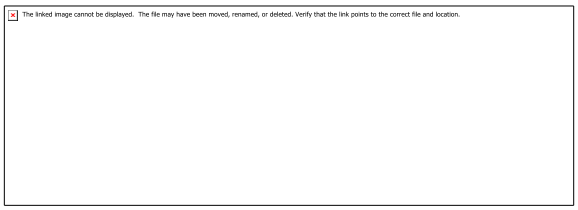

SECTION 07 81 23
INTUMESCENT FIRE PROTECTION

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1 GENERAL

1.1 SECTION INCLUDES

1.1.1 Intumescent Coatings:
1.1.1.1 Latex, water based, single component coating providing fire resistant protection. (Ff88)

1.2 RELATED SECTIONS

1.2.1 Section 09 90 00 - Painting and Coating.

1.2.2 Section 09 96 44 - Fire Resistant Coatings.

1.2.3 Section 09 96 46 - Intumescent Coatings.

1.3 REFERENCES

1.3.1 ASTM International (ASTM):
1.3.1.1 ASTM D562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.
1.3.1.2 ASTM D1475 - Standard Test Method for Density of Liquid Coatings, Inks, and Related Products.
1.3.1.3 ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing.
1.3.1.4 ASTM D-3675 /ASTM E162 / ASTM E-662 - Standard Test Method for Surface Flammability of Flexible Cellular Materials Using A Radiant Heat Energy Source.
1.3.1.5 ASTM D3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related.
1.3.1.6 ASTM D5116 - Standard Guide for Small-Scale Environmental Chamber Determinations of Organic Emissions from Indoor Materials/Products.
1.3.1.7 ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2018.
1.3.1.8 ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
1.3.1.9 ASTM E162 - Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
1.3.1.10 ASTM E662 - Standard Test Method for Specific Optical Density of Smoke Generated by Solid Materials.
1.3.1.11 ASTM E736 - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members.
1.3.1.12 ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop

Systems.

1.3.1.13 ASTM E-1354 - Standard Test Method for Heat and Visible Smoke Release Rates for Materials and Products Using an Oxygen Consumption Calorimeter.

1.3.1.14 ASTM E2768 - Standard Test Method for Extended Duration Surface Burning Characteristics of Building Materials (30 min Tunnel Test).

1.3.1.15 ASTM E2957 - Standard Test Method for Resistance to Wildfire Penetration of Eaves, Soffits and Other Projections.

1.3.1.16 ASTM E3048 - Standard Test Method for Determination of Time to Burn-through using the Scale Calorimeter.

1.3.2 Australian Standards (AS)

1.3.2.1 AD 1530 - Methods for fire tests on building materials, components, and structures.

1.3.2.2 AS 1530.3 - Simultaneous determination of ignitability, flame propagation, heat release and smoke release.

1.3.2.3 AS 1530.4 - Fire-resistance tests for elements of construction.

1.3.3 British Standards (BS):

1.3.3.1 BS476 - Fire Testing.

1.3.3.1.1 Part 6 - Fire Propagation Test.

1.3.3.1.2 Part 7 - Surface Spread of Flame Test.

1.3.4 California Air Resources Board (CARB).

1.3.5 FM Global (FM): Approvals.

1.3.5.1 FM 4975 - Fire-Retardant Paints and Coatings Over Combustible Surfaces.

1.3.5.2 FM 4470 Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for Use in Class 1 and Noncombustible Roof Deck Construction.

1.3.6 European Standards (EN)

1.3.6.1 EN 13501 - Poland (PN) Fire Classification of Construction Products and Building Elements: B-s2,d0.

1.3.7 International Building Code (IBC):

1.3.8 International Code Council (ICC):

1.3.8.1 ICC ESL 1213 CAN S102 - Listing report.

1.3.8.2 ICC ESL 1411 - Full Scale ASTM E119.

1.3.8.3 ICC ESL 1371 - Aluminum Composite Paint Burn-Through.

1.3.9 Master Painters Institute (MPI).

1.3.10 National Fire Protection Association (NFPA).

1.3.10.1 NFPA 251 - Standard Methods of Tests of Fire Endurance Building Construction and Materials.

1.3.10.2 NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth.

1.3.10.3 NFPA 276 - Standard Method of Fire Test for Determining the Heat Release Rate of Roofing Assemblies with Combustible Above-Deck Roofing Components.

