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## SECTION 230523.13 - BUTTERFLY VALVES FOR HVAC PIPING

### **TIPS:**

To view non-printing **Editor's Notes** that provide guidance for editing, click on MasterWorks/Single-File Formatting/Toggle/Editor's Notes.

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## PART 1 - GENERAL

### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

### 1.2 SUMMARY

- A. Section Includes:
1. Iron, single-flange butterfly valves.
  2. Iron, grooved-end butterfly valves.
  3. High-performance butterfly valves.
  4. Chainwheels.

### 1.3 DEFINITIONS

- A. CWP: Cold working pressure.
- B. EPDM: Ethylene propylene copolymer rubber.
- C. MSS: Manufacturer's Standardization Society.
- D. NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.
- E. PTFE: Polytetrafluoroethylene.

### 1.4 ACTION SUBMITTALS

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

### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Prepare valves for shipping as follows:
  - 1. Protect internal parts against rust and corrosion.
  - 2. Protect threads, flange faces, grooves, and weld ends.
  - 3. Set butterfly valves closed or slightly open.
- 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 handwheels or stems as lifting or rigging points.

### 1.6 WARRANTY

- A. Manufacturer's Special Warranty on Domestic Products: Conbraco Industries, Inc. warrants products to be free of defects in workmanship or material for a period of five years. This warranty applies to Apollo brand products with "Made in the USA" markings only. Conbraco will correct such defects by suitable repair or replacement at Conbraco's discretion.
- B. Manufacturer's Special Warranty on International Products: APOLLO INTERNATIONAL products will be free of defects in workmanship or material for a period of two years. Conbraco will correct such defects by suitable repair or replacement at Conbraco's discretion.
- C. Manufacturer's Special Warranty on Apollo-Shurjoint Products warrants products to free of defects in workmanship or material for a period of ten years. This Limited Warranty applies to manufacturing defects only and does not cover severe service/temperature applications or wear parts.

## 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 B16.1 for flanges on iron valves.
  - 2. ASME B16.5 for pipe flanges and flanged fittings, NPS 1/2 through NPS 24.
  - 3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
  - 4. ASME B31.1 for power piping valves.
  - 5. ASME B31.9 for building services piping valves.
- C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
- D. Valve Pressure-Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- E. Valve Sizes: Same as upstream piping unless otherwise indicated.
- F. Valve Actuator Types:
  - 1. Gear Actuator: For valves **NPS 8 (DN 200)** and larger.
  - 2. Handlever: For valves **NPS 6 (DN 150)** and smaller.
  - 3. Chainwheel: Device for attachment to gear, stem, or other actuator of size and with chain for mounting height, according to "Valve Installation" Article.
- G. Valves in Insulated Piping: With **2-inch (50-mm)** stem extensions with extended necks.

## 2.2 IRON, SINGLE-FLANGE BUTTERFLY VALVES

- A. Iron, Single-Flange Butterfly Valves with Aluminum-Bronze Disc:
  - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; [**LD141**] [**LD145**] [**LC149**] Series, or a comparable product by one of the following:
    - a. Milwaukee Valve Company.
    - b. NIBCO INC.
    - c. **<Insert manufacturer's name>**.
  - 2. Description:
    - a. Standard: MSS SP-67, Type I.
    - b. CWP Rating for Valves **NPS 2 to NPS 12 (DN 50 to DN 300): 200 psig (1380 kPa)**.
    - c. CWP Rating for Valves **NPS 14 to NPS 24 (DN 350 to DN 600): 150 psig (1030 kPa)**.

- d. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
- e. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
- f. Seat: [EPDM] [NBR].
- g. Stem: One- or two-piece stainless steel.
- h. Disc: Aluminum bronze.

