

SECTION 078100 - APPLIED FIREPROOFING

TIPS:

To view non-printing **Editor's Notes** that provide guidance for editing, click on Masterworks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on Masterworks/Supporting Information.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes sprayed fire-resistive materials.
- B. Related Requirements:
 - 1. Section 078123 "Intumescent Fireproofing" for mastic and intumescent fire-resistive coatings.
 - 2. Section 099646 "Intumescent Painting" for intumescent paints that are fire retarding but not fire resistive.

1.3 DEFINITIONS

- A. SFRM: Sprayed fire-resistive materials.

1.4 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.
 - 1. Review products, design ratings, restrained and unrestrained conditions, densities, thicknesses, bond strengths, and other performance requirements.

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Sustainable Design Submittals:

1. <Double click to insert sustainable design text for paints and coatings.>

C. Shop Drawings: Framing plans or schedules, or both, indicating the following:

1. Extent of fireproofing for each construction and fire-resistance rating.
2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
3. Minimum fireproofing thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
4. Treatment of fireproofing after application.

D. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard dimensions

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer and testing agency.
- B. Product Certificates: For each type of fireproofing.
- C. Evaluation Reports: For fireproofing, from ICC-ES.
- D. Field quality-control reports.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

1.8 FIELD CONDITIONS

- A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is **40 deg F (6 deg C)** or lower unless temporary protection and heat are provided to maintain temperature at or above this level during, and for 24 hours after product application.
- B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire-resistance design and manufacturer's written instructions.

- B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.
- C. Fire-Resistance Design: Indicated on Drawings, tested according to ASTM E 119 or UL 263 ; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Steel members are to be considered unrestrained unless specifically noted otherwise.
 - 2. UL design listings must state that the loading was determined by Allowable Stress Design Method or Load and Resistance Factor Design Method. UL design listings requiring a load restriction factor are not allowed.
- D. [<Double click to insert sustainable design text for fireproofing primers and coatings.>](#)
- E. Asbestos: Provide products containing no detectable asbestos.

2.2 SPRAYED FIRE-RESISTIVE MATERIALS

- A. Standard Durability SFRM, [**Interior Locations, Concealed Conditions for Low Rise Buildings**]: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application. Dry mix inorganic spray-applied fire resistive material containing mineral slag wool and Portland-cement are not permitted.
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies ; Monokote MK-6
 - 2. Bond Strength: Minimum **200-lbf/sq. ft. (9.57-kPa)** cohesive and adhesive strength based on field testing according to ASTM E 736.
 - 3. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E 605.
 - 4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than **0.375 inch (9 mm)**.
 - 5. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: [**10**] **<Insert number>** or less.
 - b. Smoke-Developed Index: [**10**] **<Insert number>** or less.
 - 6. Compressive Strength: Minimum **10 lbf/sq. in. (68.9 kPa)** according to ASTM E 761.
 - 7. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 - 8. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 - 9. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
 - 10. Air Erosion: Maximum weight loss of [**0.025 g/sq. ft. (0.270 g/sq. m)**] **<Insert value>** in 24 hours according to ASTM E 859.
 - 11. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in [**no growth on specimens per ASTM G 21**] [**or**] [**rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273**].

12. Sound Absorption: [NRC] [or] [SAA] of [0.50 to 0.75] [0.60 to 0.70] [0.65 to 0.75] [not less than 0.60] <Insert range or single value> according to ASTM C 423 for Type A mounting according to ASTM E 795.
 13. Finish: [Spray-textured finish] [Rolled, spray-textured finish] <Insert requirement>.[Apply separate, colored topcoat after finishing.]
- B. Intermediate Durability SFRM, [Interior Locations, Exposed to View Only or for Buildings Between 75 and 420 Feet Tall]: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application. Dry mix inorganic spray-applied fire resistive material containing mineral slag wool and Portland-cement are not permitted.
1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies; Monokote MK-10/HB
 2. Bond Strength: Minimum 600-lbf/sq. ft. (28.4-kPa) cohesive and adhesive strength based on field testing according to ASTM E 736.
 3. Density: Not less than density specified in the approved fire-resistance design, according to ASTM E 605.
 4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than 0.375 inch (9 mm).
 5. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: [10] <Insert number> or less.
 - b. Smoke-Developed Index: [10] <Insert number> or less.
 6. Compressive Strength: Minimum 30 lbf/sq. in. (206 kPa) according to ASTM E 761.
 7. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 8. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 9. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
 10. Air Erosion: Maximum weight loss of [0.025 g/sq. ft. (0.270 g/sq. m)] <Insert value> in 24 hours according to ASTM E 859.
 11. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in [no growth on specimens per ASTM G 21] [or] [rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273].
 12. Sound Absorption: [NRC] [or] [SAA] of [0.50 to 0.75] [0.60 to 0.70] [0.65 to 0.75] [not less than 0.60] <Insert range or single value> according to ASTM C 423 for Type A mounting according to ASTM E 795.
 13. Finish: [Spray-textured finish] [Rolled, spray-textured finish] <Insert requirement>.[Apply separate, colored topcoat after finishing.]
- C. Super High Rise Durability SFRM, [Interior Locations, for Buildings Over 420 Feet Tall]: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application. Dry mix inorganic spray-applied fire resistive material containing mineral slag wool and Portland-cement are not permitted.
1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies; Monokote MK-1000/HB
 2. Bond Strength: Minimum 1000-lbf/sq. ft. (47.2-kPa) cohesive and adhesive strength based on field testing according to ASTM E 736.

