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SECTION 230523.14 - CHECK 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.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on MasterWorks/Supporting Information.

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. Bronze lift check valves.
 - 2. Bronze swing check valves.
 - 3. Iron swing check valves.
 - 4. Iron swing check valves with closure control.
 - 5. Iron, grooved-end swing check valves.
 - 6. Iron, center-guided check valves.
 - 7. Iron, plate-type check valves.

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.
- F. SWP: Steam working pressure.

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. Block check valves in either closed or open position.
- 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 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 B1.20.1 for threads for threaded-end valves.
 - 2. ASME B16.1 for flanges on iron valves.
 - 3. ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.
 - 4. ASME B16.18 for solder joint.
 - 5. ASME B31.1 for power piping valves.
 - 6. ASME B31.9 for building services piping valves.
- C. AWWA Compliance: Comply with AWWA C606 for grooved-end connections.
- D. 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.
- 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 Bypass and Drain Connections: MSS SP-45.

2.2 BRONZE LIFT CHECK VALVES

- A. Bronze Lift Check Valves with Bronze Disc, Class 125:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Crane; Crane Energy Flow Solutions.
 - b. Jenkins Valves; Crane Energy Flow Solutions.
 - c. Stockham; Crane Energy Flow Solutions.
 - d. <Insert manufacturer's name>.
 - 2. Description:
 - a. Standard: MSS SP-80, Type 1.
 - b. CWP Rating: 200 psig (1380 kPa).
 - c. Body Design: Vertical flow.
 - d. Body Material: ASTM B 61 or ASTM B 62, bronze.

- e. Ends: Threaded.
- f. Disc: Bronze.

B. Bronze Lift Check Valves with Nonmetallic Disc, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Flo Fab Inc.
 - b. Hammond Valve.
 - c. KITZ Corporation.
 - d. Milwaukee Valve Company.
 - e. Mueller Steam Specialty; A WATTS Brand.
 - f. NIBCO INC.
 - g. Red White Valve Corp.
 - h. WATTS.
 - i. **<Insert manufacturer's name>**.
2. Description:
 - a. Standard: MSS SP-80, Type 2.
 - b. CWP Rating: **200 psig (1380 kPa)**.
 - c. Body Design: Vertical flow.
 - d. Body Material: ASTM B 61 or ASTM B 62, bronze.
 - e. Ends: Threaded.
 - f. Disc: NBR or PTFE.

2.3 BRONZE SWING CHECK VALVES

A. Bronze Swing Check Valves with Bronze Disc, Class 125:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; **[161T] [161S]** Series, or a comparable product by one of the following:
 - a. NIBCO INC.
 - b. Stockham; Crane Energy Flow Solutions.
 - c. **<Insert manufacturer's name>**.
2. Description:
 - a. Standard: MSS SP-80, Type 3.
 - b. CWP Rating: **200 psig (1380 kPa)**.
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Ends: Threaded or soldered.
 - f. Disc: Bronze.

B. Bronze Swing Check Valves with Nonmetallic Disc, Class 125:

PRODUCT MASTERSPEC LICENSED BY ARCOM TO CONBRACO, INC.

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; [163T] [163S] [163TPR] Series, or a comparable product by one of the following:
 - a. NIBCO INC.
 - b. Stockham; Crane Energy Flow Solutions.
 - c. <Insert manufacturer's name>.
 2. Description:
 - a. Standard: MSS SP-80, Type 4.
 - b. CWP Rating: 200 psig (1380 kPa). Press valves 15 psi (100 kPa) SWP maximum.
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Ends: Threaded, soldered, and press as required by valve schedules below.
 - f. Disc: PTFE.
- C. Bronze Swing Check Valves with Bronze Disc, Class 150:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; 164T Series, or a comparable product by one of the following:
 - a. NIBCO INC.
 - b. Stockham; Crane Energy Flow Solutions.
 - c. <Insert manufacturer's name>.
 2. Description:
 - a. Standard: MSS SP-80, Type 3.
 - b. CWP Rating: 300 psig (2070 kPa).
 - c. Body Design: Horizontal flow.
 - d. Body Material: ASTM B 62, bronze.
 - e. Ends: Threaded.
 - f. Disc: Bronze.
- D. Bronze Swing Check Valves with Nonmetallic Disc, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Crane; Crane Energy Flow Solutions.
 - b. Hammond Valve.
 - c. Jenkins Valves; Crane Energy Flow Solutions.
 - d. Milwaukee Valve Company.
 - e. NIBCO INC.
 - f. WATTS.
 - g. <Insert manufacturer's name>.
 2. Description:
 - a. Standard: MSS SP-80, Type 4.

