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Text indicated in bold and by square brackets is optional. Make appropriate decisions and delete the optional text as well as the brackets in the final copy of the specification. Delete or hide the SPEC NOTES in the final version of the document.

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PART 1 - GENERAL

1.1 GENERAL INSTRUCTIONS

IFTI Spec Note: Retain or delete this article in all Sections of Project Manual.

- A. Read and conform to: The general provisions of the **[Contract Type]**, including General and Supplementary Conditions; and the requirements of Division 01 Specifications and any additional documents referred to in this Section.

1.2 SUMMARY

- A. Provide labor, materials, products, equipment and services to complete the thermal barrier coating work specified herein. This includes, but is not necessarily limited, to:
 - 1. Surface preparation and application of fire-protective intumescent thermal barrier coating to spray-applied polyurethane foams.
- B. Related Requirements: Specifications throughout all Divisions of the Project shall be read and may be directly applicable to this Section.
 - 1. Related requirements provided below are for convenience purposes only.
 - a. Section 07 21 19, Foamed In-Place Insulation: For provision of foamed-in-place polyurethane insulation.

1.3 REFERENCES

IFTI Spec Note: Retain only references that apply to this Project.

- A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
- B. All reference amendments adopted prior to the Bid Closing date of this Project shall be applicable to this Project.
- C. All materials, installation and workmanship shall comply with all applicable requirements and standards.
- D. American Society of Testing and Materials (ASTM):
 - 1. ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials
 - 2. ASTM E119: Standard Test Methods for Fire Tests of Building Construction and Materials
 - 3. ASTM E2768: Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test)
 - 4. ASTM E96: Standard Test Methods for Water Vapor Transmission of Materials
 - 5. ASTM E661: Standard Test Method for Performance Under Concentrated Static and Impact Loads
- E. California Department of Public Health
 - 1. CDPH/EHLB/Standard Method v1.2 (sect. 01350): Standard Method For The Testing And Evaluation Of Volatile Organic Chemical Emissions From Indoor Sources Using Environmental Chambers
- F. IAPMO ES: Uniform Evaluation Service, a subsidiary of the International Association of Plumbing and Mechanical Officials (IAPMO)
- G. ICC-ES: International Code Council Evaluation Service
- H. International Organization for Standardization (ISO)
 - 1. ISO 9001: Quality management systems – Requirements
 - 2. ISO 9705: Reaction to fire tests -- Room corner test for wall and ceiling lining products

- I. LEED: Leadership in Energy and Environmental Design
- J. National Fire Protection Association:
 - 1. NFPA 286: Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth
 - 2. NFPA 285: Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components

1.4 DEFINITIONS

- A. Fogging: Procedure in which sprayed polyurethane foam applicator thinly mists surface with sprayed polyurethane foam to dull glossy sheens and provide fine texture to ensure adhesion of coatings.
- B. WFT: Wet Film Thickness.
- C. DFT: Dry Film Thickness.

1.5 ADMINISTRATIVE REQUIREMENTS

- A. Pre-installation Meetings: Schedule and conduct pre-installation meeting at Project Site, to coordinate work of this Section, with work of related Subcontractors.
 - 1. Ensure attendance of Subcontractor performing work of this Section and representatives of manufacturers and fabricators involved in, or affected by, installation and coordination with other materials and installations that have preceded or will follow. Advise Architect and Owner in advance of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the activity under consideration.
 - 3. Record significant discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.

1.6 ACTION SUBMITTALS

- A. Submit all submittals in accordance with Section [01 33 00 - Submittal Procedures].
- B. Product List: Provide product data complete with cross-reference to coating system and locations of application areas.
- C. Samples: Submit samples for each type of coating system and each color of intumescent thermal barrier coating indicated. Submit Samples on rigid backing, not less than 200 mm (8 inches) square. Provide step coats on samples to show each coat required for system.

1.7 INFORMATIONAL SUBMITTALS

IFTI Spec Note: Always verify applicability and validity of test reports. Do not specify out-of-date reports.

- A. Evaluation reports: Submit Evaluation reports in accordance with **[ICC-ESR 3702] [IAPMO ER 499] [UL R40016]** showing compliance with applicable building codes.
 - 1. Submit Evaluation report from accredited independent evaluation agency, indicating compliance of intumescent thermal barrier with specifications for specified performance characteristics and physical properties.
- B. Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
 - 1. Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, and cleaning procedures.
- C. Applicator's Field Reports: Submit applicator's job work written reports that includes information about ambient conditions, application thicknesses and results of on-site testing to verify compliance of Work, as described in this Section.