1.3.11 New York Material and Equipment Acceptance Division (MEA).

1.3.12 South Coast Air Quality Management District (SCAQMD).

1.3.13 Underwriters Laboratories (UL):

1.3.13.1 UL 263 - Standard for Safety for Fire Tests of Building Construction and Materials.
1.3.13.2 UL 723 - Standard for Safety for Surface Burning Characteristics of Building Materials.

1.3.14 Underwriters' Laboratories of Canada, Ltd. (ULC):
1.3.14.1 ULC S101 - Fire Endurance Test of Building Construction and Materials.
1.3.14.2 ULC S102 - Surface Burning Characteristics of Building Materials and Assemblies.

1.3.15 Uniform Building Code (UBC):
1.3.15.1 UBC 26-2 - Test Method for the Evaluation of Thermal Barriers.
1.3.15.2 UBC 26-3 - Room Fire Test Standard for Interior of Foam Plastic Systems.

1.3.16 New Zealand (NZ) Building Code C3.4 (a).
1.3.16.1 NZBC-ISO 9705: Group Number Classification 1-S.

1.4 SUBMITTALS

1.4.1 Submit under provisions of Section 01 30 00 - Administrative Requirements.

1.4.2 Product Data:
1.4.2.1 Product Data Paints and Coatings: For interior paints and coatings, documentation including printed statement of VOC content.
1.4.2.2 Manufacturer's data sheets on each product to be used.
1.4.2.3 Preparation instructions and recommendations.
1.4.2.4 Storage and handling requirements and recommendations.
1.4.2.5 Typical installation methods.
1.4.2.6 Product List: Cross-reference to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules. Include manufacturer's recommended spreading rate and DFT (dry film thickness) for each separate coat for each type of substrate indicated to achieve intended use.

1.4.3 Verification Samples: Two representative units of each type, size, pattern, and color.

1.4.4 Shop Drawings: Include details of materials, construction, and finish. Include relationship with adjacent construction.

1.5 QUALITY ASSURANCE

1.5.1 Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum of five years documented experience.
1.5.1.1 The manufacturer does recommend third party special inspections to ensure that the dry film thickness complies with the manufacturer's recommendation.

1.5.2 Applicator Qualifications: A commercial firm or individual experienced in applying materials similar in material, design, and extent to those indicated for this Project, and whose work has resulted in applications with a record of successful in-service performance, and the following additional requirements:
1.5.2.1 Approval: Licensed-experienced Contractor Applicator.
1.5.2.2 Similar Projects: When requested, the Applicator shall provide a list of the last five (5) comparable jobs including name and location, specifying authority / project manager, start / completion dates, and value of the painting work.
1.5.2.3 Staffing: The Applicator shall show proof before commencement of work that he will maintain a qualified crew throughout the duration of the work.

1.5.3 Source Limitations: Provide each type of product from a single manufacturing source to

ensure uniformity.

1.5.4 Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
- 1.5.4.1 The intent of mock-up is to demonstrate quality of workmanship and visual appearance.
- 1.5.4.2 If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
- 1.5.4.3 Retain mock-up during construction as a standard for comparison with completed work.
- 1.5.4.4 Do not alter or remove mock-up until work is completed or removal is authorized.
- 1.5.4.5 Mock-up may be incorporated into final construction upon Owner's approval.

1.5.5 Field Samples: At owner's expense, the Owner1 will select a qualified independent testing agency, not affiliated with the applicator, to verify that preparation of substrate and application thickness of the intumescent coating complies with the requirements specified.