3. Density: Not less than 18 pcf density as tested in accordance with ASTM E 605.
 4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than **0.375 inch (9 mm)**.
 5. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: **[10] <Insert number>** or less.
 - b. Smoke-Developed Index: **[10] <Insert number>** or less.
 6. Compressive Strength: Minimum **50 lbf/sq. in. (345 kPa)** according to ASTM E 761.
 7. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 8. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 9. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
 10. Air Erosion: Maximum weight loss of **[0.025 g/sq. ft. (0.270 g/sq. m)] <Insert value>** in 24 hours according to ASTM E 859.
 11. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in **[no growth on specimens per ASTM G 21] [or] [rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273]**.
 12. Sound Absorption: **[NRC] [or] [SAA] of [0.50 to 0.75] [0.60 to 0.70] [0.65 to 0.75] [not less than 0.60] <Insert range or single value>** according to ASTM C 423 for Type A mounting according to ASTM E 795.
 13. Finish: **[Spray-textured finish] [Rolled, spray-textured finish] <Insert requirement>.[Apply separate, colored topcoat after finishing.]**
- D. Medium Durability SFRM, **[Interior Locations, Exposed Conditions to Abrasion/Moisture]**: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application. Dry mix inorganic spray-applied fire resistive material containing mineral slag wool and Portland-cement are not permitted.
1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies; Monokote Z-106/HY
 2. Bond Strength: Minimum **2000-lbf/sq. ft. (94.5-kPa)** cohesive and adhesive strength based on field testing according to ASTM E 736.
 3. Density: Not less than 22 pcf density as tested in accordance with ASTM E 605.
 4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than **0.375 inch (9 mm)**.
 5. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: **[10] <Insert number>** or less.
 - b. Smoke-Developed Index: **[10] <Insert number>** or less.
 6. Compressive Strength: Minimum **100 lbf/sq. in. (680 kPa)** according to ASTM E 761.
 7. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 8. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 9. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.

10. Air Erosion: Maximum weight loss of [**0.025 g/sq. ft. (0.270 g/sq. m)**] <Insert value> in 24 hours according to ASTM E 859.
 11. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in [**no growth on specimens per ASTM G 21**] [or] [rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273].
 12. Sound Absorption: [NRC] [or] [SAA] of [0.50 to 0.75] [0.60 to 0.70] [0.65 to 0.75] [not less than 0.60] <Insert range or single value> according to ASTM C 423 for Type A mounting according to ASTM E 795.
 13. Finish: [**Spray-textured finish**] [Rolled, spray-textured finish] [Skip-troweled finish] <Insert requirement>.[Apply separate, colored topcoat after finishing.]
- E. High Durability SFRM, [**Interior or Exterior Locations, Exposed Conditions Subject to Impact or Direct Moisture**]: Manufacturer's standard, factory-mixed, lightweight, dry formulation, complying with indicated fire-resistance design, and mixed with water at Project site to form a slurry or mortar before conveyance and application.
1. Basis-of-Design Product: Subject to compliance with requirements, provide GCP Applied Technologies; Monokote Z-146
 2. Bond Strength: Minimum **10000-lbf/sq. ft. (478-kPa)** cohesive and adhesive strength based on field testing according to ASTM E 736.
 3. Density: Not less than 40 pcf density as tested in accordance with ASTM E 605.
 4. Thickness: As required for fire-resistance design indicated, measured according to requirements of fire-resistance design or ASTM E 605, whichever is thicker, but not less than **0.375 inch (9 mm)**.
 5. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: [**10**] <Insert number> or less.
 - b. Smoke-Developed Index: [**10**] <Insert number> or less.
 6. Compressive Strength: Minimum **500 lbf/sq. in. (3450 kPa)** according to ASTM E 761.
 7. Corrosion Resistance: No evidence of corrosion according to ASTM E 937.
 8. Deflection: No cracking, spalling, or delamination according to ASTM E 759.
 9. Effect of Impact on Bonding: No cracking, spalling, or delamination according to ASTM E 760.
 10. Air Erosion: Maximum weight loss of [**0.025 g/sq. ft. (0.270 g/sq. m)**] <Insert value> in 24 hours according to ASTM E 859.
 11. Fungal Resistance: Treat products with manufacturer's standard antimicrobial formulation to result in [**no growth on specimens per ASTM G 21**] [or] [rating of 10 according to ASTM D 3274 when tested according to ASTM D 3273].
 12. Sound Absorption: [NRC] [or] [SAA] of [0.50 to 0.75] [0.60 to 0.70] [0.65 to 0.75] [not less than 0.60] <Insert range or single value> according to ASTM C 423 for Type A mounting according to ASTM E 795.
 13. Finish: [**Spray-textured finish**] [Rolled, spray-textured finish] [Skip-troweled finish] [Skip-trowel finish with corner beads] <Insert requirement>.[Apply separate, colored topcoat after finishing.]

