

SECTION 099646 - INTUMESCENT PAINTING

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. This Section includes surface preparation and application of fire-retardant intumescent paint to **[interior] [and] [exterior]** items and surfaces in order to reduce their flame spread rate and smoke developed rate to levels required by the Life Safety Code. This Section does not apply to intumescent coats applied to structural elements to achieve a specified fire resistance rating.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Related Sections include the following:
 - 1. Division 01 Section "Sustainable Design Requirements" for additional LEED requirements.
 - 2. Division 07 Section "Applied Fireproofing" for fire-resistance-rated intumescent mastic materials.
 - 3. Division 09 painting Sections for primers, finish coats, and wood stains that may be used with intumescent paint finishes.
 - 4. Division 09 Section "High-Temperature-Resistant Coatings" for special coatings designed to protect steel from extremely high temperatures.
- C. Alternates: Refer to Division 01 Section "Alternates" for description of Work in this Section affected by alternates.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
 - 1. Material List: Provide an inclusive list of required intumescent paint materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 - 2. Manufacturer's Information: Provide manufacturer's technical information, including label analysis and instructions for handling, storing, and applying intumescent paint materials.
- B. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors available for each intumescent paint finish indicated.

1. After color selection, Contracting Officer will furnish color chips for surfaces to be coated.
- C. Samples for Verification: For each color to be applied, with texture to simulate actual conditions, on representative Samples of actual substrate.
1. Provide stepped Samples, defining each separate coat, including primers and finish coats. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 2. Provide a list of materials and applications for each coat of each finish Sample. Label each Sample for location and application.
 3. Submit **<Insert number>** Samples on the following substrates for Contracting Officer's review of color and texture only:
 - a. Painted Wood: [~~300-mm- (12-inch-)~~] **<Insert size>** square Samples of each color and material on hardboard.
 - b. Stained or Natural Wood: [~~100-by-200-mm (4-by-8-inch)~~] **<Insert size>** Samples of natural or stained wood finish on representative **<Insert species of wood to be used>** surfaces.
- D. LEED Submittals:
1. Credit EQ 4.2: Manufacturers' product data for paints and coatings, including printed statement of VOC content and chemical components and material safety data sheets.
- E. Qualification Data: For Applicator.
- F. Material Test Reports: For each intumescent paint.
- G. Material Certificates: For each intumescent paint, signed by manufacturers.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying intumescent paints similar in material, design, and extent to those indicated for the Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain primers and undercoat materials for each intumescent paint system from same manufacturer as finish coats, or of type approved by manufacturer.
1. Notify Contracting Officer of problems anticipated using specified coating systems.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample submittals.
1. Contracting Officer will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate.
 - a. Wall Surfaces: Provide samples of at least **9 sq. m (100 sq. ft.)**.
 - b. Small Areas and Items: Contracting Officer will designate items or areas required.

2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated.
 - a. After finishes are accepted, Contracting Officer will use the room or surface to evaluate coating systems of a similar nature.
 3. Final approval of colors will be from benchmark samples.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Do not schedule conference until after submittals have been reviewed and approved by the NIH Division of the Fire Marshal.
- E. Fire-Test-Response Characteristics: Provide intumescent paints with the following surface-burning characteristics as determined by testing identical products per ASTM E 84, by UL, or by another testing and inspecting agency acceptable to authorities having jurisdiction:
1. Flame-Spread Index: **[25 or less] [26-75]**.
 2. Smoke-Developed Index: 450 or less.

1.5 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between **10 and 32 deg C (50 and 90 deg F)**.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between **7 and 35 deg C (45 and 95 deg F)**.
- C. Do not apply intumescent paints in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; if temperature is less than **3 deg C (5 deg F)** above the dew point; or to damp or wet surfaces.
 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated, during application and drying periods, within temperature limits specified by manufacturer.

