DIVISION 9

FINISHES

SECTION 09900

PAINTING

PART 1 - GENERAL

1.1 Description

A. This Section covers field painting, including surface preparation, finish coats, priming, piping identification, protection of surfaces and related work.

1. Surfaces shall have at least three coats of paint including primer, at conclusion of field painting, unless otherwise specified.

2. Apply at least two field coats of paint to all surfaces, regardless of number of paint coats previously applied.

3. Apply number of coats required to obtain minimum dry film thicknesses specified.

1.2 Quality Assurance

A. Reference to Federal or Military Specifications.

1. Reference defines only general type and quality.

2. Not intended to limit acceptable materials to an exact formulation.

B. First field coat over shop painted or previously painted surfaces shall cause no wrinkling, lifting, or other damage to underlying paint.

C. Apply paint compatible with underlying coats as recommended by paint manufacturer.

D. Do not add adulterant, thinner, or other material not included in the paint formulation.

E. Consistency and Viscosity.

1. Factory mix paint to proper consistency and viscosity for hot weather application without thinning.

2. Thin paint only as necessary to obtain recommended coverage at lower application temperatures.

3. Do not reduce wet film thickness of applied paint by addition of paint thinner, or for any other reason, below recommended coverage rate.

F. Paint used for intermediate and finish coats shall be guaranteed by paint manufacturer to be:

1. Mercury-free and fumeproof.

2. Suitable for water and wastewater treatment plant application and USEPA approved.

3. Do not use paint that is not mercury-free and fumeproof.

4. Use lead-free paints if available.

5. Do not use paints with lead content that cause discoloration.

1.3 Submittals

A. Product and Color Selection.

1. Submit color cards for paints and colors proposed to be used for all surfaces, pipe and equipment covered in this section.

B. Submit complete descriptive specifications to Engineer for review.

1. Include guarantee required under Paragraph 1.2.-F.

1.4 Delivery, Storage, and Handling

A. Deliver paint to the job site in original unopened containers with labels intact, and include:

1. Manufacturer's name.

2. Type of paint.

3. Manufacturer's stock number.

4. Color.

5. Instructions for reducing, where applicable.

B. Store paint inside and do not allow to freeze.

1.5 Job Conditions

A. Weather.

1. Apply paint only when:

a. Surface and ambient temperatures are between 50°F and 90°F when using a water-thinned coating; and between 45° and 95°F for other types of coatings.

b. The temperature is expected to stay above freezing in the period that the coating is to dry.

c. Metal temperature and atmospheric conditions will not cause condensation on surface of metal.

B. Protection.

1. Use drop cloths, tape, or other effective methods to protect surfaces from spraying, spattering, or spilling of paint.

2. Remove paint deposited on surfaces which are not being painted at that time.

3. Surface clean and spot paint with aluminum paint surfaces, except metals, when bituminous paints are spilled or dropped on them. Cover with specified paints.

4. Exposed concrete or masonry not specified to be painted which is damaged by paint shall be:

a. Removed and rebuilt, or

b. Painted in entirety with two coats of masonry paint, if authorized by Owner.

C. Contractor is responsible for:

1. Paint applied during wet, damp, or foggy weather or when windblown dust, dirt, debris, or insects will collect on freshly applied paint.

2. Damage to painted surfaces prior to acceptance by Owner.

PART 2 – PRODUCTS

2.1 Materials

A. Paints selected for each type surface shall be the system of a single manufacturer.

B. Apply a tie-coat between primer and finish coats, if recommended by manufacturer.

2.2 Metal Surfaces

A. Alkyd Enamel, Gloss.

1. Location Schedule.

a. All surfaces of structural and miscellaneous steel exposed in exterior locations.

b. All exposed surfaces of steel doors, door frames, gravelstops, cap flashing and metal cabinet enclosures.

c. Metal curbs for power roof ventilators.

2. Alkyd Enamel, Gloss System; F.S. TT-E-489, Cl. A.
Surface Prep: SSPC-SP6, Commercial Blast.

a. Use a vinyl wash primer as a pretreatment on all galvanized steel, aluminum, copper, and stainless steel to be painted, no other primer required. Use a tie-coat if manufacturer recommends.

