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
- Veterans Administration (VA): H-08-1
- U.S. Army Corps of Engineers. CEVS-07811
- U.S. Environmental Protection Agency (EPA): Regulation 40
- Construction Specification Canada (CSC) TEK-AID
- Factory Mutual Approved

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 NAVFACENGCOM Guide Specification NFGS 07810, Sprayed-On Fireproofing
- 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.

<table>
<thead>
<tr>
<th>Product</th>
<th>Conductivity (k)*</th>
<th>Resistance (R/inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLAZE-SHIELD II</td>
<td>0.30 BTU in/hr ft °F @ 75°F (0.043 W/mk @ 24°C)</td>
<td>3.33</td>
</tr>
</tbody>
</table>

*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:

<table>
<thead>
<tr>
<th>Product</th>
<th>Thickness</th>
<th>Base</th>
<th>NRC Rating*</th>
</tr>
</thead>
<tbody>
<tr>
<td>BLAZE-SHIELD II</td>
<td>1/2 inch (13 mm)</td>
<td>Deck &amp; Beam</td>
<td>0.75</td>
</tr>
<tr>
<td>BLAZE-SHIELD II</td>
<td>1 inch (25 mm)</td>
<td>Solid</td>
<td>0.75</td>
</tr>
</tbody>
</table>

*When tested in accordance with ASTM C423

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>ASTM Method</th>
<th>Standard Performance*</th>
<th>Tested Performance**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density</td>
<td>E805</td>
<td>15 psf (240 kg/m²)</td>
<td>16 psf (256 kg/m²)</td>
</tr>
<tr>
<td>Combustibility</td>
<td>E136</td>
<td>Noncombustible</td>
<td>Noncombustible</td>
</tr>
<tr>
<td>Cohesion/Adhesion</td>
<td>E736</td>
<td>150 psf (7.2 kPa)</td>
<td>360 psf (17.2 kPa)</td>
</tr>
<tr>
<td>Deflection</td>
<td>E759</td>
<td>No Cracks or Delaminations</td>
<td>No Cracks or Delaminations</td>
</tr>
<tr>
<td>Bond Impact</td>
<td>E760</td>
<td>No Cracks or Delaminations</td>
<td>No Cracks or Delaminations</td>
</tr>
<tr>
<td>Compressive Strength</td>
<td>E761</td>
<td>750 psf (35.9 kPa)</td>
<td>2,380 psf (114 kPa)</td>
</tr>
<tr>
<td>Air Erosion Resistance</td>
<td>E859</td>
<td>Less than 0.025 g/ft² (0.37 g/m²)</td>
<td>0.000 g/ft² (0.000 g/m²)</td>
</tr>
<tr>
<td>Corrosion Resistance</td>
<td>E937, Mil. Std. 810</td>
<td>Does Not Promote Corrosion of Steel</td>
<td>Does Not Promote Corrosion of Steel</td>
</tr>
<tr>
<td>Fungal Resistance</td>
<td>G21</td>
<td>No Growth After 28 Days</td>
<td>Passed</td>
</tr>
</tbody>
</table>

* 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

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 located and 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 01300 - Structural Steel

1.3.2 Section 01600 - Metal Decking

1.3.3 Section 01700 - Insulation

1.3.4 Section 01710 - Firestopping

1.3.5 Section 01910 - Inorganic Insulations

1.3.6 Section 03000 - Lath and Plaster

1.3.7 Section 03900 - Painting

1.4 References

A. ASTM B4 - Surface Burning Characteristics of Building Materials

B. ASTM E119 - Fire Tests of Building Construction and Materials

C. ASTM E160 - Noncombustibility

D. Behavior of Materials in a Vertical Tube Furnace at 750°F

E. ASTM E605 - Thickness and Density of Sprayed Fire-Resistant Materials Applied to Structural Members

F. ASTM E678 - Cohesive/Adhesion of Sprayed Fire-Resistant Materials Applied to Structural Members

G. ASTM E709 - Effect of Deformation of Sprayed Fire-Resistant Materials Applied to Structural Members

H. ASTM E710 - Effect of Impact on Bonding of Sprayed Fire-Resistant Materials Applied to Structural Members

I. ASTM E889 - Air Emissivity of Sprayed Fire-Resistant Materials Applied to Structural Members

J. ASTM E897 - Corrosion of Steel by Sprayed Fire-Resistant Materials Applied to Structural Members

K. CAN/ULC-S130 - Standard Methods of Fire Tests of Building Construction and Materials

L. CAN/ULC-S132 - Snow Tunnel Test


1.4.1 Underwriters Laboratories, Inc. (UL) Fire Resistance Directory

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


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 information. 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 shall be removed and removed from the project.

