

**SECTION 09 91 00  
PAINTING**

**PART 1-GENERAL**

**1.1 DESCRIPTION**

- A. Section specifies field painting.
- B. Section specifies prime coats which may be applied in shop under other sections.
- C. Painting includes identity markings.

**1.2 RELATED WORK**

- A. Shop prime painting of steel and ferrous metals: Division 08 - OPENINGS, Division 10 - SPECIALTIES, Division 21 - FIRE SUPPRESSION, Division 22 - PLUMBING, Division 23 - HEATING, VENTILATION AND AIR-CONDITIONING, and Division 26 - ELECTRICAL.

**1.3 SUBMITTALS**

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:  
Before work is started, or sample panels are prepared, submit manufacturer's literature, the current Master Painters Institute (MPI) "Approved Product List" indicating brand label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI "Approved Product List" where applicable is acceptable.
  - 1. VOC data: for paints, include printed statement of VOC content and chemical components.
- C. Sample Panels:
  - 1. After painters' materials have been approved and before work is started submit sample panels showing each type of finish and color specified.
  - 2. Panels to show color: Composition board, 100 by 250 by 3 mm (4 inch by 10 inch by 1/8 inch).
  - 3. Attach labels to panel stating the following:
    - a. Federal Specification Number or manufacturers name and product number of paints used.
    - b. Product type and color.
    - c. Name of project.

5. Strips showing not less than 50 mm (2 inch) wide strips of undercoats and 100 mm (4 inch) wide strip of finish coat.
- D. Sample of identity markers if used.
- E. Manufacturers' Certificates indicating compliance with specified requirements:
  1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.

#### **1.4 DELIVERY AND STORAGE**

- A. Deliver materials to site in manufacturer's sealed container marked to show following:
  1. Name of manufacturer.
  2. Product type.
  3. Batch number.
  4. Instructions for use.
  5. Safety precautions.
- B. In addition to manufacturer's label, provide a label legibly printed as following:
  1. Federal Specification Number, where applicable, and name of material.
  2. Surface upon which material is to be applied.
  3. If paint or other coating, state coat types; prime, body or finish.
- C. Maintain space for storage, and handling of painting materials and equipment in a neat and orderly condition to prevent spontaneous combustion from occurring or igniting adjacent items.
- D. Store materials at site at least 24 hours before using, at a temperature between 18 and 30 degrees C (65 and 85 degrees F).

#### **1.5 APPLICABLE PUBLICATIONS**

- A. Publications listed below form a part of this specification to the extent referenced. Publications are referenced in the text by basic designation only.
- B. American Conference of Governmental Industrial Hygienists (ACGIH):  
ACGIH TLV-BKLT-1992.....Threshold Limit Values (TLV) for Chemical  
Substances and Physical Agents and Biological  
Exposure Indices (BEIs)  
ACGIH TLV-DOC.....Documentation of Threshold Limit Values and  
Biological Exposure Indices, (Sixth Edition)
- C. American National Standards Institute (ANSI):  
A13.1-96.....Scheme for the Identification of Piping Systems
- D. American Society for Testing and Materials (ASTM):  
D260-86.....Boiled Linseed Oil
- E. Master Painters Institute (MPI):

No. 145-09.....Latex,Interior, Institutional Low Odor/VOC (MPI  
Gloss Level 3): MPI 145.

No. 146-09.....Latex,Interior, Institutional Low Odor/VOC (MPI  
Gloss Level 4): MPI 146.

No. 149-09.....Primer Sealer, Interior Institutional Low  
Odor/VOC: MPI 149.

