

VALVES

General

In general, follow the guidelines below when designing and specifying valves. Unless specifically indicated otherwise, these guidelines are not intended to restrict or replace professional judgment.

Related Sections

Section 15060 - Pipe and Pipe Fittings

Section 15140 - Pipe Hangers

Preferred Manufacturers

The University (Facilities Planning and Design) maintains a "Mechanical Trades Preferred Manufacturers List". This list is updated regularly, generally in February and August. The A/E shall use this list in developing construction document specifications. Obtain a current copy from the University Project Coordinator.

Design and Application Requirements

Fire Protection

Valves for use in Fire Protection Systems shall be U.L./FM approved, NFPA rated.

Natural Gas

Natural gas shut-off valves 2" and under, shall be AGA approved ball valves. Valves 2-1/2" and larger, shall be lubricated plug valves.

Potable Water Systems

Generally, isolation valves for potable cold and hot water shall be ball or rising stem gate valves for sizes 2" and smaller. Valves 2-1/2" and larger shall be butterfly valves.

Valves at city water mains, near water meter, shall comply with City of Ann Arbor requirements.

Hydronic Systems

For Chilled Water, Hot Water Heating and Condenser Water Systems, butterfly valves are preferred for isolation service for sizes 2-1/2" and larger; ball valves are preferred for sizes 2" and smaller.

Steam and Condensate Systems

Low Pressure and Medium Pressure Steam valves shall be rated for 150 psig, and 450 °F.

For Low and Medium Pressure Steam, isolation valves 2" and smaller shall be rising stem gate valves. Valves 2-1/2" and larger shall be high performance butterfly valves (rated for steam service) or rising stem gate valves. Within tunnels, gate valves shall be used unless space confinement prohibits their installation.

Control valves for low pressure steam fired absorption chillers shall be a special low pressure drop butterfly valve. Consult "Preferred Manufacturers List".

Shut-off valves for condensate shall be rising stem gate valves.

Vacuum Systems

Specify valves rated for vacuum service in vacuum systems.

General Valve Material Requirements

Do not specify valves with plastic handles.

Compatibility with Service

All valves shall have seats, stem seals and disc materials compatible for intended fluid, temperature, pressure and service. Valve pressure ratings shall meet or exceed system pressure ratings in which they are installed. All valves on chilled water systems shall be selected for use with ethylene glycol. Although it is not common to fill chilled water systems with freeze-preventing concentrations of glycol year-round, the University does commonly fill coils with glycol during the winter. In the spring, this glycol is usually not flushed, and becomes part of the chilled water system. This results in low glycol concentrations all over campus and has caused premature valve leakage, especially for control valves.

Pipe Connections

Valves 2" and smaller shall have screwed connections for steel piping and sweated connections for copper piping. Valves 2-1/2" and larger shall have flanged connections

Repacking Under Pressure

Gates, Globe and Angle Valves shall be pressure rated and of type that can be packed under pressure whether open or closed.

Bubble-Tight Construction

Butterfly, Ball and Eccentric Plug Valves shall be of bubble-tight construction.

Chain Wheel Requirement

Within mechanical rooms, manually operated valves 4" and larger, and installed 10 feet A.F.F., or higher, shall have chain wheel operators. Chain shall reach to within 7'-0" of floor or operating platform.

Valve Material Requirements - by Valve Type

Ball and Eccentric Plug Valves

In general, ball valves shall be two piece design, with stainless steel ball. When used for isolation (not throttling or balancing), valve shall be full port construction.

Plug and ball valves 4" and larger shall have enclosed worm gear operators with position indicators.

Balancing Valves

In general, specify only valves specifically designed to be used for balancing.

Butterfly Valves

Valve body shall be of full lug construction, and allow for disconnecting piping from either direction while maintaining shut-off service.

Butterfly valves shall be high performance type where required as note above.

Manually operated butterfly valves 4" and larger shall have enclosed worm gear operators with position indicators. Manually operated valves smaller than 4" shall have levers with locking devices.

Check Valves

Check valves 2" and larger in pump discharge, and 3" and larger on water riser, shall be non-slam type.

Installation Requirements

Isolation valves shall be installed at all equipment, including all coils, pumps, heat exchangers, steam traps and expansion tanks.

Strainer blow-down valves shall always be quarter turn types, such as ball valves so that the mesh gets a sudden flow increase instead of a gradual increase. This is much more effective at breaking loose dirt.

Gate valves in risers shall have valved drain on upper side of valve.

Valves 10" and larger shall be positively proven to be new with dated certificate of manufacture.