1.6 EXTRA MATERIALS

- A. Furnish extra intumescent and fire-inert paint materials from same production run as materials applied in quantities described below. Package paint materials in unopened, factory-sealed containers for storage, and identify with labels describing contents. Deliver extra materials to NIH.
 1. Quantity: Furnish NIH with extra paint materials in quantities indicated below:
 - a. Flat, Intumescent **[Latex] [Solvent-Thinned]** Paint: **[One] <Insert number>** case(s) of each color applied.
 - b. Semigloss, Intumescent **[Latex] [Solvent-Thinned]** Paint: **[7.57 L (2 gal.)] <Insert number>** of each color applied.
 - c. Clear, Intumescent Paint: **[7.57 L (2 gal.)] <Insert number>**.

- d. Fire-Inert [**Latex**] [**Solvent-Thinned**] Paint: [**7.57 L (2 gal.)**] <Insert number> of each color applied.
2. Quantity: Additional [**5**] <Insert percent> percent, but no less than **1 gal. (3.78 L)**, as appropriate, of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.
- B. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.
- C. Manufacturers' Names: Shortened versions (shown in parenthesis) of the following manufacturers names are referred to in other Part 2 articles:
 1. Albi Manufacturing; a division of StanChem, Inc. (Albi).
 2. Benjamin Moore & Co. (Moore).
 3. Fire Research Laboratories; Ocean Fire Retardants Inc. (FRL).
 4. Flame Control Coatings, Inc. (FCC).
 5. International Fire-Resistant Systems, Inc. (IFRS).
 6. NoFire Technologies, Inc. (NoFire).
 7. PPG Industries, Inc. (PPG).
 8. <Insert manufacturer's name.>

2.2 INTUMESCENT PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide undercoat and finish-coat materials 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.
- B. Material Quality: Provide manufacturer's best-quality intumescent and fire-inert paint materials. Paint material containers not displaying manufacturer's product identification are not acceptable.
 1. Provide water-reducible or solvent-reducible, clear or pigmented, intumescent and fire-inert paint materials formulated to retard flame spread and intended for use on [**interior**] [**and**] [**exterior**] combustibile surfaces.
 2. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificate of performance for proposed substitutions.

- C. Chemical Components of Interior Paints and Coatings: Provide products that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and the following chemical restrictions:
1. Flat Paints and Coatings: VOC content of not more than 50 g/L.
 2. Non-Flat Paints and Coatings: VOC content of not more than 150 g/L.
 3. Varnishes and Sanding Sealers: VOC content of not more than 350 g/L.
 4. Stains: VOC content of not more than 250 g/L.
 5. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
 6. Restricted Components: Paints and coatings shall not contain any of the following:
 - a. Acrolein.
 - b. Acrylonitrile.
 - c. Antimony.
 - d. Benzene.
 - e. Butyl benzyl phthalate.
 - f. Cadmium.
 - g. Di (2-ethylhexyl) phthalate.
 - h. Di-n-butyl phthalate.
 - i. Di-n-octyl phthalate.
 - j. 1,2-dichlorobenzene.
 - k. Diethyl phthalate.
 - l. Dimethyl phthalate.
 - m. Ethylbenzene.
 - n. Formaldehyde.
 - o. Hexavalent chromium.
 - p. Isophorone.
 - q. Lead.
 - r. Mercury.
 - s. Methyl ethyl ketone.
 - t. Methyl isobutyl ketone.
 - u. Methylene chloride.
 - v. Naphthalene.
 - w. Toluene (methylbenzene).
 - x. 1,1,1-trichloroethane.
 - y. Vinyl chloride.
- D. Colors: **[Match Contracting Officer's samples] [As indicated by manufacturer's designations] [As selected by Contracting Officer from manufacturer's full range].**

2.3 INTERIOR INTUMESCENT FINISH COATS

- A. Wood and Hardboard: Provide the following paint finish systems over **[new]** **[existing]** wood surfaces:
1. Prime Coat: Factory-formulated alkyd or latex wood primers applied at spreading rate recommended by manufacturer.