- b. CWP Rating: 300 psig (2070 kPa).
- c. Body Design: Horizontal flow.
- d. Body Material: ASTM B 62, bronze.
- e. Ends: Threaded.
- f. Disc: PTFE.

2.4 IRON SWING CHECK VALVES

A. Iron Swing Check Valves with Metal Seats, Class 125:

- 1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; 910F Series, or a comparable product by one of the following:
 - a. NIBCO INC.
 - b. Stockham; Crane Energy Flow Solutions.
 - c. <Insert manufacturer's name>.
- 2. Description:
 - a. Standard: MSS SP-71, Type I.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).
 - d. Body Design: Clear or full waterway.
 - e. Body Material: ASTM A 126, gray iron with bolted bonnet.
 - f. Ends: Flanged.
 - g. Trim: Bronze.
 - h. Gasket: Asbestos free.

B. Iron Swing Check Valves with Nonmetallic-to-Metal Seats, Class 125:

- 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Crane; Crane Energy Flow Solutions.
 - b. Stockham; Crane Energy Flow Solutions.
 - c. <Insert manufacturer's name>.
- 2. Description:
 - a. Standard: MSS SP-71, Type I.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).
 - d. Body Design: Clear or full waterway.
 - e. Body Material: ASTM A 126, gray iron with bolted bonnet.
 - f. Ends: Flanged.
 - g. Trim: Composition.
 - h. Seat Ring: Bronze.
 - i. Disc Holder: Bronze.
 - j. Disc: PTFE.
 - k. Gasket: Asbestos free.

C. Iron Swing Check Valves with Metal Seats, Class 250:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; 920F Series, or a comparable product by one of the following:
 - a. NIBCO INC.
 - b. Stockham; Crane Energy Flow Solutions.
 - c. **<Insert manufacturer's name>**.
2. Description:
 - a. Standard: MSS SP-71, Type I.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **500 psig (3450 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **300 psig (2070 kPa)**.
 - d. Body Design: Clear or full waterway.
 - e. Body Material: ASTM A 126, gray iron with bolted bonnet.
 - f. Ends: Flanged.
 - g. Trim: Bronze.
 - h. Gasket: Asbestos free.

2.5 IRON SWING CHECK VALVES WITH CLOSURE CONTROL

A. Iron Swing Check Valves with Lever- and Spring-Closure Control, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. NIBCO INC.
 - b. **<Insert manufacturer's name>**.
2. Description:
 - a. Standard: MSS SP-71, Type I.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **200 psig (1380 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **150 psig (1035 kPa)**.
 - d. Body Design: Clear or full waterway.
 - e. Body Material: ASTM A 126, gray iron with bolted bonnet.
 - f. Ends: Flanged.
 - g. Trim: Bronze.
 - h. Gasket: Asbestos free.
 - i. Closure Control: Factory-installed, exterior lever and spring.

B. Iron Swing Check Valves with Lever and Weight-Closure Control, Class 125:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; 910FLW Series, or a comparable product by one of the following:
 - a. NIBCO INC.
 - b. Stockham; Crane Energy Flow Solutions.

- c. <Insert manufacturer's name>.
2. Description:
 - a. Standard: MSS SP-71, Type I.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).
 - d. Body Design: Clear or full waterway.
 - e. Body Material: ASTM A 126, gray iron with bolted bonnet.
 - f. Ends: Flanged.
 - g. Trim: Bronze.
 - h. Gasket: Asbestos free.
 - i. Closure Control: Factory-installed, exterior lever and weight.

2.6 IRON, GROOVED-END SWING CHECK VALVES

A. Iron, Grooved-End Swing Check Valves, 300 CWP:

1. Basis-of-Design Product: Subject to compliance with requirements, provide products by Shurjoint Piping Products USA Inc.; SJ-900, or a comparable product by one of the following:
 - a. Anvil International.
 - b. Grinnell Mechanical Products.
 - c. Tyco Valves & Controls.
 - d. Victaulic Company.
 - e. <Insert manufacturer's name>.
2. Description:
 - a. CWP Rating: 300 psig (2070 kPa).
 - b. Body Material: ASTM A 536, ductile iron.
 - c. Seal: EPDM.
 - d. Disc: Spring operated, ductile iron or stainless steel.

