SECTION 07 81 23
INTUMESCENT FIREPROOFING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including General and Supplementary Conditions and Division 1 Specification Sections apply to this section.

1.02 DEFINITIONS

A. Intumescent coatings: Material or combination of fireproofing materials used to help retain the structural integrity of steel members by maintaining an effective thermal barrier to provide fire resistance rating as documented by listings from accredited test laboratories.

1.03 GENERAL DESCRIPTION OF THE WORK IN THIS SECTION

A. Intumescent coatings applied to primary and secondary structural steel members to provide specified fire resistance rating.

1.04 RELATED WORK OF OTHER SECTIONS

A. Coordinate work of this section with work of other sections as required to properly execute the work and as necessary to maintain satisfactory progress of the work of other sections, including:

1. Section 01 40 00 – Quality Assurance
2. Section 03 30 00 – Cast-In-Place Concrete
3. Section 04 20 00 – Unit Masonry
4. Section 05 12 00 – Structural Steel Framing
5. Section 05 50 00 – Metal Fabrications
6. Section 07 81 16 – Cementitious Fireproofing
7. Section 07 80 00 – Firestopping
8. Section 09 20 00 – Plaster and Gypsum Board
9. Section 09 90 00 – Painting and Coatings

1.05 REFERENCES

A. Underwriters Laboratories Inc. (UL) Fire Resistance Directory

B. Test Requirements and Reference Standards:

1. ASTM E119,"Standard Test Methods for Fire Tests of Building Construction and Materials"
2. ASTM E84, "Standard Test Method for Surface Burning Characteristics of Building Materials"
3. ASTM D2240, "Standard Test Method for Rubber Property—Durometer Hardness"
4. ASTM D2794, "Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)"
5. ASTM D4060, "Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser"
6. ASTM D4541, "Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers"
7. ASTM E329-09, "Standard Specification for Agencies Engaged in Construction Inspection and Testing"
8. National Fire Protection Association, NFPA 251
9. Underwriters Laboratories Inc. (UL) ANSI/UL263
10. Underwriters Laboratories of Canada (ULc) CAN/ULC S101-M
11. Association of the Wall and Ceiling Industry, AWCI Technical Manual 12-B, current edition.

C. Building codes: The most current edition of the Office of State Fire Marshal adopted California Building Code and California Fire Code.

D. Industry References:
1. Underwriters Laboratories (UL), www.ul.com
2. Underwriters Laboratories of Canada (ULC), www.ulc.ca
2. National Fireproofing Contractors Association (NFCA), www.nfca-online.org/
3. The Society for Protective Coatings (SSPC), www.sspc.org/
4. Association of the Wall and Ceiling Industry (AWCI), www.awci.org

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company responsible for the manufacture of fire protection materials with local direct technical employee(s) (as distinct from distributors or authorized agents) readily available at the project site. Intumescent coatings shall be manufactured under the follow-up services program of Underwriter's Laboratories (UL) or UL Canada (ULc) and bear the UL (and/or ULc) label (mark). Manufacturer's technical representative to be on site

during start of installation and be generally available on site as requested during the application process.

B. Installer Qualifications: Engage experienced Installer certified, licensed, or otherwise qualified by the intumescent coatings manufacturer as having the necessary training to install manufacturer's products, and otherwise have the experience and staff to properly perform the installation. Installer shall be trained by the intumescent coatings manufacturer's direct employee(s) (as distinct from distributors or authorized agents).

C. Installation: Verify steel members have been properly prepared, including the use of a compatible primer, and install intumescent coatings in accordance with manufacturer's written recommendations published in their product technical literature and/or provided by manufacturer.

D. Product Identification: Label packages (pail or bucket) with manufacturer name, product name, expiration date, UL or ULc label (mark).

E. Special Inspection: Owner to employ a qualified independent inspection and testing agency to perform field quality control testing services in accordance with NFCA 400 Field Quality Assurance Procedure, local building code and Authority Having Jurisdiction requirements.

F. Inspection and Testing Agency Qualifications: ASTM E329-09, "Standard Specification for Agencies Engaged in Construction Inspection and Testing" and NFCA 400 Field Quality Assurance Procedure.

G. Field Constructed Mockups: Prior to installing intumescent coatings, Installer shall apply products specified for exposed applications to demonstrate aesthetic qualities and workmanship. Build mockups to comply with the following requirements, using materials indicated for final unit of Work.

1. Location: As indicated on drawings.
2. Extent of Mockups: Approximately 5 sq. ft. of surface for each product indicated.

