 1/120th of the span.

2.2.1.2 Bond Impact: When tested in accordance with ASTM E760, the material shall not crack or delaminate from the concrete topped galvanized deck to which it is applied.

2.2.1.3 Cohesion/Adhesion (bond strength): When tested in accordance with ASTM E736, the material applied over uncoated or galvanized steel shall have an average bond strength of 150 psf (7.2 kPa)

2.2.1.4 Air Erosion: When tested in accordance with ASTM E859, the material shall not be subject to losses from the finished application greater than 0.025 grams per sq. ft. (0.27 grams per square meter).

2.2.1.5 Compressive Strength: When tested in accordance with ASTM E761, the material shall not deform more than 10 percent when subjected to a crushing force of 1,440 psf (68.9 kPa).

2.2.1.6 Corrosion Resistance: When tested in accordance with ASTM E937, the material shall not promote corrosion of steel.

2.2.1.7 Noncombustibility: When tested in accordance with ASTM E136 or CAN4-S114, the material shall be noncombustible.

2.2.1.8 Surface Burning Characteristics: When tested in accordance with ASTM E84 or CAN/ULC-S102, the material shall exhibit the following surface burning characteristics:  
Flame Spread ..... 0  
Smoke Developed ..... 0

2.2.1.9 Density: When tested in accordance with ASTM E605, the material shall meet the minimum individual and average density values as listed in the appropriate UL / ULC design or as required by the authority having jurisdiction.

2.2.2 The material shall have been tested and classified by Underwriters Laboratories (UL) or Underwriters Laboratories of Canada (ULC) in accordance with the procedures of UL 263(ASTM E119) or CAN/ULC-S101.

2.2.3 Spray-applied fire resistive materials shall be applied at the appropriate minimum thickness and density to achieve the following ratings:

Floor assemblies \_\_\_\_hr.

Roof assemblies \_\_\_\_hr.

Beams \_\_\_\_hr.

Girders \_\_\_\_hr.

Columns \_\_\_\_hr.

Joists \_\_\_\_hr.

2.2.4 Potable water shall be used for the application of spray-applied fire resistive materials.

2.2.5 Spray-applied fire resistive materials shall contain no detectable asbestos. Material manufacturer shall provide certification of such upon request.

### PART 3 – EXECUTION

#### 3.1 Preparation

3.1.1 All surfaces to receive spray-applied fire resistive material shall be free of oil, grease, loose mill scale, dirt, paints/primer or other foreign materials which would impair satisfactory bonding to the surface. Manufacturer shall be contacted for procedures on handling primed/painted steel. Any cleaning of surfaces to receive sprayed fire protection shall be the responsibility of the General Contractor or Steel Erector, as outlined in the structural steel or steel deck section.

3.1.2 Clips, hangers, supports, sleeves and other attachments to the substrate are to be placed by others prior to the application of spray-applied fire resistive materials.

3.1.3 The installation of ducts, piping, conduit or other suspended equipment shall not take place until the application of spray-applied fire resistive materials is complete in an area.

3.1.4 The spray-applied fire resistive material shall only be applied to steel deck which has been fabricated and erected in accordance with the criteria set by the Steel Deck Institute.

3.1.5 When roof traffic is anticipated, as in the case of periodic maintenance, roofing pavers shall be installed as a walkway to distribute loads.

#### 3.2 Application

3.2.1 Equipment, mixing and application shall be in accordance with the manufacturer's written application instructions.

3.2.2 The application of spray-applied fire resistive material shall not commence until certification has been received by the General Contractor that surfaces to receive sprayed fire protection have been inspected by the applicator and are acceptable to receive spray-applied fire resistive material.

3.2.3 All unsuitable substrates must be identified and made known to the General Contractor and corrected prior to application of the spray-applied fire resistive material.

3.2.4 Spray-applied fire resistive material shall not be applied to steel floor decks prior to the completion of concrete work on that deck.

3.2.5 The application of spray-applied fire resistive material to the underside of roof deck shall not commence until the roofing is completely installed and tight, all penthouses are complete, all mechanical units have been placed, and after construction roof traffic has ceased.

3.2.6 Proper temperature and ventilation shall be maintained as specified in 1.7.1, 1.7.2, and 1.7.2.1.

3.2.7 Provide masking, drop cloths or other suitable coverings to prevent overspray from coming in contact with surfaces not intended to be sprayed.

3.2.8 CAFCO BOND-SEAL (Type EBS) adhesive shall be applied as per the appropriate UL/ULC fire resistance design and manufacturer's written recommendations.

#### 3.3 Repairing and Cleaning

3.3.1 All patching of and repair to spray-applied fire resistive material, due to damage by other trades, shall be performed under this section and paid for by the trade responsible for the damage.

3.3.2 After the completion of the work in this section, equipment shall be removed and all surfaces not to be sprayed shall be cleaned to the extent previously agreed to by the applicator and General Contractor.

#### 3.4 Inspection and Testing

3.4.1 The spray-applied fire resistive material shall be tested for thickness and density in accordance with one of the following procedures:  
ASTM E605 – Standard Test Method of Sprayed Fire-Resistive Materials Applied to Structural Members.

AWCI Publication: Technical Manual 12-A Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials; an Annotated Guide.

IBC® INTERNATIONAL BUILDING CODE® CHAPTER 17 STRUCTURAL TESTS AND SPECIAL INSPECTIONS Section 1704 Special Inspections.

#### Product Availability

Isolatek International Spray-Applied Fire Resistive Materials are available to trained, recognized applicators around the world from strategically located production and distribution points in the U.S., Canada, Mexico, Europe and the Pacific Basin.



ISOLATEK INTERNATIONAL is registered with the  
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We support our customers with unsurpassed technical expertise and customer service, complemented by an extensive global network of experienced sales representatives and recognized applicators. For detailed product information or for the name of the sales representative in your area please contact us.

The performance data herein reflect our expectations based on tests conducted in accordance with recognized standard methods under controlled conditions. The applicator, general contractor, property owner and/or user MUST read, understand and follow the directions, specifications and/or recommendations set forth in Isolatek International's publications concerning use and application of these products, and should not rely merely on the information contained in this Technical Data Sheet. Isolatek International is not responsible for property damage, bodily injuries, consequential damages, or losses of any kind that arise from or are related to the applicator's general contractor's, or property owner's failure to follow the recommendations set forth in Isolatek International's publications. The sale of these products shall be subject to the Terms and Conditions set forth in the Company's invoices.



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