B. Iron, Single-Flange Butterfly Valves with Ductile-Iron Disc:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc. [LD141] [LD145] Series, or a comparable product by one of the following:
  - a. Milwaukee Valve Company.
  - b. NIBCO INC.
  - c. <Insert manufacturer's name>.
2. Description:
  - a. Standard: MSS SP-67, Type I.
  - b. CWP Rating for Valves NPS 2 to NPS 12 (DN 50 to DN 300): 200 psig (1380 kPa).
  - c. CWP Rating for Valves NPS 14 to NPS 24 (DN 350 to DN 600): 150 psig (1030 kPa).
  - d. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
  - e. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.
  - f. Seat: [EPDM] [NBR].
  - g. Stem: One- or two-piece stainless steel.
  - h. Disc: Nickel-plated[ or -coated] ductile iron.

C. Iron, Single-Flange Butterfly Valves with Stainless-Steel Disc:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; [LD141] [LD145] Series, or a comparable product by one of the following:
  - a. Milwaukee Valve Company.
  - b. NIBCO INC.
  - c. <Insert manufacturer's name>.
2. Description:
  - a. Standard: MSS SP-67, Type I.
  - b. CWP Rating for Valves NPS 2 to NPS 12 (DN 50 to DN 300): 200 psig (1380 kPa).
  - c. CWP Rating for Valves NPS 14 to NPS 24 (DN 350 to DN 600): 150 psig (1030 kPa).
  - d. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
  - e. Body Material: ASTM A 126, cast iron or ASTM A 536, ductile iron.

- f. Seat: [EPDM] [NBR].
- g. Stem: One- or two-piece stainless steel.
- h. Disc: Stainless steel.

## 2.3 DUCTILE IRON WAFER (FLANGELESS) BUTTERFLY VALVES

### A. Ductile Iron, Wafer (Flangeless) Butterfly Valves with Aluminum-Bronze Disc:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; [WD141] [WD145] Series, or a comparable product by one of the following:
  - a. Milwaukee Valve Company.
  - b. NIBCO, Inc.
  - c. <Insert manufacturer's name>.
2. Description:
  - a. Standard: MSS SP-67, Type I.
  - b. CWP Rating for Valves NPS 2 to NPS 12 (DN 50 to DN 300): 200 psig (1380 kPa).
  - c. Body Material: ASTM A 536, ductile iron.
  - d. Seat: [EPDM] [NBR].
  - e. Stem: One- or two-piece stainless steel.
  - f. Disc: Aluminum bronze.

### B. Ductile Iron, Wafer (Flangeless) Butterfly Valves with Ductile-Iron Disc:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; [WD141] [WD145] Series, or a comparable product by one of the following:
  - a. Milwaukee Valve Company.
  - b. NIBCO, Inc.
  - c. <Insert manufacturer's name>.
2. Description:
  - a. Standard: MSS SP-67, Type I.
  - b. CWP Rating for Valves NPS 2 to NPS 12 (DN 50 to DN 300): 200 psig (1380 kPa).
  - c. Body Material: ASTM A 536, ductile iron.
  - d. Seat: [EPDM] [NBR].
  - e. Stem: One- or two-piece stainless steel.
  - f. Disc: Ductile iron.

### C. Ductile Iron, Wafer (flangeless) Butterfly Valves with Stainless Steel Disc:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc. [**WD141**] [**WD145**] Series, or a comparable product by one of the following:
  - a. Milwaukee Valve Company.
  - b. NIBCO, Inc.
  - c. **<Insert manufacturer's name>**.
  
2. Description:
  - a. Standard: MSS SP-67, Type I.
  - b. CWP Rating for Valves **NPS 2 to NPS 12 (DN 50 to DN 300): 200 psig (1380 kPa)**.
  - c. Body Material: ASTM A 536, ductile iron.
  - d. Seat: [**EPDM**] [**NBR**].
  - e. Stem: One- or two-piece stainless steel.
  - f. Disc: Stainless steel.

## 2.4 DUCTILE-IRON, GROOVED-END BUTTERFLY VALVES

### A. Iron, Grooved-End Butterfly Valves, 175 CWP:

1. Basis-of-Design Product: Subject to compliance with requirements, provide products by Apollo-Shurjoint Piping Products USA Inc.; [**SJ-300N-L**] [**SJ-300N-W**], or comparable products by one of the following:
  - a. Grinnell Mechanical Products.
  - b. Kennedy Valve Company; a division of McWane, Inc.
  - c. Tyco Fire Products LP.
  - d. Victaulic Company.
  - e. **<Insert manufacturer's name>**.
  
