

SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Under this Section, the Contractor shall furnish all labor, materials and equipment for Painting as shown on the Drawings, as specified and/or directed.

1.02 REFERENCES

- A. The publications listed below and their latest revisions form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only.
 - 1. Code of Federal Regulations (CFR) Publications:
 - a. 29 1910.1000 - Occupational Safety and Health Standards
 - b. 29 1910.1025 - Occupational Safety and Health Standards (Lead)
 - 2. Federal Standard (FED-STD):
 - a. 313 - Material Safety Data Sheets Preparation and Submission of
 - 3. Society for Protective Coatings (SSPC) Publications:
 - a. Paint-1 - Shop, Field, and Maintenance Painting
 - b. Paint-3 - A Guide to Safety in Paint Application
 - c. Paint-20 - Zinc-Rich Coatings Inorganic and Organic
 - d. SP 1 - Solvent Cleaning
 - e. SP 2 - Hand Tool Cleaning
 - f. SP 3 - Power Tool Cleaning
 - g. SP 6 - Commercial Blast Cleaning
 - h. SP 7 - Brush-Off Blast Cleaning
 - i. SP 10 - Near-White Metal Blast Cleaning
 - j. VIS1 - Guide and Reference Photographs for Steel Surfaces
Prepared by Dry Abrasive Blast Cleaning

1.03 SUBMITTALS

- A. Submit the following based on the Coating Manufacturer's review of the project conditions.
 - 1. Manufacturer's Instructions:
 - a. Paint application instructions
 - b. Manufacturer's material safety data sheets
 - 1) Submit Manufacturer's material safety data sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.

1.04 REGULATORY REQUIREMENTS

- A. Lead Content: Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.
- B. Chromate Content: Do not use coatings containing zinc-chromate or strontium-chromate.
- C. Asbestos Content: Materials shall not contain asbestos.

1.05 DELIVERY AND STORAGE

- A. Deliver materials in sealed, labeled containers bearing the manufacturer's name, brand designation, specification number, batch number, color, and date of manufacture. Restrict storage and mixing of materials to locations designated by the Engineer.

1.06 SAFETY METHODS

- A. Apply coating materials using safety methods and equipment in accordance with the following:
- B. Safety Methods Used During Coating Application: Comply with the requirements of SSPC Paint-3.
- C. Toxic Materials: To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:
 - 1. The chemical manufacturer when using mineral spirits, or other chemicals. Use impermeable gloves, chemical goggles or face shield, and other recommended protective clothing and equipment to avoid exposure of skin, eyes, and respiratory system. Conduct work in a manner to minimize exposure of building occupants and the general public.
 - 2. The appropriate OSHA standard in 29 CFR 1910.1025 for surface preparation on painted surfaces containing lead, zinc-chromate, strontium-chromate, asbestos, or other toxic ingredients.
 - 3. 29 CFR 1910.1000.
 - 4. Threshold Limit Values (R) of the American Conference of Governmental Industrial Hygienists.
 - 5. Manufacturer's Material Safety Data Sheets (MSDS).

1.07 ENVIRONMENTAL CONDITIONS

- A. Exterior Coatings: Do not apply coating to surfaces during foggy or rainy weather, or under the following surface temperature conditions:
 - 1. Less than 5 degrees F above the dew point;
 - 2. Below 40 degrees F (for oil-based paints), 50 degrees F (for latex paints), or over 95 degrees F, unless approved by the Engineer.

- B. Interior Coatings: Apply coatings when surfaces to be painted are dry and the following surface temperatures can be maintained:
 - 1. Between 65 and 95 degrees F during the application of enamels and varnishes;
 - 2. Between 50 and 95 degrees F during the application of other coatings.

1.08 COLOR SELECTION

- A. Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Owner.