2.7 IRON, CENTER-GUIDED CHECK VALVES

A. Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.
 - b. APCO Willamette Valve and Primer Corporation.
 - c. Crispin Valve.
 - d. DFT Inc.
 - e. Flo Fab Inc.
 - f. GA Industries, Inc.
 - g. Hammond Valve.

- h. Metraflex Company (The).
- i. Milwaukee Valve Company.
- j. Mueller Steam Specialty; A WATTS Brand.
- k. NIBCO INC.
- l. Spence Engineering Company, Inc.
- m. Sure Flow Equipment Inc.
- n. Val-Matic Valve & Manufacturing Corp.
- o. WATTS.
- p. **<Insert manufacturer's name>**.

2. Description:

- a. Standard: MSS SP-125.
- b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).**
- c. **NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).**
- d. Body Material: ASTM A 126, gray iron.
- e. Style: Compact wafer.
- f. Seat: Bronze.

B. Iron, Globe, Center-Guided Check Valves with Metal Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

- a. APCO Willamette Valve and Primer Corporation.
- b. Crispin Valve.
- c. DFT Inc.
- d. Flomatic Corporation.
- e. Hammond Valve.
- f. Metraflex Company (The).
- g. Milwaukee Valve Company.
- h. Mueller Steam Specialty; A WATTS Brand.
- i. NIBCO INC.
- j. Spence Engineering Company, Inc.
- k. Sure Flow Equipment Inc.
- l. Val-Matic Valve & Manufacturing Corp.
- m. WATTS.
- n. **<Insert manufacturer's name>**.

2. Description:

- a. Standard: MSS SP-125.
- b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).**
- c. **NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).**
- d. Body Material: ASTM A 126, gray iron.
- e. Style: Globe, spring loaded.
- f. Ends: Flanged.
- g. Seat: Bronze.

C. Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat, Class 150:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. Val-Matic Valve & Manufacturing Corp.
 - d. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **300 psig (2070 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **250 psig (1725 kPa)**.
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Compact wafer.
 - f. Seat: Bronze.
- D. Iron, Globe, Center-Guided Check Valves with Metal Seat, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. Val-Matic Valve & Manufacturing Corp.
 - d. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **300 psig (2070 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **250 psig (1725 kPa)**.
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Globe, spring loaded.
 - f. Ends: Flanged.
 - g. Seat: Bronze.
- E. Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat, Class 250:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. DFT Inc.
 - d. Flo Fab Inc.
 - e. Hammond Valve.
 - f. Metraflex Company (The).
 - g. Milwaukee Valve Company.
 - h. NIBCO INC.
 - i. Sure Flow Equipment Inc.

- j. Val-Matic Valve & Manufacturing Corp.
 - k. <Insert manufacturer's name>.
2. Description:
- a. Standard: MSS SP-125.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 400 psig (2760 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 300 psig (2070 kPa).
 - d. Body Material: ASTM A 126, gray iron.
 - e. Style: Compact wafer, spring loaded.
 - f. Seat: Bronze.
- F. Iron, Globe, Center-Guided Check Valves with Metal Seat, Class 250:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. DFT Inc.
 - d. Flomatic Corporation.
 - e. Hammond Valve.
 - f. Metraflex Company (The).
 - g. Milwaukee Valve Company.
 - h. Mueller Steam Specialty; A WATTS Brand.
 - i. NIBCO INC.
 - j. Val-Matic Valve & Manufacturing Corp.
 - k. <Insert manufacturer's name>.
2. Description:
- a. Standard: MSS SP-125.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 400 psig (2760 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 300 psig (2070 kPa).
 - d. Body Material: ASTM A 126, gray iron.
 - e. Style: Globe, spring loaded.
 - f. Ends: Flanged.
 - g. Seat: Bronze.
- G. Iron, Compact-Wafer, Center-Guided Check Valves with Metal Seat, Class 300:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. Val-Matic Valve & Manufacturing Corp.
 - d. <Insert manufacturer's name>.
2. Description:

