SECTION 230523.13 - BUTTERFLY VALVES FOR HVAC PIPING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

1. GENERAL
   * + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

* + - * 1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
      1. SUMMARY
         1. Section Includes:

Iron, single-flange butterfly valves.

Iron, grooved-end butterfly valves.

High-performance butterfly valves.

Chainwheels.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a project.

* + - * 1. CWP: Cold working pressure.
        2. EPDM: Ethylene propylene copolymer rubber.
        3. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
        4. SWP: Steam working pressure.
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
         4. Product Data: For each type of valve.
      2. DELIVERY, STORAGE, AND HANDLING

Information in this article is paraphrased from MSS publications.

* + - * 1. Prepare valves for shipping as follows:

Protect internal parts against rust and corrosion.

Protect threads, flange faces, grooves, and weld ends.

Set butterfly valves closed or slightly open.

* + - * 1. Use the following precautions during storage:

Maintain valve end protection.

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.

* + - * 1. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

1. PRODUCTS

See Editing Instruction No. 1 in the Evaluations for cautions about named manufacturers and products. For an explanation of options and Contractor's product selection procedures, see Section 016000 "Product Requirements."

* + - 1. GENERAL REQUIREMENTS FOR VALVES

HVAC valve applications specified in this Section are limited to NPS 24 (DN 600). Many valves specified are available in larger sizes.

* + - * 1. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.
        2. ASME Compliance:

ASME B16.1 for flanges on iron valves.

ASME B16.5 for pipe flanges and flanged fittings, NPS 1/2 through NPS 24.

ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

ASME B31.1 for power piping valves.

ASME B31.9 for building services piping valves.

* + - * 1. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.

Caution: Revise pressure ratings and insert temperature ratings in valve articles if valves with higher ratings are required. Valves larger than NPS 12 (DN 300) typically have a lower pressure rating than smaller valves. Verify pressure requirements for large valves.

* + - * 1. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
        2. Valve Sizes: Same as upstream piping unless otherwise indicated.
        3. Valve Actuator Types:

Gear Actuator: For valves NPS 8 and larger.

Handlever: For valves NPS 6 and smaller.

Chainwheel: Device for attachment to gear, stem, or other actuator of size and with chain for mounting height, according to "Valve Installation" Article.

* + - * 1. Valves in Insulated Piping: With 2-inch stem extensions with extended necks.
        2. Valves shall be first quality, free from all imperfections and defects, with body markings indicating manufacturer and rating.
        3. Valve parts of same manufacturer, size and type shall be interchangeable.
      1. IRON, SINGLE-FLANGE BUTTERFLY VALVES

Retain one or more of "Iron, Single-Flange Butterfly Valves with Aluminum-Bronze Disc," "Iron, Single-Flange Butterfly Valves with Ductile-Iron Disc," and "Iron, Single-Flange Butterfly Valves with Stainless-Steel Disc" paragraphs below if iron, single-flange butterfly valves are required. MSS SP-67 covers iron, single-flange butterfly valves NPS 1-1/2 to NPS 72 (DN 40 to DN 1800).

150 CWP, iron, single-flange butterfly valves are made in NPS 14 (DN 350) and larger.

* + - * 1. Iron, Single-Flange Butterfly Valves with Aluminum-Bronze Disc:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9703) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Flow Controls; Conbraco Industries, Inc](http://www.specagent.com/Lookup?uid=123457063572).

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063576).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063579).

Approved equivalent.

Description:

Standard: MSS SP-67, Type I.

CWP Rating: [**150 psig**] [**200 psig**].

Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.

Body Material: ASTM A126, cast iron or ASTM A536, ductile iron.

Seat: [**EPDM**] [**NBR**].

Stem: One- or two-piece stainless steel.

Disc: Aluminum bronze.

* + - * 1. Iron, Single-Flange Butterfly Valves with Ductile-Iron Disc:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9704) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Flow Controls; Conbraco Industries, Inc](http://www.specagent.com/Lookup?uid=123457063589).

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063593).

[Mueller Steam Specialty; A WATTS Brand](http://www.specagent.com/Lookup?uid=123457063596).

Approved equivalent.