F. Steel Structures Painting Council (SSPC):

SSPC SP 1-00 (R2004)....Solvent Cleaning

SSPC SP 2-00 (R2004)....Hand Tool Cleaning

SSPC SP 3-00 (R2004)....Power Tool Cleaning

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

A. Identity markers options:

1. Pressure sensitive vinyl markers.
2. Snap-on coil plastic markers.

B. Interior Epoxy Paints:

1. Waterbased Epoxy (Semi-gloss).
  - a. Basis-of-Design: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, "Pro Industrial Precatalized Waterbased Epoxy" K46 Series by Sherwin Williams Inc.
  - b. VOC Content: less than 155g/L as tested by EPA Method 24.
  - c. Adhesion: 58 per ASTM D3359.
  - d. Abrasion Resistance: 74.4 mg loss per ASTM 4060t.
  - e. Direct Impact Resistance: less than 100 inch-pounds per ASTM D2794.
  - f. Pencil Hardness: 2B per ASTM D3363.
2. Primer Sealer, Low Odor/VOC acrylic primer sealer: compatible product with the epoxy paint product specified.
  - a. Primer, Rust-Inhibitive, Water-Based (MPI #107).
  - b. Basis-of-Design Product: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, "Pro Industrial Pro-Cryl Universal Primer B66-310 series" by Sherwin Williams, Inc.
  - b. VOC Content: less than 100 g/L when tested by EPA Method 24.
  - c. Adhesion: 500 psi per ASTM D4541
  - d. Direct Impact Resistance: greater than 140 inch/pounds per ASTM D2794.
  - e. Corrosion Weathering, as tested by ASTM D5894, 10-cycles, 3360 hours: Passing.
  - f. Dry Heat Resistance: 200 degrees Fahrenheit per ASTM D2485.

g. Flexibility per ASTM D522, 180 degree bend, 1/4 inch mandrel:  
passes.

h. Pencil Hardness: H per ASTM D3363.

## **2.2 PAINT PROPERTIES**

- A. Use ready-mixed (including colors).
- B. Where no requirements are given in the referenced specifications for primers, use primers with pigment and vehicle, compatible with substrate and finish coats specified.

## **2.3 REGULATORY REQUIREMENTS/QUALITY ASSURANCE**

- A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.
  - 1. Human Carcinogens: Materials shall not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.

## **PART 3 - EXECUTION**

### **3.1 JOB CONDITIONS**

- A. Safety: Observe required safety regulations and manufacturer's warning and instructions for storage, handling and application of painting materials.
  - 1. Take necessary precautions to protect personnel and property from hazards due to falls, injuries, toxic fumes, fire, explosion, or other harm.
  - 2. Deposit soiled cleaning rags and waste materials in metal containers approved for that purpose. Dispose of such items off the site at end of each day's work.
- B. Atmospheric and Surface Conditions:
  - 1. Do not apply coating when air or substrate conditions are:
    - a. Less than 3 degrees C (5 degrees F) above dew point.
    - b. Below 10 degrees C (50 degrees F) or over 35 degrees C (95 degrees F), unless specifically pre-approved by the Contracting Officer's Technical Representative (COTR), with approval of the Contracting Officer, and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.
  - 2. Maintain interior temperatures until paint dries hard.
  - 3. Apply only on clean, dry surfaces except as follows:

### **3.2 SURFACE PREPARATION**

- A. Method of surface preparation is optional, provided manufacturer's written recommendations are followed and that the results of finish painting produce solid even color and texture specified with no overlays.

B. General:

1. Remove prefabricated items not to be painted such as lighting fixtures, escutcheon plates, hardware, trim, and similar items for reinstallation after paint is dried.
2. Remove items for reinstallation and complete painting of such items and adjacent areas when item or adjacent surface is not accessible or finish is different.
3. See other sections of specifications for specified surface conditions and prime coat.
4. Clean surfaces for painting with materials and methods compatible with substrate and specified finish. Remove any residue remaining from cleaning agents used.

C. Ferrous Metals:

1. Remove oil, grease, soil, drawing and cutting compounds, flux and other detrimental foreign matter in accordance with SSPC-SP 1 (Solvent Cleaning).
2. Remove loose mill scale, rust, and paint, by hand or power tool cleaning, as defined in SSPC-SP 2 (Hand Tool Cleaning) and SSPC-SP 3 (Power Tool Cleaning).
3. Fill dents, holes and similar voids and depressions in flat exposed surfaces of hollow steel doors and frames, access panels, roll-up steel doors and similar items specified to have semi-gloss or gloss finish with TT-F-322D (Filler, Two-Component Type, For Dents, Small Holes and Blow-Holes). Finish flush with adjacent surfaces.
  - a. This includes flat head countersunk screws used for permanent anchors.
  - b. Do not fill screws of item intended for removal such as glazing beads.
4. Spot prime abraded and damaged areas in shop prime coat which expose bare metal with same type of paint used for prime coat. Feather edge of spot prime to produce smooth finish coat.
5. Spot prime abraded and damaged areas which expose bare metal of factory finished items with paint as recommended by manufacturer of item.

