

**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 markers and identity markings.

1.2 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, indicating brand names, product type color, gloss level, coating composition, Federal Specification Number or manufacturers name or product number where applicable, and certificates as specified.
- C. Sample of identity markers if used.
- D. Manufacturers' Certificates indicating compliance with specified requirements:
 - 1. Manufacturer's paint substituted for Federal Specification paints meets or exceeds performance of paint specified.

1.3 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 °K (65 and 85 °F).

1.4 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 (sixth Edition...Documentation of Threshold Limit Values and Biological Exposure Indices.

- C. Federal Specifications (Fed. Spec.):

P-W-155CWax Floor, Water-Emulsion

INT AMD 1

TT-C-535B(2)Coating, Epoxy, Two Component, For Interior Use On
Metal, Wood, Wallboard, Painted Surfaces, Concrete And Masonry

TT-C-542E.....Coating, Polyurethane, Oil Free, Moisture Curing

TT-E-489H.....Enamel, Alkyd, Gloss Low VOC Content

TT-E-506K.....Enamel, Alkyd, Gloss, Tints And White (For Interior
Use)

TT-E-508C.....Enamel, Interior, Semigloss, Tints And White

TT-E-545C.....Primer, (Enamel, Undercoat Alkyd Odorless,
Interior, Flat, Tints And White)

TT-F-322D.....Filler, Two-Component Type, For Dents, Cracks,
INT AMD 1.....Small-Holes And Blow-Holes

TT-F-340C.....Filler, Wood, Plastic

TT-F-1098D.....Filler Block, Solvent-Thinned, for Porous Surfaces
(Concrete Block, Cinder Block, Stucco Etc.)

TT-P-19D.....Paint Latex (Acrylic Emulsion, Exterior Wood And
Masonry)

TT-P025E(2).....Primer, Coating, Exterior Undercoat For Wood,
Ready-Mixed, White And Tints

TT-P-26C(1)Paint, Interior, White, Tints And Black, Fire

Retardant

- TT-P-29JPaint, Latex
 - TT-P-30E(1)Paint, Alkyd, Odorless, Interior, Flat, White And
Tints
 - TT-P-38E.....Paint, Aluminum (Ready-mixed)
 - TT-P-59E(1)Paint, Ready Mix, International Orange (Not For
Residential Use)
 - TT-P-102E.....Paint, Oil (Alkyd Modified, Exterior, Low VOC)
INT AMD 1
 - TT-P-641G(1)Primer Coating, Zinc Dust-Zinc Oxide (For
Galvanized Surfaces)
 - TT-P-645B.....Primer, Paint, Zinc-Molybdate, Alkyd Type
 - TT-P-650D.....Primer Coating, Latex Base, Interior, White (For
Gypsum Wallboard, or Plaster)
 - TT-P-664D.....Primer Coating, Alkyd, Corrosion-Inhibiting, Lead
And Chromate Free, VOC-Compliant
 - TT-P-791B.....Putty, Pure-Flaxseed-Oil Type (For Wood-Sash-
Glazing)
 - TT-P-1411A.....Paint, Copolymer-Resin, Cementitious (For
Waterproofing Concrete and Masonry Walls)
 - TT-P-1511B.....Paint, Latex (Gloss And Semigloss, Tints And White)
(For Interior Use)
 - TT-P-2119Paint, Latex-Base, High Traffic Area, Flat And
Eggshell Finish, (Low Lustre), (For Interior Use)
 - TT-S-179B(1)SSealer, Surface, Pigmented Oil, For Plaster And
Wallboard
- D. Commercial Item Description (CID):
- A-A-1272Plaster, Gypsum (Spackling Compound)
 - A-A-1555Water Paint, Powder (Cementitious, White and
Colors)
 - A-A-2210Filler, Wood Paste
- E. Western Wood Products Association (WWPA):
- Research Note No.312- Revised Jan 30, 1985 Painting Over Knots
- F. Steel Structures Painting Council (SSPC):

- SP 1-89No. 1, Solvent Cleaning
- SP 2-89No. 2, Hand Tool Cleaning
- SP 3-89No. 3, Power Tool Cleaning
- G. Military Specifications (Mil. Spec.):
 - MIL-P-21035BPaint, High Zinc Dust Content, Galvanizing, Repair
- H. American National Standards Institute (ANSI):
 - ANSI-A13.1-81Scheme for the Identification of Piping Systems
- I. American Society for Testing and Materials (ASTM):
 - D260-86.....Boiled Linseed Oil

