



DESIGN GUIDELINE 220553 **MECHANICAL IDENTIFICATION AND PAINTING**

General

In general, follow the guidelines below when specifying identification and painting of mechanical piping, ductwork and equipment. Unless otherwise indicated, these guidelines are not intended to restrict or replace professional judgment.

Related Sections

Related References

In general it is the University's intention to follow industry practice, and to use existing standards to establish these guidelines.

- ANSI A13.1 - Scheme for the Identification of Piping Systems

Piping and Ductwork Identification

All pipes in all exposed locations shall be identified with factory fabricated, precurled labels securely attached to the pipe. Film markers are not acceptable, as they tend to wear off with time. Ductwork mains and all fume hood exhaust ductwork require labeling.

Clearly identify direction of flow in piping and ductwork with arrows. Arrows and markers shall be mounted to provide unobstructed visibility from floor level.

Pipe and Ductwork labels should indicate full name of service as indicated below. Abbreviations should be used on drawings only.

Pipe Labeling

Pipe labels should be installed at all access panels or doors, adjacent to valves and branch connections, both sides of floors, ceilings and walls, all major changes in direction, on straight lengths of pipe every 25 feet, and at points of termination (except in occupied spaces).

Identify contents of piping system by both fluid contained and unique temperature and/or pressure (if necessary to distinguish between other systems with same fluid at different conditions); e.g., Potable Hot Water - 110°F vs. Potable Hot Water - 140°F.

Plumbing and Waste Pipe System Labels

Acid Waste	ACID	Black on Yellow
Brine	BR	White on Green
Compressed Air	A	White on Blue
Fire Protection	FP	White on Red
Hazardous Waste	HAZ	Black on Yellow
High Purity Water	DI	White on Green
Hot Water Supply, Potable	HW	Black on Yellow
Hot Water Return, Potable	HWR	Black on Yellow
Natural Gas	G	Black on Yellow
Non-Potable Water	NPW	Black on Yellow
Potable Cold Water	CW	White on Green
Radiation Waste	RAD	Black on Yellow
Sanitary Waste	SAN	White on Green
Silver Recovery	AG	Black on Yellow
Soft Cold Water	SCW	White on Green

Drawing I.D.Letter and Label ColorHeating and Cooling Pipe System Labels

Chilled Water Return	CHWR	White on Green
Chilled Water Supply	CHWS	White on Green
Condenser Water Return	CWR	White on Green
Condenser Water Supply	CWS	White on Green
Fuel Oil Return	FOR	Black on Yellow
Fuel Oil Supply	FOS	Black on Yellow
High Pressure Condensate	HPC	Black on Yellow
High Pressure Steam	HPS	Black on Yellow
Hot Water Heating Return	HHWR	Black on Yellow
Hot Water Heating Supply	HHWS	Black on Yellow
Low Pressure Condensate	LPC	Black on Yellow
Low Pressure Steam (15#)	LPS	Black on Yellow
Medium Pressure Condensate	MPC	Black on Yellow
Medium Pressure Steam (60#)	MPS	Black on Yellow
Pumped Steam Condensate	PC	Black on Yellow

Drawing I.D.Letter and Label ColorMedical Gas Pipe System Labels

Medical Compressed Air	MCA	Black on Yellow
Laboratory Vacuum	LVAC	White on Blue
Dental Vacuum	DVAC	White on Blue
Nitrous Evacuation	N20EVAC	White on Blue
Oxygen	OX	White on Green
Nitrous Oxide	NO	White on Blue
Carbon Dioxide	CO2	White or Black on Gray
Helium	HE	White on Brown
Nitrogen	N	White on Black
Medical Vacuum	MVAC	Black on White

Drawing I.D.Letter and Label Color

Ductwork Labeling

Ductwork labels should be installed at all access panels or doors, both sides of floors, ceilings and walls, all major changes in direction, and on straight lengths of duct every 40 feet.

For ductwork, drawing identification and label should include identification of associated equipment, eg. "Supply Air (AHU-1)" for label, and "SA (AHU-1)" on drawings.

<u>Service/ Duct Label</u>	<u>Drawing</u>	<u>Letter and Label Color</u>
HVAC Supply Air (Equip. #)	SA (Eq.#)	White on Green
HVAC Return Air (Equip. #)	RA (Eq.#)	White on Green
HVAC Exhaust Air (Equip. #)	EA (Eq.#)	Black on Yellow
Outdoor Air (Equip. #)	OA (Eq.#)	White on Green
Fume Hood Exhaust (Equip. #)	FHEA (Eq.#)	Black on Yellow

Equipment Identification

During design phase, A/E shall assign equipment numbers to be used in the construction documents, in conjunction with the Project Coordinator.

Numbers for major mechanical equipment such as air handlers, chillers and pumps should be unique within a building and continue the sequence established by existing equipment. As an example, if air handlers AC-1, AC-2 and AC-3 already exist, then a new air handler should be named AC-4 (not AC-1 or AHU-4 or ACU-4). Although many equipment designators are presently used throughout the University, the A/E is encouraged to use the designators listed below where possible. All major equipment shall be labeled using this designator, engraved on a plastic label and permanently affixed to the unit. Where the first equipment item on a project is not named "-1", the equipment schedule should note that all the equipment with names preceding it are existing.

All small equipment intended to appear on test and balance reports, including VAV boxes, should be identified on design drawings with a unique number. Field labeling is not required for small equipment.

<u>Drawing I.D. & Equip. Label</u>	<u>Equipment</u>	<u>Drawing I.D. & Equip. Label</u>	<u>Equipment</u>
ACC	air cooled condenser	GEF	general exhaust fan
AHU	air handling unit	GWH	gas-fired water heater
CH	chiller	HTX	heat exchanger
CHWP	chilled water pump	HWB	hot water boiler
CP	condensate pump	HWHP	hot water heating pump
CT	cooling tower	P	pump (other than those listed)
CUH	cabinet unit heater	RF	return fan
CWP	condenser water pump	SB	steam boiler
EWB	electric water heater	SF	supply fan
FHEF	fume hood exhaust fan	UH	unit heater
FP	fire pump	VP	vacuum pump

Valve Identification

Only special use valves need be numbered on design drawings. However, all valves and regulators, except those directly serving equipment, shall be provided with 1-1/2 inch diameter brass tags with stamped numbers and letters. Tags shall indicate the system in which installed (using abbreviations listed in "Piping and Ductwork Identification" above), and valve number for systems having more than one valve.

Contractor shall provide a separate directory and drawing for plumbing, heating, and air conditioning systems. Drawing shall be scaled as required to indicate the location of each valve. A copy of the drawing shall be plastic laminated, suitable for framing, and turned over to maintenance for field use. A copy of each drawing shall be included in each copy of the Operation and Maintenance Manuals.

Painting

In general, painting of mechanical components is to be done where needed for component protection, housekeeping or aesthetics, not for identification of mechanical systems. All fire protection piping shall be painted red.

In concealed areas, including shafts and above acoustic ceilings:

Paint is not required for most piping and ductwork.

In exposed areas, including mechanical equipment rooms, and labs with no ceilings:

Paint uninsulated pipe and ductwork the same color as the background ceiling. Consult with architect and Project Coordinator. Insulated pipe and ductwork does not require paint, unless called for by Project Coordinator for aesthetic reasons.

Exterior:

Paint uninsulated pipe and ductwork the same color as the background building, or complementary color as directed by Project Coordinator. Insulated pipe and ductwork does not require paint, provided insulation material does not require paint for protection. Depending on visibility, insulated pipe and duct, and mechanical equipment may be painted to match background, as instructed by Project Coordinator.