D. Gypsum Board:

1. Remove efflorescence, loose and chalking plaster or finishing materials.
2. Remove dust, dirt, and other deterrents to paint adhesion.
3. Fill holes, cracks, and other depressions with CID-A-A-1272A Plaster, Gypsum (Spackling Compound) finished flush with adjacent surface, with texture to match texture of adjacent surface. Patch holes over 25 mm

(1-inch) in diameter as specified in Section for plaster or gypsum board.

### **3.3 PAINT PREPARATION**

- A. Thoroughly mix painting materials to ensure uniformity of color, complete dispersion of pigment and uniform composition.
- B. Do not thin unless necessary for application and when finish paint is used for body and prime coats. Use materials and quantities for thinning as specified in manufacturer's printed instructions.
- C. Remove paint skins, then strain paint through commercial paint strainer to remove lumps and other particles.
- D. For tinting required to produce exact shades specified, use color pigment recommended by the paint manufacturer.

### **3.4 APPLICATION**

- A. Start of surface preparation or painting will be construed as acceptance of the surface as satisfactory for the application of materials.
- B. Unless otherwise specified, apply paint in three coats; prime, body, and finish. When two coats applied to prime coat are the same, first coat applied over primer is body coat and second coat is finish coat.
- C. Apply each coat evenly and cover substrate completely.
- D. Allow not less than 48 hours between application of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by Resident Engineer.
- E. Finish surfaces to show solid even color, free from runs, lumps, brushmarks, laps, holidays, or other defects.
- F. Apply by brush, roller or spray, except as otherwise specified.
- G. Do not spray paint in existing occupied spaces unless approved by Contracting Officer Technical Representative (COTR) with approval of the Contracting Officer, except in spaces sealed from existing occupied spaces.
- H. Do not paint in closed position operable items such as access doors and panels and similar items.

### **3.5 PRIME PAINTING**

- A. After surface preparation prime surfaces before application of body and finish coats, except as otherwise specified.
- B. Spot prime and apply body coat to damaged and abraded painted surfaces before applying succeeding coats.
- C. Additional field applied prime coats over shop or factory applied prime coats are not required.
- D. Metals:

1. Steel Surfaces scheduled to have Interior Epoxy Paint: Epoxy Primer/Sealer.

E. Gypsum Board:

1. Gypsum Board surfaces scheduled to have Interior Epoxy Paint: Epoxy Primer/Sealer.

**3.6 INTERIOR FINISHES**

A. Metal Work: EP2:

1. Apply to exposed surfaces.
2. Omit body and finish coats on surfaces concealed after installation except electrical conduit containing conductors over 600 volts.
3. Ferrous Metal and Other Metals Scheduled EP2:
  - a. Apply two coats of interior epoxy paint (gloss) over compatible metal primer.

B. Gypsum Board EP1:

1. Interior surfaces: Two coats of interior epoxy paint (gloss) over compatible primer.
2. Where interior surfaces are being painted to match existing adjacent surfaces, match gloss level of existing surface (in cleaned condition).

**3.7 REFINISHING EXISTING PAINTED SURFACES**

- A. Clean, patch and repair existing surfaces as specified under surface preparation.
- B. Remove and reinstall items as specified under surface preparation.
- C. Remove existing finishes or apply separation coats to prevent non compatible coatings from having contact.
- D. Patched or Replaced Areas in Surfaces and Components: Apply spot prime and body coats as specified for new work to repaired areas or replaced components.
- E. Except where scheduled for complete painting apply finish coat over plane surface to nearest break in plane, such as corner, reveal, or frame.
- F. Refinish areas as specified for new work to match adjoining work unless specified or scheduled otherwise.
- G. Sand or dull glossy surfaces prior to painting.
- H. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.

**3.8 MECHANICAL AND ELECTRICAL WORK FIELD PAINTING SCHEDULE**

- A. Field painting of mechanical and electrical consists of cleaning, touching-up abraded shop prime coats, and applying prime, body and finish coats to materials and equipment if not factory finished in space scheduled to be finished.

