

230553S01 - Identification for HVAC Piping and Equipment (Ameresco)

Piping:

All plumbing and mechanical piping must be color coded and labeled, including sprinkler lines, every 15 feet above a ceiling system and every 10 feet in an open mechanical room.

See [006290S01 to 006290S04](#) for ESCO Buildings List / Compliance Requirements.

University of Kentucky Standard Color Coding for Mechanical Piping

Type of Service	Markings	Color*	No.*
High pressure steam and return (over 76 psig)	H.P.S. & H.P.R.	Safety Red	SW4081
Medium pressure steam and return (21 psig to 75 psig)	M.P.S. & M.P.R.	International Orange	SW4082
Low pressure steam and return (0 psig to 20 psig)	L.P.S. & L.P.R.	Safety Orange	SW4083
Domestic cold Water	D.C.W.	Safety Green	SW4085
Domestic hot Water	D.H.W.	Green Byte	SW4076
Medium temperature hot water & return (300 less)	M.T.H.W. & M.T.H.W.R.	Safety yellow	SW4084
Reheat supply & return	R.S. & R.R.	Junction yellow	SW4033
Chilled water supply & return	C.W.S. & C.W.R.	Safety blue	SW4086
Condenser water supply & return	C.D.W.S. & C.D.W.R.	Slate gray	SW4026
Natural gas	GAS	Deck Red	SW4040
Safety valve vents	S.V.V.	Galvano	SW4027
Cast iron soil & waste vents	W.&V.	Vacuum Black	SW4032
Chilled hot water	C.H.W.	Galvano	SW4027
Air (steel pipe)	AIR	Galvano	SW4027
Air (copper pipe)	AIR	None	--
Vacuum (copper pipe)	VAC	None	--
Vacuum (steel pipe)	VAC	Galvano	SW4027
Roof leaders	R.L.	Galvano	SW4027
Soft water	S.W.	Pillar White	SW4029
De-mineralized water	D.W.	None	--
Distilled water	DIST. W.	None	--
Diesel fuel	D. FUEL	Galvano	SW4027
Nitrogen	NITROGEN	Galvano	SW4027
Elevator oil lines	E.O.L.	Galvano	SW4027
Muratic acid	MUR. ACID	Galvano	SW4027
Sulfuric acid	SUL. ACID	Galvano	SW4027
Chromate or cooling tower additives	C.T.A.	Galvano	SW4027
Boiler treatment	B.T.	Galvano	SW4027
Gasoline	GASOLINE	Galvano	SW4027
Nitrous oxide (copper)	N. OXIDE	None	--
Caustic soda	C. SODA	Galvano	SW4027
Condensate pump discharge	COND. P.D.	Galvano	SW4027
Sump pump discharge	S. PUMP DIS.	Galvano	SW4027
Oxygen	OXYGEN	None	--
Fire suppression / sprinkler system	FIRE	Safety Red	SW4081
Ammonia	AMMONIA	Bolt brown	SW4001
Glycol solutions	GLYCOL	Rotor Turquoise	SW4066
Freon – R500	FREON R-500	Junction yellow	SW4033
Freon – R502	FREON R-502	Recycled Red	SW4073

NOTES: * Color and number are from the Sherwin Williams System 4000 color selection guide dated 1999.

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II Valves:

All valves must have labels, both a tag on the valve and on the ceiling grid.

All labels for valves must be on ceiling grid (see UK's standard for lettering below).

U.K.'s Standards for Standard Lettering:

Attach Seton-Ply Discs to ceiling grid under equipment or to access doors in non-accessible ceiling.

EQUIPMENT: COLOR:

Valve Yellow
Fire Damper Black
Smoke Damper Black
Volume Damper Black
Terminal Unit Red
Variable Volume Unit Red
Heating Coil Blue
Cabinet Unit Heater Red

ENGRAVED:

V.
F.D.
SM.D.
V.D.
T.
V.V.
H.C.
C.H.

[Ameresco Contract]

1.1 EQUIPMENT LABELS

A. Plastic Labels for Equipment:

1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, **1/8 inch (3.2 mm)** thick, and having predrilled holes for attachment hardware.
2. Letter Color: Black.
3. Background Color: White.
4. Maximum Temperature: Able to withstand temperatures up to **160 deg F (71 deg C)**.
5. Minimum Label Size: Length and width vary for required label content, but not less than **2-1/2 by 3/4 inch (64 by 19 mm)**.
6. Minimum Letter Size: **1/4 inch (6.4 mm)** for name of units if viewing distance is less than **24 inches (600 mm)**, **1/2 inch (13 mm)** for viewing distances up to **72 inches (1830 mm)**, 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.

