

SECTION 15190

MECHANICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Identification of mechanical products installed under Division 15.

B. Related Sections:

1. Section 09900 - Painting.

1.02 REFERENCES

A. American National Standards Institute (ANSI).

- ANSI A13.1 "Scheme for the Identification of Piping Systems".
- ANSI Z53.1 "Safety Color Code for Marking Physical Hazards".

B. American Society of Heating, Refrigerating and Air Conditioning Engineers (ASHRAE).

1.03 DESIGN REQUIREMENTS

A. Assignment of unit identification numbers to operating units of equipment within a class

or

subclass will be made during the design phase of new buildings, additions, or remodeling of existing structures.

A class, subclass list will be provided to the designer by the Facilities

Management

Preventive Maintenance coordinator, indicating codes to use for the assignment of unit identification numbers.

B. In new structures, the numbering system will start in the basement with O1, within a

class

or subclass, and continue on in ascending order up to and including the equipment that may, be located on a roof.

C. When new operating equipment is to be added to an existing structure, the numbering of any new units of equipment will be fit in with the existing numbering scheme. The designer should contact the UCB Preventive Maintenance Office for information and/or instructions and details.

D. Specify that all equipment, including motors, shall be stenciled with the proper

class-

subclass code and correct unit identification as indicated in the contract documents, using a contrasting color.

E. Specify labels to identify location of valves, terminal units and Fire and F/S dampers above ceilings, as noted below in this section.

F. Drawings shall indicate unique numbers for all terminal units (e.g. VAV boxes). Specify that Contractor shall label the units accordingly, including the space being served.

G. Install engraved plates on split systems; indicating the other unit(s) a device serves, for example condensing-unit and fan-coil unit, chiller and cooling tower, etc...

1.04 DEFINITIONS (Excerpts from ANSI A13.1-1981)

A. Materials Inherently Hazardous:

1. Flammable or Explosive:

a. Materials which are easily ignited, including materials known as fire producers
or
those creating an explosive atmosphere.

2. Chemically Active or Toxic:

a. Materials which are corrosive, or are in themselves toxic or productive of poisonous gases.

3. At Temperatures or Pressures:

a. Materials which, when released from the piping, would have a potential for inflicting injury, or property damage by burns, impingement, or flashing to vapor state.

4. Radioactive:

a. Materials which emit ionizing radiation.

B. Materials of Inherently Low Hazard:

1. All materials which are not hazardous by nature, and are near enough to ambient

pressure and temperature that people working on systems carrying these materials run little risk through their release.

C. Fire Quenching Materials:

1. This classification includes sprinkler systems, and other piped fire fighting or fire protection equipment. This includes water, chemical foam, CO₂, Halon, etc.

PART 2 - PRODUCTS

2.01 IDENTIFICATION MATERIALS FOR PIPING AND EQUIPMENT

A. Metal Tags:

1. Round brass discs, minimum 1-1/2" diameter with edges ground smooth.
2. Each tag punched and provided with brass chain for installation.

B. Engraved Nameplates:

1. Laminated three-layer plastic with engraved black letters on light contrasting background color.

C. Paint Stencils:

1. Of size and color per ANSI/ASME A13.1 using clean cut letters and oil base semi-gloss enamel paint.
2. Paint material shall comply with Section 09900-Painting.
3. Size of Legend and Letters for Stencils:

Insulation or Pipe Diameter	Length of Color Field	Size of Letters
3/4" to 1-1/4"	8"	1/2"
1-1/2" to 2"	8"	3/4"
2-1/2" to 6"	12"	1-1/4"
8" to 10"	24"	2-1/2"
over 10"	32"	3-1/2"
Ductwork and Equipment	N/A	2-1/2"

- D. Pressure Sensitive Markers: Brady Type 350 flexible vinyl film identification markers and tape, with legend, size and color coding per ANSI A13.1.

- E. Semi-rigid Plastic Identification Pipe Markers: Seton Setmark with legend, size and color

coding per ANSI A13.1 Direction of flow arrows are to be included on each marker, unless otherwise specified.