1) Ameron, Amercoat 1788 Vinyl Wash Primer.

2) Cook, 900-G-002 Vinyl Wash Primer.

3) Koppers, 801 Wash Coat.

4) Mobil, 13-Y-8 Vinyl Wash Primer.

5) Tnemec, 32-1210 Vinoline Wash Primer.

6) Or equal.

b. Primer for all other surfaces.

1) Ameron, Amercoat 185 Universal Primer.

2) Cook, Barrier Coat, No. 142.

3) Koppers, Pug Primer (for nonpotable).

4) Koppers, No. 10 Inhibitive Primer (for potable systems).

5) Mobil, 13-R-50 Cromox, Q.D. Primer.

6) Porter, U-Prime 284.

7) Tnemec, 37-77 Chem-Prime.

8) Or equal.

c. Finish coats.

1) Ameron, Amercoat 5401.

2) Cook, Armorcote Gloss Enamel.

3) Koppers, Glamortex 501 Enamel.

4) Mobil, Series 12 Panorama Coatings.

5) Porter, IA24.

6) Tnemec, "Hi-Build Tneme-Gloss".

7) Or equal.

3. Minimum dry film thickness in mils.

Primer	2.0
Finish Coats	3.0
TOTAL	5.0

B. Epoxy-Polyamide, Enamel.

1. Location schedule.

a. All exposed surfaces of new cast/ductile iron and steel piping inside buildings including valves, fittings, flanges, bolts, supports, and accessories therefore, and including galvanized surfaces after proper priming. Additionally existing piping as designated on the plans.

b. All surfaces of structural and miscellaneous steel exposed inside UV building. (Galvanized surfaces are not to be painted.)

c. All exposed surfaces of electrical conduit inside UV building, including fittings, boxes, supports and accessories therefore, after proper priming.

d. Supports and miscellaneous metal for equipment which handle corrosive chemicals.

e. All pipe hangers specified for mechanical systems and all pipe hangers specified for process piping.

2. Epoxy Polyamide Enamel System.
Surface Prep: Immersion, SSPC-SP10, Near-White Blast; Non-immersion, SSPC-SP6, Commercial Blast.

a. Primer.

1) Ameron, Amercoat 71 Primer.

2) Cook, Epicon-A Inhibitive Primer.

3) Koppers, 654 Epoxy Primer.

4) Mobil, 89-W9 Hi-Build White.

5) Porter, MCR 4300 Primer.

6) Tnemec, 66-1211 Epoxoline Primer.

7) Or equal.

b. Finish coats.

1) Ameron, Amercoat 72 Polyamide Epoxy.

2) Cook, Epicon-R HB.

3) Koppers, 200 HB Epoxy.

4) Mobil, Epoxy Enamel 84 Series.

5) Porter, MCR 43.

6) Tnemec, Hi-Build Epoxoline Series 66.

7) Or equal.

3. Minimum dry film thickness in mils.

Primer:	2.0
Finish coats:	10.0
TOTAL	12.0

2.3 Concrete and Masonry Surfaces

A. Latex Emulsion, Acrylic

1. Location schedule.

a. All concrete and concrete block surfaces (except floor surfaces and areas designated on Drawings or in Specifications to receive other finishes) which are exposed to view in interior building locations.

2. Latex Emulsion Acrylic System

a. Surface Prep: Follow manufacturer's recommendations.

b. Acrylic containing at least 36 percent by volume nonvolatile solids.

c. Primer (block filler): required for interior face of CMU Walls.

1) Ameron, Amercoat 209 Masonry Filler.

2) Cook, 826-W-304 Latex Block Filler.

3) Koppers, Concrete and Masonry Filler.

4) Mobil, 79-W-8 Latex Block Filler.

5) Porter, 895 Unifill.

6) Tnemec, 560 Block Filler (interior), 561 Modified Epoxy Masonry Filler (exterior).

7) Or equal.

d. Finish Coats.

1) Ameron, Amercoat 5801 Acrylic Latex.

2) Cook, 827 Series Sulfide Fume Resistant Paint.

