

SECTION 230523.12 - BALL VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Bronze ball valves.
2. Steel ball valves.
3. Stainless steel ball valves.
4. Iron ball valves.

1.2 DEFINITIONS

- A. CWP: Cold working pressure.
- B. SWP: Steam working pressure.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of valve.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
1. Protect internal parts against rust and corrosion.
 2. Protect threads, flange faces, and weld ends.
 3. Set ball valves open to minimize exposure of functional surfaces.
- B. Use the following precautions during storage:
1. Maintain valve end protection.
 2. Store valves indoors and maintain at higher-than-ambient-dew-point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.
- C. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use operating handles or stems as lifting or rigging points.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

- A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
- B. ASME Compliance:
 - 1. ASME B1.20.1 for threads for threaded-end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.5 for flanges on steel valves.
 - 4. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 5. ASME B16.18 for solder-joint connections.
 - 6. ASME B31.1 for power piping valves.
 - 7. ASME B31.9 for building services piping valves.
- C. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.
- D. Refer to HVAC valve schedule articles for applications of valves.
- E. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- F. Valve Sizes: Same as upstream piping unless otherwise indicated.
- G. Valve Actuator Types:
 - 1. Gear Actuator: For quarter-turn valves NPS 4 and larger.
 - 2. Handlever: For quarter-turn valves smaller than NPS 4.
- H. Valves in Insulated Piping:
 - 1. Include 2-inch stem extensions.
 - 2. Extended operating handle of nonthermal-conductive material, and protective sleeves that allow operation of valves without breaking the vapor seals or disturbing insulation.
 - 3. Memory stops that are fully adjustable after insulation is applied.
- I. Valve Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE BALL VALVES

- A. Bronze Ball Valves, Two-Piece with Full Port and Bronze Trim:
 - 1. Manufacturers:
 - a. Apollo Valves
 - b. Crane Valve, North America.
 - c. Hammond Valve.

- d. Milwaukee Valve Company.
 - e. NIBCO, Inc.
- 2. Description:
 - a. Standard: MSS SP-110.
 - b. SWP Rating: 150 psig.
 - c. CWP Rating: 600 psig.
 - d. Body Design: Two piece.
 - e. Body Material: Bronze.
 - f. Ends: Threaded.
 - g. Seats: RPTFE.
 - h. Stem: Bronze.
 - i. Ball: Chrome-plated brass.
 - j. Port: Full.

2.3 STEEL BALL VALVES

A. Steel Ball Valves with Full Port and Stainless-Steel Trim, Class 150:

- 1. Manufacturers:
 - a. Apollo Valves
 - b. Crane Valve, North America.
 - c. Hammond Valve.
 - d. Milwaukee Valve Company.
 - e. NIBCO, Inc.
- 2. Description:
 - a. Standard: MSS SP-72.
 - b. CWP Rating: 285 psig.
 - c. Body Design: Split body.
 - d. Body Material: Carbon steel, ASTM A 216, Type WCB.
 - e. Ends: Flanged.
 - f. Seats: RPTFE.
 - g. Stem: Stainless steel.
 - h. Ball: Stainless steel, vented.
 - i. Port: Full.

2.4 STAINLESS STEEL BALL VALVES

A. Stainless Steel Ball Valves with Full Port and Stainless-Steel Trim, Class 150:

- 1. Manufacturers:
 - a. Apollo Valves
 - b. Crane Valve, North America.
 - c. Hammond Valve.

- d. Milwaukee Valve Company.
 - e. NIBCO, Inc.
2. Description:
- a. Body Design: Three-piece.
 - b. Body Material: 316L Stainless Steel, ASTM A 351, CF3M.
 - c. Connections: Threaded (1/2" to 2"), Flanged (2-1/2" to 6").
 - d. Seats: PTFE
 - e. Stem: 316L Stainless steel with TFM stem packing, blow-out proof. Provide with stem extension where piping is insulated.
 - f. Ball: 316L Stainless steel.
 - g. Port: Full.

2.5 IRON BALL VALVES

A. Iron Ball Valves, Class 125:

1. Manufacturers:
- a. Apollo Valves
 - b. Crane Valve, North America.
 - c. Hammond Valve.
 - d. Milwaukee Valve Company.
 - e. NIBCO, Inc.
2. Description:
- a. Standard: MSS SP-72.
 - b. CWP Rating: 200 psig.
 - c. SWP Rating: 125 psig.
 - d. Body Design: Split body.
 - e. Body Material: ASTM A 126, gray iron.
 - f. Ends: Flanged.
 - g. Seats: PTFE.
 - h. Stem: Stainless steel.
 - i. Ball: Stainless steel.
 - j. Port: Full.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.

3.2 VALVE INSTALLATION

- A. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- B. Locate valves for easy access and provide separate support where necessary.
- C. Install valves in horizontal piping with stem at or above center of pipe.
- D. Install valves in position to allow full stem movement.
- E. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.

3.3 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valves with specified SWP classes or CWP ratings are unavailable, the same types of valves with higher SWP classes or CWP ratings may be substituted.
- B. Select valves with the following end connections:
 - 1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
 - 2. For Copper Tubing, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 3. For Copper Tubing, NPS 5 and Larger: Flanged ends.
 - 4. For Steel Piping, NPS 2 and Smaller: Threaded ends.
 - 5. For Steel Piping, NPS 2-1/2 to NPS 4: Flanged ends except where threaded valve-end option is indicated in valve schedules below.
 - 6. For Steel Piping, NPS 5 and Larger: Flanged ends.

3.4 CHILLED-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: bronze ball valves, piece, with bronze trim, and full port.
 - 1. Valves may be provided with solder-joint ends instead of threaded ends.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Iron ball valves, Class 125.

- a. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
- 2. Steel ball valves, Class 150.

3.5 PROCESS CHILLED-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller:
 - 1. 316L stainless steel ball valves, three-piece, and full port.
 - a. Valves shall be provided with threaded ends.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. 316L stainless steel ball valves, three-piece, and full port.
 - a. Valves shall be provided with flanged ends.

3.6 HEATING-WATER VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: bronze ball valves, two piece with bronze trim, and full port.
 - 1. Valves may be provided with solder-joint ends instead of threaded ends.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Iron ball valves, Class 125.
 - a. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 - 2. Steel ball valves, Class 150.

3.7 MEDIUM-PRESSURE STEAM VALVE SCHEDULE (MORE THAN 15 PSIG)

- A. Pipe NPS 2 and Smaller: bronze ball valves, two piece with bronze trim, and full port.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Iron ball valves, Class 125.
 - a. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 - 2. Steel ball valves, Class 300.

3.8 STEAM-CONDENSATE VALVE SCHEDULE

- A. Pipe NPS 2 and Smaller: bronze ball valves, two piece with bronze trim, and full port.
- B. Pipe NPS 2-1/2 and Larger:
 - 1. Iron ball valves, Class 125.
 - a. Iron Valves, NPS 2-1/2 to NPS 4: May be provided with threaded ends instead of flanged ends.
 - 2. Steel ball valves, Class 300.

END OF SECTION 230523.12