1.09 LOCATION AND SURFACE TYPE TO BE PAINTED

- A. Painting Included: Where a space or surface is indicated to be painted, include the following unless indicated otherwise.
 - 1. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.
 - 2. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.
 - 3. Existing coated surfaces that are damaged during performance of the work.
- B. Painting Excluded: Do not paint the following unless indicated otherwise.
 - 1. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.
 - 2. Surfaces in concealed spaces. Concealed spaces are defined as spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, and chases.
 - 3. Steel to be embedded in concrete.
 - 4. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.
- C. Exterior Painting: Includes new surfaces, existing coated surfaces, and existing uncoated surfaces, of the building items and appurtenances. Also included are existing coated surfaces made bare by cleaning operations.
- D. Interior Painting: Includes new surfaces, existing uncoated surfaces, and existing coated surfaces of the building and appurtenances as indicated and existing coated surfaces made bare by cleaning operations. Where a space or surface is indicated to be painted, include the following items, unless indicated otherwise.
- E. Mechanical and Electrical Painting: Includes field coating of interior and exterior new and existing surfaces.

1. Where a space or surface is indicated to be painted, include the following items unless indicated otherwise.
 - a. Exposed piping, conduit, and ductwork;
 - b. Supports, hangers, air grilles, and registers;
 - c. Miscellaneous metal work and insulation coverings.
2. Do not paint the following, unless indicated otherwise:
 - a. Zinc-coated, aluminum, and copper surfaces under insulation;
 - b. Aluminum or plastic jacket on piping.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS OF PAINT MATERIALS:

- A. Products shall comply with MPI standards indicated and shall be listed in the "MPI Approved Product List."

2.02 MATERIALS

- A. Provide as far as practical, pretreatments, primers and top coats from one coating manufacturer. Coatings shall be applied as a complete system and must be compatible with the substrate and each coating component. Coating systems shall be the manufacturer's industrial or commercial systems and are specified by generic type only. Residential coating systems shall not be permitted.
- B. See painting schedule at the end of this Section.
- C. Provide brands and qualities of materials for use on work exactly as specified, or an approved equal.
- D. Coordination: Provide finish coats which are compatible with prime paints used. Provide barrier coats over incompatible primers where required. Submit written notification of anticipated problems using specified coatings with substrates primed by others.
- E. Paint Colors:
 1. Provide colors as indicated or selected by Owner.
 2. Paint area of each color for observation, review and revisions before batch mixing of colors, or shipping large quantities of that color to job. Allow revisions to approved colors and textures after review of initial area of each color.
 - a. Vary top coats in shade from preceding coat without affecting finish color.
- F. Mixing and Tinting:

1. Job mix or job tint only if approved. Mix only in pails in suitably sized non-ferrous or oxide-resistant metal pans.
2. Strain to remove lumps and specks.
3. Use tinting colors recommended by manufacturer for the specific type of finish.
4. Add non-mercuric fungicidal agent to exterior finishes by manufacturer.

PART 3 - EXECUTION

3.01 PROTECTION OF AREAS AND SPACES

- A. Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.
1. All switch and receptacle covers shall be removed and masked before painting.
 2. All posted signs and pictures shall be removed from the wall and shall be placed back on the walls after painting.
 3. All floor areas, including stair treads, shall be completely covered to protect them from damage and paint droppings.

3.02 SURFACE PREPARATION

- A. Remove dirt, splinters, loose particles, grease, oil, disintegrated coatings, and other substances deleterious to coating performance as specified for each substrate.
- B. Existing Coating Surfaces With No Defects: Before application of coatings, perform the following on surfaces covered by soundly-adhered coatings, defined as those which cannot be removed with a putty knife:
1. Wipe previously painted surfaces to receive solvent-based coatings, except stucco and similarly rough surfaces clean with a clean, dry cloth saturated with mineral spirits, FS TT-T-291. Allow surface to dry. Wiping shall immediately precede the application of the first coat of any coating, unless specified otherwise.
 2. Sand existing enamel and other glossy surfaces to remove gloss. Brush and wipe clean with a dry cloth.
 3. The requirements specified are minimum. Comply also with the instructions and recommendations of the paint manufacturer for preparation and application.