3) Koppers, 600 Acrylic.

4) Mobil, 79 Series.

5) Porter, 16 Acrylic.

6) Tnemec, Tneme-Cryl.

7) Or equal.

3. Minimum dry film thickness in mils.

a. Primer: as per manufacturer's recommendations.

b. Finish Coats: 4.0.

2.4 Concrete Floors

A. Polyurethane Sealer and Dustproofer.

1. Location schedule.

a. All interior concrete floors.

2. Polyurethane Sealer and Dustproofer.

a. Surface preparations follow manufacturer's recommendations.

b. Finish Coats.

1) Euclid chemical company, Eucothane "O".

2) L & M Construction Chemicals, Dress and Seal

3) Sonneborn, Kure-N-Seal 800

4) Or equal.

c. Color: Transparent or clear.

3. Coverage: Per manufacturer's recommendations.

2.5 Surfaces not to be Painted

A. Location schedule.

1. Exposed surfaces of aluminum, except ductwork.

2. Polished or finished stainless steel. Unfinished stainless steel shall be painted.

3. Nickel or chromium.

4. Galvanized surfaces, except piping, conduit, ductwork, and other items specifically noted.

5. Piping concealed in inaccessible plumbing chases and above suspended ceilings.

6. Rubber and plastics, including fiberglass reinforced plastics.

7. Acoustical panel ceilings.

8. Surfaces specified to be factory finished.

2.7 Other Surfaces

A. Special coatings.

1. Exposed exterior concrete, reference Section 07160 - Damp-proofing.

B. Factory finished surfaces.

1. Touch up and repair damaged coating on pumps, motors, speed reducers, electrical control panels, lockers, casework and all other items furnished with finish factory coating.

2. Use same or similar paint used by equipment manufacturer.

PART 3 - EXECUTION

3.1 Surface Preparation

A. Surfaces to be painted shall:

1. Be dry, free of dirt, dust, sand, grit, mud, oil, grease, rust, loose mill scale, or other objectionable substances.

2. Meet strictest recommendations of paint manufacturer for surface preparation.

3. Be free of oil and grease by use of solvents or detergents before mechanical cleaning is started.

4. Be free of cracks, pits, projections, or other imperfections which would prevent formation of a smooth, unbroken paint film.

B. Perform cleaning and painting operations in a manner which will prevent dust or other contaminants from settling on freshly painted surfaces.

C. Remove gloss and dull the surface of previously painted surfaces for proper adhesion of top coats.

D. Touch-up paint and repair of previously painted surfaces.

1. Clean, sand or wire brush such surfaces in a manner that edges of adjacent paint are feathered or otherwise smoothed.

2. Touch-up and repair of painted surfaces shall not be noticeable when completed.

3. Completely remove paint made brittle or otherwise damaged by heat of welding and repair as stated above.

E. Pipe Surfaces.

1. All ductile iron pipe to receive a finish coating shall have surface prepared in accordance with SSPC-SP6.

2. All steel pipe to receive a finish coating shall have a dry surface and proper surface temperature per manufacturer's recommendations. Remove all grease, oil, dirt, rust, loose paint, loose mill scale and other loose detrimental foreign matter in accordance with SSPC-SP3.

3. Piping shall be painted in similar color scheme to existing plant piping.

F. Ferrous Metal Surfaces.

1. Scrape and wire brush weld surfaces to remove slag and weld spatter if not removed by specified surface preparation.

2. Do not use tools which produce excessive roughness.

3. Tightly adhering mill scale that cannot be lifted with a sharp knife, need not be removed.

G. Concrete Surfaces.

1. Remove dirt, dust, efflorescence, oil or grease stains, or other foreign substances, by wire or fiber brushing or scrubbing, scraping, or other appropriate methods.

2. Use a solvent or detergent to remove oil or grease, prior to mechanical cleaning.

H. Concrete Block Surfaces.

1. Point voids and openings.
2. All concrete block surfaces to be painted shall be filled so that a continuous unbroken paint film is obtained.