Description:

Standard: MSS SP-67, Type I.

CWP Rating: [**150 psig**] [**200 psig**].

Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.

Body Material: ASTM A126, cast iron or ASTM A536, ductile iron.

Seat: [**EPDM**] [**NBR**].

Stem: One- or two-piece stainless steel.

Disc: Nickel-plated[**or -coated**] ductile iron.

* + - * 1. Iron, Single-Flange Butterfly Valves with Stainless-Steel Disc:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9705) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Flow Controls; Conbraco Industries, Inc](http://www.specagent.com/Lookup?uid=123457063621).

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063610).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063614).

Approved equivalent.

Description:

Standard: MSS SP-67, Type I.

CWP Rating: [**150 psig**] [**200 psig**].

Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.

Body Material: ASTM A126, cast iron or ASTM A536, ductile iron.

Seat: [**EPDM**] [**NBR**].

Stem: One- or two-piece stainless steel.

Disc: Stainless steel.

* + - 1. DUCTILE-IRON, GROOVED-END BUTTERFLY VALVES

Retain "Iron, Grooved-End Butterfly Valves, 175 CWP" or "Iron, Grooved-End Butterfly Valves, 300 CWP" Paragraphparagraph below, or both, if iron, grooved-end butterfly valves are required. MSS SP-67 covers iron, grooved-end butterfly valves from NPS 1-1/2 to NPS 72 (DN 40 to DN 1800).

* + - * 1. Iron, Grooved-End Butterfly Valves, 175 CWP:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9706) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Grinnell G-Fire by Johnson Controls Company](http://www.specagent.com/Lookup?uid=123457064265).

[Kennedy Valve Company; a division of McWane, Inc](http://www.specagent.com/Lookup?uid=123457063623).

[Victaulic Company](http://www.specagent.com/Lookup?uid=123457063626).

Approved equivalent.

Description:

Standard: MSS SP-67, Type I.

CWP Rating: 175 psig.

Body Material: Coated, ductile iron.

Stem: Two-piece stainless steel.

Disc: Coated, ductile iron.

Seal: EPDM.

* + - * 1. Iron, Grooved-End Butterfly Valves, 300 CWP:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9707) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Grinnell G-Fire by Johnson Controls Company](http://www.specagent.com/Lookup?uid=123457064266).

[Kennedy Valve Company; a division of McWane, Inc](http://www.specagent.com/Lookup?uid=123457063629).

[Victaulic Company](http://www.specagent.com/Lookup?uid=123457063634).

Approved equivalent.

Description:

Standard: MSS SP-67, Type I.

NPS 8 and Smaller CWP Rating: 300 psig.

NPS 10 and Larger CWP Rating: 200 psig.

Body Material: Coated, ductile iron.

Stem: Two-piece stainless steel.

Disc: Coated, ductile iron.

Seal: EPDM.

* + - 1. HIGH-PERFORMANCE BUTTERFLY VALVES

Retain "Single-Flange, High-Performance Butterfly Valves, Class 150" or "Single-Flange, High-Performance Butterfly Valves, Class 300" Paragraphparagraph below, or both, if high-performance butterfly valves are required. MSS SP-68, for high-pressure valves, covers high-performance butterfly valves from NPS 3 to NPS 48 (DN 80 to DN 1200).

* + - * 1. Single-Flange, High-Performance Butterfly Valves, Class 150:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9708) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Flow Controls; Conbraco Industries, Inc](http://www.specagent.com/Lookup?uid=123457082892).

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063642).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063645).

Approved equivalent.

Description:

Standard: MSS SP-68.

CWP Rating: 285 psig at 100 deg F.

Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.

Body Material: Carbon steel, cast iron, ductile iron, or stainless steel.

Seat: Reinforced PTFE or metal.

Stem: Stainless steel; offset from seat plane.

Disc: Carbon steel.

Service: Bidirectional.

* + - * 1. Single-Flange, High-Performance Butterfly Valves, Class 300:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9709) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Apollo Flow Controls; Conbraco Industries, Inc](http://www.specagent.com/Lookup?uid=123457082893).

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063656).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063659).

Approved equivalent.