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Alkyd Gloss Enamel (G): Fed. Spec. TT-E-506.
- B. Alkyd Semigloss Enamel (SG): Fed. Spec. TT-E-508.
- C. Enamel Undercoat and Primer: Fed. Spec. TT-E-545.
- D. Metal Filler: Fed. Spec. TT-F-322, Type I or II or single component filler meeting the same requirements.
- E. Plastic Wood: Fed. Spec. TT-F-340.
- F. Concrete Masonry Unit Filler: Fed Spec. TT-F-1098.
- G. Acrylic Emulsion (AE) Fed. Spec. TT-P-19.
- H. Wood Oil Base Primer: Fed. Spec. TT-P-25.
- I. Latex Emulsion (LE): Fed. Spec. TT-P-29, Type I or Type II.
- J. Alkyd Flat (AK): Fed. Spec. TT-P-30.
- K. Aluminum Paint (AP): Fed. Spec. TT-P-38.
- L. Zinc Dust Primer: Fed. Spec. TT-P-641, Type II, except use Type III for latex or rubber paint finish.
- M. Zinc Molybdate Primer: Fed. Spec. TT-P-645.
- N. Latex Primer: Fed. Spec. TT-P-650.
- O. Ferrous Metal Primer: Fed. Spec. TT-P-664.
- P. Putty: Fed. Spec. TT-P-791, Type II.
- Q. Latex Gloss (GL) and Semi-Gloss: (SG): Fed. Spec. TT-P-1511.
- R. Latex Flat (LF) and Low Lustre (LL): Fed. Spec. TT-P-2119.
- S. Gypsum Board and Gypsum Plaster Sealer: Fed. Spec. TT-S-179.
- T. Wood Stain: Fed. Spec. TT-S-711.
- U. Spackling Compound: CID A-A-1272.

- V. Water Paint: CID A-A-1555.
- W. Filler Wood Paste: CID A-A-2210.
- X. Zinc Rich Paint: Mil. Spec. MIL-P-21035.
- Y. Plastic Tape:
 - 1. Pigmented vinyl plastic film in colors as specified in Section, 09050 or specified.
 - 2. Pressure sensitive adhesive back.
 - 3. Widths as shown.
- Z. Identity markers options:
 - 1. Pressure sensitive vinyl markers.
 - 2. Snap-on coil plastic markers

2.2 PAINT PROPERTIES

- A. Use ready-mixed (including colors), except two component polyesters, paints having metallic powders packaged separately and paints requiring specified additives.
- B. Materials finely ground, uniform in consistency and readily dispersed to form a smooth and homogeneous fluid.
- C. 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

- A. Paint materials shall conform to the restrictions of the local Environmental and Toxic Control jurisdiction.
 - 1. Volatile Organic Compounds (VOC): VOC content of paint materials shall not exceed local, state or district requirements.
 - 2. Lead-Base Paint:
 - a. Comply with Section 410 of the Lead-Based Paint Poisoning Prevention Act, as amended, and with implementing regulations promulgated by Secretary of Housing and Urban Development.
 - b. Regulations concerning prohibition against use of lead-based paint in federal and federally assisted construction, or rehabilitation of residential structures are set forth in Subpart F, Title 24, Code of Federal Regulations, Department of Housing and Urban Development.
 - 3. Asbestos: Materials shall not contain asbestos.

4. Chromate, Cadmium, Mercury, Silica: Materials shall not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or silica sand.
5. Human Carcinogens: Materials shall not contain any of the ACGIH-BKLT and ACGHI-DOC confirmed or suspected human carcinogens.
6. Comply with the Regional Ozone Transport Commission (OTC) regulations regarding Volatile Organic Content (VOC).

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 days work.
- B. Atmospheric and Surface Conditions:
 1. Do no exterior or interior painting in foggy, damp or rainy weather. When building is completely enclosed, interior work may be painted.
 2. Paint exterior and interior surfaces when ambient temperature is between 10 and 32 degrees C (50 and 90 degrees F), except when otherwise designated in manufacturer's printed instructions. Maintain interior temperatures until paint dries hard.
 3. Do no exterior painting when it is windy and dusty.
 4. Do no painting in direct sunlight or on surfaces which will soon be warmed by the sun.
 5. Apply only on clean, dry and frost free surfaces except as follows:
 - a. Apply water thinned acrylic and cementitious paints to damp (not wet) surfaces where allowed by manufacturer's printed instructions.
 - b. Dampened with a fine mist of water on hot dry days concrete and masonry surfaces to which water thinned acrylic and cementitious paints are applied to prevent excessive suction and to cool surface.