1. Setmark Type SNA markers to be used on diameters 3/4" thru 5".
2. Setmark Type STR markers to be used on diameters 6" or larger.

PART 3 - EXECUTION

3.01 IDENTIFICATION OF PIPING AND EQUIPMENT

A. General:

1. Provide pipe identification, stencils, or engraved name plates to clearly identify the mechanical equipment, piping and controls of the various mechanical systems and direction of flow in piping. Valve tags are not required.

B. Methods for identification as follows:

1. Metal Tags:

- a. Stamp tags with letter prefixes to indicate service, followed by a number for location in system.

2. Engraved Nameplates:

- a. Attach nameplates with brass screws.
- b. Pressure-sensitive embossed labels are not acceptable.
- c. Nameplates shall bear the same identifying legend used on the Contract Documents.

3. Painted Stencils:

- a. Pipes and equipment to be stenciled shall first be wiped clean of dirt, dust, rust, grease and moisture.
- b. Prepare surfaces in accordance with Section 09900-Painting for stencils.
- c. Pipes and equipment shall be painted with required color code to a smooth hard surface in the area the stencil is to be applied.
- d. Stenciled markings shall be neatly performed with no overspray, drips, or other imperfections.
- e. Legend Letters and Color Field size as specified for Paint Stencils in Part 2 of this Section.
- f. Paint application shall comply with Section 09900-Painting.

4. Pressure Sensitive Markers: Apply pressure sensitive markers in accordance with manufacturer's recommendations with complete wrap around. Marker adhesion will be tested for permanence. Any markers showing dog ears, bubbles, or other failings shall be replaced.
5. Semi-Rigid Plastic Identification Markers: Seton Setmark pre-molded (not pressure sensitive) identification markers may be used at Contractor's option on service piping which is accessible for maintenance operations (but not on piping in finished spaces). This type marker shall not be installed on bare pipe when surface temperature exceeds 180 deg. F unless a 1" thick insulation band is first provided under marker for protection from the hot pipe.

C. Classification of Hazards of Materials, Designation of Colors and University Legend:

Color of Classification	Color of Field	University Letters	Legend
Materials Inherently Hazardous:			
Flammable or Explosive:			
Natural Gas	Yellow	Black	NG
Chemically Active or Toxic	Yellow	Black	
Acid Waste	Yellow	Black	AW
Chlorine	Yellow	Black	C
Extreme temperatures or Pressures:			
Boiler Feed Water	Yellow	Black	BFW
Chilled-Water Supply/with Glycol	Orange	Black	CWS/G
Chilled-Water Return/with Glycol	Orange	Black	CWR/G
Distilled Water	Orange	Black	DW
Domestic Hot Water	Orange	Black	HW
Domestic Hot Water, Circulating	Orange	Black	HWC
180 deg. Domestic Hot Water	Yellow	Black	HHW
180 deg. Domestic Hot Water, Circulating	Yellow	Black	HHWC
Heating Water Supply/with Glycol	Yellow	Black	HWS/G
Heating Water Return/with Glycol	Yellow	Black	HWR/G
Low-Pressure Steam	Yellow	Black	LPS
Low-Pressure Steam Condensate	Yellow	Black	LPSC
High-Pressure Steam	Yellow	Black	HPS
High-Pressure Steam Condensate	Yellow	Black	HPSC
Sanitary Sewer	Orange	Black	SAN
Storm Sewer	Orange	Black	SS
Tower-Water Supply	Orange	Black	TWS
Tower-Water Return	Orange	Black	TWR
Waste Vent	Orange	Black	V
High Pressure Compressed Air (over 90 psig)	Yellow	Black	CA
Refrigerant:	Yellow	Black	REF
Materials of Inherently Low Hazard:			
Liquid or Liquid Admixture:			
Chilled-Water Supply	Green	White	CWS
Chilled-Water Return	Green	White	CWR
Domestic Cold Water	Green	White	W
Gas or Gaseous Admixture:			
Medium Pressure Compressed Air (30-90 psig)	Blue	White	CA
Low Pressure Compressed Air (less than 30 psig)	Blue	White	CA
Vacuum	Blue	White	VAC
Fire Quenching Materials:			
Water, Foam, CO2, Halon:	Red	White	
Fire Lines	Red	White	FL