- C. Existing Coated Surfaces with Minor Defects: Sand, spackle, and treat minor defects to render them smooth. Minor defects are defined as scratches, nicks, cracks, gouges, spalls, alligating, chalking, and irregularities due to partial peeling of previous coatings.
- D. Removal of Existing Coatings: Remove existing coatings from the following surfaces:
 - 1. Surfaces containing large areas of minor defects;
 - 2. Surfaces containing more than 20 percent peeling area; and
 - 3. Surfaces designated by the Engineer, such as surfaces where rust shows through existing coatings.
- E. Substrate Repair:
 - 1. Repair substrate surface damaged during coating removal;
 - 2. Sand edges of adjacent soundly-adhered existing coatings so they are tapered as smooth as practical to areas involved with coating removal; and
 - 3. Clean and prime the substrate as specified.

3.03 PREPARATION OF METAL SURFACES

- A. Existing and New Ferrous Surfaces:
 - 1. Shop-coated Surfaces and Small Areas That Contain Rust, Mill Scale and Other Foreign Substances: Solvent clean in accordance with SSPC SP 1 to remove oil and grease. Where shop coat is missing or damaged, clean according to SSPC SP 2 or SSPC SP 3.
 - 2. Surfaces With More Than 20 Percent Rust, Mill Scale, and Other Foreign Substances: Clean entire surface in accordance with SSPC SP 6.
 - 3. Galvanized steel shall be prepared for painting in accordance with ASTM D6386.
 - 4. Immersed Surfaces to Receive a Coating: Clean in accordance with SSPC SP 10.
- B. Final Ferrous Surface Condition: Cleaned surface shall be similar to photographs in SSPC VIS1 as follows:

DEGREE OF CLEANING	ADHERENT MILL SCALE	RUSTING MILL SCALE	RUSTED	PITTED AND RUSTED
Hand Tool Cleaning SSPC SP 2	(1)	B St 2	C St 2	D St 2
Power Tool Cleaning SSPC SP 3	(1)	B St 3	C St 3	D St 3
Commercial Blast Cleaning SSPC SP 6	(1)	(1)	C Sa 2	D Sa 2

DEGREE OF CLEANING	ADHERENT MILL SCALE	RUSTING MILL SCALE	RUSTED	PITTED AND RUSTED
Brush-Off Blast Cleaning SSPC SP 7	(1)	B Sa 1	C Sa 1	D Sa 1
Near White Blast Cleaning SSPC SP 10	A Sa 2-1/2	B Sa 2-1/2	C Sa 2-1/2	D Sa 2-1/2
Note: (1) No photograph is available or recommended for comparison.				

3.04 PREPARATION OF CONCRETE AND CEMENTITIOUS SURFACE

A. Concrete and Masonry:

1. Surface Cleaning: Remove the following deleterious substances.
 - a. Dirt, Chalking, Grease, and Oil: Wash new [and existing uncoated] surfaces with a solution composed of 3 ounces (2/3 cup) trisodium phosphate, 1 ounce (1/3 cup) household detergent, and 3 quarts of warm water. Then rinse thoroughly with fresh water. Wash existing coated surfaces with a suitable detergent and rinse thoroughly. For large areas, water blasting may be used.
 - b. Fungus and Mold: Wash existing coated and existing uncoated surfaces with a solution composed of 3 ounces (2/3 cup) trisodium phosphate, 1 ounce (1/3 cup) household detergent, 1 quart 5 percent sodium hypochlorite solution and 3 quarts of warm water. Rinse thoroughly with fresh water.
 - c. Glaze and Loose Particles: Remove by wire brushing.
 - d. Efflorescence: Remove by scraping or wire brushing followed by washing with a 5- to 10-percent by weight aqueous solution of hydrochloric (muriatic) acid. Do not allow acid to remain on the surface for more than five minutes before rinsing with fresh water. Do not acid clean more than 4 square feet of surface, per workman, at one time.
 - e. Removal of Existing Coatings: For surfaces to receive textured coating FS TT-C-555, remove existing coatings including soundly adhered coatings if recommended by textured coating manufacturer.
 - 1) Cosmetic Repair of Minor Defects: Repair or fill mortar joints and minor defects, including but not limited to spalls, in accordance with manufacturer's recommendations and prior to coating application.