3.2 SURFACE PREPARATION

- A. Method of surface preparation is optional, provided results of finish painting produce solid even color and texture specified with no overlays.
- B. General:

1. Remove prefinished 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. Do not use solvents, acid, or steam on concrete and masonry.

C. Wood:

1. Sand to a smooth even surface and then dust off.
2. Sand surfaces showing raised grain smooth between each coat.
3. Wipe surface with a tack rag prior to applying finish.
4. Surface painted with an opaque finish:
 - a. Coat knots, sap and pitch streaks with knot sealer before applying paint.
 - b. Apply two coats of knot sealer over large knots.
5. After application of prime or first coat of stain, fill cracks, nail and screw holes, depressions and similar defects with plastic wood or putty compound. Use plastic wood for transparent finish, to match wood. Sand to make smooth and finish flush with adjacent surface.
6. Before applying finish coat, reapply plastic wood or putty compound if required, and sand surface to remove surface blemishes. Finish flush with adjacent surfaces.
7. Fill open grained wood such as oak, walnut, ash and mahogany with a paste wood filler, colored to match wood color.
 - a. Thin filler in accordance with manufacturer's instructions for application.
 - b. Remove excess filler, wipe as clean as possible, allow to dry and sand as specified.

D. Ferrous Metals:

1. Remove oil, grease, soil, drawing and cutting compounds, flux and other detrimental foreign matter by use of solvents, emulsions, cleaning compounds, or by steam cleaning, as defined in SSPC-SP 1.

2. Remove loose mill scale, rust, and paint, by hand or power tool cleaning, as defined in SSPC-SP 2 and SSPC-SP 3, except where high temperature aluminum paint is used, prepare surface in accordance with paint manufacturer's instructions.
 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 metal filler compound. 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.
- E. Zinc-Coated (Galvanized) Metal, Zinc, Aluminum, Copper and Copper Alloys
Surfaces Specified Painted:
1. Clean surfaces to remove grease, oil and other deterrents to paint adhesion, with toluene, xylene or similar solvents in accordance with SSPC-SP 1.
 2. Spot coat abraded and damaged areas of zinc-coating which expose base metal, using zinc rich paint MIL Spec MIL -P-21035, on hot-dip zinc-coated items and spot prime with zinc dust primer, Fed Spec. TT-P-641.
- F. Masonry, Concrete, Cement Board, Cement Plaster and Stucco:
1. Clean and remove dust, dirt, oil, grease efflorescence, form release agents, laitance, and other deterrents to paint adhesion.
 2. Use emulsion type cleaning agents to remove oil, grease, paint and similar products. Use of solvents, acid, or steam is not permitted.
 3. Remove loose mortar in masonry work.
 4. Replace mortar and fill open joints, holes, cracks and depressions with new mortar specified in Section MORTAR AND GROUTS. Do not fill weep holes. Finish to match adjacent surface.
 5. Neutralize Concrete floors to be painted by washing with a solution of 1.4 Kg (3 pounds) of zinc sulfate crystals to 3.8 L (1 gallon) of water, allow to dry three days and brush thoroughly free of crystals.

6. Repair broken and spalled concrete edges with concrete patching compound to match adjacent surfaces as specified in CONCRETE Sections. Remove projections to level of adjacent surface by grinding or similar methods.
- G. Gypsum Plaster and 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 spackling compound CID-A-A-1555 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. Mix two component and two part paint and those requiring additives in such a manner as to uniformly blend as specified in manufacturer's printed instructions unless specified otherwise.
- E. 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 COTR.
- E. Finish surfaces to show solid even color, free from runs, lumps, brushmarks, laps, holidays, or other defects.

- F. Apply by brush, or roller, except as otherwise specified.
- G. Do not spray paint in existing occupied spaces unless approved by COTR, except in spaces sealed from existing occupied spaces.
 - 1. Apply painting materials specifically required by manufacturer to be applied by spraying,
 - 2. In areas, where paint is applied by spray, mask or enclose with polyethylene, or similar air tight material with edges and seams continuously sealed including items specified in WORK NOT PAINTED, motors, controls, telephone, and electrical equipment, fronts of sterilizes and other recessed equipment and similar prefinished items.
- H. Do not paint in closed position operable items such as access doors and panels, window sashes, overhead doors, and similar items except overhead roll-up doors and shutters.

