UL 252A

STANDARD FOR SAFETY

Compressed Gas Regulator Accessories

UL Standard for Safety for Compressed Gas Regulator Accessories, UL 252A

Fourth Edition, Dated September 16, 2010

Summary of Topics

This revision of ANSI/UL 252A dated July 12, 2019 includes requirements for outlet connections and batteries.

Text that has been changed in any manner or impacted by UL's electronic publishing system is marked with a vertical line in the margin.

The new and revised requirements are substantially in accordance with Proposal(s) on this subject dated September 15, 2017 and May 3, 2019.

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Standard for Compressed Gas Regulator Accessories

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The Department of Defense (DoD) has adopted UL 252A on August 12, 2002. The publication of revised pages or a new edition of this Standard will not invalidate the DoD adoption.

Comments or proposals for revisions on any part of the Standard may be submitted to UL at any time. Proposals should be submitted via a Proposal Request in UL's On-Line Collaborative Standards Development System (CSDS) at https://csds.ul.com.

No Text on This Page

CONTENTS

INTRODUCTION

CONSTRUCTION

PERFORMANCE

MANUFACTURING AND PRODUCTION TESTS

MARKINGS

No Text on This Page

INTRODUCTION

1 Scope

1.1 These requirements cover accessories intended for direct connection to the low or delivery pressure side of compressed gas regulators. These devices are not intended for direct connection to high or storage cylinder pressures.

1.2 Accessories covered by these requirements are intended for use with compressed gases such as air, carbon dioxide, inert gases, fuel gases, nitrogen, nitrous oxide and oxygen.

1.3 The suitability of an accessory in combination with a compressed gas regulator shall be judged under the applicable requirements of the Standard for Compressed Gas Regulators, UL 252.

1.4 These requirements do not cover:

a) Flow characteristics,

b) The physiological effects of accessories to be used with medical gases,

c) Accuracy of pressure gauges and flow indicators, nor

d) Accessories that are covered by other UL standards.

2 Components

2.1 Except as indicated in 2.2, a component of a product covered by this standard shall comply with the requirements for that component.

2.2 A component is not required to comply with a specific requirement that:

a) Involves a feature or characteristic not required in the application of the component in the product covered by this standard, or

b) Is superseded by a requirement in this standard.

2.3 A component shall be used in accordance with its rating established for the intended conditions of use.

2.4 Specific components are incomplete in construction features or restricted in performance capabilities. Such components are intended for use only under limited conditions, such as certain temperatures not exceeding specified limits, and shall be used only under those specific conditions.

3 Units of Measurement

3.1 Values stated without parentheses are the requirement. Values in parentheses are explanatory or approximate information.

4 Glossary

4.1 For the purpose of this standard, the following definitions apply.

4.2 FLOW INDICATORS –

a) Flow Gauges – Gauges used to indicate gas flow rates, calibrated to a fixed orifice outlet with a variable source pressure.

b) Flowmeters – A flow tube and float used to indicate gas flow rate calibrated to a fixed source pressure with a variable orifice.

4.3 FUEL GAS – Acetylene, hydrogen, natural gas, LP-Gas, methylacetylene-propadiene stabilized, and other liquefied and nonliquefied flammable gases that are stable because of their composition or because of the conditions of storage.

4.4 INERT GAS – Helium, neon, argon, krypton, xenon, and radon are evaluated as inert gases.

4.4.1 INTRINSICALLY SAFE CIRCUIT – A circuit in which any spark or thermal effect, produced either normally or in specified fault conditions, is incapable of causing ignition of a mixture of flammable or combustible material in air in the mixture's most easily ignitable concentration.

4.5 PRESSURE GAUGES – Gauges used to indicate gas pressure, mechanism used of the elastic element type.

4.6 REGULATOR CLASS – Defines the maximum end use pressure for the product based on the gas pressure or the CGA connection provided on the compressed gas regulator to which the accessory is intended to be installed. See Table 4.1.

