SECTION 230553 - IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			1. SUMMARY
				1. Section Includes:

Equipment labels.

Warning signs and labels.

Pipe labels.

Duct labels.

Stencils.

Valve tags.

Warning tags.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.
				5. Samples: For color, letter style, and graphic representation required for each identification material and device.
				6. Equipment Label Schedule: Include a listing of all equipment to be labeled with the proposed content for each label.
				7. Valve numbering scheme.
				8. Valve Schedules: For each piping system to include in maintenance manuals.
1. PRODUCTS

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products.

* + - 1. EQUIPMENT LABELS

Copy paragraphs below and revise for each product.

* + - * 1. Metal Labels for Equipment:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9462) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brady Corporation](http://www.specagent.com/Lookup?uid=123456944705).

[emedco](http://www.specagent.com/Lookup?uid=123456944710).

[Seton Identification Products; a Brady Corporation company](http://www.specagent.com/Lookup?uid=123456944714).

Approved equivalent.

Retain multiple material options in "Material and Thickness" Subparagraph below to allow Contractor to retain most cost-effective material.

Material and Thickness: [**Brass, 0.032-inch**] [**stainless steel, 0.025-inch**] [**aluminum, 0.032-inch**] [**or**] [**anodized aluminum, 0.032-inch**] minimum thickness, and having predrilled or stamped holes for attachment hardware.

Letter Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.

Background Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.

Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

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-quarters the size of principal lettering.

Fasteners: Stainless-steel [**rivets**] [**or**] [**self-tapping screws**].

Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

* + - * 1. Plastic Labels for Equipment:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9463) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brady Corporation](http://www.specagent.com/Lookup?uid=123456944715).

[emedco](http://www.specagent.com/Lookup?uid=123456944720).

[Seton Identification Products; a Brady Corporation company](http://www.specagent.com/Lookup?uid=123456944724).

Approved equivalent.

Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, [**1/16 inch**] [**1/8 inch**] <**Insert dimension**> thick, and having predrilled holes for attachment hardware.

Letter Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.

Background Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.

Maximum Temperature: Able to withstand temperatures up to 160 deg F.

Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.

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-quarters the size of principal lettering.

Fasteners: Stainless-steel [**rivets**] [**or**] [**self-tapping screws**].

Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.

In "Label Content" Paragraph below, the objective of labeling equipment is to coordinate it with Drawings, including plans, details, and schedules. This will allow other information, such as capacities and operating characteristics, to be obtained.

* + - * 1. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
				2. Equipment Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number, and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.
			1. WARNING SIGNS AND LABELS

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9464) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brady Corporation](http://www.specagent.com/Lookup?uid=123456944725).

[emedco](http://www.specagent.com/Lookup?uid=123456944730).

[Seton Identification Products; a Brady Corporation company](http://www.specagent.com/Lookup?uid=123456944734).

Approved equivalent.

* + - * 1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, [**1/16 inch**] [**1/8 inch**] <**Insert dimension**> thick, and having predrilled holes for attachment hardware.
				2. Letter Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.
				3. Background Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.
				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 2-1/2 by 3/4 inch.
				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-quarters 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.

In "Label Content" Paragraph below, the objective of labeling equipment is to coordinate it with Drawings, including plans, details, and schedules. This will allow other information, such as capacities and operating characteristics, to be obtained.

* + - * 1. Label Content: Include caution and warning information plus emergency notification instructions.
			1. PIPE LABELS

Retain this article if labeling devices identify some or all piping. Identification of piping by color-coded painting is covered in "Pipe Label Installation" Article.

Do not use pipe labels or plastic tapes for bare pipes conveying fluids at temperatures of 125 deg F (52 deg C) or higher.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9465) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brady Corporation](http://www.specagent.com/Lookup?uid=123456944737).

[emedco](http://www.specagent.com/Lookup?uid=123456944742).

[Seton Identification Products; a Brady Corporation company](http://www.specagent.com/Lookup?uid=123456944746).

Approved equivalent.

* + - * 1. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service, and showing flow direction according to ASME A13.1.
				2. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to [**partially cover**] [**cover full**] circumference of pipe and to attach to pipe without fasteners or adhesive.
				3. Self-Adhesive Pipe Labels: Printed plastic with contact-type, permanent-adhesive backing.
				4. Pipe Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings; also include pipe size and an arrow indicating flow direction.