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, except for exterior exposed steel apply an additional prime coat.
- D. Prime rebates for stop and face glazing of wood, and for face glazing of steel.
- E. Wood and Wood Particleboard:
 - 1. Use same kind of primer specified for exposed face surface.
 - a. Exterior wood: Wood oil base primer except where wood stain is scheduled.
 - b. Interior wood except for transparent finish: Enamel primer, thinned if recommended by manufacturer.
 - 2. Apply two coats of primer or sealer to surfaces of wood doors, including top and bottom edges, which are cut for fitting or for other reason.
 - 3. Apply one coat of primer as soon as delivered to site to surfaces of unfinished woodwork, except concealed surfaces of shop fabricated or assembled millwork and surfaces specified to have varnish, stain or natural finish.
 - 4. Back prime and seal ends of exterior woodwork, and edges of exterior plywood specified to be finished.
 - 5. Apply fire retardant paint to wood for fire retardant finish.

- F. Metals except boilers, incinerator stacks, and engine exhaust pipes:
 - 1. Steel and iron: Ferrous metal primer. Use epoxy coating where finish of epoxy coating is specified.
 - 2. Zinc-coated steel and iron: Zinc dust primer.
 - 3. Terne metal: Ferrous metal primer.
 - 4. Copper and copper alloys scheduled to be painted: Zinc molybdate primer.
 - 5. Machinery not factory finished: Enamel, Alkyd, Gloss Low VOC content.
 - 6. Asphalt coated metal: Aluminum paint.
 - 7. Metal over 94 degrees C. (200 degrees F), Boilers, Incinerator Stacks, and Engine Exhaust Pipes: Heat Resistant Paint, 650 degrees C (1200 degrees F).
- G. Gypsum Board and Hardboard:
 - 1. Surfaces scheduled to have acrylic emulsion or latex emulsion finish: Use acrylic emulsion or latex emulsion respectively.
 - 2. Latex primer, except use pigmented sealer in shower and bath rooms.
 - 3. Surfaces scheduled to receive vinyl coated fabric wallcovering:
Use enamel undercoat, and primer.
 - 4. Use epoxy coating for surfaces scheduled to receive epoxy finish.
- H. Concrete Floors: Floor Enamel.

3.6 INTERIOR FINISHES

- A. Apply following finish coats over prime coats in spaces or on surfaces specified in Section, 09050.
- B. Metal Work:
 - 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, Galvanized Metal, and Other Metals Scheduled:
 - a. Apply two coats of Alkyd Semigloss (SG) unless specified otherwise.
 - b. Machinery: One coat Enamel, Alkyd Gloss, Low VOC content.
 - c. Ferrous Metal over 94 degrees K (200 degrees F:), Boilers, Incinerator Stacks, and Engine Exhaust Pipes: One coat Heat Resisting Paint, 650 degrees K (1200 degrees F). (HR).
- C. Gypsum Board:
 - 1. One coat of enamel undercoat plus one coat of low-luster (LL).
- D. Plaster:

1. One coat of enamel undercoat plus one coat of low-luster (LL).
- E. Cement Board: One coat of acrylic emulsion (AE).
 - I. Miscellaneous:
 1. Apply where specified in Section 09050.
 2. Aluminum Paint: Two coats. (AP)
 3. Gold Paint: Two coats (GP)
 4. Existing acoustical units scheduled to be repainted except acoustical units with a vinyl finish:
 - a. Clean units free of dust, dirt, grease, and other deterrents to paint adhesion.
 - b. Mineral fiber units: One coat of latex-emulsion paint (LE).
 - c. Cement board and metal units: One coat of alkyd flat (AK) or semigloss (SG).
 - d. Units of organic fiber or other material not having a class A rating: One coat of fire retardant paint (FR).
 5. Interstitial floor markings: One coat floor enamel (FR).

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. In existing rooms and areas where alterations occur, clean existing stained and natural finished wood retouch abraded surfaces and then give entire surface one coat of polyurethane varnish (PV).
- G. Refinish areas as specified for new work to match adjoining work unless specified or scheduled otherwise.
- H. Coat knots and pitch streaks showing through old finish with knot sealer before refinishing.
- I. Sand or dull glossy surfaces prior to painting.
- J. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.