Note to Specifier: *5 sq. ft. is a suggested minimum area and should be adjusted based on the scope of the project and/or a desire to completely coat one or more structural members that would be incorporated into the finished project.*

3. Notify architect one week in advance of the dates and times when mockups will be built.
4. Obtain architect's written acceptance of mockups before start of actual unit of work.
5. Retain and maintain mockups during construction in undisturbed condition as a standard for judging completed units of work.

a. Accepted mockups in undisturbed condition at time of substantial completion may become part of completed unit of work.

1.07 SUBMITTALS

A. Product data for each intumescent coating indicated on drawings and Finish Schedule.

B. Product certificates from manufacturer documenting intumescent coatings comply with specified requirements including those for fire test response characteristics and compatibility with adhesives, primers, and other surface coatings on substrates indicated to receive intumescent coatings.

C. Fire Resistance Rating Listings: UL, ULc, or other accredited testing agency indicating type and size of steel member to receive intumescent coatings and minimum dry thickness (mils) to achieve specified fire resistance rating.

D. Qualification Data: Installer to demonstrate capabilities and experience on completed projects which are comparable in size and scope by providing the following information:

1. Project location: City, State, and Country
2. Scope of work: project type, contract valuation
3. Completion date
4. Architect: firm and contact information
5. Owner: name and contact information

E. LEED Submittals:

1. Product Data for Credit EQ c4.2: Low emitting materials – Adhesives and sealants, documentation including printed statement of VOC content.
2. VOC content: <125 g/L
3. Meets requirements for LEED 4.1 rating system

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to Project site in original, unopened packages with manufacturer's labels intact and legible.

B. Install intumescent coatings prior to expiration date included on packaging. Properly discard expired product in accordance to local and federal regulations.

C. Store intumescent coatings protected from direct sunlight and maintained at a temperature as specified by the manufacturer. The product must not be frozen or

stored at freezing temperatures. Identify and label material damaged due to improper storage, remove from Project site and properly discard.

1.09 PROJECT CONDITIONS

A. Environmental Conditions:

1. Do not install Intumescent Coatings when ambient or substrate temperatures are, or prior to full cure will be, outside the manufacturer's recommended installation temperatures, unless temporary protection and heating/cooling is provided to maintain temperatures within the prescribed range for the period specified by the manufacturer.
2. Do not install intumescent coatings when relative humidity is outside the limits established by the manufacturer. Consult manufacturer to determine precautions that may be implemented to prevent condensation from forming on the steel during application of fireproofing.
3.

B. Ventilation: Ventilate areas where intumescent coatings will be installed by natural means or, where this is inadequate, forced air circulation during and after application until fireproofing dries / is cured thoroughly.

1.10 SEQUENCING

A. Sequence and coordinate application of intumescent coatings with related work specified in other Sections to comply with the following requirements:

1. Coordinate installation of intumescent coatings with other items of work that may interfere with proper installation of coatings.
2. Do not begin applying intumescent coatings until clips, hangers, supports, and other welded connections have been installed. Intumescent coatings manufacturer must approve in writing any clips, hangers, supports or connections that may installed over coating using mechanical or adhesive devices.
3. Provide temporary enclosures as necessary to prevent deterioration of intumescent coatings due to exposure to unfavorable environmental conditions as required by installation procedures and product performance capabilities as supplied by manufacturer. Exposure to exterior elements for any portion of construction cycle must be supported a verified burn test to ensure no degradation of fire properties.
4. Take appropriate steps to avoid abrasion and other damage to the applied intumescent coatings during construction operations.
5 Do not protect or conceal structural members to which intumescent coatings have been applied until each area has been inspected, tested, and corrections have been made to any deficient areas.

PART 2 - PRODUCTS

2.1 FIREPROOFING

A. Intumescent coatings: Factory mixed formulation consisting of a modified heavy bodied coating, with inorganic reinforcing fibers (non-asbestos) for spray application.

1. Basis of Design: Water-Based Product: Subject to compliance with requirements, provide the following; Hilti Fire Finish CFP-SP WB by Hilti, Inc.,. Or Approved Equal.

Physical Characteristics:

1. Surface Burning Characteristics of Building Materials, ASTM E 84 (UL 723, CAN/ULC-S102): Class A Rating.
    a. Flame Spread: 0
    b. Smoke Development <= 45
2. Durometer Hardness, ASTM D2240: >= 63 Shore D
3. Impact Resistance, ASTM D2794: >= 65 in-lb
4. Abrasion Resistance, ASTM D4060: <= 0.140 g/1000 cycles
5. Adhesion, ASTM D4541: >= 350 psi
6. VOC < 50 g/l as per CDPH Standard Method v 1.1-2010 or newer

2. Basis of Design: Solvent-Based Product: Subject to compliance with requirements, provide the following; Hilti All Weather High Build CFP-SP AWHB by Hilti, Inc.,. Or Approved Equal. Must be applied by a trained and approved applicator per manufacturer.

