

**MSS SP-117-2006**

# Bellows Seals for Globe and Gate Valves

**Standard Practice**  
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This MSS Standard Practice was developed under the consensus of the MSS Technical Committee 114 and the MSS Coordinating Committee. The content of this Standard Practice is the result of the efforts of competent and concerned volunteers to provide an effective, clear, and non-exclusive specification that will benefit the industry as a whole. This MSS Standard Practice is intended as a basis for common practice by the manufacturer, the user, and the general public. The existence of an MSS Standard Practice does not in itself preclude the manufacture, sale, or use of products not conforming to the Standard Practice. Mandatory conformance is established only by reference in a code, specification, sales contract, or public law, as applicable.

Unless otherwise specifically noted in this MSS SP, any standard referred to herein is identified by the date of issue that was applicable to the referenced standard(s) at the date of issue of this MSS SP. (See Annex B.)

In this Standard Practice all notes, annexes, tables, and figures are construed to be essential to the understanding of the message of the standard, and are considered part of the text unless noted as "supplemental". All appendices appearing in this document are construed as "supplemental". Supplemental information does not include mandatory requirements.

Substantive changes in this 2006 edition are “flagged” by parallel bars as shown on the margins of this paragraph. The specific detail of the change may be determined by comparing the material flagged with that in the previous edition.

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## Bellows Seals for Globe and Gate Valves

### 1. **SCOPE**<sup>(1)</sup>

1.1 This Standard Practice covers requirements for design, materials, fabrication, installation, qualification, examination, testing, and shipment of metal bellows and/or bellows assemblies to be installed in manual and automated on-off globe and gate valves.

1.2 This Standard Practice is applicable to metal bellows used in conjunction with steel globe and gate valves which otherwise satisfy the requirements of standards such as API600/ISO10434, API602/ISO 15761, ASME B16.34 and API603. Such standards are referred to herein as the "parent" valve specifications.

1.3 This Standard Practice does not apply to non-metallic bellows or bellows made of low melting point materials such as brass, phosphor-bronze, or similar materials.

1.4 Except where specifically noted in the text of this Standard Practice, the requirements here are not intended to supersede or replace those requirements of the parent valve standard. This standard specifies additional requirements for those valves utilizing bellows seals.

1.5 It is the responsibility of the bellows valve manufacturer to ensure compliance with this Standard Practice.

### 2. **MARKING**

2.1 Valves utilizing bellows seals shall have a corrosion-resistant metal identification plate securely attached, giving the following information:

a) Bellows seal per MSS SP-117

b) Bellows Material: (insert actual bellows material)

Note: If the parent valve elevated pressure-temperature rating is to be derated or service temperature limited due to bellows design limitations, any bellows rated limitations to the parent valve pressure-temperature rating shall be marked as required by the parent valve specification.

### 3. **DESIGN**

#### 3.1 *General*

3.1.1 The purpose of the bellows seal is to provide a metal barrier between the stem at its point of entry through the pressure boundary and the process fluid within the valve to eliminate stem leakage. The bellows seal is not intended to be a structural member of the valve nor is it considered to be the ultimate pressure containing mechanism of the valve. Thus, the bellows seal is to be designed in conjunction with and not as a substitute for the conventional pressure boundary components normally required. See Figure 1 for an example of a typical valve assembly with bellows seal.

3.1.2 Because a conventional pressure boundary mechanism is available to act as the ultimate pressure containing mechanism, latitude is permitted in the design of bellows seals so long as they satisfy the performance and all other requirements of this Standard Practice.

3.1.3 Except as specifically noted herein, the rules governing the design of all other valve components found in the parent valve specifications apply.

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<sup>(1)</sup> This Standard Practice is not intended for valves developed for and predominantly used in instrument piping systems.