3.8 PAINT COLOR

- A. Color and gloss of finish coats is specified in Section 09 06 00.
- B. For additional requirements regarding color see Articles, REFINISHING EXISTING PAINTED SURFACE and MECHANICAL AND ELECTRICAL FIELD PAINTING SCHEDULE.
- C. Coat Colors:
 - 1. Color of priming coat: Lighter than body coat.
 - 2. Color of body coat: Lighter than finish coat.
 - 3. Color prime and body coats to not show through the finish coat and to mask surface imperfections or contrasts.
- D. Painting, Caulking, Closures, and Fillers Adjacent to Casework:
 - 1. Paint to match color of casework where casework has a paint finish.
 - 2. Paint to match color of wall where casework is stainless steel, plastic laminate, or varnished wood.

3.9 MECHANICAL AND ELECTRICAL WORK FIELD PAINTING SCHEDULE

- A. Field painting of mechanical and electrical work, 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. In spaces not scheduled to be finish painted in Section 09 06 00 paint as specified under paragraph H, colors.
- C. Paint various systems specified in Divisions 2, 15, and 16.
- D. Paint after tests have been completed.
- E. Omit prime coat from factory prime-coated items.
- F. 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, pipe basements, pipe tunnels, trenches, attics, roof spaces, shafts and furred spaces except on electrical conduit containing feeders 600 volts or more.
- G. Omit field painting of items specified in Subparagraph, WORK NOT PAINTED.
- H. Wall Color: Matching adjoining construction in texture and color.
- I. Apply paint systems on properly prepared and primed surface as follows:
 - 1. Interior Locations:
 - a. Apply two coats of alkyd semigloss to following items:

- 1) Metal under 94 degrees K (200 degrees F) of items such as bare piping, fittings, hangers and supports.
- 2) Equipment and systems such as hinged covers and frames for control cabinets and boxes, cast-iron radiators, electric conduits and panel boards.
- 3) Heating, ventilating, air conditioning, plumbing equipment, and machinery having shop prime coat and not factory finished.
- b. Ferrous metal exposed in hydrotherapy equipment room and chlorinator room of water and sewerage treatment plants: Two coats of epoxy paint.
- c. Apply two coats of latex emulsion on finish of insulation on boiler breeching and uptakes inside boiler house, drums, drumheads, oil heaters, feed water heaters, tanks and piping.
- d. Apply two coats of high temperature over 650 degrees K (1200 degrees F) paint to ferrous metal surface over 94 degrees K (200 degrees F) of following items:
 - 1) Garbage and trash incinerator.
 - 2) Medical waste incinerator.
 - 3) Exterior of boilers and ferrous metal in connection with boiler settings including supporting members, doors and door frames and fuel oil burning equipment.
 - 4) Steam line flanges, bare pipe, fittings, valves, hangers and supports over 94 degrees K (200 degrees F).
 - 5) Engine generator exhaust piping and muffler.
- e. Paint electrical conduits containing cables rated 600 volts or more, two coats Federal Safety Orange in exposed and concealed spaces full length of conduit.
2. Other exposed locations:
 - a. Metal surfaces, except aluminum, of cooling towers exposed to view, including connected pipes, rails, ladders: Two coats of aluminum paint.
 - b. Cloth jackets of insulation of ducts and pipes in connection with plumbing, air conditioning, ventilating refrigeration and heating systems: Two coats of acrylic emulsion.

3.10 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 identity marker options or stencil applied painted on.
 - 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 psi) and above
 - b. Medium Pressure - 104 to 413 Kpa (15 to 59 psi).
 - c. Low Pressure - 103 Kpa (14 psi) and below
 - d. Add Fuel oil grade numbers.
 - 6. Legend name in full or in abbreviated form as follows:

PIPING	COLOR OF EXPOSED PIPING	COLOR OF BACKGROUND	COLOR OF LETTERS	LEGEND ABBREVIATIONS
Hot Water Heating Supply		Yellow	Black	H. W. Htg Sup.
Hot Water Heating Return		Yellow	Black	H. W. Htg. Ret.

- B. Fire and Smoke Partitions:
 - 1. Identify partitions above ceilings on both sides of partitions except within shafts in letters not less than 64 mm (2 1/2 inches) high.
 - 2. Stenciled message: "SMOKE PARTITION" or, 'FIRE PARTITION" as applicable.
 - 3. Locate not more than 6100 mm (20 feet) on center on corridor sides of partitions, and with a least one message per room on room side of partition.
 - 4. Use semigloss paint of color that contrasts with color of substrate.

3.12 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.

--- E N D ---