



# CAFCO® 400

## Spray-Applied Fire Resistive Material

CAFCO 400 is a portland cement based Spray-Applied Fire Resistive Material (SFRM). It is a medium density wet mix product, designed to provide fire protection for structural steel in commercial and high rise construction. The durable surface and portland cement based formulation of the product make it well suited for application in areas which may be subjected to higher levels of abuse and elevated humidity levels.

CAFCO 400 offers the best fire resistance performance per unit thickness of any commercial SFRM. This means less material is needed to achieve required fire ratings. With virtually no waste during installation, CAFCO 400 is cost effective, clean and neat in appearance.

### CODE COMPLIANCES

CAFCO 400 satisfies the requirements of the following:

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

### MAJOR SPECIFICATIONS

CAFCO 400 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

### FIRE TEST PERFORMANCE

CAFCO 400 has been extensively tested for fire endurance by Underwriters Laboratories (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

CAFCO 400 has also been tested in accordance with ASTM E84 (UL723,CAN/ULC-S102) and has the following Surface Burning Characteristics

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

### THERMAL PROPERTIES

CAFCO 400 is also a thermal insulator. This benefit is important in reducing heat loss, particularly when the product is applied to the underside of a roof deck. The R-value added by CAFCO 400 may allow a reduction in roof insulation.

Product	Conductivity (k)*	Resistance (R/inch)
CAFCO 400	0.494 BTU in/hr ft <sup>2</sup> (0.0712 W/mK)	2.02

\*When tested in accordance with ASTM C518

Physical Performance			
Characteristic	ASTM Method	Standard Performance*	Tested Performance**
Density	E605	22 pcf (353 kg/m <sup>3</sup> )	25 pcf (400 kg/m <sup>3</sup> )
Combustibility	E136	Noncombustible	Noncombustible
Cohesion/Adhesion	E736	434 psf (20.8 kPa)	8,556 psf (409.6 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	7,344 psf (351 kPa)	22,112 psf (1058.7 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
Sound Absorption	C423		0.60 NRC 1/2" (13mm) on deck and beam
Cone Calorimeter	E1354	No Flaming or Heat Release	No Flaming or Heat Release
Fungal Resistance	G21	No Growth After 28 Days	Passed

\* Standard performance based on General Services Administration AIA/SC/GSA/07811. Refer to UL design for density requirement. For further information refer to the application manual.

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



# CAFCO 400 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 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 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 E605 – Thickness and Density of Sprayed Fire-Resistive Materials Applied to Structural Members.
- D. ASTM E736 – Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
- E. ASTM E759 – Effect of Deflection of Sprayed Fire-Resistive Materials Applied to Structural Members.
- F. ASTM E760 – Effect of Impact on Bonding of Sprayed Fire-Resistive Materials Applied to Structural Members.
- G. ASTM E761 – Compressive Strength of Sprayed Fire-Resistive Materials Applied to Structural Members.
- H. ASTM E859 – Air Erosion of Sprayed Fire-Resistive Materials Applied to Structural Members.
- I. ASTM E937 – Corrosion of Steel by Sprayed Fire-Resistive Materials Applied to Structural Members.
- J. CAN / ULC-S101 – Standard Methods of Fire Tests of Building Construction and Materials.
- K. CAN / ULC-S102 – Steiner Tunnel Test.
- 1.4.1 Underwriters Laboratories of Canada (ULC) List of Equipment and Materials.
- 1.4.2 Underwriters Laboratories, Inc (ULI) Fire Resistance Directory.
- 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 specification, including certification as may be required to show material compliance with Contract Documents. Test Data: Additional laboratory test results shall be submitted for all specified performance criteria.
- 1.5.2 Test Data: Additional 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 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.

## 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 CAFCO 400, (UL/ULC designation: Type 400) 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 434 psf (20.8 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 7,344 psf (351 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 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
- 2.2.1.8 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 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 be free of all forms of asbestos, including actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite. 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/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 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. AWC Publication: 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