



# CAFco® BLAZE-SHIELD® II

## Spray-Applied Fire Resistive Material

CAFco BLAZE-SHIELD II is an inorganic, portland cement based Spray-Applied Fire Resistive Material (SFRM) designed to provide fire resistive ratings for structural steel and concrete in commercial construction.

Applied directly to deck, steel beams, columns or concrete surfaces, the outstanding value and proven fire resistive performance of CAFco BLAZE-SHIELD II make it an excellent choice for concealed commercial environments

CAFco BLAZE-SHIELD II has been tested and is classified as "investigated for exterior use" by Underwriters Laboratories, Inc. allowing it to remain exposed to weather conditions during the construction cycle. In addition, it's high recycled content, no pre-mixing and reduced labor costs to install make BLAZE-SHIELD II the most cost effective SFRM in the world.

CAFco BLAZE-SHIELD II is applied exclusively by CAFco licensed and trained contractors. Our technical staff works closely with building team members to meet all fire protection needs.

### CODE COMPLIANCES

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

- IBC-International Building Code (ICC ESR-1649)
- New York City—MEA
- NBC - National Building Code of Canada

### MAJOR SPECIFICATIONS

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

- General Services Administration (GSA): AIA/SC/GSA: 07811
- Department of the Navy NAVFACENCOM Guide Specification NFGS 07810, Sprayed-On Fireproofing
- Veterans Administration (VA): H-08-1
- U.S. ARMY Corps of Engineers. CEGS-07811
- U.S. Environmental Protection Agency (EPA): Regulation 40
- Construction Specification Canada (CSC) TEK-AID
- Factory Mutual Approved



### FIRE TEST PERFORMANCE

CAFco BLAZE-SHIELD II has been extensively tested for fire endurance by Underwriters Laboratories, Inc. (UL) and Underwriters Laboratories of Canada (ULC) in accordance with ASTM E119 (UL 263, CAN/ULC-S101).

These tests have resulted in ratings of up to 4 hours for:

- Floor Assemblies
- Beams
- Joists
- Columns
- Roof Assemblies
- Walls and Partitions

CAFco BLAZE-SHIELD II has also been tested in accordance with ASTM E84 and CAN/ULC-S102 and has the following Surface Burning Characteristics:

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

### THERMAL PROPERTIES

The unique formulation of CAFco BLAZE-SHIELD II makes it a very effective thermal insulator. This benefit is important in reducing heat loss, particularly when applied to the underside of a roof deck. The R-value added by CAFco BLAZE-SHIELD II may allow a reduction in roof insulation.

Product	Conductivity (k)*	Resistance (R/inch)
BLAZE-SHIELD II	0.30 BTU in/hr ft <sup>2</sup> °F @ 75°F (0.043 W/mK @ 24°C)	3.33

\*When tested in accordance with ASTM C518

### ACOUSTICAL PROPERTIES

As an efficient sound-absorbing material, CAFco BLAZE-SHIELD II adds value to the fire protection application in areas where high-noise levels are anticipated. Typical acoustical performance is as follows:

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

Physical Performance			
Characteristic	ASTM Method	Standard Performance*	Tested Performance**
Density	E605	15 pcf (240 kg/m <sup>3</sup> )	16 pcf (256 kg/m <sup>3</sup> )
Combustibility	E136	Noncombustible	Noncombustible
Cohesion/Adhesion	E736	150 psf (7.2 kPa)	375 psf (17.9 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	750 psf (35.9 kPa)	2,380 psf (114 kPa)
Air Erosion Resistance	E859	Less than 0.025 g/ft <sup>2</sup> (0.27 g/m <sup>2</sup> )	0.000 g/ft <sup>2</sup> (0.000 g/m <sup>2</sup> )
Corrosion Resistance	E937, Mil. Std. 810	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 General Services Administration AIA/SC/GSA/07811 except for density, which is based on UL. Refer to UL design for density requirement.

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

# CAFCO BLAZE-SHIELD II Guide Specification

## 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 spray-applied fire resistive material 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 and the 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 licensed 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 05100 - Structural Steel.
- 1.3.2 Section 05300 - Metal Decking.
- 1.3.3 Section 07200 - Insulation.
- 1.3.4 Section 07270 - Firestopping.
- 1.3.5 Section 07812 - Intumescent Coatings.
- 1.3.6 Section 09200 - Lath and Plaster.
- 1.3.7 Section 09900 - Painting.
- 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, Inc. (UL) Fire Resistance Directory.

- 1.4.2 Underwriters Laboratories of Canada (ULC) List of Equipment and Materials.
- 1.4.3 Uniform Building Code Standard No. 7-6 (current edition): Thickness and Density Determination for Spray-Applied Fire Protection.
- 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 specifications, 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 and ULC 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 spray-applied fire resistive material during and subsequent to its application.
- 1.7.2.1 In enclosed areas ventilation shall not be less than 4 complete air changes per hour.
- 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.
- 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 750 psf (35.9 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 non-combustible.
- 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, Inc. (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 approved 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.

- 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 spray-applied fire resistive material 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.

## PART 2 – PRODUCTS

- 2.1 Acceptable Manufacturers. 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 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.

## PART 3 – EXECUTION

- 3.1 Preparation
- 3.1.1 All surfaces to receive fire protection shall be free of oil, grease, loose mill scale, dirt, paints/primers 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 spray-applied fire resistive material 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 material is complete in an area.
- 3.1.4 The spray-applied fire resistive material shall only

- 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. AWC/ - Technical Manual 12-A Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials an Annotated Guide. UBC Standard No. 7-6 - Thickness and Density Determination for Spray-Applied Fire Protection.
- Product Availability
- Isolatek International Spray-Applied Fire Resistive Materials are available to trained, licensed contractors 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 AIA Continuing Education System (AIA/CES)

### For Further Information

CAFCO Technical and Sales Representatives are always available to lend assistance. Additional printed materials, including Material Safety Data Sheets, and other product literature, are available upon request. For more information about our CAFCO line of sprayed fire protection, thermal and acoustical treatments, Intumescent Coatings, thermal barriers and CAFCO-BOARD® or for the name of the Sales Representative in your area, please contact:

**In the United States:** Isolatek International, Stanhope, New Jersey Tel: 800.631.9600 Fax: 973.347.9170

**In Mexico & Central America:** Cafco Mexico S.A. de C.V., Mexico D.F. Tel: 525.254.6683 Fax: 525.531.7826

**In Andean Countries:** Cafco Andina S.A., Santiago, Chile Tel: 562.719.0394

**In Canada:** Cafco Industries, Toronto (Ontario) Tel: 888.873.0003 Fax: 416.679.2933

**In Asia/Pacific:** Tel: 60.3.5121.3886 Fax: 60.3.5121.4886

For more detailed product information, visit our website at [www.cafco.com](http://www.cafco.com) or contact us at [technical@isolatek.com](mailto:technical@isolatek.com)



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Total Passive Fire Protection 9/11