

## **SECTION 23 05 53 - IDENTIFICATION FOR MECHANICAL PIPING AND EQUIPMENT**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

**A. Section Includes:**

1. Equipment labels.
2. Pipe labels.
3. Valve tags.
4. Valve schedules.
5. Warning tags.

#### **1.2 SUBMITTAL**

- A. Product Data:** For each type of product indicated.
- B. Samples:** For color, letter style, and graphic representation required for each identification material and device.
- C. Valve numbering scheme.**
- D. Valve Schedules:** For each piping system. Furnish extra copies (in addition to mounted copies) to include in maintenance manuals.

#### **1.3 QUALITY ASSURANCE**

- A. ASME Compliance:** Comply with ASME A13.1, "Scheme for the Identification of Piping Systems," for viewing angles of identification devices for piping.

#### **1.4 COORDINATION**

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.**
- B. Coordinate installation of identifying devices with location of access panels and doors.**

## PART 2 - PRODUCTS

### 2.1 EQUIPMENT LABELS

#### A. Plastic Labels:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch thick, and having predrilled holes for attachment hardware.
2. Letter Color: White.
3. Background Color: Black.
4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
5. Minimum Label Size: Length and width vary for required label content, but not less than 1-1/2 by 4 inches.
6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
7. Fasteners: Stainless-steel rivets or self-tapping screws.
8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

- B. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified.

### 2.2 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction.
- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
- D. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
1. Flow-Direction Arrows: Integral with piping system service lettering to accommodate both directions, or as separate unit on each pipe label to indicate flow direction.
  2. Lettering Size: At least 1-1/2 inches high.

### 2.3 VALVE TAGS

#### A. Valve Tags: 0.032 inch thick brass.

1. Data: Service, identification number, and temperature of the line controlled.
2. 1-inch x 2-1/2 inch with lettering 5/16 inch high.

3. Fastener: Brass chain or S-hook.

## 2.4 VALVE SCHEDULES

- A. Assign and tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal operating position (open, closed, or modulating), temperature, pressure, size, and variations for identification. Mark valves for emergency shutoff and similar special uses. Mount valve schedule in frame with clear plastic cover, include mounting screws.

## 2.5 WARNING TAGS

- A. Warning Tags: Preprinted plasticized card stock with matte finish.
  1. Size: 4 by 7 inches.
  2. Fasteners: Brass grommet and chain.
  3. Nomenclature: Large-size primary caption such as LABORATORY WATER, DO NOT DRINK.
  4. Color: Yellow background with 1/2 inch black lettering.

## 2.6 PLUMBING FIXTURES

- A. Labels for non-potable fixtures shall have black 1/2 inch lettering and yellow background on self-adhesive waterproof paper, plastic or vinyl.
- B. Labels for potable fixtures shall have white 1/2 inch lettering and sky blue background on self-adhesive waterproof paper, plastic or vinyl.

# PART 3 - EXECUTION

## 3.1 PREPARATION

- A. Clean piping and equipment surfaces of substances that could impair bond of identification devices, including dirt, oil, grease, release agents, and incompatible primers, paints, and encapsulants.

## 3.2 EQUIPMENT LABEL

- A. Install or permanently fasten labels on each major item of mechanical equipment that does not have nameplate or has nameplate that is damaged or located where not easily visible.
- B. Locate equipment labels where accessible and visible.

- C. Include nameplates for the following general categories of equipment:
1. Fuel-burning units, including boilers, furnaces, and heaters.
  2. Pumps, compressors, chillers, condensers, and similar motor-driven units.
  3. Heat exchangers, electric coils, evaporators, cooling towers, heat recovery units, and similar equipment.
  4. Fans, blowers and air terminals.
  5. Air handling units.
  6. Packaged units.
- D. Equipment Marker Installation: Install with permanent adhesive on or near each major item of mechanical equipment. Data required for markers may be included on signs, and markers may be omitted if both are indicated.

### 3.3 PIPE LABEL

- A. Piping Color-Coding: Painting of piping is specified in Division 09 Section "Interior Painting."
- B. Locate pipe labels where piping is exposed in finished spaces; machine rooms; accessible maintenance spaces such as removable accessible ceiling shafts, tunnels, and plenums; and exterior nonconcealed locations as follows:
1. Near each valve and control device.
  2. Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.
  3. Near penetrations through walls, floors, ceilings, and inaccessible enclosures.
  4. At access doors, manholes, and similar access points that permit view of concealed piping.
  5. Near major equipment items and other points of origination and termination.
  6. At least once in each space, at least once every 20 feet, spaced at maximum intervals of 50 feet along each run. Reduce intervals to 25 feet in areas of congested piping and equipment.
  7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- C. Anchor piping labels at each end with adhesive arrow bands around the full circumference of the pipe and overlapping at the ends. Adhesive arrow bands shall have a background color that is coded in accordance with the following table. If the stated background color is not commercially available, incorporate arrows into the label and provide color-coded bands without arrows.

Service	Background Color
Steam	Aluminum
Condensate	Orange
Heating Hot Water	Tan
Central Cooling Water	White
Potable Cold Water	Dark Blue
Lab Cold Water	Light Blue
Potable Hot Water	Bright Yellow

Lab Hot Water	Dark Yellow
Gas	Green
Air, RO/DI, Vacuum, Chemical Waste and Vent	Black
Fire Service	Red
Waste, Soil, Vent, Rain Leader	Brown

- D. For liquid piping systems, indicate on the labels whether they are supply or return pipes.
- E. For cooling water pipes connected to the campus tunnel system, state “Central Cooling Water” on the labels. For chilled water pipes connected to a chiller within the building, state “Chilled Water” or “Process Chilled Water” on the labels.
- F. Indicate pressures on labels for steam lines with pressure greater than 20 psig and on all gas lines (such as nitrogen, compressed air, etc.) over 30 psig.
- G. Orient adhesive labels parallel to the pipe, and locate labels where they can be read from the floor or the most likely approach for access.
- H. Where exposed pipes in occupied areas are to be painted, the color will be specified by the Architect for aesthetic purposes. The term “exposed” in this context means unhidden by architectural elements, not uninsulated.
- I. On all piping, apply labels stating “asbestos free” at least once in each space, at least once every 20 feet, and within 6 inches of each point of connection with existing piping insulation. Mark the circumference of the new insulation with a black marking pen at each point of connection with existing insulation and draw an arrow from the nearest “asbestos free” to the black line. On the arrow, write with the black marker “terminates here.”

### 3.4 VALVE TAGS

- A. Tag each valve unless it is within 15 feet of the equipment served and in the same room.

### 3.5 VALVE SCHEDULE

- A. Install valve schedule on wall in accessible location in each major equipment room.

### 3.6 WARNING-TAG INSTALLATION

- A. Attach warning tags to equipment and other items where required.

### 3.7 PLUMBING FIXTURES

- A. Non-potable: Identify all fixtures dispensing laboratory water (intended for research, processing, or other non-domestic uses) in laboratories with cautionary signage placed above or behind the fixture as follows:

LABORATORY  
WATER  
DO NOT DRINK

- B. Potable: All fixtures dispensing potable water except restroom sinks, eye washes, drinking fountains and their associated cup/pot fillers, shall be identified by placement of advisory signage as follows:

POTABLE WATER

**END OF SECTION 23 05 53**