D. Piping:

1. Identify all piping accessible for maintenance in crawl spaces, tunnels, above ceilings,
and access spaces as well as exposed to view utilizing stenciled markings according to the following procedures:
 - a. Use an arrow marker for each pipe-content legend. The arrow shall always point away from the pipe legend and in the direction of flow: color and height of arrow to be same as content legend lettering.
 - b. If flow can be in both directions, use a double-headed arrow indication.
 - c. Apply pipe legend and arrow indication at every point of pipe entry or exit where line goes through wall or ceiling cut.
 - d. Apply pipe legend and arrow indication within 3" of each valve to show proper identification of pipe contents and direction of flow.
 - e. The legend shall be applied to the pipe so that lettering is in the most legible position. For overhead piping, apply legend on the lower half of the pipe where view is unobstructed, so that legend can be read at a glance from floor level.
 - f. For pipes under 3/4" O.D., fasten brass tags securely at specified legend locations.
 - g. Legend on steam piping, condensate return, compressed air, gas, and vacuum systems shall include working pressure or vacuum.

E. Controls:

1. Magnetic starters and relays, shall have nameplates or be stenciled to identify connecting or controlled equipment.
2. Manual operating switches, fused disconnect switches and thermal over-load switches which have not been specified as furnished with indexed faceplates shall also have nameplates or be stenciled as to "connected" or "controlled" equipment.
3. Automatic controls, control panels, zone valves, pressure electric, electric pressure switches, relays, and starters shall be clearly identified.

F. Pumps:

1. Pumps shall be identified as to service and zones served.
2. Base mounted pumps shall be stenciled or have system served nameplates.
3. Brass tags secured by tie wires may be used on small in-line pumps.

G. Storage Tanks, Water Treatment Equipment and Heaters:

1. Tanks and heaters shall be stenciled as to service.
2. The connecting pipes to each shall be identified and the service temperature entering and leaving the tank or heater shall be indicated.

H. Fans:

1. Supply and exhaust fans and air handling units and connecting ductwork supplying one or more areas from an equipment room or isolated crawl or furred space shall have nameplate or be stenciled as to plan code number, service and areas of zones served.

I. Air Conditioning Equipment:

1. Equipment such as chillers, pumps, condensers, or roof-top equipment shall be identified by stencils, or system nameplates. Labels of remote equipment shall also indicate the space(s) being served and the location of their electrical breaker (Panel ID, Room No. and Circuit).
2. Refrigeration equipment shall be labeled with the type and approximate quantity of refrigerant.

J. Lift-Out Ceilings & Access Doors:

1. Provide Kroy type adhesive labels on ceiling tee or access door to identify concealed valves, air terminal units, fire/smoke and fire dampers, or similar concealed mechanical equipment which is directly above nameplate in ceiling space.
 - a. Use the following colors for specified labels:
 1. Fire-protection devices, including dampers: 3/8" red letters on white background.
 2. Air-handling terminal devices: 3/8" black letters on white background.
 3. Isolation, balancing and control valves: 3/8" black letters on white background.
2. Label shall be installed oriented to read towards the ceiling tile that needs to be removed for access.

K. Terminal Units

1. Identify all units with unique numbers corresponding to the drawings.

L. Motors Controlled By Energy Management System:

1. The University shall furnish the following self-adhering signs which the Contractor shall install as indicated:

CAUTION

**THIS EQUIPMENT IS
UNDER COMPUTER
CONTROL AND MAY
CYCLE AT ANY TIME.**

**BEFORE WORKING ON IT,
DISCONNECT THE
ELECTRICAL POWER
AND CONTACT THE
UNIVERSITY SERVICE
CENTER AT EXT. 2-5522.**

END OF SECTION