3.2 Field Priming

A. Surfaces of equipment, steel, and cast iron:

1. Prime surfaces which have not been shop primed.

2. Remove shop coatings which are damaged or have failed and field prime surfaces.

3.3 Piping Identification

A. Identify exposed interior and exterior piping with lettering or tags designating service of each piping system.

1. Provide flow directional arrows.

2. Completely paint with similar colors to existing piping with color coding, except surfaces specified to be unpainted shall have segments painted with specified coding color long enough to accommodate required lettering and arrows.

3. Paint existing piping to remain in place to match adjacent surfaces, unless otherwise designated by Engineer.

B. Lettering Location.

1. Provide lettering and flow direction arrows as follows:

a. Near equipment served.

b. Adjacent to valves.

c. Both sides of walls and floors where pipe passes through.

d. At each branch or tee.

e. At intervals of not more than 50 feet in run of pipe.

2. If, in the opinion of the Engineer, the foregoing requirements result in an excessive number of labels or arrows on a run of pipe, the number required may be reduced as directed in the field.

C. Metal Tags.

1. Tag and chain materials: aluminum or stainless steel.

2. Provide metal tags instead of lettering where the outside diameter of pipe or pipe covering is 5/8 inch or smaller.
3. Stamp-in or engrave identifying lettering on tags and fasten to the pipe with suitable chains.

4. Color code pipes even when metal tags are used.

D. Lettering.

1. Paint, stencil, or use snap-on markers on piping.

2. Snap-on markers.

   a. Plastic sleeve type

3. Letter size, as follows:

Outside Diameter of Pipe of Covering	Minimum Height of Letters
5/8 inch and smaller	Metal tags-1/4 inch
3/4 inch through 4 inch	3/4 inch
5 inch and larger	2 inches

E. Color Coding and Lettering Schedule.

1. Color code 12 inch and smaller piping for following services.

2. Paint electrical conduits to match adjacent ceiling or wall surfaces.

3. Paint vent lines to match surfaces they adjoin.

4. Paint equipment designations and numbers on or adjacent to equipment which is identified on Drawings by equipment designations.

   a. Pumps.

   b. Valves.

   c. Flowmeters.

   d. Other items of equipment identified on Drawings.

   e. Paint numbers of at least 2 inches high or as designated by Engineer.

   f. Do not paint designations on pipe hangars, roof drains, and other non-operable items.

3.4 Application

A. Apply paint in a neat manner, with finished surfaces free of runs, sags, ridges, laps, and brush marks.

1. Tint the first top coat differently from the finish top coat if the same paint is to be used to assure complete coverage.

2. Paint all exposed surfaces, including sides and edges.

B. Do not apply successive coats until each previous paint coat is hard and dry through entire paint film.

1. Apply each coat in a manner that will produce an even film of uniform and proper thickness.

2. Do not apply any coat at a rate of coverage per gallon which is greater than maximum rate recommended by manufacturer.

3. Avoid paint films showing runs, sags, ridges, laps, brush marks, checks, blisters, teardrops, or fat edges.

a. Remove paint containing such defects and repaint.

C. Priming.

1. Provide a brush coat of primer to edges, corners, crevices, welds, bolts, and nuts before specified spot or touch-up painting of metal surfaces.

2. Give special attention to filling crevices.

D. Repaint abraded and otherwise damaged portions of shop applied paint.

E. Welded Seams and Other Uncoated Surfaces.

1. Use specified primer on:

a. Welded seams and other uncoated surfaces.

b. Field installed bolts, nuts, and washers.

c. Surfaces where paint has been damaged by heat.

2. Do not apply finish coats to patch, spot, or touch-up painting until prime coat is dry and hard.

3.5 Field Quality Control

A. Mixing and Thinning.

1. Thoroughly mix paint each time any is withdrawn from container.

2. Keep paint containers tightly closed except when withdrawing paint.

3. Thin only as necessary to obtain recommended coverage at lower application temperatures.

4. Wet film thickness of applied paint shall not be reduced:

   a. By addition of paint thinner or otherwise.

   b. Below that represented by the recommended coverage rate.

B. Engineer shall measure all coating systems with a film gauge to verify that minimum specified thicknesses have been obtained.

END OF SECTION