Description:

Standard: MSS SP-68.

CWP Rating: 720 psig at 100 deg F.

Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.

Body Material: Carbon steel, cast iron, or ductile iron.

Seat: Reinforced PTFE or metal.

Stem: Stainless steel; offset from seat plane.

Disc: Carbon steel.

Service: Bidirectional.

* + - 1. CHAIN WHEELS

* + - * 1. [Manufacturers:](http://www.specagent.com/Lookup?ulid=9516) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Babbitt Steam Specialty Co](http://www.specagent.com/Lookup?uid=123457063663).

[Roto Hammer Industries](http://www.specagent.com/Lookup?uid=123457063664).

[Trumbull Industries](http://www.specagent.com/Lookup?uid=123457063665).

Approved equivalent.

Retain option in "Description" Paragraphparagraph if chainwheel does not mount directly to the valve stem or gearbox shaft.

* + - * 1. Description: Valve actuation assembly with sprocket rim, chain guides, chain[**, and attachment brackets for mounting chainwheels directly to hand wheels**].

In "Sprocket Rim with Chain Guides" Subparagraphsubparagraph below, consider specifying aluminum or zinc or epoxy coatings for corrosive operating conditions. Specify bronze for severe operating conditions. See the Evaluations.

Sprocket Rim with Chain Guides: [**Ductile iron**] [**Ductile or cast iron**] [**Cast iron**] [**Aluminum**] [**Bronze**], of type and size required for valve.[**Include zinc or epoxy coating.**]

In "Chain" Subparagraphsubparagraph below, choose chain material appropriate for chosen sprocket rim material

Chain: [**Hot-dip, galvanized steel**] [**Brass**] [**Stainless steel**], of size required to fit sprocket rim.

1. EXECUTION
   * + 1. EXAMINATION
          1. 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.
          2. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
          3. Examine mating flange faces for damage. 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.
          4. Do not attempt to repair defective valves; replace with new valves.
       2. VALVE INSTALLATION
          1. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
          2. Locate valves for easy access and provide separate support where necessary.
          3. Install valves in horizontal piping with stem at or above center of pipe.
          4. Install valves in position to allow full stem movement.
          5. Install chainwheels on operators for butterfly valves [**NPS 4**] <**Insert size**> and larger and more than [**96 inches**] <**Insert dimension**> above floor. Extend chains to [**60 inches**] <**Insert dimension**> above finished floor.
          6. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.
       3. ADJUSTING
          1. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.
       4. CHILLED-WATER VALVE SCHEDULE
          1. Pipe NPS 2-1/2 and Larger:

Retain one or more of subparagraphs below and indicate location of each type on Drawings.

Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: [**Ductile-iron**] disc, 200 CWP, and [**EPDM**] [**NBR**] seat.

Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: [**Ductile-iron**] disc, 150 CWP, and [**EPDM**] [**NBR**] seat.

Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: [**175**] [**300**] CWP.

High-Performance Butterfly Valves: Single flange, [**Class 150**] [**Class 300**].

* + - 1. CONDENSER-WATER VALVE SCHEDULE
         1. Pipe NPS 2-1/2 and Larger:

Retain one or more of subparagraphs below and indicate location of each type on Drawings.

Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: [**Aluminum-bronze**] disc, 200 CWP, and [**EPDM**] [**NBR**] seat.

Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: [**Aluminum-bronze**] disc, 150 CWP, and [**EPDM**] [**NBR**] seat.

Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: [**175**] [**300**] CWP.

High-Performance Butterfly Valves: Single flange, [**Class 150**] [**Class 300**].

* + - 1. HEATING-WATER VALVE SCHEDULE
         1. Pipe NPS 2-1/2 and Larger:

Retain one or more of subparagraphs below and indicate location of each type on Drawings.

Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12: [**Ductile-iron**] disc, 200 CWP, and [**EPDM**] [**NBR**] seat.

Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24: [**Ductile-iron**] disc, 150 CWP, and [**EPDM**] [**NBR**] seat.

Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12: [**175**] [**300**] CWP.

High-Performance Butterfly Valves: Single flange, [**Class 150**] [**Class 300**].

END OF SECTION 230523.13