

SECTION 09 91 00
PAINING

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 and striping or markers and identity markings.

1.2 RELATED WORK

- A. Shop prime painting of steel and ferrous metals: Division 05 - METALS, Division 08 - OPENINGS, Division 22 - PLUMBING, Division 23 – HEATING, VENTILATION AND AIR-CONDITIONING, Division 26 - ELECTRICAL, Division 27 - COMMUNICATIONS, and Division 28 – ELECTRONIC SAFETY AND SECURITY sections.

1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data: Provide for all products supplied under this Section. Product names or marking shall correspond with references in the Schedule requested in this Section.
- C. Schedule: Show each system of paint to be used listing primer, intermediate and finish coat product, and where each system will be applied.
- D. 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: Semi-rigid board, 216 by 280 (8½ inch by 11 inch).
 - 3. Attach labels to panel stating the following:
 - a. Federal Specification Number or manufacturers name and product number of paints used.
 - b. Paint type markings as indicated on Drawings.
 - c. Product type and color.
 - d. Color Formula.
 - e. Name of project.
 - 4. Step back successive coats so each coat can be clearly seen.

5. Strips showing not less than 50 mm (2 inch) wide strips of undercoats and 100 mm (4 inch) wide strip of finish coat.
- 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-DOCDocumentation of Threshold Limit Values and Biological
Exposure Indices, (Sixth Edition)
- C. American National Standards Institute (ANSI):
- A13.1-96Scheme for the Identification of Piping Systems
- D. American Society for Testing and Materials (ASTM):
- D260-86Boiled Linseed Oil

- D522-93a(2008).....Standard Test Methods for Mandrel Bend Test of Attached Organic Coatings
- D714-02(2009).....Standard Test Method for Evaluating Degree of Blistering of Paints
- D1654-08Standard Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments
- D2486-06Standard Test Methods for Scrub Resistance of Wall Paints
- D2794-93(2004).....Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)
- D3363-05Standard Test Method for Film Hardness by Pencil Test
- D4060-10Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser
- D4541-09Standard Test Method for Pull-Off Strength of Coatings Using Portable Adhesion Testers
- D5894-05Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal, (Alternating Exposures in a Fog/Dry Cabinet and a UV/Condensation Cabinet)
- E. Commercial Item Description (CID):
- A-A-1555Water Paint, Powder (Cementitious, White and Colors) (WPC) (cancelled)
- A-A-3120Paint, For Swimming Pools (RF) (cancelled)
- F. Environmental Protection Agency (EPA)
- Method #24-90.....Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings
- G. Federal Specifications (Fed Spec):
- TT-P-1411A.....Paint, Copolymer-Resin, Cementitious (For Waterproofing Concrete and Masonry Walls) (CEP)
- H. Master Painters Institute (MPI):
- No. 11-04Latex, Exterior Semi-Gloss (MPI Gloss Level 5)
- No. 22-04Aluminum Paint, High Heat (up to 590° - 1100F) (HR)
- No. 43-04Interior Satin Latex, (MPI Gloss Level 4)
- No. 44-04Interior Low Sheen Latex, (MPI Gloss Level 2)
- No. 50-04Primer Sealer, Latex, Interior,(MPI Primer)

- No. 72-09Polyurethane, Two-Component, Pigmented, Gloss (MPI Gloss Level 6)
- No. 94-04Exterior Alkyd, Semi-Gloss (EO)
- No. 98Epoxy, High Build, Gloss
- No. 108Epoxy, High Build, Low Gloss
- No. 153-04Light Industrial Coating, Interior, Water Based, Semi-Gloss (MPI Gloss Level 5)
- No. 163-04Light Industrial Coating, Exterior, Water Based, Semi-Gloss (MPI Gloss Level 5)

- I. Steel Structures Painting Council (SSPC):
 - SSPC SP 1-00Solvent Cleaning
 - SSPC SP 2-00Hand Tool Cleaning
 - SSPC SP 3-00Power Tool Cleaning

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Latex, Exterior Semi-Gloss (MPI Gloss Level 5): MPI 11.
- B. High Heat Resistant Coating (HR): MPI 22.
- C. Interior Satin Latex: MPI 43.
- D. Interior Low Sheen Latex: MPI 44.
- E. Primer Sealer, Latex, Interior: MPI 50.
- F. Polyurethane, Two-Component, Pigmented, Gloss (MPI Gloss Level 6): MPI 72
- G. Exterior Alkyd, Semi-Gloss (EO): MPI 94.
- H. Epoxy, High Build, Gloss: MPI 98
- I. Epoxy, High Build, Low Gloss: MPI 108
- J. Light Industrial Coating, Interior, Water Based, Semi-Gloss (MPI Gloss Level 5): MPI 153
- K. Light Industrial Coating, Exterior, Water Based, Semi-Gloss (MPI Gloss Level 5): MPI 163

2.2 PAINT PROPERTIES

- A. All primers and paints to be very low odor/low VOC.
- B. Use ready-mixed (including colors), except two component epoxies, polyurethanes, polyesters, paints having metallic powders packaged separately and paints requiring specified additives.

