SECTION 230523.15 - GATE VALVES FOR HVAC PIPING

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

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

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:

Bronze gate valves.

Iron gate valves.

Chainwheels.

* + - 1. DEFINITIONS

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

* + - * 1. CWP: Cold working pressure.
        2. NRS: Nonrising stem.
        3. OS&Y: Outside screw and yoke.
        4. RS: Rising stem.
        5. 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 gate valves closed to prevent rattling.

* + - * 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 B1.20.1 for threads for threaded-end valves.

ASME B16.1 for flanges on iron valves.

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

Valve solder-joint end connections are not recommended for valves in HVAC piping. Soldering and brazing methods used to achieve required pressure-temperature ratings may damage internal valve parts. Special installation requirements for soldered valves may make threaded valves more cost-effective.

Caution: Use solder with melting point below 840 deg F (454 deg C).

ASME B16.18 for solder joint.

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.
        2. 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.

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. RS Valves in Insulated Piping: With 2-inch (50-mm) stem extensions.
        4. Valve Bypass and Drain Connections: MSS SP-45.
        5. Valves shall be first quality, free from all imperfections and defects, with body markings indicating manufacturer and rating.
        6. Valve parts of same manufacturer, size and type shall be interchangeable.
        7. Manually operated gate valves shall be of rising stem type, unless otherwise specified.
        8. Valves which use packing, shall be capable of being packed when wide open and under full working pressure.
      1. BRONZE GATE VALVES

Retain one or more of four "Bronze Gate Valves" paragraphs below if bronze gate valves are required. MSS SP-80 covers bronze gate valves from NPS 1/4 to NPS 3 (DN 8 to DN 80).

* + - * 1. Bronze Gate Valves, NRS, Class 125:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9748) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063942).

[Milwaukee Valve Company](http://www.specagent.com/Lookup?uid=123457063945).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063946).

Approved equivalent.

Description:

Standard: MSS SP-80, Type 1.

CWP Rating: 200 psig (1380 kPa).

Body Material: ASTM B62, bronze with integral seat and screw-in bonnet.

Ends: Threaded[**or solder joint**].

Stem: Bronze.

Disc: Solid wedge; bronze.

Packing: Asbestos free.

Handwheel: Malleable iron[**, bronze, or aluminum**].

* + - * 1. Bronze Gate Valves, RS, Class 125:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9749) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063955).

[Milwaukee Valve Company](http://www.specagent.com/Lookup?uid=123457063958).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063959).

Approved equivalent.

Description:

Standard: MSS SP-80, Type 2.

CWP Rating: 200 psig (1380 kPa).

Body Material: ASTM B62, bronze with integral seat and screw-in bonnet.

Ends: Threaded[**or solder joint**].

Stem: Bronze.

Disc: Solid wedge; bronze.

Packing: Asbestos free.

Handwheel: Malleable iron, bronze, or aluminum.

* + - * 1. Bronze Gate Valves, NRS, Class 150:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9750) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063963).

[Milwaukee Valve Company](http://www.specagent.com/Lookup?uid=123457063965).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063966).

Approved equivalent.

Description:

Standard: MSS SP-80, Type 1.

CWP Rating: 300 psig (2070 kPa).

Body Material: ASTM B62, bronze with integral seat and union-ring bonnet.

Ends: Threaded.

Stem: Bronze.

Disc: Solid wedge; bronze.

Packing: Asbestos free.

Handwheel: Malleable iron, bronze, or aluminum.

* + - * 1. Bronze Gate Valves, RS, Class 150:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9751) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063973).

[Milwaukee Valve Company](http://www.specagent.com/Lookup?uid=123457063976).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063977).

Approved equivalent.

Description:

Standard: MSS SP-80, Type 2.

CWP Rating: 300 psig (2070 kPa).

Body Material: ASTM B62, bronze with integral seat and union-ring bonnet.

Ends: Threaded.

Stem: Bronze.

Disc: Solid wedge; bronze.

Packing: Asbestos free.

Handwheel: Malleable iron[**, bronze, or aluminum**].

* + - 1. IRON GATE VALVES

Retain one or more of four "Iron Gate Valves" paragraphs below if iron gate valves are required. MSS SP-70 covers iron gate valves from NPS 2 to NPS 48 (DN 50 to DN 1200).

* + - * 1. Iron Gate Valves, NRS, Class 125:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9752) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063985).

[Milwaukee Valve Company](http://www.specagent.com/Lookup?uid=123457063989).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457063990).

Approved equivalent.

Description:

Standard: MSS SP-70, Type I.

NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).

NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).

Body Material: ASTM A126, gray iron with bolted bonnet.

Ends: Flanged.

Trim: Bronze.

Disc: Solid wedge.

Packing and Gasket: Asbestos free.

* + - * 1. Iron Gate Valves, OS&Y, Class 125:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9753) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Hammond Valve](http://www.specagent.com/Lookup?uid=123457063999).

[Milwaukee Valve Company](http://www.specagent.com/Lookup?uid=123457064003).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457064004).

Approved equivalent.

Description:

Standard: MSS SP-70, Type I.

NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 200 psig (1380 kPa).

NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 150 psig (1035 kPa).

Body Material: ASTM A126, gray iron with bolted bonnet.

Ends: Flanged.

Trim: Bronze.

Disc: Solid wedge.

Packing and Gasket: Asbestos free.

* + - * 1. Iron Gate Valves, NRS, Class 250:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9754) 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=123457082906).

[Crane; a Crane brand](http://www.specagent.com/Lookup?uid=123457064009).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457064011).

Approved equivalent.

Description:

Standard: MSS SP-70, Type I.

NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 500 psig (3450 kPa).

NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 300 psig (2070 kPa).

Body Material: ASTM A126, gray iron with bolted bonnet.

Ends: Flanged.

Trim: Bronze.

Disc: Solid wedge.

Packing and Gasket: Asbestos free.

* + - * 1. Iron Gate Valves, OS&Y, Class 250:

[Manufacturers:](http://www.specagent.com/Lookup?ulid=9755) 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=123457082907).

[Crane; a Crane brand](http://www.specagent.com/Lookup?uid=123457064013).

[NIBCO INC](http://www.specagent.com/Lookup?uid=123457064017).

Approved equivalent.

Description:

Standard: MSS SP-70, Type I.

NPS 2-1/2 to NPS 12 (DN 65 to DN 300), CWP Rating: 500 psig (3450 kPa).

NPS 14 to NPS 24 (DN 350 to DN 600), CWP Rating: 300 psig (2070 kPa).

Body Material: ASTM A126, gray iron with bolted bonnet.

Ends: Flanged.

Trim: Bronze.

Disc: Solid wedge.

Packing and Gasket: Asbestos free.

* + - 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=123457064020).

[Roto Hammer Industries](http://www.specagent.com/Lookup?uid=123457064021).

[Trumbull Industries](http://www.specagent.com/Lookup?uid=123457064022).

Approved equivalent.

Retain option in "Description" Paragraphparagraph below 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 the zinc or epoxy coatings for corrosive operating conditions. Bronze should be specified 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 threads on valve and mating pipe for form and cleanliness.
          4. 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.
          5. 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 gate 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.
          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. GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

The Section Text is arranged to provide bronze or brass valves in NPS 2 (DN 50) and smaller and iron valves from NPS 2-1/2 to NPS 24 (DN 65 to DN 600).

Caution: Verify that valve classes and pressure-temperature ratings are adequate for system fluid. Repeat each category listing if necessary and insert required pressure range for each listing. Indicate location of each different pressure system on Drawings.

Retain and revise valve applications in paragraphs and schedules below. Coordinate with valves specified in Part 2.

* + - * 1. If valve applications are not indicated, use the following:

Shutoff Service: Gate valves.

* + - * 1. 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.
        2. Select valves, except wafer types, with the following end connections:

For Copper Tubing, NPS 2 (DN 50) and Smaller: Threaded ends, except where solder-joint valve-end option is indicated in valve schedules below.

For Copper Tubing, 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 below.

For Copper Tubing, NPS 5 (DN 125) and Larger: Flanged ends.

For Steel Piping, NPS 2 (DN 50) and Smaller: Threaded ends.

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 below.

For Steel Piping, NPS 5 (DN 125) and Larger: Flanged ends.

For Grooved-End [**Copper Tubing**] [**and**] [**Steel Piping**], except for Steam and Steam Condensate Piping: Valve ends may be grooved.

* + - 1. CHILLED-WATER VALVE SCHEDULE
         1. Pipe NPS 2 (DN 50) and Smaller: Bronze valves, [**NRS**] [**RS**], [**Class 125**] [**Class 150**], with [**soldered**] [**threaded**] ends.
         2. Pipe NPS 2-1/2 (DN 65) and Larger: Iron gate valves, [**NRS**] [**OS&Y**], [**Class 125**] [**Class 250**].
      2. CONDENSER-WATER VALVE SCHEDULE
         1. Pipe NPS 2 (DN 50) and Smaller: Bronze valves, [**NRS**] [**RS**], [**Class 125**] [**Class 150**], with [**soldered**] [**threaded**] ends.
         2. Pipe NPS 2-1/2 (DN 65) and Larger: Iron gate valves, [**NRS**] [**OS&Y**], [**Class 125**] [**Class 250**].
      3. HEATING-WATER VALVE SCHEDULE
         1. Pipe NPS 2 (DN 50) and Smaller: Bronze valves, [**NRS**] [**RS**], [**Class 125**] [**Class 150**] with [**soldered**] [**threaded**] ends.
         2. Pipe NPS 2-1/2 (DN 65) and Larger: Iron gate valves, [**NRS**] [**OS&Y**], [**Class 125**] [**Class 250**].
      4. LOW-PRESSURE STEAM VALVE SCHEDULE (15 PSIG (104 kPa) OR LESS)
         1. Pipe NPS 2 (DN 50) and Smaller: Bronze gate valves, [**NRS**] [**RS**], [**Class 125**] [**Class 150**].
         2. Pipe NPS 2-1/2 (DN 65) and Larger: Iron gate valves, [**NRS**] [**OS&Y**], [**Class 125**] [**Class 250**].
      5. HIGH-PRESSURE STEAM VALVE SCHEDULE (MORE THAN 15 PSIG (104 kPa)
         1. Pipe NPS 2 (DN 50) and Smaller: Bronze gate valves, [**NRS**] [**RS**], [**Class 125**] [**Class 150**] [Class 250].
         2. Pipe NPS 2-1/2 (DN 65) and Larger: Iron gate valves, [**NRS**] [**OS&Y**], [**Class 125**] [**Class 250**].
      6. STEAM-CONDENSATE VALVE SCHEDULE
         1. Pipe NPS 2 (DN 50) and Smaller: Bronze gate valves, [**NRS**] [**RS**], [**Class 125**] [**Class 150**] [Class 250].
         2. Pipe NPS 2-1/2 and Larger: Iron gate valves, [**NRS**] [**OS&Y**], [**Class 125**] [**Class 250**].
         3. Pipe NPS 2-1/2 (DN 65) and Larger: Iron gate valves, [**NRS**] [**OS&Y**], [**Class 125**] [**Class 250**].

END OF SECTION 230523.15