- B. Paint various systems specified in Division 02 - EXISTING CONDITIONS, Division 21 - FIRE SUPPRESSION, Division 22 - PLUMBING, Division 23 - HEATING, VENTILATION AND AIR-CONDITIONING and Division 26 - ELECTRICAL, Division.
- C. Paint after tests have been completed.
- D. Finish painting of mechanical and electrical equipment is not required when located in interstitial spaces, above suspended ceilings, in concealed areas such as pipe and electric closets, and furred spaces except on electrical conduit containing feeders 600 volts or more.
- E. Color:
  - a. White .....Exterior unfinished surfaces of enameled plumbing fixtures. Insulation coverings on breeching and uptake inside boiler house, drums and drum-heads, oil heaters, condensate tanks and condensate piping.
  - b. Gray: .....Heating, ventilating, air conditioning and refrigeration equipment (except as required to match surrounding surfaces), and water and sewage treatment equipment and sewage ejection equipment.
  - c. Aluminum Color: Ferrous metal on outside of boilers and in connection with boiler settings including supporting doors and door frames and fuel oil burning equipment, and steam generation system (bare piping, fittings, hangers, supports, valves, traps and miscellaneous iron work in contact with pipe).
  - d. Federal Safety Red: Exposed fire protection piping hydrants, post indicators, electrical conducts containing fire alarm control wiring, and fire alarm equipment.
  - e. Federal Safety Orange: .Entire lengths of electrical conduits containing feeders 600 volts or more.
  - f. Color to match brickwork sheet metal covering on breeching outside of exterior wall of boiler house.

### **3.9 IDENTITY PAINTING SCHEDULE**

- A. Identify designated service in accordance with ANSI A13.1, unless specified otherwise, on exposed piping, piping above removable ceilings, piping in accessible pipe spaces, interstitial spaces, and piping behind access panels.
  - 1. Legend may be identified using 2.1 G options or by stencil applications.
  - 2. Apply legends adjacent to changes in direction, on branches, where pipes pass through walls or floors, adjacent to operating accessories such as valves, regulators, strainers and cleanouts a minimum of 12 000



mm (40 feet) apart on straight runs of piping. Identification next to plumbing fixtures is not required.

3. Locate Legends clearly visible from operating position.
4. Use arrow to indicate direction of flow.
5. Identify pipe contents with sufficient additional details such as temperature, pressure, and contents to identify possible hazard. Insert working pressure shown on drawings where asterisk appears for High, Medium, and Low Pressure designations as follows:
  - a. High Pressure - 414 kPa (60 psig) and above.
  - b. Medium Pressure - 104 to 413 kPa (15 to 59 psig).
  - c. Low Pressure - 103 kPa (14 psig) and below.
  - d. Add Fuel oil grade numbers.
6. Legend name in full or in abbreviated form as follows:

| PIPING                            | COLOR OF<br>EXPOSED PIPING | COLOR OF<br>BACKGROUND | COLOR OF<br>LETTERS | LEGEND<br>ABBREVIATIONS |
|-----------------------------------|----------------------------|------------------------|---------------------|-------------------------|
| Blow-off                          |                            | Yellow                 | Black               | Blow-off                |
| Boiler Feedwater                  |                            | Yellow                 | Black               | Blr Feed                |
| A/C Condenser Water Supply        |                            | Green                  | White               | A/C Cond Wtr Sup        |
| A/C Condenser Water Return        |                            | Green                  | White               | A/C Cond Wtr Ret        |
| Chilled Water Supply              |                            | Green                  | White               | Ch. Wtr Sup             |
| Chilled Water Return              |                            | Green                  | White               | Ch. Wtr Ret             |
| Shop Compressed Air               |                            | Yellow                 | Black               | Shop Air                |
| Air-Instrument Controls           |                            | Green                  | White               | Air-Inst Cont           |
| Drain Line                        |                            | Green                  | White               | Drain                   |
| Emergency Shower                  |                            | Green                  | White               | Emg Shower              |
| High Pressure Steam               |                            | Yellow                 | Black               | H.P. _____*             |
| High Pressure Condensate Return   |                            | Yellow                 | Black               | H.P. Ret _____*         |
| Medium Pressure Steam             |                            | Yellow                 | Black               | M. P. Stm _____*        |
| Medium Pressure Condensate Return |                            | Yellow                 | Black               | M.P. Ret _____*         |
| Low Pressure Steam                |                            | Yellow                 | Black               | L.P. Stm _____*         |
| Low Pressure Condensate Return    |                            | Yellow                 | Black               | L.P. Ret _____*         |
| High Temperature Water Supply     |                            | Yellow                 | Black               | H. Temp Wtr Sup         |
| High Temperature Water Return     |                            | Yellow                 | Black               | H. Temp Wtr Ret         |
| Hot Water Heating Supply          |                            | Yellow                 | Black               | H. W. Htg Sup           |
| Hot Water Heating Return          |                            | Yellow                 | Black               | H. W. Htg Ret           |
| Gravity Condensate Return         |                            | Yellow                 | Black               | Gravity Cond Ret        |
| Pumped Condensate Return          |                            | Yellow                 | Black               | Pumped Cond Ret         |
| Vacuum Condensate Return          |                            | Yellow                 | Black               | Vac Cond Ret            |