IFTI Spec Note: Include the information below only if the Project is attempting to meet some very specific LEED criteria. Verify with the rest of the Project team to see if the products specified in this Section have any significant LEED credit impact.

- D. Sustainable Design Submittals (LEED): Submit following information for products used in this Section.
 - 1. Recycled Content: Submit listing of recycled content products used, including details of required percentages of recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
 - 2. Local/Regional Materials: Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site and cost.
 - 3. VOC data (Adhesives – Field Applied): Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits in accordance with CDPH/EHLB/Standard Method v1.2.

1.8 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: Submit operation and maintenance data for intumescent coatings work for inclusion in operation and maintenance manuals specified in Division 01.

1.9 QUALITY ASSURANCE

- A. Qualifications:
 - 1. **[Installer: company specializing in intumescent thermal barrier installations with 5 years documented experience and approved by manufacturer.]**
- B. Manufacturers:

1. Provide products by a firm specializing in the fabrication of firestopping who has successfully produced work similar in design and extent to that required for the project, in not less than three (3) projects of similar size and scope and whose work has resulted in construction with a record of successful in-service performance for a minimum period of ten (10) years.
 2. Manufacturer shall have a program of continuous quality management implemented conforming to the requirements of ISO 9001. Submit proof of certification upon request.
- C. Mock-ups:
1. Construct mock-ups in accordance with requirements of Division 01 to verify selections made under sample submittals, and to demonstrate aesthetic effects and set quality standards for materials and execution.
 2. Apply mock-up of intumescent coating work, illustrating assembly including substrate preparation and quality of workmanship in presence of Architect and Owner.
 3. Mock-ups shall be used as a benchmark for judging the texture and thickness of the finished work. Mock-ups may form part of the completed Work if undisturbed at the time of substantial completion.
- D. Source Limitations: Obtain each coating system from single source from single manufacturer or provide a system approved in writing by intumescent thermal barrier coating manufacturer.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the project in manufacturer's unopened packages, fully identified as to trade name, type and other identifying data.
- B. Packaged materials shall bear the appropriate labels, seals and WHI and/or UL label (mark) for fire resistive ratings and shall be stored at temperatures in compliance with manufacturer instructions in a dry interior location away from direct sunlight.
- C. Ensure materials are not subjected to freezing temperatures.
- D. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained in accordance with manufacturer's recommendations, but not less than 50 deg F.

1.11 PROJECT CONDITIONS

- A. Ensure minimum substrate temperature and ambient temperature of 50 deg F is maintained prior to, during, and a minimum of 72 hours after application.
- B. Provide temporary enclosures and heat to maintain environmental conditions in application areas. Responsibility for provision of such temporary enclosures and heat shall be General Contractor's unless noted otherwise.
- C. Ensure ventilation of not less than 0.3 complete air exchanges per hour is maintained until materials are cured.
- D. Ensure relative humidity does not exceed 85% throughout application and curing period of materials. Provide compatible bonding primer or protective topcoats when Products are installed in areas of high humidity
- E. Do not apply products in snow, rain, fog, or mist, or to damp or wet surfaces.

- F. Allow wet surfaces to dry thoroughly and to attain temperature and conditions specified before starting or continuing coating operation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Materials specified in this Section are based on products by International Fireproof Technology Inc; 6208, 17528 Von Karman Ave, Irvine, CA 92614, United States Tel: (949) 975-8588 Web: www.painttoprotect.com; as listed in this Specification.
- B. Substitution Limitations: **[No further substitutions are acceptable.] [Conforming to requirements of Section 01 25 00 - Substitution Procedures]**

2.2 REGULATORY REQUIREMENTS

- A. Products shall meet requirements of municipal, state, or federal authorities having jurisdiction.
- B. Fire protective coating systems shall comply with the following requirements:
 - 1. Provide rated systems complying with the following requirements based on tests performed by a qualified testing agency acceptable to authorities having jurisdiction:
 - 2. All systems and products shall bear the classification rating and listing of a qualified testing agency based on designations listed by one of the following:

IFTI Spec Note: Retain only subparagraph(s) below that reference the directories of testing agency or agencies approved by authorities having jurisdiction.