1.6 PRE-INSTALLATION CONFERENCE

1.6.1 Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor and trades involved. Agenda shall include schedule, responsibilities, critical path items and approvals.
- 1.6.1.1 Review project requirements, substrate conditions, manufacturer's installation recommendations and warranty requirements. Comply with Division 1 Project Management and Coordination (Project Meetings) Section.
- 1.6.1.2 Pre-installation Testing: Conduct pre-installation testing as follows:
  - 1.6.1.2.1 _____.

1.7 DELIVERY, STORAGE, AND HANDLING

1.7.1 Store and handle in strict compliance with manufacturer's written instructions and recommendations.
- 1.7.1.1 Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 50 degrees F (10 degrees C).
  - 1.7.1.1.1 Maintain containers in clean condition, free of foreign materials and residue.
  - 1.7.1.1.2 Remove rags and waste from storage areas daily.
  - 1.7.1.1.3 Store fire retardant coatings in a separate location from fire resistant coatings, and label areas to reflect designation.

1.7.2 Protect from damage due to weather, excessive temperature, and construction operations.

1.7.3 Do not apply any materials that have been frozen or have come into contact with contaminants prior to use. Immediately remove any such materials from the jobsite.

1.8 PROJECT CONDITIONS

1.8.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
- 1.8.1.1 Apply waterborne intumescent paints only when temperatures of surfaces to be painted and ambient air temperatures are between 50 and 85 degrees F (10 and 29 degrees C).
- 1.8.1.2 Apply solvent-thinned intumescent paints only when temperatures of surfaces to be painted and ambient air temperatures are between 45 and 95 degrees F (7

and 35 degrees C).

1.8.1.3 Do not apply intumescent paints in snow, rain, fog, or mist; when relative humidity exceeds 75 percent; at temperatures less than 5 degrees F (3 degrees C) above the dew point; or to damp or wet surfaces.

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

1.8.1.5 Moisture Content: Moisture content in wood substrates shall not exceed 12 percent levels.

1.9 WARRANTY

1.9.1 Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

1.9.2 Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under contract documents.

1.9.2.1 Warranty Period: 10 year limited warranty commencing on Date of Substantial Completion.

2 PRODUCTS

2.1 MANUFACTURERS

2.1.1 Acceptable Manufacturer: Firefree Coatings, Inc., which is located at: 8 Commercial Blvd. Suite E; Novato, CA 94949; Toll Free Tel: 888-990-3388; Tel: 415-459-6488; Email:request info (info@firefree.com); Web:https://www.firefree.com

2.1.2 Substitutions: Not permitted.

2.2 INTUMESCENT FIREPROOFING

2.2.1 General:

2.2.1.1 Material Compatibility:

2.2.1.1.1 Provide materials for use within each paint system that are compatible with one another, and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

2.2.1.1.2 For each material or coat, provide products and spreading rates recommended in writing by intumescent paint manufacturer for use on substrate indicated. Comply with requirements for fire-retardant coating classification and surface-burning characteristics indicated.

2.2.1.2 Paint Colorants: To have zero (0) VOCs and free of hazardous chemicals.

2.2.1.3 Primer: Intumescent paint manufacturer's recommended primer compatible with substrate and other materials indicated.

2.2.1.3.1 Application over rough wood, primer is not required.

2.2.1.3.2 Use appropriate primer for its intended use, then apply intermediate coat for fire protection.

2.2.1.3.3 assembly and rating desired.

2.2.1.3.4 As a result of its' superior fire resistant performance, Firefree 88 can provide significant material and labor cost reductions, resulting in significant savings when compared to other construction options in situations such as construction, both new, retrofit, and defective, (residential, commercial, industrial and government), insulation and transportation. Recommended for historic properties, schools, health care (hospitals, assisted living), apartments, condominium, high-rises, hotels, stores, restaurants, oil and solar facilities, government facilities, military applications and facilities, transportation (aerospace, aviation, light rail,

maritime, energy). Delete if not required.