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.

Retain second option in "Lettering Size" Subparagraph below if visibility due to distance from piping is an issue.

Lettering Size: [**Size letters according to ASME A13.1 for piping**] [**At least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances**].

* + - 1. DUCT LABELS

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9882) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brady Corporation](http://www.specagent.com/Lookup?uid=123456944747).

[emedco](http://www.specagent.com/Lookup?uid=123456944752).

[Seton Identification Products; a Brady Corporation company](http://www.specagent.com/Lookup?uid=123456944756).

Approved equivalent.

* + - * 1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, [**1/16 inch**] [**1/8 inch**] <**Insert dimension**> thick, and having predrilled holes for attachment hardware.
				2. Letter Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.
				3. Background Color: [**Black**] [**Blue**] [**Red**] [**White**] [**Yellow**] <**Insert color**>.
				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 2-1/2 by 3/4 inch.
				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-quarters 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.
				9. Duct Label Contents: Include identification of duct service using same designations or abbreviations as used on Drawings; also include duct size and an arrow indicating flow direction.

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.

* + - 1. STENCILS
				1. Stencils for Piping:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9466) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brimar Industries, Inc](http://www.specagent.com/Lookup?uid=123456944757).

[Craftmark Pipe Markers](http://www.specagent.com/Lookup?uid=123456944760).

[Kolbi Pipe Marker Co](http://www.specagent.com/Lookup?uid=123456944761).

Approved equivalent.

Retain second option in "Lettering Size" Subparagraph below if visibility due to distance from piping is an issue.

Lettering Size: [Size letters according to ASME A13.1 for piping] [At least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances].

Stencil Material: [Aluminum] [Brass] [Fiberboard] [Fiberboard or metal] <Insert material>.

Stencil Paint: Exterior, gloss, [alkyd enamel] [acrylic enamel] <Insert paint type> in colors complying with recommendations in ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

Identification Paint: Exterior, [alkyd enamel] [acrylic enamel] <Insert paint type> in colors according to ASME A13.1 unless otherwise indicated. Paint may be in pressurized spray-can form.

* + - * 1. Stencils for Ducts:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9883) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brimar Industries, Inc](http://www.specagent.com/Lookup?uid=123456944763).

[Craftmark Pipe Markers](http://www.specagent.com/Lookup?uid=123456944766).

[Kolbi Pipe Marker Co](http://www.specagent.com/Lookup?uid=123456944767).

Approved equivalent.

Lettering Size: Minimum letter height of 1-1/4 inches for viewing distances up to 15 feet and proportionately larger lettering for greater viewing distances.

Stencil Material: [**Aluminum**] [**Brass**] [**Fiberboard**] [**Fiberboard or metal**] <**Insert material**>.

Stencil Paint: Exterior, gloss, [**alkyd enamel**] [**acrylic enamel**] <**Insert paint type**>. Paint may be in pressurized spray-can form.

Identification Paint: Exterior, [**alkyd enamel**] [**acrylic enamel**] <**Insert paint type**>. Paint may be in pressurized spray-can form.

* + - * 1. Stencils for Access Panels and Door Labels, Equipment Labels, and Similar Operational Instructions:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9884) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brimar Industries, Inc](http://www.specagent.com/Lookup?uid=123456944769).

[Craftmark Pipe Markers](http://www.specagent.com/Lookup?uid=123456944772).

[Kolbi Pipe Marker Co](http://www.specagent.com/Lookup?uid=123456944773).

Approved equivalent.

Lettering Size: Minimum letter height of 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.

Stencil Material: [**Aluminum**] [**Brass**] [**Fiberboard**] [**Fiberboard or metal**] <**Insert material**>.

Stencil Paint: Exterior, gloss, [alkyd enamel] [acrylic enamel] <Insert paint type>. Paint may be in pressurized spray-can form.

Identification Paint: Exterior, [**alkyd enamel**] [**acrylic enamel**] <**Insert paint type**>. Paint may be in pressurized spray-can form.

* + - 1. VALVE TAGS

Retain requirement in "Action Submittals" Article to submit numbering scheme for approval.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9467) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brady Corporation](http://www.specagent.com/Lookup?uid=123456944776).

[emedco](http://www.specagent.com/Lookup?uid=123456944781).

