

STAINLESS-STEEL OR STAINLESS-STEEL-LINED, BONNETLESS, KNIFE GATE VALVES WITH FLANGED ENDS

1. SCOPE AND FIELD OF APPLICATION

1.1 This Standard Practice covers all stainless-steel or stainless-steel-lined, cast, or fabricated bonnetless, knife gate valves with flanged ends from size NPS 2 (DN 50) through NPS 36 (DN 900).

1.2 The valves identified in this Standard Practice are intended for use in applications where shock loadings are not encountered. Applications at conditions other than those specified in Section 3 require special design considerations.

2. STANDARD UNITS

The values stated in either U.S. customary units or SI (metric) units are to be regarded separately as the “standard”. Within the text, the SI (metric) units are shown in parenthesis. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in non-conformance with this Standard Practice.

3. PRESSURE RATING

This Standard Practice covers valves with a gauge pressure rating not exceeding the values in the following table, at temperatures between 32 °F and 150 °F (0 °C and 66 °C).

U.S. Customary		SI (Metric)	
NPS	psi	DN	bar
2 – 24	150	50 – 600	10.3
30, 36	100	750, 900	6.9

4. SIZE

The valve sizes in Table 1 (NPS) and Table 2 (DN) are the nominal sizes of the end connections.

5. MARKING

The valve shall be marked in accordance with MSS SP-25, including the following requirements and modifications:

- a) Manufacturer’s name or trademark/logo.
- b) The body material of construction or code. When more than one material or grade of material is used, each shall be identified. The material in contact with the fluid media shall be listed and identified as “lining” on the name plate. It is not required to repeat the material designation of fabricated bodies.
- c) Marking to show “seat side” of valve. Since most valves are manufactured for closure in one direction only, the valve shall be marked showing the “seat side” (downstream side) of the valve in such a manner that the markings can be seen with the valve installed in the pipeline. The user shall be responsible for correct directional installation. When bi-directional performance is required, testing in the reverse direction from the seat shall be as per agreement between the customer and the manufacturer. Markings shall still indicate the seat side of the valve. Bi-directional designs do not require a flow direction indicator.

- d) The valve shall be marked for installation purposes, indicating:
 - 1) Care to be taken in valve installation with respect to direction of closure.
 - 2) Care to be taken when installing studs or bolts in the tapped holes of the flange in the area of the chest to prevent chest damage. The “chest” is the body area between the packing chamber and the flanges.
 - 3) Packing nuts may require adjustment to obtain a tight seal.
- e) The stem material need not be listed.

6. **MATERIALS**

6.1 Materials used for major components of these valves are listed in Table 3. Equivalent stainless steel grades are listed in Table 4.

6.2 Materials for stainless-steel-lined knife gate valves, per Tables 3 and 4 of this Standard Practice, shall be by agreement between purchaser and manufacturer.

7. **DESIGN**

7.1 Valves shall be all stainless steel or stainless-steel-lined, by agreement as per Section 6.2. All interior wetted surfaces, including raised faces, gasket and packing chamber surfaces shall be stainless steel. Liners shall be sealed to prevent external leakage. With the exception of hard facing overlays and coatings, all internal wetted parts shall have a corrosion resistance at least equivalent to the trim items (gate and seat rings) or valve liner; whichever is considered to have the lesser corrosion resistance. Hard face overlays (Cobalt or Ni-Cr types) on valve seating surfaces or wear surfaces are acceptable. Stem material shall be the manufacturer's standard unless otherwise agreed upon between the manufacturer and purchaser. Coatings applied to internal wetted surfaces shall be by agreement between the manufacturer and user.

Dimensions shall be in accordance with Table 1 (inches) or Table 2 (millimeters).

7.2 The design of all valves shall prevent permanent distortion of the body or seats when tested as specified in Section 10. Some permanent distortion of stainless-steel parts is acceptable during the shell test of Section 10.1 provided it can be demonstrated that there will be no further deformation upon subsequent pressure loadings.

7.3 When through-bolting is specified, valves shall have flange holes per ASME B16.5 for sizes NPS 2 (DN 50) through NPS 24 (DN 600) for Class 150, and per ASME B16.47, Series A for sizes larger than NPS 24 (DN 600), see Table 1 (NPS) and Table 2 (DN) notes; except flange bolt holes that contact the chest shall be tapped in accordance with Table 1 or Table 2 of this Standard Practice.

7.4 The valve port I.D. shall not be less than 90 percent (90%) of the nominal inside diameter of Schedule 40 pipe.

7.5 Because of variations in basic valve design, differential pressure, and valve accessibility, it is not possible to standardize the conditions under which a manually operated valve requires mechanical assistance.

Consideration should be given to the use of mechanical assistance on all valves over NPS 8 (DN 200) when the differential pressure, during valve operation, approaches the valve's rated working pressure. In addition, consideration should be given to the use of mechanical assistance on all NPS 16 (DN 400) valves and larger, regardless of differential pressure.

8. WELDING

All body pressure boundary welds shall be in accordance with the ASME Boiler and Pressure Vessel Code, Section IX.

9. TOLERANCES

The following tolerances shall be followed:

Face-to-face:

NPS 10 (DN 250) and smaller

| ±0.06 in. (±1.5 mm) |

NPS 12 (DN 300) and larger

| ±0.12 in. (±3.0 mm) |

Flange outside diameter:

| ±0.06 in. (±1.5 mm) |

Bolt circle diameter drilling:

| ±0.06 in. (±1.5 mm) |

Center-to-center of adjacent bolt holes:

±0.03 in. (±0.8 mm)

10. PRODUCTION TESTS

10.1 **Shell Test (Body)** Each valve shall be hydrostatically pressure tested at 1.5 times the rated working pressure with no visible leakage allowed (leakage through the packing or gate seal shall not be cause for rejection). Tests shall be performed to the requirements of MSS SP-151.

The test fluid shall be water (which may contain a corrosion inhibitor), kerosene, or another suitable fluid provided such fluid has viscosity that is not greater than that of water. The test fluid temperature shall not exceed 125 °F (50 °C).

10.2 **Seat Test** After the shell test, each valve shall be hydrostatically pressure tested per the requirements of MSS SP-151.

11. SHIPPING INFORMATION

11.1 Valve packing nuts may be loosened prior to shipment to extend packing life. These nuts may have to be adjusted after installation.

11.2 Unless indicated otherwise, valves shall be shipped with covers to protect the raised face of the flanges.