2.2.2 Basis of Design: Firefree88 (Ff88) as manufactured by Firefree Coatings Inc. A premium waster-based, nontoxic, intumescent latex fire-resistant coating tested to comply with fire ratings performance prescribed under the International Building Code (IBC).

2.2.2.1 Certifications and Compliance: Tested by Independent ISO/IEC 17025 Accredited Laboratory.

2.2.2.1.1 Qualifies For LEED v4 Credit.

2.2.2.1.2 CDPH/EHLB Standard Method v1.2, 2017 Emissions.

2.2.2.1.3 Master Painters Institute (MPI) Green Performance: GPS1/GPS2.

2.2.2.2 Properties:

2.2.2.2.1 Application State: Liquid. A water-based latex coating.

2.2.2.2.2 Color: White. Finish: Flat: 1.9 to 2.2 at 60. Flat: 0.5 to 1 at 85.

2.2.2.2.3 Top Coat: Premium Latex Paint.

2.2.2.2.3.1 Color: White.

2.2.2.2.4 VOC per ASTM D3960: Less than 36 grams per L.

2.2.2.2.4.1 Meets OTC, SCAQMD CARB regulations.

2.2.2.2.5 Volume Solids: 67 percent.

2.2.2.2.6 Viscosity per ASTM D562: 115 at 77 degrees F (25 degrees C) kU.

2.2.2.2.7 Specific Gravity/Density g/ml per ASTM D1475: 1.272 plus or minus 0.05.

2.2.2.2.8 Thinning: Not Recommended.

2.2.2.2.9 Shelf-Life: 2 years (unopened).

2.2.2.2.10 Comply with fire ratings performance prescribed under the International Building Code (IBC).

2.2.2.2.10.1 Fire resistant testing which measures a product's ability to prevent fire penetration over a period of time.