2. Description:
  - a. Standard: MSS SP-67, Type I.
  - b. CWP Rating: **175 psig (1200 kPa)**.
  - c. Body Material: Coated, ductile iron.
  - d. Stem: Two-piece stainless steel.
  - e. Disc: Coated, ductile iron.
  - f. Seal: EPDM.

### B. Iron, Grooved-End Butterfly Valves, 300 CWP:

1. Basis-of-Design Product: Subject to compliance with requirements, provide products by Apollo-Shurjoint Piping Products USA Inc.; [**SJ-300N-L**] [**SJ-300N-W**], or a comparable product by one of the following:
  - a. Anvil International.
  - b. Grinnell Mechanical Products.
  - c. Kennedy Valve Company; a division of McWane, Inc.

- d. Mueller Steam Specialty; A WATTS Brand.
- e. NIBCO INC.
- f. Tyco Fire Products LP.
- g. Victaulic Company.
- h. **<Insert manufacturer's name>**.

2. Description:

- a. Standard: MSS SP-67, Type I.
- b. **NPS 8 (DN 50)** and Smaller CWP Rating: **300 psig (2070 kPa)**.
- c. **NPS 10 (DN 250)** and Larger CWP Rating: **200 psig (1380 kPa)**.
- d. Body Material: Coated, ductile iron.
- e. Stem: Two-piece stainless steel.
- f. Disc: Coated, ductile iron.
- g. Seal: EPDM.

## 2.5 HIGH-PERFORMANCE BUTTERFLY VALVES

### A. Single-Flange, High-Performance Butterfly Valves, Class 150:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; 215L Series, or a comparable product by one of the following:
  - a. Jamesbury; Metso.
  - b. NIBCO INC.
  - c. **<Insert manufacturer's name>**.
2. Description:
  - a. Standard: MSS SP-68.
  - b. Carbon Steel - WCB: CWP Rating: **285 psig (1965 kPa)** at **100 deg F (38 deg C)**.
  - c. Stainless Steel CF8M: CWP Rating: **275 psig (1896 kPa)** at **100 deg F (38 deg C)**.
  - d. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
  - e. Body Material: Carbon steel, cast iron, ductile iron, or stainless steel.
  - f. Seat: Reinforced PTFE or metal.
  - g. Stem: Stainless steel; offset from seat plane.
  - h. Disc: Carbon steel.
  - i. Service: Bidirectional.

### B. Single-Flange, High-Performance Butterfly Valves, Class 300:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; 230L Series, or a comparable product by one of the following:
  - a. Jamesbury; Metso.
  - b. NIBCO INC.
  - c. **<Insert manufacturer's name>**.
2. Description:

- a. Standard: MSS SP-68.
- b. Carbon Steel-WCB: CWP Rating: 740 psig (5102 kPa) at 100 deg F (38 deg C).
- c. Stainless Steel - CF8M: CWP Rating: 720 psig (4965 kPa) at 100 deg F (38 deg C).
- d. Body Design: Lug type; suitable for bidirectional dead-end service at rated pressure without use of downstream flange.
- e. Body Material: Carbon steel, cast iron, or ductile iron.
- f. Seat: Reinforced PTFE or metal.
- g. Stem: Stainless steel; offset from seat plane.
- h. Disc: Carbon steel.
- i. Service: Bidirectional.

## 2.6 CHAINWHEELS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc. chainwheels, or comparable products by one of the following:
  1. Babbitt Steam Specialty Co.
  2. Roto Hammer Industries.
  3. Trumbull Industries.
  4. **<Insert manufacturer's name>**.
- B. Description: Valve actuation assembly with sprocket rim, chain guides, chain[, **and attachment brackets for mounting chainwheels directly to hand wheels**].
  1. 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.**]
  2. Chain: [**Hot-dip, galvanized steel**] [**Brass**] [**Stainless steel**], of size required to fit sprocket rim.

