15100 VALVES

PART 1: GENERAL

1.01 SUMMARY COMMENTS

A. Unless otherwise noted, all valves for shut-off and bypass service shall be ball valves, 2" and below, and butterfly valves 2-1/2" and above. Ball valves are acceptable in 2-1/2" and 3" copper only.

B. Valves for balancing operations shall not be ball or butterfly.

C. All end connections shall be the same as is used for fittings for 2" and below. Two and one half inches (2-1/2") and above, valves shall be flanged. Solder joints acceptable in 2-1/2" and 3" copper ball valves.

D. Unless otherwise directed for valve applications, steam and condensate pressure ranges are defined below:

1. Low Pressure----15 psig maximum

2. High Pressure---16-125 psig

E. All valves shall be labeled with 1-1/2" (one and one half inch) brass tags bearing a letter to indicate the service and a number to indicate the valve. A permanent valve chart and system schematic diagram shall show the location of all valves.

F. A manufacturer's valve tag shall be on all valves identifying the valve type and major component materials.

G. Install valves after welding adjacent to valve is complete to protect seat and disk.

H. Insulated valves shall have extended handle stems.

I. All valves for all services shall be fully bi-directional and suitable for dead end service.

J. On all valves the packing compression is to be independent of the stem, ball or handle systems. All valve stems are to be blowout proof. Packing shall be accessible without disturbing the insulation.

K. Plug or gate valves shall not be used on any services without approval by the Department of Planning, Design and Construction.
L. All valves used for vent or drain service on water systems shall have a brass hose connection with cap and chain.

M. Non-electric radiator valves with valve mounted heads are not acceptable, except on cast iron radiators. See Section 15500.

PART 2: PRODUCTS

2.01 BALL VALVES

A. For all water services, low pressure steam, low pressure condensate and all other normal non-corrosive services, ball valves shall be:

1. Body Bronze
2. Body Style Standard Port
3. Trim 316 Stainless Steel Ball and Stem, with stem extension to raise handle out of insulation
4. Seat Reinforced Teflon (RTFE), 15% glass filled double seal
5. Seat Working P/T Rating 300 psig @ 250˚F Minimum
6. Body Working P/T Rating 300 psig @ 300˚F Minimum
7. WOG Rating 300 psig Minimum
8. Saturated Steam Rating 150 psig Minimum

B. For high pressure steam service ball valves shall be:

1. Body Carbon or 316 Stainless Steel
2. Body Style Standard Port, butt or socket weld connection
3. Trim 316 Stainless Steel Ball and Stem, with stem extension, if required, to raise handle out of insulation
4. Seat High Temperature RTFE, double seal
5. Seat Working P/T Rating 100 psig @ 450˚F Minimum
6. Body Working P/T Rating 750 psig @ 100˚F Minimum
7. WOG Rating 400 psig Minimum
8. Steam Rating 100 psig @ 450˚F Minimum

C. For special applications, obtain approval of Planning, Design and Construction.
D. Minimum Flow Coefficients (Cv):

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<th>SIZE</th>
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2.02 BUTTERFLY VALVES

A. GENERAL

1. Buried chilled water and domestic water valves are to be Clow or M&H AWWA butterfly valves with mechanical joints, 150 psig seats, ANSI Class 150B bodies and 450 ft-lb operator. Valves are to close clockwise.

2. All butterfly valves for high pressure steam service shall be installed with a warm up bypass using two properly sized (1" to 2") high pressure ball valves in series, two unions and an expansion offset. Each valve shall also have a 1-1/2" (one and one half inch) blowdown on either side with a nipple and blank flange for use during warm-up.

3. For special applications, obtain approval of Planning, Design and Construction.

4. All lugged butterfly valves shall be fully bi-directional and bi-directionally dead-endable to the full pressure rating of the seat. This is defined to mean that the seat rating is not reduced when pressure is applied in either direction and the valve is capable of serving as a blank flange, when bolted to the end of a line from either side of the valve body and no mating flange is attached. The means of attaching the body to the pipe flange, and of attaching the seat ring to the body shall meet the ANSI class rating of the valve without mechanical failure. This requirement normally results in partially lugged butterfly valves not being acceptable.

5. Packing shall be able to be tightened without removing the insulation.

6. External disc position indicators shall be provided.

7. Valves must be fully factory assembled, set and tested.
8. Gear operators on steam valves shall be spaced 4" (four inches) above packing assembly.

9. Install all steam valves with the stem at least 30° off vertical to protect the bottom bearing from debris.

10. On all butterfly valve actuators located greater than 5' (five feet) above the floor install chainwheels to 5' (five feet) above the floor when the design engineer determines valve service is critical.

B. For all water services (except direct buried or in the primary chilled water within a building) and all other normal non-corrosive services butterfly valves shall be:

1. Body Ductile Iron or Cast Iron
2. Body Style Fully lugged
3. Trim 316 or 17-4 pH Stainless Steel
4. Disc Stainless Steel
5. Seat Resilient Seat, fully bi-directional dead-endable, EPDM
6. Seat Working P/T Rating 150 psig @ 250F Minimum
7. Body Working P/T Rating ANSI 150
8. Actuator under 4" Locking Lever Handle 4" and over----Handwheel Gear Operator

C. For low and high pressure steam, condensate, the chilled water building entrance or primary chilled water in a building butterfly valve shall be:

1. Body Carbon Steel
2. Body Style Tapped Lug (full flange)
3. Trim 316 Stainless Steel Double Offset Stem
4. Disc 316 Stainless Steel
5. Seat High temperature RTFE, fully bi-directional dead-endable
6. Seat Working P/T Rating  100 psig @ 450°F Minimum
7. Body Working P/T Rating  ANSI 150
8. Actuator  Handwheel Gear Operator

2.03 GAUGE VALVES

Provide ball valves for shut-off on all pressure gauges at the gauge and separate 1/2" (one half inch) ball valves for the various taps to the gauge on a manifold gauge.

2.04 CHECK VALVES

A. Two inches (2") and under:  45° swing check, screwed end.

B. Two and one half inches (2 1/2") and over:  Non-slam type globe style lift check, non-slam type tilting disc or wafer body non-slam type lift check.  Double disc or bi-folding disc type valves are not acceptable.

2.05 AIR VENT VALVES

On chilled water and glycol service use manual vents only.  Do not use automatic vents.

END OF SECTION