Atlanta VA Medical Center  
Decatur GA 30033

Renovate SPS  
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|                                       |       |        |                 |                    |
|---------------------------------------|-------|--------|-----------------|--------------------|
| Fuel Oil - Grade                      |       | Green  | White           | Fuel Oil-Grade __* |
| Boiler Water Sampling                 |       | Yellow | Black           | Sample             |
| Chemical Feed                         |       | Yellow | Black           | Chem Feed          |
| Continuous Blow-Down                  |       | Yellow | Black           | Cont. B D          |
| Pumped Condensate                     |       | Black  |                 | Pump Cond          |
| Pump Recirculating                    |       | Yellow | Black           | Pump-Recirc.       |
| Vent Line                             |       | Yellow | Black           | Vent               |
| Alkali                                |       | Yellow | Black           | Alk                |
| Bleach                                |       | Yellow | Black           | Bleach             |
| Detergent                             |       | Yellow | Black           | Det                |
| Liquid Supply                         |       | Yellow | Black           | Liq Sup            |
| Reuse Water                           |       | Yellow | Black           | Reuse Wtr          |
| Cold Water (Domestic)                 | White | Green  | White           | C.W. Dom           |
| Hot Water (Domestic)                  |       |        |                 |                    |
| Supply                                | White | Yellow | Black           | H.W. Dom           |
| Return                                | White | Yellow | Black           | H.W. Dom Ret       |
| Tempered Water                        | White | Yellow | Black           | Temp. Wtr          |
| Ice Water                             |       |        |                 |                    |
| Supply                                | White | Green  | White           | Ice Wtr            |
| Return                                | White | Green  | White           | Ice Wtr Ret        |
| Reagent Grade Water                   |       | Green  | White           | RG                 |
| Reverse Osmosis                       |       | Green  | White           | RO                 |
| Sanitary Waste                        |       | Green  | White           | San Waste          |
| Sanitary Vent                         |       | Green  | White           | San Vent           |
| Storm Drainage                        |       | Green  | White           | St Drain           |
| Pump Drainage                         |       | Green  | White           | Pump Disch         |
| Chemical Resistant Pipe               |       |        |                 |                    |
| Waste                                 |       | Yellow | Black           | Acid Waste         |
| Vent                                  |       | Yellow | Black           | Acid Vent          |
| Atmospheric Vent                      |       | Green  | White           | ATV                |
| Silver Recovery                       |       | Green  | White           | Silver Rec         |
| Oral Evacuation                       |       | Green  | White           | Oral Evac          |
| Fuel Gas                              |       | Yellow | Black           | Gas                |
| Fire Protection Water                 |       |        |                 |                    |
| Sprinkler                             |       | Red    | White           | Auto Spr           |
| Standpipe                             |       | Red    | White           | Stand              |
| Sprinkler                             |       | Red    | White           | Drain              |
| Hot Water Supply Domestic/Solar Water |       |        | H.W. Sup Dom/SW |                    |
| Hot Water Return Domestic/Solar Water |       |        | H.W. Ret Dom/SW |                    |

7. Electrical Conduits containing feeders over 600 volts, paint legends using 50 mm (2 inch) high black numbers and letters, showing the voltage class rating. Provide legends where conduits pass through walls and floors and at maximum 6100 mm (20 foot) intervals in between. Use labels with yellow background with black border and words "Danger High Voltage Class \_\_", adding the appropriate voltage..
8. See Sections for methods of identification, legends, and abbreviations of the following:
  - a. Regular compressed air lines: Section 22 15 00, GENERAL SERVICE COMPRESSED-AIR SYSTEMS.
  - b. Conduits containing high voltage feeders over 600 volts: Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

### **3.10 PROTECTION CLEAN UP, AND TOUCH-UP**

- A. Protect work from paint droppings and spattering by use of masking, drop cloths, removal of items or by other approved methods.
- B. Upon completion, clean paint from hardware, glass and other surfaces and items not required to be painted of paint drops or smears.
- C. Before final inspection, touch-up or refinished in a manner to produce solid even color and finish texture, free from defects in work which was damaged or discolored.

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