- 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 and recommended by the finish paint manufacturer for the substrate and finish paints scheduled.

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, and Silica: Materials shall not contain zinc-chromate, strontium-chromate, Cadmium, mercury or mercury compounds or free crystalline silica.
 - 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 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 and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.
2. Maintain interior temperatures until paint dries hard.
3. Do no exterior painting when it is windy and dusty.
4. Do not paint in direct sunlight or on surfaces that the sun will soon warm.
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. 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).

Exception: 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 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 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 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. 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. Tint successive coats sufficiently to make it possible to identify individual coats.
- D. Apply each coat evenly and cover substrate completely.
- E. Allow not less than 48 hours between application of succeeding coats, except as allowed by manufacturer's printed instructions, and approved by Resident Engineer.
- F. Finish surfaces to show solid even color, free from runs, lumps, brushmarks, laps, holidays, or other defects.
- G. Apply by brush, roller or spray, except as otherwise specified.
- H. Do not spray paint in existing occupied spaces unless approved by Resident Engineer, 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.
- I. 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. Provide primer recommended by the finish paint manufacturer for use with the substrate and finish paint specified.

3.6 EXTERIOR FINISHES

- A. General Exterior Paint System Notes:
 - 1. Specific products listed are for reference only other similar products are also acceptable. Similar shall be understood to be paints of similar or greater solids content, similar depth of application (DFT) and similar in-service performance record.
 - 2. All paints are to be applied at the manufacturers suggested depth (DFT) level for the substrate and type of application.
 - 3. All paints in a single system to be by a single manufacturer.
- B. Exterior Metal (including Doors and Frames):
 - 1. Two coats, Acrylic, DTM (direct to metal) paint; Semi-gloss, MPI 163.
 - 2. Provide primer plus two finish coats. Primer may be the same as finish coats, if recommended by the manufacturer for the substrate.
 - 3. Design Basis: Sherwin Williams Sher-Cryl HPA Semi-Gloss
- C. Paint System for Galvanized Steel Exterior Railings and Supports: 3 Coat Epoxy/Urethane
 - 1. Prime Coat: Polyamide epoxy, recommended by manufacturer for direct application to galvanized surfaces. Acceptable products include:
 - a. Benjamin Moore: Super Spec HP, Epoxy Metal Primer (P33)
 - b. Sherwin Williams: Macropoxy 646
 - c. Devoe: Devran 224HS
 - d. PPG Paints: Pitt-Guard 95-245
 - e. Tnemec: 66 Hi-build
 - f. Or recommended by the manufacturer for use on galvanized steel and for the intermediate and finish coat scheduled.
 - 2. Intermediate Coat: Polyamide epoxy:
 - a. Benjamin Moore: Super Spec HP, Epoxy Metal Primer (P36)
 - b. Sherwin Williams: Macropoxy 646
 - c. Devoe: Devran 224HS
 - d. PPG Paints: Pitt-Guard 95-245
 - e. Tnemec: 66 Hi-build
 - f. Or paints listed in MPI 98 or 108.

3. Top Coat: Aliphatic Acrylic Polyurethane, Finish Gloss. Recommended by the manufacturer for uses as exterior top coat over scheduled epoxy intermediate coat.

Acceptable products include:

- a. Benjamin Moore: Super Spec HP, Urethane Gloss P74/KP74
- b. Sherwin Williams: Acrolon 218 HS
- c. Devoe: Devthane 379H
- d. PPG Paints: Pitthane Ultra, 95-812/819
- e. Tnemec: 175 Endura-shield II
- f. Paint listed in MPI 72

3.7 INTERIOR FINISHES

- A. Metal Doors, Frames and Miscellaneous Metal:
 1. Apply to exposed surfaces.
 2. Two coats Low VOC, 100% Acrylic, Semi-gloss, MPI 153, 163 or equivalent.
 3. Design Basis: Sherwin Williams Pro Industrial 0 VOC Acrylic.
- B. Gypsum Board Walls:
 1. Apply two coats Acrylic: MPI 43 (Interior Satin Latex) or Interior MPI 44 (Low Sheen Latex), (acrylic only).
 2. Match existing: Sherwin Williams ProMar 200 Interior Latex Semi-Gloss.
- C. Gypsum Board Ceilings:
 1. Two coats Low VOC Acrylic, Egg-shell, MPI 44.
 2. Design Basis: Sherwin Williams ProMar 200 Interior Latex Eg-Shell

3.8 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. Prepare surfaces as recommended by paint manufacturer.
 1. Remove existing finishes or apply separation coats to prevent non compatible coatings from having contact.
 2. Sand or dull glossy surfaces prior to painting.
 3. Sand existing coatings to a feather edge so that transition between new and existing finish will not show in finished work.
- 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.

