

**MSS SP-61-2013**

# Pressure Testing of Valves

**Standard Practice**  
Developed and Approved by the  
Manufacturers Standardization Society of the  
Valve and Fittings Industry, Inc.  
127 Park Street, NE  
Vienna, Virginia 22180-4602  
Phone: (703) 281-6613  
Fax: (703) 281-6671  
E-mail: [standards@mss-hq.org](mailto:standards@mss-hq.org)



[www.mss-hq.org](http://www.mss-hq.org)

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 resulting efforts of competent and experienced volunteers to provide an effective, clear, and non-exclusive standard that will benefit the industry as a whole. This MSS Standard Practice describes minimal requirements and 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 to this Standard Practice is established only by reference in other documents such as a code, specification, sales contract, or public law, as applicable. MSS has no power, nor does it undertake, to enforce or certify compliance with this document. Any certification or other statement of compliance with the requirements of this Standard Practice shall not be attributable to MSS and is solely the responsibility of the certifier or maker of the statement.

*“Unless indicated otherwise within this MSS Standard Practice, other standards documents referenced to herein are identified by the date of issue that was applicable to this Standard Practice at the date of approval of this MSS Standard Practice (see Annex A). This Standard Practice shall remain silent on the validity of those other standards of prior or subsequent dates of issue even though applicable provisions may not have changed.”*

By publication of this Standard Practice, no position is taken with respect to the validity of any potential claim(s) or of any patent rights in connection therewith. MSS shall not be held responsible for identifying any patent rights. Users are expressly advised that determination of patent rights and the risk of infringement of such rights are entirely their responsibility.

In this Standard Practice, all text, notes, annexes, tables, figures, and references are construed to be essential to the understanding of the message of the standard, and are considered normative unless indicated as “supplemental”. All appendices, if included, that appear in this document are construed as “supplemental”. Note that supplemental information does not include mandatory requirements.

U.S. customary units in this Standard Practice are the standard; (SI) metric units are for reference only.

Substantive changes in this 2013 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.

Non-toleranced dimensions in this Standard Practice are nominal unless otherwise specified.

*Excerpts of this Standard Practice may be quoted with permission. Credit lines should read ‘Extracted from MSS SP-61-2013 with permission of the publisher, Manufacturers Standardization Society of the Valve and Fittings Industry’. Reproduction and/or electronic transmission or dissemination is prohibited under copyright convention unless written permission is granted by the Manufacturers Standardization Society of the Valve and Fittings Industry Inc. All rights reserved.*

Originally Published: February 1961  
Current Edition Approved: December 2012 (Updated April 2013)  
Current Edition Published: May 2013

MSS is a registered trademark of Manufacturers Standardization Society of the Valve and Fittings Industry, Inc.

Copyright ©, 2013 by  
Manufacturers Standardization Society  
of the  
Valve and Fittings Industry, Inc.  
Printed in U.S.A.

**| FOREWORD |**

This Standard Practice for Pressure Testing of Valves was originally adopted in 1961. It was developed for the purpose of providing a uniform means of testing valves commonly used in the "full open" and "full closed" type of service. For control valves, refer to standards ISA-75.19.01 and FCI 70-2, which may be more appropriate for control valve pressure testing.

**TABLE OF CONTENTS**

<b><u>SECTION</u></b>	<b><u>PAGE</u></b>
1 SCOPE .....	1
2 DEFINITIONS .....	1
3 GENERAL REQUIREMENTS .....	1
4 SHELL LEAKAGE TESTS .....	2
5 SEAT CLOSURE TESTS .....	2

**TABLE**

1 Shell Leakage Test Duration .....	2
2 Alternate Gas Test .....	2
3 Seat Closure Test Duration .....	4
4 Units of Leakage per NPS/DN .....	4

**ANNEX**

A Referenced Standards and Applicable Dates .....	5
---	---

## PRESSURE TESTING OF VALVES

### 1. SCOPE

This Standard Practice establishes requirements and acceptance criteria for shell and seat closure pressure testing of valves.

### 2. DEFINITIONS

#### 2.1 *Production Pressure Test*

Pressure tests, which include closure member and shell leakage tests, shall be performed on production units manufactured for sale. Production pressure tests verify the pressure containing capability of production units.

#### 2.2 *Shell Leakage Test*

An internal pressure test of the pressure containing envelope to demonstrate pressure containing capability of the external pressure boundary.

#### 2.3 *Seat and Closure Member Test*

An internal pressure test of flow regulating elements (seats, seals, and closure member such as gate, disc, ball, or plug) to demonstrate static pressure performance within allowable leakage tolerances.

#### 2.4 *No Visible Leakage*

2.4.1 The term "no visible leakage", applied to a hydrostatic test liquid, is defined as a leak rate that will produce no visible weeping or formation of drops (1) at the test pressure area and (2) for the duration of the test.

2.4.2 The term "no visible leakage", as applied to air or gas testing, is defined as a leak rate<sup>(1)</sup> that will produce no visible formation of bubbles in a water immersion test or after application of leak detection fluid at the test pressure and for the duration of the test.

2.4.3 For automatic leak detection methods, this definition shall be considered equivalent to a leak rate no greater than  $4.1 \times 10^{-5}$  in<sup>3</sup>/sec ( $6.7 \times 10^{-4}$  ml/sec)<sup>(1)</sup> with a pressure differential of 80 to 100 psi (5.5 to 6.9 bar) for application to valves of NPS 8 (DN 200) and smaller.

### 3. GENERAL REQUIREMENTS

3.1 The manufacturer shall be responsible for the performance of tests specified herein.

3.2 Fluid for shell and seat closure tests shall be air, inert gas, or liquid, such as water (which may contain a corrosion inhibitor), kerosene, or other fluid with viscosity not greater than that of water. Temperature of the test fluid shall not exceed 125 °F (52 °C).

3.3 Valves shall be substantially relieved of air or gas when tested with liquid.

3.4 Seat closure tests for NPS 4 (DN 100) and larger valves shall be conducted after an acceptable shell test. Seat closure tests for smaller valves may be conducted before or after the shell test at the manufacturer's option. However, when valves conform to ASME B16.34, the requirements of Section 7.2 of ASME B16.34 shall apply.

---

NOTE: (1) This leakage rate is based on the measured leakage of nitrogen gas from a needle valve with a 0.167 in. O.D. x 0.091 in. I.D. tube submerged in water to a depth of 1 inch. The tube end was cut square and smooth with no chamfers or butts and the tube axis was parallel to the surface of the water. Leakage was adjusted to a level equal to 40 bubbles in 10 minutes at 90 psi. The 40 bubbles equaled 1.6 ml or, 1 bubble = 0.04 SCC. Using this data, a leak rate equivalent to 1 bubble every minute is found to be  $4.1 \times 10^{-5}$  in<sup>3</sup>/sec ( $6.7 \times 10^{-4}$  ml/sec).