- a. Albi: **[None] [Primer approved by Albi] [Albi 490W]**.
 - b. FCC: **[None] [No. 3001 Primer]**.
 - c. FRL: Latex primer.
 - d. IFRS: Primer approved by IFRS.
 - e. Moore: Fresh Start Alkyd Enamel Underbody or Super Spec Alkyd Enamel Undercoater/Primer Sealer.
 - f. NoFire: **[None] [Primer approved by NoFire]**.
 - g. PPG: Speed Hide 6-6 interior quick-drying enamel undercoater.
 - h. **<Insert manufacturer's name; product name or designation.>**
2. First[**and Second**] Coat: Intumescent-type, fire-retardant paint applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than **[0.10 mm (4 mils)]** **<Insert number>**.
- a. Albi: **[Albi-Cote 107A solvent-thinned] [Albi-Cote FRL fire-retardant latex]** flat coating.
 - b. FCC: **[No. 10-10 solvent-thinned] [No. 20-20 latex]** flat coating.
 - c. FRL: FireCoat 320 flat latex fire-protective coating.
 - d. IFRS: Firefree88 flat latex coating.
 - e. Moore: M59 220 latex fire-retardant coating.
 - f. NoFire: A-18 flat latex intumescent fire-retardant coating.
 - g. PPG: Speed Hide 42-7 flat latex interior fire-retardant coating.
 - h. **<Insert manufacturer's name; product name or designation.>**
3. Topcoat: Protective fire-inert coating that will not affect fire-retardant class of intumescent coating.
- a. Albi: Albi 144 semigloss fire-inert alkyd coating.
 - b. FCC: **[None] [No. 30-30, pigmented, solvent-thinned, semigloss]**.
 - c. FRL: **[None] [TopCoat A, clear] [TopCoat X, pigmented]**.
 - d. IFRS: **[None] [Coating approved by IFRS]**.
 - e. Moore: None recommended.
 - f. NoFire: Latex-based coating approved by NoFire.
 - g. PPG: None recommended.
 - h. **<Insert manufacturer's name product name or designation.>**

2.4 EXTERIOR INTUMESCENT FINISH COATS

- A. Wood and Hardboard: Provide the following paint finish systems over **[new] [existing]** wood surfaces:
- 1. Prime Coat: Factory-formulated alkyd or latex wood primers applied at spreading rate recommended by manufacturer.
 - a. Albi: None required.
 - b. FRL: Latex primer.
 - c. NoFire: Primer approved by NoFire.
 - d. **<Insert manufacturer's name; product name or designation.>**

2. First[**and Second**] Coat: Flat, intumescent-type, fire-retardant, latex paint applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than **[0.15 mm (6 mils)]** <Insert number>.
 - a. Albi: Albi-Cote 107A solvent-thinned coating.
 - b. FRL: FireCoat 320 interior flat latex fire-protective coating.
 - c. NoFire: A-18 flat latex fire-retardant coating.
 - d. <Insert manufacturer's name; product name or designation.>
3. Topcoat: Protective fire-inert coating that will not affect fire-retardant class of intumescent coating.
 - a. Albi: Albi 144 semigloss fire-inert solvent-thinned coating.
 - b. FRL: **[TopCoat A, clear]** **[TopCoat X, pigmented]** fire-protective coating.
 - c. NoFire: Latex-based coating approved by NoFire.
 - d. <Insert manufacturer's name; product name or designation.>

2.5 INTUMESCENT CLEAR FINISH COATS

- A. **[Clear]** **[Stained]** Woodwork: Provide the following finishes over **[new]** **[existing]** woodwork:
 1. Stain Coat: Factory-formulated, nonbleeding, alkyd-based penetrating wood stain for **[interior]** **[exterior]** application applied at spreading rate recommended by manufacturer.
 - a. Stain approved by intumescent coating manufacturer.
 2. Clear Sanding Sealer: Factory-formulated, fast drying, alkyd-based clear wood sealer for interior application applied at spreading rate recommended by manufacturer.
 - a. FCC: No. 6 clear interior/exterior sealer.
 - b. FRL: Sealer approved by FRL.
 - c. <Insert manufacturer's name; product name or designation.>
 3. First[**and Second**] Coat: Clear, intumescent-type, fire-retardant varnish applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than **[0.15 mm (6 mils)]** <Insert number>.
 - a. FCC: No. 166 (Class A) interior, solvent-thinned satin finish.
 - b. FRL: ClearCoat II, solvent-thinned **[flat]** **[satin]** finish.
 - c. <Insert manufacturer's name; product name or designation.>
 4. Topcoat: Protective fire-inert clear coating that will not affect fire-test-response characteristics of intumescent coating.
 - a. FCC: No. 167 (Class A) interior, solvent-thinned **[low]** **[semigloss]** **[hi-gloss]** sheen.
 - b. FRL: TopCoat A, clear, **[flat]** **[satin]** **[semigloss]** **[hi-gloss]** sheen.
 - c. <Insert manufacturer's name; product name or designation.>