- a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **500 psig (3450 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **400 psig (2760 kPa)**.
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Compact wafer, spring loaded.
 - f. Seat: Bronze.
- H. Iron, Globe, Center-Guided Check Valves with Metal Seat, Class 300:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. Val-Matic Valve & Manufacturing Corp.
 - d. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **500 psig (3450 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **400 psig (2760 kPa)**.
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Globe, spring loaded.
 - f. Ends: Flanged.
 - g. Seat: Bronze.
- I. Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat, Class 125:
1. Basis-of-Design Product: Subject to compliance with requirements, provide Apollo, Conbraco Industries, Inc.; **[910WB]** **[910WE]** Series, or a comparable product by one of the following:
 - a. NIBCO INC.
 - b. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **200 psig (1380 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **150 psig (1035 kPa)**.
 - d. Body Material: ASTM A 126, gray iron.
 - e. Style: Compact wafer.
 - f. Seat: **[EPDM]** **[or]** **[NBR]** **<Insert material>**.
- J. Iron, Globe, Center-Guided Check Valves with Resilient Seat, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Anvil International.

- b. APCO Willamette Valve and Primer Corporation.
 - c. Crispin Valve.
 - d. DFT Inc.
 - e. GA Industries, Inc.
 - f. Hammond Valve.
 - g. Milwaukee Valve Company.
 - h. NIBCO INC.
 - i. Sure Flow Equipment Inc.
 - j. Val-Matic Valve & Manufacturing Corp.
 - k. Zurn Industries, LLC.
 - l. <Insert manufacturer's name>.
2. Description:
- a. Standard: MSS SP-125.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).
 - d. Body Material: ASTM A 126, gray iron.
 - e. Style: Globe, spring loaded.
 - f. Ends: Flanged.
 - g. Seat: [EPDM] [or] [NBR] <Insert material>.
- K. Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. Val-Matic Valve & Manufacturing Corp.
 - d. <Insert manufacturer's name>.
 2. Description:
 - a. Standard: MSS SP-125.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 300 psig (2070 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 250 psig (1725 kPa).
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Compact wafer.
 - f. Seat: [EPDM] [or] [NBR] <Insert material>.
- L. Iron, Globe, Center-Guided Check Valves with Resilient Seat, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. DFT Inc.
 - d. Val-Matic Valve & Manufacturing Corp.
 - e. <Insert manufacturer's name>.

2. Description:
 - a. Standard: MSS SP-125.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 300 psig (2070 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 250 psig (1725 kPa).
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Globe, spring loaded.
 - f. Ends: Flanged.
 - g. Seat: [EPDM] [or] [NBR] <Insert material>.

M. Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat, Class 250:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. DFT Inc.
 - d. Flo Fab Inc.
 - e. Hammond Valve.
 - f. Milwaukee Valve Company.
 - g. NIBCO INC.
 - h. Sure Flow Equipment Inc.
 - i. Val-Matic Valve & Manufacturing Corp.
 - j. <Insert manufacturer's name>.
2. Description:
 - a. Standard: MSS SP-125.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 400 psig (2760 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 300 psig (2070 kPa).
 - d. Body Material: ASTM A 126, gray iron.
 - e. Style: Compact wafer, spring loaded.
 - f. Seat: [EPDM] [or] [NBR] <Insert material>.

N. Iron, Globe, Center-Guided Check Valves with Resilient Seat, Class 250:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. DFT Inc.
 - d. Hammond Valve.
 - e. Milwaukee Valve Company.
 - f. NIBCO INC.
 - g. Val-Matic Valve & Manufacturing Corp.
 - h. <Insert manufacturer's name>.
2. Description:

- a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **400 psig (2760 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **300 psig (2070 kPa)**.
 - d. Body Material: ASTM A 126, gray iron.
 - e. Style: Globe, spring loaded.
 - f. Ends: Flanged.
 - g. Seat: **[EPDM] [or] [NBR] <Insert material>**.
- O. Iron, Compact-Wafer, Center-Guided Check Valves with Resilient Seat, Class 300:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. Val-Matic Valve & Manufacturing Corp.
 - d. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **500 psig (3450 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **400 psig (2760 kPa)**.
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Compact wafer, spring loaded.
 - f. Seat: **[EPDM] [or] [NBR] <Insert material>**.
- P. Iron, Globe, Center-Guided Check Valves with Resilient Seat, Class 300:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crispin Valve.
 - c. Val-Matic Valve & Manufacturing Corp.
 - d. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: MSS SP-125.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **500 psig (3450 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **400 psig (2760 kPa)**.
 - d. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - e. Style: Globe, spring loaded.
 - f. Ends: Flanged.
 - g. Seat: **[EPDM] [or] [NBR] <Insert material>**.