3.9 PAINT COLOR

- A. Color and gloss of finish coats shall match existing.
- 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 Other Surfaces:
 - 1. Paint to match color of adjacent surface.

3.10 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, Division 26 - ELECTRICAL, Division 27 - COMMUNICATIONS, and Division 28 – ELECTRONIC SAFETY AND SECURITY.
- C. Paint after tests have been completed.
- D. Omit prime coat from factory prime-coated items.
- E. 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.
- F. Omit field painting of items specified in paragraph, Building and Structural WORK NOT PAINTED.
- G. Color:

1. WhiteExterior 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.
 2. 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.
 3. 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).
 4. Federal Safety Red: Exposed fire protection piping hydrants, post indicators, electrical conducts containing fire alarm control wiring, and fire alarm equipment.
- H. Apply paint systems on properly prepared and primed surface as follows:
1. Exterior Locations:
 - a. Apply two coats of MPI 94 (Exterior Alkyd, Semi-gloss (EO)) to the following ferrous metal items: Vent and exhaust pipes with temperatures under 94 degrees C (200 degrees F), roof drains, fire hydrants, post indicators, yard hydrants, exposed piping and similar items.
 - b. Apply two coats of MPI 11 (Exterior Latex, Semi Gloss (AE)) to the following metal items: Galvanized and zinc-copper alloy metal.
 2. Interior Locations Including In Crawl Spaces:
 - a. Apply two coats of MPI 153 (Light Industrial Coating, Interior, Water Based, Semi-Gloss; MPI Gloss Level 5) to following items:
 - 1) Metal under 94 degrees C (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. Apply two coats of MPI 22 (High Heat Resistant Coating (HR)) to ferrous metal surface over 94 degrees K (200 degrees F) of following items:

- 1) Steam line flanges, bare pipe, fittings, valves, hangers and supports over 94 degrees K (200 degrees F).
3. Other exposed locations:
 - a. Cloth jackets of insulation of ducts and pipes in connection with plumbing, air conditioning, ventilating refrigeration and heating systems: One coat of Interior Latex Primer Sealer recommended by finish paint manufacturer and one coat of MPI 43 (Interior Satin Latex, MPI Gloss Level 4).

3.11 BUILDING AND STRUCTURAL WORK FIELD PAINTING

- A. Painting and finishing of interior and exterior work except as specified under paragraph 3.11
- B.
 1. Painting of disturbed, damaged and repaired or patched surfaces when entire space is not scheduled for complete repainting or refinishing.
 2. Painting of ferrous metal and galvanized metal.
 3. Identity painting and safety painting.
- B. Building and Structural Work not Painted:
 1. Prefinished items:
 - a. Casework, doors, elevator entrances and cabs, metal panels, wall covering, and similar items specified factory finished under other sections.
 - b. Factory finished equipment and pre-engineered metal building components such as metal roof and wall panels.
 2. Finished surfaces:
 - a. Hardware except ferrous metal.
 - b. Anodized aluminum, stainless steel, chromium plating, copper, and brass, except as otherwise specified.
 - c. Signs, fixtures, and other similar items integrally finished.
 3. Concealed surfaces:
 - a. Inside dumbwaiter, elevator and duct shafts, interstitial spaces, pipe basements, crawl spaces, pipe tunnels, above ceilings, attics, except as otherwise specified.
 - b. Inside walls or other spaces behind access doors or panels.
 4. Moving and operating parts:
 - a. Shafts, chains, gears, mechanical and electrical operators, linkages, and sprinkler heads, and sensing devices.
 - b. Tracks for overhead or coiling doors, shutters, and grilles.

5. Labels:
 - a. Code required label, such as Underwriters Laboratories Inc., Inchcape Testing Services, Inc., or Factory Mutual Research Corporation.
 - b. Identification plates, instruction plates, performance rating, and nomenclature.
6. Galvanized metal:
 - a. Exterior chain link fence and gates, corrugated metal areaways, and gratings.
 - b. Gas Storage Racks.
 - c. Except where specifically specified to be painted.
7. Metal safety treads and nosings.
8. Gaskets.
9. Ceilings, walls, columns in interstitial spaces.
10. Ceilings, walls, and columns in pipe basements.

3.12 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 EXPOSED PIPING	COLOR OF BACKGROUND	COLOR OF LETTERS	LEGEND ABBREVIATIONS
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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
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

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.

3.13 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 ---