[Seton Identification Products; a Brady Corporation company](http://www.specagent.com/Lookup?uid=123456944785).

Approved equivalent.

* + - * 1. Description: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch numbers.

Tag Material: [**Brass, 0.032-inch**] [**stainless steel, 0.025-inch**] [**aluminum, 0.032-inch**] [**or**] [**anodized aluminum, 0.032-inch**] minimum thickness, and having predrilled or stamped holes for attachment hardware.

Fasteners: Brass [**wire-link chain**] [**or**] [**beaded chain**] [**or**] [**S-hook**].

* + - * 1. Valve Schedules: For each piping system, on 8-1/2-by-11-inch 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.

Valve-tag schedule shall be included in operation and maintenance data.

* + - 1. VALVE SERVICE IDENTIFICATION CHART FRAMES
				1. Type: Satin finished extruded aluminum frame with rigid clear plastic glazing, size to fit 8-1/2-by-11 inches valve chart.
			2. WARNING TAGS

Copy paragraphs below and revise for each product.

The configuration and materials of elastomeric isolation pads depends on the equipment being supported. It is possible to have more than one type of elastomeric isolation pad on same Project. Insert Drawing designation for each elastomeric isolation pad type required. Use these designations on Drawings to identify each product.

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9468) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Brady Corporation](http://www.specagent.com/Lookup?uid=123456944786).

[emedco](http://www.specagent.com/Lookup?uid=123456944791).

[Seton Identification Products; a Brady Corporation company](http://www.specagent.com/Lookup?uid=123456944795).

Approved equivalent.

* + - * 1. Description: Preprinted or partially preprinted accident-prevention tags of plasticized card stock with matte finish suitable for writing.

Size: [**3 by 5-1/4 inches minimum**] [**Approximately 4 by 7 inches**] <**Insert size**>.

Fasteners: [**Brass grommet and wire**] [**Reinforced grommet and wire or string**].

Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."

Color: Safety-yellow background with black lettering.

1. EXECUTION
	* + 1. PREPARATION
				1. 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. GENERAL INSTALLATION REQUIREMENTS
				1. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.
				2. Coordinate installation of identifying devices with locations of access panels and doors.
				3. Install identifying devices before installing acoustical ceilings and similar concealment.
			3. EQUIPMENT LABEL INSTALLATION
				1. Install or permanently fasten labels on each major item of mechanical equipment.
				2. Locate equipment labels where accessible and visible.
			4. PIPE LABEL INSTALLATION

Retain "Piping Color Coding" Paragraph below to identify piping systems by color-coded painting. Labels will still be required to identify service, pipe size, and flow direction.

* + - * 1. Piping Color Coding: Painting of piping is specified in [**Section 099123 "Interior Painting."**] [**Section 099600 "High-Performance Coatings."**]

Retain "Stenciled Pipe Label Option" Paragraph below only if stenciled labels are permitted.

* + - * 1. Stenciled Pipe Label Option: Stenciled labels may be provided instead of manufactured pipe labels, at Installer's option. Install stenciled pipe labels, complying with ASME A13.1,[**with painted, color-coded bands or rectangles**] on each piping system.

Identification Paint: Use for contrasting background.

Stencil Paint: Use for pipe marking.

Revise "Pipe Label Locations" Paragraph below to suit Project.

* + - * 1. Pipe Label Locations: 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:

Near each valve and control device.

Near each branch connection, excluding short takeoffs for fixtures and terminal units. Where flow pattern is not obvious, mark each pipe at branch.

Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.

At access doors, manholes, and similar access points that permit view of concealed piping.

Near major equipment items and other points of origination and termination.

Spaced at maximum intervals of [**50 feet**] <**Insert dimension**> along each run. Reduce intervals to [**25 feet**] <**Insert dimension**> in areas of congested piping and equipment.

On piping above removable acoustical ceilings. Omit intermediately spaced labels.

"Directional Flow Arrows" Paragraph below is in compliance with ASME A13.1.

* + - * 1. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes, including pipes where flow is allowed in both directions.
				2. Pipe Label Color Schedule:

Retain first option in the following three subparagraphs below if water does not contain toxic or corrosive fluids per ASME A13.1.

Chilled-Water Piping: [**White letters on a safety-green background**] [**Black letters on a safety-orange background**] <**Insert colors**>.

