ISOLATEK® INTERNATIONAL

CAFCO® 400
(Americas)
ISOLATEK® Type 400
(Worldwide)
Spray-Applied Fireproofing

DESCRIPTION
CAFCO 400 / ISOLATEK Type 400 is a Portland cement based, wet mix, medium density Spray-Applied Fire Resistive Material (SFRM) designed to provide fire protection for structural steel and concrete in commercial and high rise construction. The durable surface and Portland cement based formulation make it well suited for applications in either unconditioned or conditioned areas.

CAFCO 400 / ISOLATEK Type 400 is used in areas which may be subject to higher levels of abuse and elevated humidity such as mechanical and electrical rooms, parking garages, elevator shafts, etc. and meets the current IBC high rise bond strength requirement of ≥ 430 psf and 1,000 psf.

In addition to fire resistance, CAFCO 400 / ISOLATEK Type 400 also provides thermal 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 400 / ISOLATEK Type 400 may also allow a reduction in roof insulation.

PRODUCT ADVANTAGES
- *Meets or exceeds industry in-place performance standards*
- *Portland cement based product is extremely durable and ideal for areas where resistance to physical abuse, abrasion forces and impact is required*
- *Offers the best fire resistance performance per unit thickness and greatest productivity of any medium density SFRM*
- *Cost effective, clean and neat in appearance*

Thermal Performance

Product	Conductivity(k)*	Resistance (R/inch)
CAFCO 400 ISOLATEK Type 400	0.494 BTU in/hr ft²°F @ 75°F (0.0712 W/m•K @ 24°C)	2.02

*When tested in accordance with ASTM C518

FIRE TEST PERFORMANCE
CAFCO 400 / ISOLATEK Type 400 has been extensively tested for fire resistance and is rated for up to 4 hours for floor assemblies, beams, joists, columns, and roof assemblies.
- Classified by UL in accordance with ANSI/UL 263 (ASTM E119)
- Classified by UL in accordance with CAN/ULC-S101 (ASTM E119)
- Tested in accordance with BS476 Parts 21 & 22 (Assessed in accordance with 5th Edition ASFP Yellow Book)
- Tested in accordance with EN13381 Parts 3 & 4
- Assessed in accordance with AS 1530.4: 2014 / AS4100:1998(R2016) Amendment 1

CAFCO 400 / ISOLATEK Type 400 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 400 / ISOLATEK Type 400 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, AC23 and AC10 Requirements (UL ER13348-01)

MAJOR SPECIFICATIONS
CAFCO 400 / ISOLATEK Type 400 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 81 00 Applied Fireproofing (VA)
- Code of Federal Regulations, Title 40 Protection of the Environment (EPA)
- PBS-P100, Facilities Standards for the Public Buildings Services (GSA)
- Factory Mutual Approved

Physical Performance

Characteristic	ASTM Method	Industry Standard Performance*	Laboratory Tested Performance**
Density	E605	22 pcf (353 kg/m³)	25.3 pcf (405 kg/m³)
Combustibility	E136	Noncombustible	Noncombustible
Cohesion/Adhesion	E736	430 psf (20.6 kPa)	8,556 psf (409.7 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 (351.7 kPa)	22,112 psf (1,058.7 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
Sound Absorption	C423		0.60 NRC 1/2" (13 mm) 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 industry standards and practices. Refer to UL design for density requirement.
** Values represent independent laboratory tests under controlled conditions.

CAFCO 400 / ISOLATEK Type 400 Guide Specification

SECTION 078100 - APPLIED FIREPROOFING

The following is an outline/shot 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 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.

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 1705 Special Inspections.

1.4.4 AWCI 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 must not be used.

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 must provide adequate 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® / ISOLATEK® brand name, by authorized producers.

2.2 Materials

2.2.1 Materials shall be CAFCO 400, (UL/ULC designation: ISOLATEK 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 a minimum bond strength of 430 psf (20.6 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 (351.7 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, 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 (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/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 by the installer 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 / ISOLATEK 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 of damaged spray-applied fire resistive material, 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 1705 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 AIA Continuing Education System (AIA/CES)

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.

Isolatek International provides passive fireproofing materials under the CAFCO® and FENDOLITE® trademarks throughout the Americas and under the ISOLATEK® trademark throughout the world.

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VERMICULITE COATING TOTAL SYSTEM REQUIREMENT:

In order to provide the warranty, a combination of Bonding Coat, Smooth Finish and Sealer Coat are mandatory, even when these requirements are not specified. It is required that the contractor provide same for a proper installation to ensure long lasting performance to the need of the warranty:

* **Bonding Coat** - vermiculite has very low adhesion value, resulting in cracks or disbond easily, hence Bonding Coat is mandatory to prevent same and ensuring good bonding to the substrate.

* **Metal Lathing** - is mandatory for thickness exceeding 30mm thickness to securely fixed to the substrate to provide keys for the steel surfaces to receive the vermiculite.

* **Smooth Finish** - is to minimise surface defects, it is absolutely necessary to compact the vermiculite to improve the vermiculite bonding properties and the vermiculite do not erode, delaminate, flake or dust. Surface defects allow moisture and containments to penetrate the cement and promote corrosion.

* **Sealer Coat** - do not allow moisture and contaminants to penetrate the cement and inhibits corrosion, flaking and dusting.