2.3 AUXILIARY MATERIALS

- A. General: Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.
- B. Substrate Primers: Primers approved by fireproofing manufacturer and complying with one or both of the following requirements:
 - 1. Primer and substrate are identical to those tested in required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - 2. Primer's bond strength in required fire-resistance design complies with specified bond strength for fireproofing and with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction, based on a series of bond tests according to ASTM E 736.
- C. Bonding Agent: Product approved by fireproofing manufacturer and complying with requirements in UL's "Fire Resistance Directory" or in the listings of another qualified testing agency acceptable to authorities having jurisdiction.
- D. Metal Lath: Expanded metal lath fabricated from material of weight, configuration, and finish required, according to fire-resistance designs indicated and fireproofing manufacturer's written instructions. Include clips, lathing accessories, corner beads, and other anchorage devices required to attach lath to substrates and to receive fireproofing.
- E. Reinforcing Fabric: Glass- or carbon-fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing manufacturer.
- F. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by fireproofing manufacturer. Include pins and attachment.
- G. Sealer: Transparent-drying, water-dispersible, tinted protective coating recommended in writing by fireproofing manufacturer for each fire-resistance design.
 - 1. [<Double click here to find, evaluate, and insert list of manufacturers and products.>](#)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design.
 - 1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds, mill scale, loose scale, incompatible primers, paints, and encapsulants, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.

2. Verify that objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items, are securely attached to substrates.
 3. Verify that substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.
- B. Verify that concrete work on steel deck is complete before beginning fireproofing work.
 - C. Verify that roof construction, installation of rooftop HVAC equipment, and other related work are complete before beginning fireproofing work.
 - D. Conduct tests according to fireproofing manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.
 - E. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 - F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.
- B. Clean substrates of substances that could impair bond of fireproofing.
- C. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.
- D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.3 APPLICATION

- A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, sealers, topcoats, finishing, and other materials and procedures affecting fireproofing work.
- B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.
- C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing.
 1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.

2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.
- D. Metal Decks:
1. Do not apply fireproofing to underside of metal deck substrates until concrete topping, if any, is completed.
 2. Do not apply fireproofing to underside of metal roof deck until roofing is completed; prohibit roof traffic during application and drying of fireproofing.
- E. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended in writing by fireproofing manufacturer.
- F. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.
- G. Extend fireproofing in full thickness over entire area of each substrate to be protected.
- H. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.
- I. For applications over encapsulant materials, including lockdown (post-removal) encapsulants, apply fireproofing that differs in color from that of encapsulant over which it is applied.
- J. Where sealers are used, apply products that are tinted to differentiate them from fireproofing over which they are applied.
- K. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.
- L. Cure fireproofing according to fireproofing manufacturer's written instructions.
- M. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.
- N. Finishes: Where indicated, apply fireproofing to produce the following finishes:
1. Manufacturer's Standard Finishes: Finish according to manufacturer's written instructions for each finish selected.
 2. Spray-Textured Finish: Finish left as spray applied with no further treatment.
 3. Rolled, Spray-Textured Finish: Even finish produced by rolling spray-applied finish with a damp paint roller to remove drippings and excessive roughness.
 4. Skip-Troweled Finish: Even leveled surface produced by troweling spray-applied finish to smooth out the texture and neaten edges.
 5. Skip-Troweled Finish with Corner Beads: Even, leveled surface produced by troweling spray-applied finish to smooth out the texture, eliminate surface markings, and square off edges.

3.4 FIELD QUALITY CONTROL

- A. Special Inspections: [**Owner will engage**] [**Engage**] a qualified special inspector to perform the following special inspections:
 - 1. Test and inspect as required by Chapter 17 of the applicable building code.
 - 2. Shop drawings showing the minimum fireproofing thicknesses needed to achieve required fire-resistance rating of each structural component and assembly must be obtained from the architect.
- B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fireproofing for the next area until test results for previously completed applications of fireproofing show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.
- C. Fireproofing will be considered defective if it does not pass tests and inspections.
 - 1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
 - 2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.
- D. Prepare test and inspection reports.

3.5 CLEANING, PROTECTING, AND REPAIRING

- 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 manufacturer and Installer, from damage resulting from construction operations or other causes, so fireproofing is without damage or deterioration at time of Substantial Completion.
- C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to work of other trades.
- D. Repair fireproofing damaged by other work before concealing it with other construction.
- E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 078100