Physical Characteristics:

1. Surface Burning Characteristics of Building Materials, ASTM E 84 (UL 723, CAN/ULC-S102): Class A Rating.
    a. Flame Spread: 0
    b. Smoke Development: 10
2. Durometer Hardness, ASTM D2240: 39 Shore D
3. Impact Resistance, ASTM D2794: 15.9 in-lb
4. Abrasion Resistance, ASTM D4060: 255 g/1000 cycles
5. Adhesion, ASTM D4541: 280 psi
6. VOC < 125 g/l as per CDPH Standard Method v 1.2-2017

B. Accepted Substitute in accordance with Section 012500.

2.2 AUXILIARY FIREPROOFING MATERIALS

A. General: Provide auxiliary fireproofing materials that are compatible with intumescent coating products and substrates and are approved by UL or other accredited testing agencies acceptable to authorities having jurisdiction for use in the fire resistive designs indicated.

B. Substrate Primers: For use on each different substrate, provide primer that complies with the following requirements:

1. Primer approved in writing by manufacturer of intumescent coatings and applied in full compliance with the primer manufacturer's recommendations.
2. Primer to have been tested by manufacturer in fire conditions to ensure fire-performance of primer-intumescent system, and adhesion of the post-burn intumescent char to the primer. Documentation of such tests to be provided upon request.
3. Primer must be fully cured prior to installation of the intumescent coating.

C. Topcoats: Suitable for application over applied intumescent coatings; of type recommended in writing by intumescent coatings manufacturer for each fire resistance design. Topcoat to have been tested by manufacturer for compatibility in fire conditions with documentation of such tests to be provided upon request. Color of topcoat shall be as selected by the architect. Colors shall not be limited to manufacturer's standard colors.

PART 3 - EXECUTION

3.1 PREPARATION

A. Cover other work subject to damage from fall out or overspray of intumescent coatings materials during application. Provide temporary enclosure as required to confine spraying operations, protect the environment, and ensure maintaining adequate ambient conditions for temperature and ventilation.

B. Clean substrates of substances that could impair bond of fireproofing, including oil, grease, rolling compounds, incompatible primers, rust, and mill scale.

C. Prime substrates with an approved and compatible primer, unless an approved and compatible shop primer has been applied and is in satisfactory condition to

receive intumescent coatings. Primer must be fully cured prior to applying intumescent coatings.

D. Apply intumescent coatings: Protect intumescent coatings from rain, direct sunlight, high humidity, strong wind (with dirt, dust or sand) during the application, drying, and curing phases, unless test evidence allows otherwise. Do not apply an additional coat of intumescent coating until previous layer has fully cured.

E. For applications visible upon 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 that would telegraph through fire resistive products after application.

3.2 INSTALLATION, GENERAL

A. Coordinate application of intumescent coatings with other construction to allow for proper application and minimize need to repair damage.

B. Comply with intumescent coatings manufacturer's instructions for mixing materials, application procedures, and types of equipment used to convey and install products, as applicable to the particular conditions of installation and as required to achieve fire resistance ratings indicated.

C. Coat substrates with primer and allow proper cure time prior to applying intumescent coatings as recommended by intumescent coatings manufacturer for material and application indicated.

D. Apply intumescent coatings identical to mock-ups.

3.3 INSTALLING INTUMESCENT FIREPROOFING

A. Apply intumescent coatings in thicknesses required to achieve fire resistance ratings designated for each condition.

B. Provide a uniform finish complying with description indicated for type of material and matching finish approved for field erected mockup.

3.4 FIELD QUALITY CONTROL

A. Inspection and Testing Agency: Coordinate installation of fireproofing with owner’s independent inspection and testing agency.

B. Inspection & testing shall be in accordance with AWCI Technical Manual 12-B.

C. Testing agency will promptly report test results in writing to the installer and architect.

D. Remove and replace intumescent coatings where test results indicate that fireproofing does not comply with specified requirements for adhesion.

E. Apply additional intumescent coatings per manufacturer's directions where test results indicate that the thickness does not comply with specified requirements.

F. Additional Testing: Where intumescent coatings are removed and replaced or repaired, Owner’s inspection and testing agency shall perform additional testing to determine compliance with specified requirements.

3.5 CLEANING, REPAIR, AND PROTECTION

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove product overspray and fall out from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

B. Cure intumescent coatings per manufacturer's recommendations.

C. Protect intumescent coatings from damage during construction.

D Repair or replace work that was not properly protected from damage during construction in accordance with manufacturer’s recommendations.

E. Ensure full curing of intumescent coating prior to application of an approved top coat.

END OF SECTION