SECTION 07 81 16
CEMENTITIOUS FIREPROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS
- A. The provisions of the general Conditions, Supplementary Conditions, and the Sections included under Division 1, General Requirements, are included as a part of this Section.

1.2 SECTION INCLUDES
- A. Cementitious mineral fiber reinforced fireproofing, spray applied.

1.3 REFERENCES
- A. ASTM E72 – Standard Test Method For Conducting Strength Tests of Panels for Building Construction
- B. ASTM E84 – Standard Test Method for Surface Burning Characteristics of Building Materials
- C. ASTM E119 – Standard Test Method for Fire Tests of Building Construction and Materials
- D. ASTM E605 – Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members
- E. ASTM E736 – Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members
- F. ASTM E759 – Standard Test Method for Effect of Deflection on Sprayed Fire Resistive Material Applied to Structural Members
- G. ASTM E761 – Standard Test Method for Compressive Strength of Sprayed Fire-Resistive Material Applied to Structural Members
- H. ASTM E859 – Standard Test Method for Air Erosion of Sprayed Fire Resistive Materials (SFRMs) Applied to Structural Members
- I. ASTM E937 - Standard Test Method for Corrosion of Steel by Sprayed Resistive Material (SFRM) Applied to Structural Members
- J. ASTM E1354 - Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter
- K. ASTM G21 – Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi
- L. UL (Underwriters Laboratories, Inc.) - Fire Hazard Classifications
- M. FBC - Florida Building Code

1.4 SUBMITTALS
- A. Submit under provisions of Section 01 33 00.
- B. Product Data: Provide data indicating product characteristics, performance and limitation criteria.
- C. Test Reports: Indicating the following:
  1. Bond Strength of Fireproofing: ASTM E72, tested to provide minimum bond strength twenty-times weight of fireproofing materials.
  2. Reports from reputable independent testing agencies, of product proposed for use, which indicate conformance to ASTM E119 and ASTM E84.
- D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.
- E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.
- F. Manufacturer's Field Reports: Indicate environmental conditions during the installation of fireproofing materials. Submit under provisions of Section 01 40 00.

1.5 QUALIFICATIONS
- A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- B. Applicator: Manufacturer approved Company specializing in applying the work of this section.

1.6 REGULATORY REQUIREMENTS
- A. Conform to applicable code for fire resistance ratings.

1.7 MOCKUP
- A. Provide mockup of applied cementitious fireproofing under provisions of Section 01 40 00.
- B. Locate where directed.
- C. Mockup may remain as part of the work.

1.8 PRE-INSTALLATION CONFERENCE
- A. Convene 2-weeks prior to commencing work of this section, under provisions of Section 01 31 00.

1.9 ENVIRONMENTAL REQUIREMENTS
- A. Apply spray fireproofing when temperature of substrate material and surrounding air meets manufacturer's installation instructions.
- B. Provide ventilation in areas receiving fireproofing during and 24 hours after application
- C. Provide temporary enclosure to prevent spray from contaminating air.

1.10 SEQUENCING
- A. Sequence work in conjunction with placement of ceiling hangers, mechanical component hangers and electrical components.

1.11 WARRANTY
- A. Provide 5-year warranty under provisions of Section 01 77 00.
- B. Warranty: Include coverage for fireproofing to remain free from cracking, checking, dusting, flaking, spalling, separation, and blistering. Reinstall or repair failures.

PART 2 PRODUCTS

2.1 MATERIAL
- A. Fireproofing shall be a factory mixed cementitious mixture blended for uniform texture, non-fibrous material.