Condenser-Water Piping: [**White letters on a safety-green background**] [**Black letters on a safety-orange background**] <**Insert colors**>.

Heating Water Piping: [**White letters on a safety-green background**] [**Black letters on a safety-orange background**] <**Insert colors**>.

Retain first option in "Refrigerant Piping" Subparagraph below if refrigerant fluid is toxic or corrosive. All other options listed are user-defined options per ASME A13.1.

Refrigerant Piping: [**Black letters on a safety-orange background**] [**White letters on a safety-purple background**] [**Black letters on a safety-white background**] [**White letters on a safety-gray background**] [**White letters on a safety-black background**] <**Insert colors**>.

Retain, in subparagraphs below, one of the user-defined color schemes per ASME A13.1.

Low-Pressure Steam Piping: [**White letters on a safety-purple background**] [**Black letters on a safety-white background**] [**White letters on a safety-gray background**] [**White letters on a safety-black background**] <**Insert colors**>.

High-Pressure Steam Piping: [**White letters on a safety-purple background**] [**Black letters on a safety-white background**] [**White letters on a safety-gray background**] [**White letters on a safety-black background**] <**Insert colors**>.

Steam Condensate Piping: [**White letters on a safety-purple background**] [**Black letters on a safety-white background**] [**White letters on a safety-gray background**] [**White letters on a safety-black background**] <**Insert colors**>.

* + - 1. DUCT LABEL INSTALLATION
				1. Install [**plastic-laminated**] [**self-adhesive**] duct labels with permanent adhesive on air ducts in the following color codes:

[**Blue**] <**Insert color**>: For cold-air supply ducts.

[**Yellow**] <**Insert color**>: For hot-air supply ducts.

[**Green**] <**Insert color**>: For exhaust-, outside-, relief-, return-, and mixed-air ducts.

Retain "Stenciled Duct Label Option" Paragraph below only if stenciled labels are permitted.

* + - * 1. Stenciled Duct Label Option: Stenciled labels showing service and flow direction may be provided instead of plastic-laminated duct labels, at Installer's option.
				2. Locate labels near points where ducts enter into and exit from concealed spaces and at maximum intervals of [**50 feet**] <**Insert dimension**> in each space where ducts are exposed or concealed by removable ceiling system.
			1. VALVE-TAG INSTALLATION

Revise this article as required to delete an entire piping system from tagging or other changes. A schedule is helpful for complex projects. Retain and revise first paragraph below if a schedule is prepared.

* + - * 1. Install tags on valves and control devices in piping systems, except check valves, valves within factory-fabricated equipment units, shutoff valves, faucets, convenience and lawn-watering hose connections, and HVAC terminal devices and similar roughing-in connections of end-use fixtures and units. List tagged valves in a valve schedule.
				2. Valve-Tag Application Schedule: Tag valves according to size, shape, and color scheme and with captions similar to those indicated in the following subparagraphs:

Other valve-tag sizes and shapes may be available if required.

Valve-Tag Size and Shape:

Chilled Water: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

Condenser Water: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

Refrigerant: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

Hot Water: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

Gas: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

Low-Pressure Steam: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

High-Pressure Steam: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

Steam Condensate: [**1-1/2 inches**] [**2 inches**], [**round**] [**square**] <**Insert shape**>.

Tag colors, if used, should follow the color schemes defined by ASME A13.1.

Valve-Tag Colors:

Toxic and Corrosive Fluids: Black letters on a safety-orange background.

Flammable Fluids: Black letters on a safety-yellow background.

Combustible Fluids: White letters on a safety-brown background.

Potable and Other Water: White letters on a safety-green background.

Compressed Air: White letters on a safety-blue background.

Defined by User: White letters on a safety-purple background, black letters on a safety-white background, white letters on a safety-gray background, and white letters on a safety-black background.

* + - * 1. Valve Service Identification Charts:

Provide 2 framed valve charts for each piping system specified to be provided with valve identification tags. Type charts on 8-1/2-by-11 inches heavy white bond paper, indicating valve number, service, and location.

Hang framed charts at locations as directed.

* + - 1. WARNING-TAG INSTALLATION
				1. Write required message on, and attach warning tags to, equipment and other items where required.

END OF SECTION 230553