B. Gypsum Board:

1. Surface Cleaning: Gypsum board shall be dry. Remove loose dirt and dust by brushing with a soft brush or rubbing with a dry cloth prior to application of the first coat material.

2. Repair of Minor Defects: Prior to painting, repair joints, cracks, holes, surface irregularities, and other minor defects with spackling compound and sand smooth.

3.05 PREPARATION OF WOOD AND PLYWOOD SURFACE

- A. New , Existing Uncoated, and Existing Coated Surfaces, Except Floors:
 1. Surface Cleaning: Surfaces shall be free from dust and other deleterious substances and in a condition approved by the Engineer prior to receiving paint or other finish. Do not use water to clean uncoated wood. Scrape to remove loose coatings. Lightly sand to roughen the entire area of previously enamel-coated wood surfaces.
 2. Removal of Fungus and Mold: Wash existing coated surfaces with a solution composed of 3 ounces (2/3 cup) trisodium phosphate, 1 ounce (1/3 cup) household detergent, 1 quart 5 percent sodium hypochlorite solution and 3 quarts of warm water. Rinse thoroughly with fresh water.
 3. Cosmetic Repair of Minor Defects:
 - a. Knots and Resinous Wood and Fire, Smoke, Water, and Color Marker Stained Existing Coated Surface: Prior to application of paint, treat with an application of commercially available knot sealer.
 - b. Open Joints and Other Openings: Fill with whiting putty. Sand smooth after putty has dried.
 - c. Checking: Where checking of the wood is present, sand the surface, wipe and apply a coat of pigmented orange shellac. Allow to dry before paint is applied.
 4. Prime Coat For New Exterior Surfaces: Prime coat before wood becomes dirty, warped, or weathered.
 5. Cracks and Nailheads: Set and putty stop nailheads and putty cracks after the prime coat has dried.

3.06 APPLICATION

- A. Coating Application: Apply coating materials in accordance with SSPC Paint-1. SSPC Paint-1 methods are applicable to all substrates, except as modified herein. Thoroughly work coating materials into joints, crevices, and open spaces. Touch up damaged coatings before applying subsequent coats. Interior areas shall be broom clean and dust free before and during the application of coating material.
 1. Drying Time: Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying. Provide each coat in specified condition to receive the next coat.
 2. Primers, and Intermediate Coats: Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by the manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover the surface of the preceding

coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.

3. Finished Surfaces: Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

B. Equipment: Apply coatings with approved brushes, approved rollers, or approved spray equipment, unless specified otherwise. Spray areas made inaccessible to brushing by items such as ducts and other equipment.

C. Thinning of Paints: Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory for the type of paint being used. Obtain written permission from the Engineer to use thinners. The written permission shall include quantities and types of thinners to use.

D. Coating Systems:

1. Systems by Substrates: Apply coatings that conform to the respective specifications listed in the following Tables:

Table

I	Exterior Metal Surfaces
II	Interior Metal Surfaces
III	Exterior Concrete Surfaces
IV	Interior Concrete Surfaces
V	Exterior Masonry Surfaces
VI	Interior Masonry Surfaces
VII	Interior Gypsum Wallboard Surfaces
VIII	Exterior and Interior Wood Surfaces

2. Minimum Dry Film Thickness (DFT): Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.

3. Coatings for Surfaces Not Specified Otherwise: Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.

4. Existing Surfaces Damaged During Performance of the Work, Including New Patches In Existing Surfaces: Coat surfaces with the following:

- a. One coat of primer.
- b. One coat of undercoat or intermediate coat.
- c. One top coat to match adjacent surfaces.

5. Existing Coated Surfaces To Be Painted: Apply coatings conforming to the respective specifications listed in the Tables herein, except that pretreatments, sealers, fillers, and primers need not be provided on surfaces where existing coatings are soundly adhered and in good condition.