2.8 IRON, PLATE-TYPE CHECK VALVES

- A. Iron, Dual-Plate Check Valves with Metal Seat, Class 125:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crane; Crane Energy Flow Solutions.
 - c. Flomatic Corporation.
 - d. Mueller Steam Specialty; A WATTS Brand.
 - e. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).**
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).**
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 126, gray iron.
 - f. Seat: Bronze.
- B. Iron, Dual-Plate Check Valves with Metal Seat, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crane; Crane Energy Flow Solutions.
 - c. Mueller Steam Specialty; A WATTS Brand.
 - d. Val-Matic Valve & Manufacturing Corp.
 - e. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 300 psig (2070 kPa).**
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 250 psig (1725 kPa).**
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - f. Seat: Bronze.
- C. Iron, Dual-Plate Check Valves with Metal Seat, Class 250:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crane; Crane Energy Flow Solutions.
 - c. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 400 psig (2760 kPa).**

- c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **300 psig (2070 kPa)**.
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 126, gray iron.
 - f. Seat: Bronze.
- D. Iron, Dual-Plate Check Valves with Metal Seat, Class 300:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crane; Crane Energy Flow Solutions.
 - c. Mueller Steam Specialty; A WATTS Brand.
 - d. Val-Matic Valve & Manufacturing Corp.
 - e. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **500 psig (3450 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **400 psig (2760 kPa)**.
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - f. Seat: Bronze.
- E. Iron, Single-Plate Check Valves with Resilient Seat, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Flo Fab Inc.
 - b. Sure Flow Equipment Inc.
 - c. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **200 psig (1380 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **150 psig (1035 kPa)**.
 - d. Body Design: Wafer, spring-loaded plate.
 - e. Body Material: ASTM A 126, gray iron.
 - f. Seat: **[EPDM] [or] [NBR] <Insert material>**.
- F. Iron, Dual-Plate Check Valves with Resilient Seat, Class 125:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Cooper Cameron Valves.
 - c. Crane; Crane Energy Flow Solutions.

- d. NIBCO INC.
 - e. Spence Engineering Company, Inc.
 - f. Stockham; Crane Energy Flow Solutions.
 - g. Sure Flow Equipment Inc.
 - h. WATTS.
 - i. **<Insert manufacturer's name>**.
2. Description:
- a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **200 psig (1380 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **150 psig (1035 kPa)**.
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 126, gray iron.
 - f. Seat: **[EPDM] [or] [NBR] <Insert material>**.
- G. Iron, Dual-Plate Check Valves with Resilient Seat, Class 150:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crane; Crane Energy Flow Solutions.
 - c. Jenkins Valves; Crane Energy Flow Solutions.
 - d. Val-Matic Valve & Manufacturing Corp.
 - e. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **300 psig (2070 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **250 psig (1725 kPa)**.
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - f. Seat: **[EPDM] [or] [NBR] <Insert material>**.
- H. Iron, Wafer, Single-Plate Check Valves with Resilient Seat, Class 250:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Sure Flow Equipment Inc.
 - b. **<Insert manufacturer's name>**.
 2. Description:
 - a. Standard: API 594.
 - b. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**, CWP Rating: **400 psig (2760 kPa)**.
 - c. **NPS 14 to NPS 24 (DN 350 to DN 600)**, CWP Rating: **300 psig (2070 kPa)**.
 - d. Body Design: Wafer, spring-loaded plate.
 - e. Body Material: ASTM A 126, gray iron.

