SECTION 099633 - HIGH-TEMPERATURE-RESISTANT COATINGS

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section includes surface preparation and application of high-temperature-resistant coating systems on steel substrates.
				2. Work under this Contract shall also include, but not necessarily be limited to:

Labor, materials, tools and other equipment, services and supervision required to complete all interior painting and decorating work as indicated on Finish Schedules and to the full extent of the drawings and specifications.

Surface preparation of substrates as required for acceptance of paint, including cleaning, small crack repair, patching, caulking, and making good surfaces and areas to the limits defined under MPI Architectural Painting Manual preparation requirements.

Specific pre-treatments noted herein or specified in the MPI Architectural Painting Manual.

Sealing / priming surfaces for painting in accordance with MPI Architectural Painting Manual requirements.

Provision of safe and adequate ventilation as required over and above temporary ventilation supplied by others, where toxic and/or volatile / flammable materials are being used.

* + - * 1. Refer to drawings and schedules (e.g., Finish Schedule) for type, location and extent of interior painting required.
			1. REFERENCES
				1. Master Painters Institute Inc., MPI Architectural Painting Manual. www.specifypaint.us.
			2. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. MPI Gloss Level 5 (Semi-Gloss): 35 to 70 units at 60 degrees, according to ASTM D523.
				2. MPI Gloss Level 6 (Gloss): 70 to 85 units at 60 degrees, according to ASTM D523.
			1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Painting Schedule: Cross-referenced Painting Schedule listing all exterior and interior substrates to be painted and specified finish paint type designation; product name and manufacturer, recommended primers and product numbers, and finish paint color designation for each substrate to be painted.

Designate exterior substrates by building name and number, substrate to be painted and surface location.

Designate interior substrates by building name and number, floor, room name and number, and surface to be painted.

* + - * 1. Product Data: For each type of product. Include preparation requirements and application instructions.
				2. Sustainable Design Submittals:
				3. Samples for Initial Selection: For each type of topcoat product indicated.

Delete "Samples for Initial Selection" paragraph above if colors and other characteristics are preselected and specified or scheduled. Retain "Samples for Verification" paragraph below with or without above.

* + - * 1. Samples for Verification: For each type of coating system and in each color and gloss of topcoat indicated.

Submit Samples on rigid backing, 8 inches square.

Apply coats on Samples in steps to show each coat required for system.

Label each coat of each Sample.

Label each Sample for location and application area.

* + - * 1. Contractor’s Qualifications: Submit documentation demonstrating compliance with requirements in Quality Assurance Article.
				2. Certification of Volatile Organic Compounds: Submit certified list demonstrating compliance requirements in Quality Assurance Article.
			1. QUALITY ASSURANCE
				1. Volatile Organic Compounds (VOCs) Regulatory Requirements: Chapter III of Title 6 of the official compilation of Codes, Rules and Regulations of the State of New York (Title 6 NYCRR), Part 205 Architectural Surface Coatings.

Certificate of Compliance: List of each paint product to be delivered and installed. List shall include written certification stating that each paint product listed complies with the VOC regulatory requirements in effect at the time of job site delivery and installation.

* + - * 1. Contractor shall have a minimum of five (5) years proven satisfactory experience and shall show proof before commencement of work that he will maintain a qualified crew of painters throughout the duration of the work. When requested by the Director’s Representative, Contractor shall provide a list of the last three comparable repainting jobs including, name, location, specifying authority / project manager, start / completion dates and value of the work.
				2. All materials, preparation and workmanship shall conform to the standards contained in the latest edition of the Master Painters Institute (MPI) Architectural Painting Manual (herein referred to as the MPI Manual).
				3. The painting contractor shall receive written confirmation of the specific surface preparation procedures and primers used for all fabricated steel items from the fabricator / supplier to ascertain appropriate and manufacturer compatible finish coat materials to be used before painting such work.
				4. Mockups: Apply mockups of each coating system indicated to verify preliminary selections made under Sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

Director’s Representative will select one surface to represent surfaces and conditions for application of each coating system specified in Part 3.

Surfaces Greater Than 200 Sq. Ft.: Provide mockups of at least 100 sq. ft..

Other Surfaces: Director’s Representative will designate items or areas required.

Final approval of color selections will be based on mockups.

If preliminary color selections are not approved, apply additional mockups of additional colors selected by Director’s Representative at no added cost to the State.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Director’s Representative specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. REGULATORY REQUIREMENTS
				1. Conform to work place safety regulations for storage, mixing, application and disposal of all paint related materials to requirements of those authorities having jurisdiction.
				2. To reduce the amount of contaminants entering waterways, sanitary / storm drain systems or into the ground the following procedures shall be strictly adhered to:

Retain cleaning water for water based materials to allow sediments to be filtered out. In no case shall equipment be cleaned using free draining water.

Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

Return solvent and oil-soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.

Empty paint cans are to be dry prior to disposal or recycling (where available).

Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire safe area at moderate temperature.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver painting materials in sealed, original labeled containers bearing manufacturer's name, brand name, type of paint or coating and color designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.
				2. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

Maintain containers in clean condition, free of foreign materials and residue.

Remove rags and waste from storage areas daily.

* + - * 1. Where toxic and/or volatile / explosive / flammable materials are being used, provide adequate fireproof storage lockers and take necessary precautions and post adequate warnings (e.g. no smoking) as required.
				2. Take necessary precautionary and safety measures to prevent fire hazards and spontaneous combustion and to protect the environment from hazard spills. Materials that constitute a fire hazard (paints, solvents, drop clothes, etc.) to be stored in suitable closed and rated containers or removed from the site on a daily basis.
				3. Comply with requirements of authorities having jurisdiction, in regard to the use, handling, storage and disposal of hazardous materials.

If necessary, insert special requirements for fire protection, heating, ventilation, and other conditions for storage areas on-site.

* + - 1. FIELD CONDITIONS

Some manufacturers' products may require higher temperatures for proper curing. Consult manufacturers and revise first paragraph below to suit requirements for specific products if necessary.

* + - * 1. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 50 and 104 deg F.
				2. Do not apply coatings when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
				3. Do not apply exterior coatings in snow, rain, fog, or mist.
				4. Perform no painting work unless a minimum lighting level of 323 Lux (30-foot candles) is provided on surfaces to be repainted.
				5. Apply paint only to dry, clean, and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.
1. PRODUCTS

Manufacturers and products listed in SpecAgent and Masterworks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. HIGH-TEMPERATURE-RESISTANT COATINGS, GENERAL
				1. MPI Standards: Provide products complying with MPI standards indicated and listed in its "MPI Approved Products List."

Generally, retain "Material Compatibility" paragraph below.

* + - * 1. Material Compatibility:

Systems could fail if paints used for individual coats are incompatible. MPI's paint systems match primers and topcoats and take compatibility into consideration.

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.

For each coat in a paint system, provide products recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

* + - * 1. Colors: [**As selected by Director’s Representative from manufacturer's full range**] [**Match Director’s Representative's samples**] [**As indicated in a color schedule**].

[**10**] [**20**] [**30**] percent of surface area will be painted with deep tones.

* + - * 1. Mechanical, Electrical, and Plumbing Components Colors: Provide paint colors shown on contract drawings or to be selected by the Director from finish paint manufacturers available color selections.

Approved finish paint manufacturers to match designated colors of other manufacturers where colors are shown on contract documents.

Safety Colors: Industry Standard ANSI Safety Colors.

Fire Protection Systems: Paint exposed piping, and handles of valves serving the system as specified below:

Sprinkler Systems: Red piping, and green valve handles.

Standpipe Systems: Red piping, and red valve handles.

Combination Sprinkler/Standpipe Systems: Red piping, and yellow valve handles.

Do not paint equipment with factory finish paint.

Color Coding: Apply exposed insulated and uninsulated piping finish paints in the following colors when piping is located in the following applicable rooms or spaces:

Applicable Rooms and Spaces: Mechanical Equipment Rooms, Steam Service Rooms, Refrigeration Machine Rooms, Boiler Rooms, Penthouse Mechanical Equipment Rooms and Power Houses.

Color code as follows:

Air, Compressed: Safety Green.

Air, Control: Safety Green.

Air, Medical: Safety yellow.

Ammonia, Gas and Liquid: Safety Yellow.

Brine: Safety Green.

Carbon Dioxide: Safety Red.

Dangerous Materials: Safety Yellow.

Engine Exhausts: Safety Yellow.

Flue Gases: Safety Yellow.

Gas, Natural and Manufactured: Safety Yellow.

Gasoline: Safety Yellow.

Glycol and Glycol/Water Mixtures: Safety Yellow.

Nitrous Oxide: Safety Blue.

Oils, Fuel and Lubrications: Safety Yellow.

Oxygen: Safety Green.

Pneumatic Tube System s: Safety Green.

Refrigerants: Safety Yellow.

Sewers, Storm and Sanitary: Safety Yellow.

Steam; Supply, Condensate Return and Exhaust: Safety Yellow.

Vacuum: Safety Green.

Vent, Atmospheric: Safety Green.

Water, Up to 140 Degrees Fahrenheit: Safety Green.

Water, 141 Degrees and Above: Safety Yellow.

Other Colors:

Exposed Ductwork: Gray.

Insulated and Uninsulated Equipment: Gray.