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements and other conditions affecting performance of work.
 - 1. Proceed with application only after unsatisfactory conditions have been corrected and surfaces to receive paint are thoroughly dry.
 - 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total intumescent paint system for various substrates. On Contracting Officer's request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify Contracting Officer about problems anticipated when using coatings specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware, hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying coatings or other surface treatments, clean substrates of substances that could impair bond of intumescent paint systems.
 - 1. Schedule cleaning and painting application so dust and other contaminants will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Wood Surfaces: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots and apply a thin coat of manufacturer's recommended knot sealer before applying prime coat. After priming, fill holes and imperfections in finished surfaces with putty or plastic wood filler. Sand smooth when dry.

- b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counter, cases, and paneling.
 - c. If transparent (clear) finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
- 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density, and as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners recommended by manufacturer and only within recommended limits.
- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match color of finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply intumescent paints according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
- 1. Paint colors, surface treatments, and finishes are indicated in paint schedules.
 - 2. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to forming a durable paint film.
 - 3. Provide finish coats that are compatible with primers used.
 - 4. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 - 5. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces.
 - 6. Finish doors on faces with intumescent finish. Paint tops, bottoms, and side edges with fire-inert finish.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
- 1. Number of coats and film thickness required are same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 - 2. If undercoats, stains, or other conditions show through the final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special

- attention to ensure that edges, corners, crevices, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
3. Allow enough time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where applying another coat of paint does not cause the undercoat to loose adhesion.
- C. Application Procedures: Apply coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
1. Brushes: Use brushes best suited for material applied. Use brush of appropriate size for surface or item being painted.
 2. Rollers: Use rollers made of carpet, velvet back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 3. Spray Equipment: Use[**airless**] spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply materials at not less than manufacturer's recommended spreading rate for surface to be coated. Provide total dry film thickness of entire system as recommended by manufacturer.
- E. Prime Coat: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to substrates required to be painted that have not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas appears in the first coat.
- F. Apply fire-inert topcoats where scheduled, using materials and application methods according to manufacturer's written instructions.
- G. Clear Finishes: Produce a smooth surface film of even sheen[**using multiple coats**]. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
- H. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.
- 3.4 FIELD QUALITY CONTROL
- A. Inspecting Agency: Engage a qualified independent inspecting agency to inspect intumescent painted surfaces and prepare inspection reports.
- B. Testing Services: Inspecting of completed installations of intumescent painted surfaces shall take place in successive stages as application of intumescent paint proceeds. Do not proceed with application of intumescent paint for the next area until [**inspecting agency**] [**NIH Division of the Fire Marshal**] determines completed work shows compliance with requirements.
1. Inspecting agency shall state in each report whether inspected intumescent painted surfaces comply with or deviate from requirements.

- C. Remove and replace intumescent paint where inspections indicate that it does not comply with specified requirements.
- D. Additional inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- E. Proceed with enclosing intumescent painted surfaces with other construction only after inspection and approval by the NIH Division of the Fire Marshal. Where intumescent painted surfaces will be left exposed, it can be inspected as part of the final acceptance (pre-occupancy) inspection performed by the NIH Division of the Fire Marshal.

3.5 CLEANING AND PROTECTION

- A. Cleanup: At the end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by proper methods. Be careful not to scratch or otherwise damage adjacent finished surfaces.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is completed, touch up and restore damaged or defaced surfaces. Comply with PDCA P1.

END OF SECTION 099646