

SECTION 07 81 16

CEMENTITIOUS FIREPROOFING

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Provide rated installations which comply with indicated ratings for fire endurance, flame spread, and combustibility; including applicable code interpretations by governing authorities, and listing and labeling by UL or FM where applicable.

1.02 RELATED SECTIONS

- A. Firestopping: Section 07 84 00.
- B. Intumescent Fireproofing: Section 07 81 23.
- C. Structural Steel: Section 05 12 00.
- D. Sustainable Design Requirements: Section 01 81 13.
- E. VOC Limits: Section 01 81 16.

1.03 QUALITY ASSURANCE

- A. Applicator: Acceptable to fireproofing manufacturer.
- B. Regulatory Requirements
 - 1. Underwriters' Laboratories, Inc.: Products, execution and thickness shall conform to approved UL designs as published in UL Fire Resistance Directory.
- C. References: Wherever the following abbreviations occur, they shall refer to the corresponding standard:
 - 1. ASTM: American Society for Testing and Materials.
 - 2. U.L.: Underwriters' Laboratories, Inc.

1.04 SUBMITTALS

- A. Manufacturer's Product Data: Submit for all items. Include instructions for bonding and applying fireproofing.
- B. Submit copies of certified test reports of:

1. Manufacturer's certification or independent test reports confirming that materials meet or exceed performance criteria specified.
 2. Reports from independent testing agencies of product proposed for use, which indicate conformance to ASTM E84 and E119.
- C. Sustainable Design Documentation Submittals: Comply with Section 01 81 13.
1. VOC Limits: Include documentation verifying product Low Emitting Material Building Product Disclosures and Optimization.
- 1.05 DELIVERY, STORAGE AND HANDLING
- A. Deliver all materials in original unopened packages bearing the manufacturer's name, brand and UL label verifying compliance with UL's quality control inspection program and the appropriate fire resistance ratings.
 - B. Keep materials dry until ready for use. Keep materials off the ground, under cover and away from sweating walls and other damp surfaces. Discard materials that have been exposed to water before actual use.
- 1.06 JOB CONDITIONS
- A. Environmental Requirements
 1. Do not apply fireproofing when temperature of substrate, material and surrounding air is below 40° F. Maintain temperature 24 hours before and 24 hours after application of fireproofing.
 2. Provide ventilation in areas to receive fireproofing during and for 24 hours after application, to help dry material and maintain nontoxic, unpolluted working area.
- 1.07 COORDINATION
- A. Sequence and coordinate application of fireproofing with other related work specified in other Sections to comply with the following requirements:
 1. Provide temporary enclosure as required to confine spraying operations and protect the environment.
 2. Provide temporary enclosures for applications to prevent deterioration of fire-resistive material due to exposure to weather and to unfavorable ambient conditions for humidity, temperature, and ventilation.
 3. Avoid unnecessary exposure of fire-resistive material to abrasion and other damage likely to occur during construction operations subsequent to its application.
 4. Do not begin applying fire-resistive material until clips, hangers, supports, sleeves, and other items penetrating fire protection are in place.

5. Coordinate others' installation of ducts, piping, and similar items that would interfere with applying fire-resistive material until application of fire protection is completed.
6. Do not install enclosing or concealing construction until after fire-resistive material has been applied, inspected, and tested and corrections have been made to defective applications.

PART 2 PRODUCTS

2.01 FIREPROOFING

- A. Type: Spray applied cementitious fireproofing.
- B. Manufacturer: Specifications are based on MK-6 by GCP APPLIED TECHNOLOGIES INC. Equal products by ISOLATEK INTERNATIONAL (CAFCO), AD FIRE PROTECTION SYSTEMS (SOUTHWEST FIREPROOFING), CARBOLINE COMPANY or ALBI MANUFACTURING are acceptable providing the performance requirements specified herein are maintained.
 1. Fibrous Ingredients: Asbestos or mineral wool are not permitted; comply with OSHA Regulation 29, FR, 1926.58.
- C. Factory mixed material applied to provide compliance with specified performance specifications and test criteria.
 1. Dry Density: The field density shall be measured in accordance with ASTM Standard E605. Minimum average density shall be that required by the manufacturer, listed in the UL Fire Resistance Directory for each rating indicated, ICBO Evaluation Report, as required by the authority having jurisdiction, or minimum average 15 pcf, whichever is greater.
 2. Deflection: Material shall not crack or delaminate when tested in accordance with ASTM E759.
 3. Impact Resistance: Fireproofing material tested in accordance with ASTM E760 shall not crack or delaminate.
 4. Bond Strength: Fireproofing, when tested in accordance with ASTM E736, shall have a minimum average bond strength of 200 psf and a minimum individual bond strength of 150 psf.
 5. Air Erosion: Maximum allowable total weight loss of the fireproofing material shall be .005 g/ft² when tested in accordance with ASTM E859. Sample surface shall be "as applied" (not pre-purged) and the total reported weight loss shall be the total weight loss over a 24 hour period from the beginning of the test.
 6. Compression: The fireproofing shall not deform more than 10 percent when subjected to 1200 psf compressive forces in accordance with ASTM E761.
 7. Corrosion Resistance: Steel shall be tested in accordance with ASTM E937 without evidence of corrosion of the steel.
 8. Surface Burning Characteristics - ASTM E84:

Flame Spread: 0.

Smoke Developed: 0.

9. Resistance to Mold: The fireproofing material shall be formulated at the time of manufacturing with a mold inhibitor. Fireproofing material shall be tested in accordance with ASTM G21 and shall show resistance to mold growth for a period of 28 days for general use.
10. Combustibility: Material shall have a maximum total heat release of 20 MJ/m² and 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 75 kw/m² with the use of electric spark ignition. The sample shall be tested in the horizontal orientation.
11. VOC Content: 0.0 g/L.

PART 3 EXECUTION

3.01 INSPECTION

- A. Verify that surfaces to receive fireproofing material are free of oil, grease, loose mill scale, or other substances which may impair proper adhesion.
- B. Confirm compatibility of surfaces to receive fireproofing material.
- C. Verify clips, hangers, supports, sleeves and other items required to penetrate fireproofing are in place.
- D. Verify ducts, piping, equipment or other items which would interfere with application of fireproofing materials are not positioned until fireproofing work is completed.
- E. Beginning of installation means acceptance of substrates and installation conditions.
- F. Testing and Inspection shall be in accordance with Technical Manual 12-A "Standard Practice for the Testing and Inspection of Field Applied Sprayed Fire-Resistive Materials; an Annotated Guide."

3.02 PROTECTION

- A. Protect adjacent surfaces and equipment from damage by overspray, fallout and dusting.
- B. Close off and seal ductwork in areas where fireproofing is being applied.
- C. Protect applied sprayed fireproofing from damage.

3.03 APPLICATION

- A. Apply fireproofing in strict accordance with manufacturer's instructions.

- B. Apply fireproofing in sufficient thickness to achieve rating with as many passes as necessary to cover with monolithic blanket of uniform density and texture.

3.04 CLEANING, PROTECTING, AND REPAIR

- A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.
- B. Protect fireproofing, according to advice of product manufacturer and Installer, from damage resulting from construction operations or other causes so fire protection will be without damage or deterioration at time of Substantial Completion.
- C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fire protection. As installation of other construction proceeds, inspect fireproofing and patch any damaged or removed areas.

3.05 CLEANING

- A. After completion of fireproofing work, remove all equipment and leave all exposed wall and floor areas in a broom-clean condition.

END OF SECTION