* + - 1. MANUFACTURERS
				1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=11177) Subject to compliance with requirements, provide products by the following:

[Benjamin Moore & Co](http://www.specagent.com/Lookup?uid=123457118128).

Cloverdale.

PPG Architectural.

Sherwin-Williams.

Or equal.

Retain "Products" paragraph below and insert lists of manufacturers and products in High-Temperature-Resistant Coating Schedule to require specific products or a comparable product from other manufacturers.

See lists of products currently approved by MPI in its "MPI Approved Products Lists." See "Writing Guide" Article in the Evaluations for further discussion.

* + - * 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to products listed in High-Temperature-Resistant Coating Schedule for the category indicated.
			1. HIGH-TEMPERATURE-RESISTANT COATINGS, GENERAL
				1. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
				2. Material Compatibility:

Systems could fail if coatings are incompatible. MPI's coating systems match primers and topcoats, taking compatibility into consideration.

Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.

For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.

If retaining subparagraph below, coordinate products retained, if any, in other Part 2 articles, to ensure that one manufacturer can provide products for an entire system.

Products shall be of same manufacturer for each coat in a coating system.

Color selection is often limited because some coating materials yellow or degrade under some environmental conditions.

* + - * 1. Colors: [**As selected by Director’s Representative from manufacturer's full range**] [**Match Director’s Representative's samples**] <**Insert requirements**>.
			1. SOURCE QUALITY CONTROL

Retain this article for large projects or critical coatings where additional control is desired. Delete if tests are not required.

* + - * 1. Testing of Coating Materials: The Director’s Representative reserves the right to invoke the following procedure:

The Director’s Representative will engage the services of a qualified testing agency to sample coating materials. Contractor will be notified in advance and may be present when samples are taken. If coating materials have already been delivered to Project site, samples may be taken at Project site. Samples will be identified, sealed, and certified by testing agency.

Testing agency will perform tests for compliance with product requirements.

The Director’s Representative may direct Contractor to stop applying coatings if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates and conditions, with Applicator present, for compliance with requirements and other conditions affecting performance of the Work.
				2. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers.
				3. Proceed with coating application only after unsatisfactory conditions have been corrected.

Application of coating indicates acceptance of surfaces and conditions.

* + - 1. PREPARATION

For renovation projects, consult "MPI Maintenance Repainting Manual" and revise first paragraph below and coating systems specified in High-Temperature-Resistant Coating Schedule.

* + - * 1. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and coating systems indicated.
				2. Remove hardware, covers, plates, and similar items already in place that are removable and 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.

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

* + - * 1. Clean substrates of substances that could impair bond of coatings, including dust, dirt, oil, grease, and incompatible paints and encapsulants.

Coordination of shop-applied prime coats with high-temperature-resistant coatings is critical.

Remove incompatible primers and reprime substrate with compatible primers or apply tie coat as required to produce coating systems indicated.

Retain "Steel Substrates" paragraph below if steel is not shop primed or if shop primer is removed in the field.

* + - * 1. Steel Substrates: Remove rust, loose mill scale, and shop primer if any. Clean using methods recommended in writing by paint manufacturer[**.**][**but not less than the following:**]

SSPC-SP 11 requires complete removal of rust, mill scale, and paint by power tools. SSPC-SP 11 uses nonabrasive methods but is not as thorough as that required by SSPC-SP 6/NACE No. 3, SSPC-SP 10/NACE No. 2, and SSPC-SP 5/NACE No. 1.

SSPC-SP 11.

SSPC-SP 6/NACE No. 3 requires that two-thirds of surface area be free of visible residue.

SSPC-SP 6/NACE No. 3.

SSPC-SP 10/NACE No. 2 requires that 95 percent of surface area be free of visible residue.

SSPC-SP 10/NACE No. 2.

SSPC-SP 5/NACE No. 1 removes visible rust, mill scale, paint, and foreign matter.

SSPC-SP 5/NACE No. 1.

Retain "Shop-Primed Steel Substrates" paragraph below if primers are shop applied and are not removed in the field.

* + - * 1. Shop-Primed Steel Substrates: Clean field welds, bolted connections, and abraded areas of shop paint. Paint exposed areas with the same material as used for shop priming to comply with SSPC-PA 1 for touching up shop-primed surfaces.
			1. APPLICATION
				1. Apply high-temperature-resistant coating systems according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual."

Indicate substrates to receive high-temperature-resistant coatings in High-Temperature-Resistant Coating Schedule or on Drawings.

Use applicators and techniques suited for coating and substrate indicated.

Coat surfaces behind movable items same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed items with prime coat only.

Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

Do not apply coatings over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.