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.

C. Equipment Label Schedule: For each item of equipment to be labeled, on **8-1/2-by-11-inch (A4)** bond paper. Tabulate equipment identification number and identify Drawing

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numbers where equipment is indicated (plans, details, and schedules), plus the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

1.2 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 (38 mm)** high.

1.3 DUCT LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, [1/16 inch (1.6 mm)] [1/8 inch (3.2 mm)] <Insert dimension> thick, and having predrilled holes for attachment hardware.
- B. Letter Color: [Black] [Blue] [Red] [White] [Yellow] <Insert color>.
- C. Background Color: [Black] [Blue] [Red] [White] [Yellow] <Insert color>.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F (71 deg C).
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch (64 by 19 mm).
- F. Minimum Letter Size: 1/4 inch (6.4 mm) for name of units if viewing distance is less than 24 inches (600 mm), 1/2 inch (13 mm) for viewing distances up to 72 inches (1830 mm), and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel [rivets] [rivets or self-tapping screws] [self-tapping screws].
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

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- I. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings, duct size, and an arrow indicating flow direction.
 1. Flow-Direction Arrows: Integral with duct system service lettering to accommodate both directions, or as separate unit on each duct label to indicate flow direction.
 2. Lettering Size: At least 1-1/2 inches (38 mm) high.

1.4 STENCILS

- A. Stencils: Prepared with letter sizes according to ASME A13.1 for piping; minimum letter height of **1-1/4 inches (32 mm)** for ducts; and minimum letter height of **3/4 inch (19 mm)** for access panel and door labels, equipment labels, and similar operational instructions.
 1. Stencil Material: Fiberboard or metal.
 2. Stencil Paint: Exterior, gloss, acrylic enamel black unless otherwise indicated. Paint may be in pressurized spray-can form.
 3. Identification Paint: Exterior, acrylic enamel in colors according to ASME A13.1 unless otherwise indicated.

1.5 UNDERGROUND-TYPE PLASTIC LINE MARKERS:

- A. General: Manufacturer's standard permanent, bright-colored, continuous-printed plastic tape, intended for direct-burial service; not less than 6" wide x 4 mils thick. Provide tape with printing which most accurately indicates type of service of buried pipe.
- B. Provide multi-ply tape consisting of solid aluminum foil core between 2-layers of plastic tape.

1.6 UTILITY SERVICE MARKERS:

- A. Markers shall consist of bronze plates, ground and polished, and marked to identify the service. Markers shall also be stamped with arrows indicating the direction the service extends. A typical marker detail is shown on the Drawings.
- B. Markers locating services at the building shall be installed in masonry or concrete walls 2' above grade. Markers locating services elsewhere on the site shall be installed in concrete walks or curbs, or in 6" x 6" steel reinforced concrete posts as detailed.

1.7 VALVE TAGS

- A. Valve Tags: Stamped or engraved with **1/4-inch (6.4-mm)** letters for piping system abbreviation and **1/2-inch (13-mm)** numbers.

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1. Tag Material: Brass, 0.032-inch (0.8-mm) minimum thickness, and having predrilled or stamped holes for attachment hardware.
 2. **Fasteners: Brass wire-link or S-hook. Wire shall not be used as a method for connecting the tags to the valve. The tags shall be installed after insulation has been installed.**
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch (A4) bond paper. 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), and variations for identification. Mark valves for emergency shutoff and similar special uses.
1. Valve-tag schedule shall be included in operation and maintenance data.

PART 2 - EXECUTION

2.1 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.

2.2 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

2.3 PIPE LABEL INSTALLATION

- A. Piping Color-Coding: Painting of piping is specified in Section "Interior Painting."
- B. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels with painted, color-coded bands or rectangles on each piping system.
1. Identification Paint: Use for contrasting background.
 2. Stencil Paint: Use for pipe marking.
- C. Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed 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.

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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. Spaced at maximum intervals of 25 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.
8. Space every 10' in mechanical rooms.