## 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 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.
- D. 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 chainwheels on operators for butterfly valves [NPS 4 (DN 100)] <Insert size> and larger and more than [96 inches (2400 mm)] <Insert dimension> above floor. Extend chains to [60 inches (1520 mm)] <Insert dimension> above finished floor.
- F. Install valve tags. Comply with requirements in Section 230553 "Identification for HVAC Piping and Equipment" for valve tags and schedules.

### 3.3 ADJUSTING

- A. 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.

### 3.4 CHILLED-WATER VALVE SCHEDULE

- A. Pipe NPS 2-1/2 (DN 65) and Larger:
  - 1. Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12 (DN 65 to DN 300): [Aluminum-bronze] [Ductile-iron] [Stainless-steel] disc, 200 CWP, and [EPDM] [NBR] seat.
  - 2. Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24 (DN 350 to DN 600): [Aluminum-bronze] [Ductile-iron] [Stainless-steel] disc, 150 CWP, and [EPDM] [NBR] seat.
  - 3. Iron, Grooved-End Butterfly Valves, NPS 2-1/2 to NPS 12 (DN 65 to DN 300): [175] [300] CWP.
  - 4. High-Performance Butterfly Valves: Single flange, [Class 150] [Class 300].

### 3.5 CONDENSER-WATER VALVE SCHEDULE

- A. Pipe NPS 2-1/2 (DN 65) and Larger:
  - 1. Iron, Single-Flange Butterfly Valves, NPS 2-1/2 to NPS 12 (DN 65 to DN 300): [Aluminum-bronze] [Ductile-iron] [Stainless-steel] disc, 200 CWP, and [EPDM] [NBR] seat.
  - 2. Iron, Single-Flange Butterfly Valves, NPS 14 to NPS 24 (DN 350 to DN 600): [Aluminum-bronze] [Ductile-iron] [Stainless-steel] disc, 150 CWP, and [EPDM] [NBR] seat.

3. Iron, Grooved-End Butterfly Valves, **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**: **[175]** **[300]** CWP.
4. High-Performance Butterfly Valves: Single flange, **[Class 150]** **[Class 300]**.

### 3.6 HEATING-WATER VALVE SCHEDULE

#### A. Pipe **NPS 2-1/2 (DN 65)** and Larger:

1. Iron, Single-Flange Butterfly Valves, **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**: **[Aluminum-bronze]** **[Ductile-iron]** **[Stainless-steel]** disc, 200 CWP, and **[EPDM]** **[NBR]** seat.
2. Iron, Single-Flange Butterfly Valves, **NPS 14 to NPS 24 (DN 350 to DN 600)**: **[Aluminum-bronze]** **[Ductile-iron]** **[Stainless-steel]** disc, 150 CWP, and **[EPDM]** **[NBR]** seat.
3. Iron, Grooved-End Butterfly Valves, **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**: **[175]** **[300]** CWP.
4. High-Performance Butterfly Valves: Single flange, **[Class 150]** **[Class 300]**.

### 3.7 LOW-PRESSURE STEAM VALVE SCHEDULE (**15 PSIG (104 kPa)** OR LESS)

- #### A. Pipe **NPS 2-1/2 (DN 65)** and Larger: High-performance butterfly valves, single flange, **[Class 150]** **[Class 300]**.

### 3.8 HIGH-PRESSURE STEAM VALVE SCHEDULE (MORE THAN **15 PSIG (104 kPa)**)

- #### A. Pipe **NPS 2-1/2 (DN 65)** and Larger: High-performance butterfly valves, single flange, **[Class 150]** **[Class 300]**.

### 3.9 STEAM-CONDENSATE VALVE SCHEDULE

- #### A. Pipe **NPS 2-1/2 (DN 65)** and Larger: High-performance butterfly valves, single flange, **[Class 150]** **[Class 300]**.

END OF SECTION 230523.13