- f. Seat: [EPDM] [or] [NBR] <Insert material>.
- I. Iron, Dual-Plate Check Valves with Resilient Seat, Class 250:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Crane; Crane Energy Flow Solutions.
 - c. Sure Flow Equipment Inc.
 - d. <Insert manufacturer's name>.
 2. Description:
 - a. Standard: API 594.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 400 psig (2760 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 300 psig (2070 kPa).
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 126, gray iron.
 - f. Seat: [EPDM] [or] [NBR] <Insert material>.
 - J. Iron, Dual-Plate Check Valves with Resilient Seat, Class 300:
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. APCO Willamette Valve and Primer Corporation.
 - b. Val-Matic Valve & Manufacturing Corp.
 - c. <Insert manufacturer's name>.
 2. Description:
 - a. Standard: API 594.
 - b. NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 500 psig (3450 kPa).
 - c. NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 400 psig (2760 kPa).
 - d. Body Design: Wafer, spring-loaded plates.
 - e. Body Material: ASTM A 395/A 395M or ASTM A 536, ductile iron.
 - f. Seat: [EPDM] [or] [NBR] <Insert material>.

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 check valves for proper direction of flow and as follows:
 - 1. Swing Check Valves: In horizontal position with hinge pin level.
 - 2. **[Center-Guided]** **[and]** **[Plate-Type]** Check Valves: In horizontal or vertical position, between flanges.
 - 3. Lift Check Valves: With stem upright and plumb.
- F. Install valve tags. Comply with requirements for valve tags and schedules in Section 230553 "Identification for HVAC Piping and Equipment."

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 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

- A. If valve applications are not indicated, use the following:
 - 1. Pump-Discharge Check Valves:
 - a. **NPS 2 (DN 50)** and Smaller: Bronze swing check valves with **[bronze]** **[or]** **[nonmetallic]** disc.
 - b. **NPS 2-1/2 (DN 65)** and Larger: Iron swing check valves with lever and weight or with spring or iron, center-guided, **[metal]** **[or]** **[resilient]**-seat check valves.
- B. 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.
- C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, **NPS 2 (DN 50)** and Smaller: Threaded ends except where solder-joint or press valve-end option is indicated in valve schedules.
2. For Copper Tubing, **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: Flanged ends except where threaded, soldered, or press valve-end option is indicated in valve schedules.
3. For Copper Tubing, **NPS 5 (DN 125)** and Larger: Flanged ends.
4. For Steel Piping, **NPS 2 (DN 50)** and Smaller: Threaded ends.
5. For Steel Piping, **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: Flanged ends except where threaded valve-end option is indicated in valve schedules.
6. For Steel Piping, **NPS 5 (DN 125)** and Larger: Flanged ends.
7. For Grooved-End [**Copper Tubing**] [**and**] [**Steel Piping**] except Steam and Steam Condensate Piping: Valve ends may be grooved.

3.5 CHILLED-WATER VALVE SCHEDULE

A. Pipe **NPS 2 (DN 50)** and Smaller:

1. Bronze Valves: May be provided with solder-joint or press ends instead of threaded ends.
2. Bronze swing check valves with [**bronze**] [**nonmetallic**] disc, [**Class 125**] [**Class 150**].

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

1. **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: Iron valves may be provided with threaded ends instead of flanged ends.
2. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**: Iron swing check valves with lever and [**spring**] [**weight**] closure control, Class 125.
3. **NPS 3 to NPS 12 (DN 80 to DN 300)**: Iron, grooved-end swing check valves, 300 CWP.
4. Iron swing check valves with [**metal**] [**nonmetallic-to-metal**] seats, [**Class 125**] [**Class 250**].
5. Iron, [**compact-wafer**] [**globe**], center-guided check valves [**metal**] [**resilient**] seat, [**Class 125**] [**Class 150**] [**Class 250**] [**Class 300**].
6. Iron, single-plate check valves with resilient seat, Class 125.
7. Iron, dual-plate check valves with metal seat, [**Class 125**] [**Class 150**] [**Class 250**] [**Class 300**].
8. Iron, dual-plate check valves with resilient seat, [**Class 125**] [**Class 150**] [**Class 250**] [**Class 300**].

3.6 CONDENSER-WATER VALVE SCHEDULE

A. Pipe **NPS 2 (DN 50)** and Smaller:

1. Bronze Valves: May be provided with solder-joint or press ends instead of threaded ends.
2. Bronze swing check valves with [**bronze**] [**nonmetallic**] disc, [**Class 125**] [**Class 150**].

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

1. **NPS 2-1/2 to NPS 4 (DN 65 to DN 100)**: Iron valves may be provided with threaded ends instead of flanged ends.
2. **NPS 2-1/2 to NPS 12 (DN 65 to DN 300)**: Iron swing check valves with lever and [**spring**] [**weight**]-closure control, Class 125.