- a. ASTM E84 FSR 0 SDC 10
- b. ASTM E2768
- c. ASTM E119
- d. ISO 9705
- e. NFPA 286
- f. NFPA 285
- g. IAPMO ER499
- h. ICC-ESR 3702
- i. UL R-40016

2.3 DESIGN AND PERFORMANCE REQUIREMENTS

- A. Material Compatibility:
 - 1. Provide materials for use within each coating system that are compatible with one another and substrates indicated.
 - 2. Apply all products according to spreading rates recommended in writing by intumescent thermal barrier coating manufacturer.
 - 3. Comply with requirements for fire-protective coating classification and surface-burning characteristics indicated.
- B. VOC Content: Products shall comply with VOC limits of authorities having jurisdiction.

2.4 INTUMESCENT THERMAL BARRIER COATING SYSTEM

- A. Bonding Primer (where required): Interior unconditioned spaces subject to freeze thaw cycling, temperature and humidity variations or as required per tested and listed system. Waterborne, acrylic emulsion, adhesion-promoting bonding primer recommended in writing by manufacturer, if required, compatible with substrate and other materials indicated.
1. Application thickness (DFT):
 - a. Prime Coat: 2 – 5 mils dft.
 2. Acceptable product:
 - a. Sherwin Williams DTM Bonding Primer
 - b. Sherwin Williams Extreme Bond Primer
 - c. Zinsser Bondz Primer
 - d. General Coatings Mfg. Corp. Ultra Bond 16
 - e. Approved equivalent recommended in writing by intumescent thermal barrier manufacturer.
- B. Fire-protective Intumescent Thermal Barrier Coating:
1. Protective coating with following characteristics, specifically formulated for application over polyurethane foam plastics and compatible with insulation:
 - a. Finish: Flat
 - b. Color: **[Ice Grey] [White] [Dark Grey] [Charcoal Black]**
 - c. VOC Content: 19 g/L less water as per EPA 24
 - d. Shore D Hardness (before topcoat and finish coat are applied): 40.
 - e. Solids by Volume: 67%
 - f. Specific Gravity: 1.30 +/- 0.05 g/cc
 - g. Drying Time @ 25 deg C (77 deg F) and 50% R.H:
 1. To touch: 1-2 hours
 2. To recoat (if required): 2-4 hours
 - h. Flashpoint: None
 - i. Reducing or Cleaning: Water
 2. Acceptable Product: “DC315” by International Fireproof Technology Inc.
- C. Decorative Topcoat (where desired)
1. Interior conditioned spaces: Water based latex-based paint recommended in writing by manufacturer compatible with substrate and other materials indicated.
 - a. Application thickness (DFT):
 1. First Coat: 1.8 – 2.4 mils dft
 2. Second Coat: 1.8 – 2.4 mils dft.
 - b. Acceptable product:
 1. Sherwin Williams ProMar 200 0 VOC Flat, EgShel, Semi-Gloss
 2. Sherwin Williams Pro Industrial Dryfall
 3. Approved equivalent recommended in writing by intumescent thermal barrier manufacturer.

D. Protective Topcoat: (where required)*

1. Interior unconditioned spaces subject to humidity, condensation or at risk of direct contact with moisture: exterior/interior, VOC compliant, protective topcoat.
 - a. Application thickness (DFT):
 1. First Coat: 2 – 4 mils dft.
 2. Second Coat: 2-- 4 mils dft.
 - b. Acceptable Product:
 1. Sherwin Williams Pro Industrial Acrylic
 2. Sherwin Williams Sher-Cryl HPA
 3. Sherwin Williams SteelMaster 9500
 4. Approved equivalent recommended in writing by intumescent thermal barrier manufacturer.*
2. Unconditioned spaces subject to constant high humidity, condensation or at risk of direct contact with moisture: industrial, exterior/interior, VOC compliant, protective topcoat.
 - a. Application thickness (DFT):
 1. First Coat: 2 – 4 mils dft.
 2. Second Coat: 2-- 4 mils dft.
 - b. Acceptable Product:
 1. Sherwin Williams Pro Industrial Waterbased Acrolon 100
 2. Sherwin Williams Pro Industrial Waterbased Catalyzed Epoxy
 3. Approved equivalent recommended in writing by intumescent thermal barrier manufacturer.*
3. Exterior Continuous Insulation systems as a component of exterior wall systems as shown in UL File FWFO.EWS0054 when installed behind approved claddings.
 - a. Application thickness (DFT):
 1. First Coat: 2 – 4 mils dft.
 2. Second Coat: 2-- 4 mils dft.
 - b. Acceptable Product:
 1. Sherwin Williams Sher-Cryl HPA