2.2.2.2.10.1.1 ASTM E119.

2.2.2.2.10.1.2 ASTM E162.

2.2.2.2.10.1.3 ASTM E662.

2.2.2.2.10.1.4 ASTM E814.

2.2.2.2.10.1.5 ASTM E1354.

2.2.2.2.10.1.6 ASTM D3675.

2.2.2.2.10.1.7 BS 476.

2.2.2.2.10.1.8 AS 1530.3.

2.2.2.2.10.1.9 AS 1530.4.

2.2.2.2.10.1.10 EN 13501-1.

2.2.2.2.10.1.11 FM 4470 (NFPA 276).

2.2.2.2.10.1.12 FM 4975.

2.2.2.2.10.2 Fire retardant testing such as ASTM E84 and Room Corner Test standards.

2.2.2.2.10.2.1 UBC 8-2.

2.2.2.2.10.2.2 UBC 26-3.

2.2.2.2.10.2.3 NFPA 286.

2.2.2.2.11 International Code Council (ICC):

2.2.2.2.11.1 ICC-ES: Listed.

2.2.2.2.11.2 ICC-ESL CAN/ULC S102-10: Listed.

2.2.2.2.11.3 LABC-LARC Supplement Listed.

2.2.2.2.12 Classified by Underwriters Laboratories (UL):

2.2.2.2.12.1 UL R14654 Classified on OSB, Douglas fir.

2.2.2.2.13 Listed and labeled by FM Approvals, a division of FM Global.

2.2.2.2.14 New York: Material and Equipment Acceptance Division (MEA):

2.2.2.2.14.1 MEA # 320-99: Accepted.

2.2.2.2.15 United Kingdom: Class O, per BS 476 Part 6 and 7.

2.2.2.2.16 New Zealand: Class 1-S, per NZBC Verification Method.

2.2.2.2.17 Australia: CSIRO, a NATA Accredited Laboratory, Assessed and Certified.

2.2.2.3 Usage: May be applied to numerous materials for 1 and 2 hour ratings.

2.2.2.3.1 Required Thickness: Varies depending on different factors including substrate, assembly and rating desired.
2.2.2.3.2 Materials Include but not Limited to: Wood, gypsum board (sheetrock, plasterboard), lathe and plaster, concrete, masonry, embossed/pressed metal tin, thin gauge metal, galvanized steel and aluminum, fiberglass, carbon fiber, plastics, and other composite materials.
2.2.2.3.3 May be used on spray polyurethane foam to achieve a 15-minute barrier.
2.2.2.3.4 Interior: Made for interior applications.
2.2.2.3.5 Exterior: Including meeting the 5 ft (m) property line:
2.2.2.3.5.1 Top Coat: Firefree Exterior (FfE) Acrylic.
2.2.2.3.5.1.1 Weatherization per ASTM D2898, method B: Passes.
2.2.2.3.5.2 Substitution of Ff88 or FfE voids any warranty express or implied.
2.2.2.4 Application: Brushed, rolled, or sprayed using an airless spray gun.
2.2.2.4.1 Similar to water-based latex paint except for recommended thickness which needs to be precisely complied with for adequate performance.
2.2.2.4.2 Substrate Primers: Primers approved by manufacturer.

3 EXECUTION

3.1 EXAMINATION

3.1.1 Do not begin installation until the substrates have been properly constructed and prepared.

3.1.2 If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

3.1.3 Examine substrates and conditions, with Applicator present, for compliance with manufacturer's requirements for surface treatments, shop-primed surfaces, maximum moisture content, and other conditions affecting performance of the Work. Begin coating only when moisture content of wood substrate is 12 percent or less when measured with an electronic moisture meter.

3.1.4 Begin coating no sooner than 28 days after the substrate is constructed and is visually dry on both sides.

3.1.5 Verify suitability of substrates, including surface conditions, and compatibility with existing finishes and primers.

3.1.6 Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.

3.1.7 Inspection:
3.1.7.1 The independent testing agency will ensure that preparation of the substrate is in accordance with the manufacturer's recommendations.
3.1.7.2 The testing agency will randomly obtain and test samples during application to verify that wet film thickness of the intumescent coating complies with requirements of this section.
3.1.7.3 Work not in compliance will be rejected and shall immediately be brought into compliance by the applicator.

3.2 PREPARATION

3.2.1 Comply with manufacturer's written instructions applicable to substrates and coating systems indicated.

3.2.2 Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or

impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.

3.2.2.1 After completing coating operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection if any.

3.2.3 Clean substrates of substances, including dirt, oil, grease, and incompatible paints and encapsulants, that could impair bond of coatings. Do not coat surfaces if surface moisture content or alkalinity exceeds that permitted in manufacturer's written instructions.

3.2.3.1 Remove incompatible primers and reprime substrate with compatible primers as required to produce coating systems indicated.

3.2.3.2 Perform cleaning and coating application so dust and other contaminants from cleaning process will not fall on wet, newly coated surfaces.

3.3 INSTALLATION

3.3.1 Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.

3.3.2 General: Apply intumescent paints according to manufacturer's written instructions and to comply with requirements for fire-retardant coating classification.

3.3.2.1 Use equipment and techniques best suited for substrate and type of material being applied.

3.3.2.2 Coat surfaces behind movable items the same as similar exposed surfaces.

3.3.2.3 Apply each coat separately according to manufacturer's written instructions.

3.3.3 Apply coatings to prepared surfaces as soon as practical after preparation and before subsequent surface soiling or deterioration.

3.3.4 Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks.

3.3.4.1 Pigmented Finishes: If undercoats or other conditions show through pigmented topcoat/overcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance.

3.4 FIELD QUALITY CONTROL

3.4.1 Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

3.4.2 Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.

3.5 CLEANING AND PROTECTION

3.5.1 At the end of each workday, remove rubbish, empty cans, rags, and other discarded materials from the Project site.

3.5.2 After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

3.5.3 Protect work of other trades against damage from coating application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

3.5.4 At completion of construction activities, touch up and restore damaged or defaced coated surfaces.

END OF SECTION