3. NPS 3 to NPS 12 (DN 80 to DN 300): Iron, grooved-end swing check valves, 300 CWP.
4. NPS 2-1/2 to NPS 24 (DN 65 to DN 600): Iron, [compact-wafer] [globe], center-guided check valves with [metal] [resilient] seat, [Class 125] [Class 150] [Class 250] [Class 300].
5. Iron swing check valves with [metal] [nonmetallic-to-metal] seats, [Class 125] [Class 250].
6. Iron, single plate-check valves with resilient seat, [Class 125] [Class 250].
7. Iron, dual-plate-check valves with metal seat, [Class 125] [Class 150] [Class 250] [Class 300].
8. Iron, dual plate check valves with resilient seat, [Class 125] [Class 150] [Class 250] [Class 300].

3.7 HEATING-WATER VALVE SCHEDULE

A. Pipe NPS 2 (DN 50) and Smaller:

1. Bronze Valves: May be provided with solder-joint or press ends instead of threaded ends.
2. Bronze swing check valves with [bronze] [nonmetallic] disc, [Class 125] [Class 150].

B. Pipe NPS 2-1/2 (DN 65) and Larger:

1. NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Iron valves may be provided with threaded ends instead of flanged ends.
2. NPS 2-1/2 to NPS 12 (DN 65 to DN 300): Iron swing check valves with lever and [spring] [weight]-closure control, Class 125.
3. NPS 3 to NPS 12 (DN 80 to DN 300): Iron, grooved-end check valves, 300 CWP.
4. Iron swing check valves with [metal] [nonmetallic-to-metal] seats, [Class 125] [Class 250].
5. Iron, [compact-wafer] [globe], center-guided check valves with [metal] [resilient] seat, [Class 125] [Class 150] [Class 250] [Class 300].
6. Iron, single-plate check valves with resilient seat, [Class 125] [Class 250].
7. Iron, dual-plate check valves with metal seat, [Class 125] [Class 150] [Class 250] [Class 300].
8. Iron, dual-plate check valves with resilient seat, [Class 125] [Class 150] [Class 250] [Class 300].

3.8 LOW-PRESSURE STEAM VALVE SCHEDULE (15 PSIG (104 kPa) OR LESS)

A. Pipe NPS 2 (DN 50) and Smaller:

1. Bronze swing check valves with [bronze] [nonmetallic] disc, [Class 125] [Class 150].
2. Bronze Valves: May be provided with solder-joint or press ends instead of threaded ends.

B. Pipe NPS 2-1/2 (DN 65) and Larger:

1. NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Iron valves may be provided with threaded or press ends instead of flanged ends.
2. Iron swing check valves with [metal] [nonmetallic-to-metal] seats: [Class 125] [Class 250].

3. NPS 2-1/2 to NPS 12 (DN 65 to DN 300): Iron swing check valves with lever and [spring] [weight]-closure control, Class 125.

3.9 HIGH-PRESSURE STEAM VALVE SCHEDULE (MORE THAN 15 PSIG (104 kPa))

A. Pipe NPS 2 (DN 50) and Smaller:

1. Bronze swing check valves with [bronze] [nonmetallic] disc, [Class 125] [Class 150].

B. Pipe NPS 2-1/2 (DN 65) and Larger:

1. Iron Valves, NPS 2-1/2 to NPS 4 (DN 65 to DN 100): May be provided with threaded ends instead of flanged ends.
2. Iron swing check valves with [metal] [nonmetallic-to-metal] seats, [Class 125] [Class 250].
3. NPS 2-1/2 to NPS 12 (DN 65 to DN 300): Iron swing check valves with lever and [spring] [weight]-closure control, Class 125.

3.10 STEAM-CONDENSATE VALVE SCHEDULE

A. Pipe NPS 2 (DN 50) and Smaller:

1. Bronze swing check valves with [bronze] [nonmetallic] disc, [Class 125] [Class 150].

B. Pipe NPS 2-1/2 (DN 65) and Larger:

1. NPS 2-1/2 to NPS 4 (DN 65 to DN 100): Iron valves may be provided with threaded ends instead of flanged ends.
2. Iron swing check valves with [metal] [nonmetallic-to-metal] seats, [Class 125] [Class 250].
3. Iron swing check valves with lever and [spring] [weight]-closure control, Class 125.

END OF SECTION 230523.14