



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
Brine
Compressed Air
Fire Protection
Hazardous Waste
High Purity Water
Hot Water Supply, Potable
Hot Water Return, Potable
Natural Gas
Non-Potable Water
Potable Cold Water
Radiation Waste
Sanitary Waste
Silver Recovery
Soft Cold Water

Drawing I.D.

ACID
BR
A
FP
HAZ
DI
HW
HWR
G
NPW
CW
RAD
SAN
AG
SCW

Letter and Label Color

Black on Yellow
White on Green
White on Blue
White on Red
Black on Yellow
White on Green
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
White on Green
Black on Yellow
White on Green
Black on Yellow
White on Green

Heating and Cooling Pipe System Labels

Chilled Water Return
Chilled Water Supply
Condenser Water Return
Condenser Water Supply
Fuel Oil Return
Fuel Oil Supply
High Pressure Condensate
High Pressure Steam
Hot Water Heating Return
Hot Water Heating Supply
Low Pressure Condensate
Low Pressure Steam (15#)
Medium Pressure Condensate
Medium Pressure Steam (60#)
Pumped Steam Condensate

Drawing I.D.

CHWR
CHWS
CWR
CWS
FOR
FOS
HPC
HPS
HHWR
HHWS
LPC
LPS
MPC
MPS
PC

Letter and Label Color

White on Green
White on Green
White on Green
White on Green
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow
Black on Yellow

Medical Gas Pipe System Labels

Medical Compressed Air
Laboratory Vacuum
Dental Vacuum
Nitrous Evacuation
Oxygen
Nitrous Oxide
Carbon Dioxide
Helium
Nitrogen
Medical Vacuum

Drawing I.D.

MCA
LVAC
DVAC
N20EVAC
OX
NO
CO2
HE
N
MVAC

Letter and Label Color

Black on Yellow
White on Blue
White on Blue
White on Blue
White on Green
White on Blue
White or Black on Gray
White on Brown
White on Black
Black on White

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.