3.07 COATING SYSTEMS FOR METAL

- A. Primer: Apply specified ferrous metal primer on the same day that surface is cleaned. If flash rusting occurs, re-clean the surface prior to application of primer.
1. Inaccessible Surfaces: Prior to erection, use two coats of the specified primer on metal surfaces that will be inaccessible after erection.
 2. Shop-primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.
 3. Pipes and Tubing: The semitransparent film applied to pipes and tubing at the mill is not to be considered a shop coat. Apply specified ferrous metal primer prior to application of subsequent coats.
 4. Exposed Nails, Screws, Fasteners, and Miscellaneous Ferrous Surfaces: On surfaces to be coated with water thinned coatings, spot prime exposed nails and other ferrous metal with latex primer.
 - a. Apply coatings of Tables I and II. "DFT" means dry film thickness in mils.

3.08 COATING SYSTEMS FOR WOOD AND PLYWOOD

- A. Apply coatings of Tables VII and VIII.
- B. Prior to erection, apply two coats of the specified primer to treat and prime wood and plywood surfaces which will be inaccessible after erection.

3.09 INSPECTION AND ACCEPTANCE

- A. In addition to meeting the previously specified requirements, demonstrate the mobility of moving components, including but not limited to swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Engineer. Perform this demonstration after appropriate curing and drying times of the coatings have elapsed and prior to invoicing for final payment.

TABLE I EXTERIOR METAL SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	SSPC SP 6	Epoxy-Polyamide	4.0	Aliphatic Polyester Polyurethane	1.5	-	-
Mild	SSPC SP 6	Alkyd-Phenolic Primer	2.0	Alkyd	1.5	Alkyd	1.5
TABLE II INTERIOR METAL SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	SSPC SP 6	Epoxy-Polyamide Primer	3.0	Epoxy-Polyamide	4.0	-	-
Mild	SSPC SP 6	Alkyd-Phenolic Primer	2.0	Alkyd	1.5	Alkyd	1.5
Immersion	SSPC SP 10	Coal-Tar Epoxy	14.0	-	-	-	-

TABLE III EXTERIOR CONCRETE SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	Clean and Dry	Modified Epoxy	8.0	-	-	-	-
Mild	Clean and Dry	Emulsified Acrylic	2.0	Emulsified Acrylic	2.0	-	-

TABLE IV INTERIOR CONCRETE SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	Brush Blast	Epoxy-Polyamide Water-Borne	4.0	Epoxy-Polyamide Water-Borne	4.0	-	-
Moderate	Brush Blast	Acrylic-Epoxy	2.0	Acrylic-Epoxy	2.0	--	-
Mild	Clean and Dry	Emulsified Acrylic	2.0	Emulsified Acrylic	2.0	-	-
Concrete Floors	Acid Etch or Brush Blast	Epoxy-Polyamide (skid resistant)	2.0	Epoxy-Polyamide	2.0	-	-

TABLE V EXTERIOR MASONRY SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
All	Clean and Dry	Modified Epoxy	60 sf/gal	Modified Epoxy	8.0	-	-

TABLE VI INTERIOR MASONRY SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	Clean and Dry	Epoxy-Polyamide Filler	75 sf/gal	Epoxy-Polyamide	4.0	Epoxy-Polyamide	4.0
Mild	Clean and Dry	Modified Epoxy Filler	60 sf/gal	Emulsified Acrylic	2.0	Emulsified Acrylic	2.0

TABLE VII INTERIOR GYPSUM WALL BOARD SURFACES							
CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
Severe	Clean and Dry	Vinyl-Acrylic Latex Sealer	1.0	Epoxy-Polyamide	4.0	Epoxy-Polyamide	4.0
Moderate	Clean and Dry	Vinyl-Acrylic Latex Sealer	1.0	Water-Borne Acrylic-Epoxy	2.0	Water-Borne Acrylic-Epoxy	2.0
Mild	Clean and Dry	Emulsified-Acrylic	2.0	Emulsified-Acrylic	2.0	-	-

TABLE VIII
EXTERIOR AND INTERIOR WOOD SURFACES

CONDITION	PREPARATION	FIRST COAT	DFT	SECOND COAT	DFT	THIRD COAT	DFT
All	Clean and Dry	Alkyd Primer	2.0	Alkyd	1.5	Alkyd	1.5

END OF SECTION