* + - * 1. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.
				2. Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections.
			1. FIELD QUALITY CONTROL
				1. Dry Film Thickness Testing: The State may engage the services of a qualified testing and inspecting agency to inspect and test coatings for dry film thickness.

Contractor shall touch up and restore coated surfaces damaged by testing.

If test results show that dry film thickness of applied coating does not comply with coating manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with coating manufacturer's written recommendations.

* + - 1. CLEANING AND PROTECTION
				1. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.
				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. Protect work of other trades against damage from coating operation. Correct damage to work of other trades by cleaning, repairing, replacing, and recoating, as approved by Director’s Representative, and leave in an undamaged condition.
				4. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.
			2. HIGH-TEMPERATURE-RESISTANT COATING SCHEDULE

Coating systems in this article are based on "MPI Architectural Painting Specification Manual." For renovation projects, consult "MPI Maintenance Repainting Manual" and revise coating systems accordingly.

"Heat-Resistant Enamel System" paragraph below relies on manufacturer's recommendations for surface preparation and component coats for a Premium Grade system and does not include a Budget Grade system. It is suitable for use on surfaces that reach a maximum temperature of 400 deg F.

* + - * 1. Type HR-1: Heat-Resistant Enamel System [**MPI EXT 5.2A**] [**and**] [**MPI INT 5.2A**]:

Prime Coat: Primer recommended in writing for use in coating system and under conditions indicated by manufacturer of topcoat.

Top Coat(s): Enamel, heat resistant (MPI Gloss Level 5 or 6), MPI #21.

Cloverdale Paint: ClovaTherm Heat Resistant Silicone Acrylic Enamel.

PPG Architectural: Protective and Marine Sigmatherm 230.

Sherwin-Williams: Epo-Phen FF.

Provide number of topcoats recommended in writing for use in coating system and under conditions indicated by manufacturer but not less than two.

"Inorganic Zinc-Rich Coating System" paragraph below relies on manufacturer's recommendations for surface preparation and component coats for a Premium Grade system and does not include a Budget Grade system. It is suitable for use on surfaces that reach a maximum temperature of 750 deg F.

* + - * 1. Type HRZ-2: Inorganic Zinc-Rich Coating System [**MPI EXT 5.2C**] [**and**] [**MPI INT 5.2C**]:

Prime Coat: Primer, zinc rich, inorganic, matching topcoat.

Top Coat(s): Primer, zinc rich, inorganic, MPI #19.

Cloverdale Paint: ClovaZinc 2 Inorganic Zinc Rich Primer.

PPG Architectural: Protective and Marine Americote D9 .

Sherwin-Williams: Protective & Marine Zinc Clad XI.

Provide number of topcoats recommended in writing for use in coating system and under conditions indicated by manufacturer but not less than two.

"Heat-Resistant Aluminum Enamel System" paragraph below relies on manufacturer's recommendations for surface preparation and component coats for a Premium Grade system and does not include a Budget Grade system. It is suitable for use on surfaces that reach a maximum temperature of 800 deg F.

* + - * 1. Type HR-2: Heat-Resistant Aluminum Enamel System [**MPI EXT 5.2B**] [**and**] [**MPI INT 5.2B**]:

Prime Coat: Primer recommended in writing for use in coating system and under conditions indicated by manufacturer of topcoat.

Top Coat(s): Aluminum paint, enamel, heat resistant, MPI #2.

Benjamin Moore: Corotech Silicone Alkyd High-Heat Coating.

PPG Architectural: Protective & Marine PPG Hi-Temp 1000 Aluminum.

Sherwin-Williams: Protective & Marine Heat-Flex Hi-Temp 1000.

Provide number of topcoats recommended in writing for use in coating system and under conditions indicated by manufacturer but not less than two.

"High-Heat-Resistant Coating System" paragraph below relies on manufacturer's recommendations for surface preparation and component coats for a Premium Grade system and does not include a Budget Grade system. It is suitable for use on surfaces that reach a maximum temperature of 1100 deg F.

* + - * 1. Type HR-3: High-Heat-Resistant Coating System [**MPI EXT 5.2D**] [**and**] [**MPI INT 5.2D**]:

Prime Coat: Primer recommended in writing for use in coating system and under conditions indicated by manufacturer of topcoat.

Top Coat(s): Aluminum paint, high heat, MPI #22.

Cloverdale Paint: ClovaTherm Hi Heat Resistant Silicone.

PPG Architectural: Protective & Marine PPG Hi-Temp 1000 Aluminum.

Sherwin-Williams: Protective & Marine Heat-Flex Hi-Temp Aluminum.

Provide number of topcoats recommended in writing for use in coating system and under conditions indicated by manufacturer but not less than two.

END OF SECTION 099633