2.2 PHYSICAL PERFORMANCE CHARACTERISTICS
- A. Fireproofing material shall meet the following performance standards:
  1. Dry Density: Measure the field density in accordance with ASTM Standard E605.
     a. Minimum average density shall be that listed in the UL Fire Resistance Directory for each rating indicated or minimum average 19 pcf, whichever is greater.
  2. Deflection: Material shall not crack or delaminate from the sub-surface when tested in accordance with ASTM E759.
  3. Bond Impact: Material shall meet impact tests of ASTM E736, with minimum average bond strength of 200 psf and minimum individual bond strength of 150 psf.
  4. Air Erosion: Maximum allowable total weight loss of the fireproofing material shall be .005 g/sq. ft. when tested in accordance with ASTM E859.
     a. Sample surface shall be "as applied" and the total reported weight loss shall be the total weight loss over a 24-hour period from the beginning of the test.
  5. High Speed Air Erosion: Materials used in plenums or ducts shall exhibit no continued erosion after 4 hours at an air speed of 47 km/h when tested in accordance with the UMC Standard 6-1 and ASTM E859.
  6. Compressive Strength: The fireproofing shall not deform more than 10% when subjected to

compressive forces of 1200 psf when tested in accordance with ASTM E761.

7. Corrosion Resistance: Test fireproofing applied to steel in accordance with ASTM E937, shall not promote corrosion of steel.
8. Surface Burning Characteristics: Material shall exhibit the following surface burning characteristics when tested in accordance with ASTM E84, Flame Spread 0, and Smoke Development 0.
9. Resistance to Mold: Formulate the fireproofing material at the time of manufacturing with a mold inhibitor.
    a. Test fireproofing material per ASTM G21 and show resistance to mold growth for a period of 21 days for general use and 60 days for materials installed in plenums.
10. Combustibility: Material shall have a maximum 125 kW/m2 peak rate of heat release 600 seconds after insertion when tested in accordance with ASTM E1354 at a radiant heat flux of 75kW/m2 with the use of electric spark ignition.
    a. Test the sample in the horizontal orientation.

B. Mixing water shall be clean, fresh, and suitable consumption and free from such amounts of mineral or organic substances as would affect the set of the fireproofing material.
    1. Provide water with sufficient pressure and volume to meet the fireproofing application schedule.

2.3 ACCESSORIES

A. Provide accessories to comply with the manufacturer's recommendations and to meet fire resistance design and code requirements.
B. Such accessories include, but not limited to, any required or optional items such as bonding agents; mechanical attachments; application aids as metal lath, scrim, or netting; or accelerators.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work.
B. Verify that clips, hangers, supports, sleeves, and other items required to penetrate fireproofing are in place.
C. Verify ducts, piping, equipment, or other items that may interfere with application of fireproofing are not in position until fireproofing work is complete.
D. Verify that voids and cracks in substrate are filled, and projections are removed where fireproofing is exposed to view as a finish material.

3.2 PREPARATION

A. Clean substrate of dirt, dust, grease, oil, loose material, or other matter that may affect bond of fireproofing.
B. Remove incompatible materials that effect bond by scraping, brushing, scrubbing, or sandblasting.

3.3 PROTECTION

A. Protect surfaces not scheduled for fireproofing and equipment from damage by over spray, fall-out, and dusting.
B. Close off and seal ductwork in areas where fireproofing is being applied.

3.4 APPLICATION

A. Install metal lath over structural members and as indicated on shop drawings.
B. Apply adhesive, fireproofing, and overcoat in accordance with manufacturer's instructions.
C. Apply fireproofing in sufficient thickness to achieve rating with as many passes necessary to cover with monolithic blanket of uniform density and texture.

3.5 FIELD QUALITY CONTROL

A. Perform field inspection and testing under provisions of Section 01 40 00.
B. Inspect the installed fireproofing after application and curing for integrity of fire protection, prior to concealment of work.
C. Re-inspect installed fireproofing for integrity of fire protection after installation of subsequent work.

3.6 CLEANING

A. Clean work under provisions of 01 77 00.
B. Remove excess material, over spray, droppings, and debris.
C. Remove fireproofing from materials and surfaces not requiring fireproofing.

END OF SECTION