*Topcoats have been investigated as to not reduce the fire resistance rating of the specific intumescent coating listed. Authorities Having Jurisdiction, Architects, Engineers or Specifiers should be consulted as to the particular requirements covering the installation and use of any coatings listed.

2.5 ACCESSORIES

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

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 EXAMINATION

- A. Verify suitability of substrates, including surface conditions, and compatibility with existing finishes and primers.
- B. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.3 PREPARATION

- A. Comply with manufacturer's written instructions applicable to substrates and coating systems indicated. Refer to test report for applicable brand and type of sprayed polyurethane foam to verify compatibility, and if a primer is required. Provide compatible primer approved by intumescent thermal barrier manufacturer to required surfaces where required by applicable test reports.
- B. Provide masking, drop cloths or other suitable coverings to prevent overspray onto surfaces not intended to be coated with intumescent coating.
- C. Ensure substrates are clean, and free of substances, including dirt, oil, grease, loose materials and incompatible that could impair bond of coatings.
- D. Do not coat surfaces if surface moisture content or alkalinity exceeds that permitted in manufacturer's written instructions.
- E. Remove incompatible primers, and reprime substrate with compatible primers as required to produce coating systems indicated.
- F. Prime or "fog" glossy foam surfaces prior to applying intumescent thermal barriers.

3.4 APPLICATION

- A. Apply intumescent thermal barrier coatings according to manufacturer's written instructions and to comply with requirements for fire-protective coating classification and applicable test reports for spray urethane foam insulation.
- B. Do not paint unless substrates are acceptable and/or until all environmental conditions (heating, ventilation, lighting and completion of other subtrade work) are acceptable for applications of products.
- C. Use airless spray equipment and techniques best suited for substrate, and in accordance with requirements indicated in manufacturer's instruction guidelines.
- D. Apply each coat separately according to manufacturer's written instructions.

- E. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections.
- F. When applying as a component of an exterior wall system do not paint unless substrates are acceptable and/or until all environmental conditions are acceptable for applications of products.
- G. Do not apply topcoats on surfaces that are not sufficiently dry. Unless manufacturer's directions state otherwise, each coat shall be sufficiently dry and hard before a following coat is applied.

3.5 CLEANING AND PROTECTION

- A. Upon completion of installation, clean excess material, overspray, and debris. Remove and clear such materials from Project site.
- B. Ensure patching of, and repair to, intumescent thermal barriers due to damage by other trades, is performed under this section, and paid for by trade responsible for damage.
- C. Ensure patching is performed by an applicator with expertise in the installation of intumescent thermal barrier coatings.
- D. Thermal barrier must be protected from weather until the protective topcoats is applied.

3.6 FIELD QUALITY CONTROL

- A. Continuously monitor WFT by performing checks to ensure correct thicknesses are applied.

IFTI Spec Note: Choose one of the following methods to measure thickness. Medallions, if used, can be maintained to verify Dry Film Thicknesses conform to requirements of Contract Documents.

- B. Measuring Thickness:
 - 1. Install medallions prior to applying the intumescent thermal barrier coating as a means of measuring wet film thickness and dry film thickness.

IFTI Spec Note: As an alternative to medallions, one can measure dry film on site by taking a representative sample of the installed coating and measuring it using calipers, optical comparators or another similar tool.

- 2. Perform thickness measurements by measuring representative sample of installed intumescent coating material by means of calipers, optical comparators or similar devices.
- C. Review results of installed thickness tests with General Contractor and ensure sign-off prior to application of topcoat (if required).

3.7 IDENTIFICATION

- A. Upon completion, provide job site label or similar method of identifying product used. Affix job site label in a prominent location, clearly indicating applicator's name, contact information, company information, products used, and measured thickness.

END OF SECTION

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