1.7 Preconstruction

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 over- and under-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-resistant material during and subsequent to its application.

1.7.3 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 delaying job progress.

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 CAFCO BLAZE-SHIELD II (UL/ULC designation Type II) applied in conformance to the drawings, specifications and following test criteria:

2.2.1.1 Deflections: When tested in accordance with ASTM E709, the material shall not crack or delaminate when the non-concave topped galvanized deck in which it is applied is subjected to a one-time vertical centimeter resulting in a downward deflection of 1/120th of the span.

2.2.1.2 Bend Impact: When tested in accordance with ASTM E709, the material shall not crack or delaminate from the concrete topped galvanized deck to which it is applied.

2.2.1.3 Cohesion (bond strength): When tested in accordance with ASTM E709, the material applied over uncoated or galvanized steel shall have an average bond strength of 150 psi (214 kPa).

2.2.1.4 Air Emissivity: When tested in accordance with ASTM E689, the material shall not be subject to losses from the finished application greater than 0.025 grams per ft² (0.37 grams per square meter).

2.2.1.5 Compressive Strength: When tested in accordance with ASTM E961, the material shall not deform more than 10 percent when subjected to a crushing force of 300 psi (2,070 kPa).

2.2.1.6 Corrosion Resistance: When tested in accordance with ASTM E857, the material shall not promote corrosion of steel.

2.2.1.7 Noncombustibility: When tested in accordance with ASTM E716 or CAN4-S114, the material shall be noncombustible.

2.2.1.8 Surface Burning Characteristics: When tested in accordance with ASTM E863 or CANULC-S112, the material shall exhibit the following surface burning characteristics:

- Flame Spread: 0
- Smoke Developed: 0
- Average density when tested in accordance with ASTM E960, the material shall meet the minimum density values 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 1715 (UL) or CANULC-S101.

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

- Floor assemblies: ___ hr
- Roof assemblies: ___ hr
- Beams: ___ hr
- Gordon: ___ hr
- Columns: ___ hr
- Joists: ___ hr

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

3. Execution

3.1 Preparation

3.1.1 All surfaces to receive fire protection shall be free of oil, grease, food mill scale, dirt, paint, primers or other foreign materials which would impair satisfactorily any bonding to the surface. Manufacturer shall be contacted for procedures on handling primed/primed steel. Any cleaning of surfaces to receive spray applied fire resistant material shall be the responsibility of the General Contractor or Steel Erection, as outlined in the structural steel or steel deck section.

3.1.2 Cuts, hangars, supports, slivers and other attachments to the substrate to be placed by others prior to the application of spray-applied fire resistant 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 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, roof 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 resistant material have been inspected by the applicable and are acceptable to receive spray-applied fire resistive material.

3.2.3 All suitable 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 Application of 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 resistant material to the underside of roof decks shall not commence until the roofing is completely installed and tight, all penetrations are complete, all mechanical units have been placed, and other 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 cloth and other suitable coverings to prevent overspray from coming in contact with surfaces not intended to be sprayed.

3.2.8 CAN/CSA-B180 (Type B/B) adhesive shall be applied as per the applicable UL/ULC fire resistance design and manufacturer’s written recommendations.

3.3 Repairing and Cleaning

3.3.1 All patching of 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 the section, the sprayed material will be removed and all surfaces not to be sprayed shall be cleaned to the extent previously agreed 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-Resistant Materials Applied to Structural Members, CAN/ULC Technical Manual 13.4-Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistant Materials; An Amended Guide UBC Standard No. 7.6 - Thickness and Density Determination for Spray Applied Fire Protection.

Product Availability

Isolatex International's Sprayed Applied Fire-Resistant Materials are available to trade, licensed contractor or those strategically located production and distribution centers in the U.S., Canada, Mexico, Europe and the Pacific Basin.

For more detailed product information, visit our website at www.caftco.com or contact us at technical@isolatek.com

The performance data herein reflect our expectations based on tests conducted in accordance with recognized standard methods under controlled conditions. The application, general contractor, property owner and/or user MUST read, understand and follow the directions, specifications and/or recommendations of the manufacturer concerning use and application of products and should not rely merely on the information contained in this product data sheet. Isolatek International is not responsible for property damage, bodily injury, consequential damages, or losses of any kind from use of the product. All references to fire applicators, general contractors, to property owners’ failure to follow the recommendations set forth in Isolatex International’s publications. The sale of these products shall be subject to the Terms and Conditions of Sale set forth in the Company’s invoice.