Table 4.1
Regulator classes

Class	Test pressure, Psi	Test pressure, (MPa)	Definition
I	200	1.38	Station type regulator
II	375	2.59	LP-Gas or MPS regulator
III	500	3.45	CGA Nos. 160, 165, 182, 200, 240, 280, 285, 300, 410, 415, 440, 450, 510, 520, 600, 668, 678, 679
IV	1800	12.41	Carbon dioxide regulator
V	3000	20.68	CGA Nos. 110, 170, 180, 280, 296, 320, 326, 330, 346, 350, 500, 540, 555, 580, 590, 660, 670, 705
VI	4000	27.58	CGA No. 577
VII	5500	37.92	CGA Nos. 347, 680, 695, 701

4.7 REMOVABLE – Capable of being removed using a screwdriver, wrench, or similar hand-tool and an opening created by the removal is to be capable of being plugged using flare fittings or pipe plugs.

4.8 RUPTURE – A fracture in an external component of the product.

CONSTRUCTION

5 Assembly

5.1 An accessory shall include all of the components required for its intended operation and installation, and shall be assembled as a single unit.

5.2 An accessory intended to be repaired shall be constructed so that parts are capable of being reassembled after being dismantled, to the extent required for routine maintenance.

5.3 A seat disc shall be attached to its poppet or holder, or otherwise assembled to prevent it from becoming dislocated under service conditions. The means to secure the disc shall not rely on cement or adhesive.

5.4 A shut-off valve shall not be equipped with a means to prevent it from closing completely.

6 Materials

6.1 A material in contact with the gas to be handled shall be resistant to the action of such gas.

6.2 With reference to the requirement in 6.1, chlorotrifluoroethylene polymers, tetrafluoroethylene, and fluorinated ethylene propylene polymers are capable of being used with oxygen.

6.3 Unalloyed copper or a copper alloy exceeding 67 percent copper shall not be used for parts in contact with acetylene or methylacetylene-propadiene stabilized (MPS).

Exception: Alloys used for bourdon tubes of gauges and inlet filters shall not contain more than 95 percent copper.

6.4 Nonductile cast iron (regular gray iron) shall not be used for bodies or enclosures for LP-Gas valves. This does not preclude the use of malleable or nodular iron.

6.5 When atmospheric corrosion of a part interferes with the intended function of an accessory, the part shall be of a corrosion-resistant material, such as stainless steel or brass, or be provided with a corrosion-resistant protective coating.

6.6 A protective coating shall provide resistance against corrosion to a degree not less than that provided by the coatings specified in 6.7. See the Comparative Corrosion Test, Section 15.

6.7 Zinc plating shall not be less than 0.0005 inch (0.013 mm) thick, except on parts where threads constitute the major portion of the area, in which case the zinc plating shall not be less than 0.00015 inch (0.0038 mm) thick.

6.8 Cadmium plating shall not be used.

6.9 Metal combinations susceptible to galvanic corrosion shall not be used if such corrosion adversely affects the intended operation or strength of an accessory.

6.10 Thread-sealing compounds and lubricants shall be compatible with the gas to which they are intended to be exposed to in service.

7 Connections

7.1 Pipe threads shall be in accordance with the Standard for Pipe Threads, General Purpose (Inch), ANSI/ASME B1.20.1; the Standard for Dryseal Pipe Threads (Inch), ANSI/ASME B1.20.3; or the Standard for Dryseal Pipe Threads (Metric Translation of B1.20.3-1976), ANSI/ASME B1.20.4.

Exception: Pipe threads complying with a national pipe thread standard compatible with those fittings.

7.2 Outlet hose connections, for welding and cutting equipment, when used, shall be provided with right-hand threads for nonfuel gases and with left-hand threads for fuel gases, complying with the Standard Connections for Regulator Outlets, Torches and Fitting Hose for Welding and Cutting Equipment, CGA E-1.

Exception: The outlet connection complies with the requirements of a national pipe thread standard compatible with those fittings.

7.3 The outlet connection of a regulator accessory for use with nitrogen, carbon-dioxide or inert gases, if provided, may be a slip-on hose connector of the serrated stem type or a quick-connect tube connection.

7A Batteries

7A.1 When used with fuel gases and oxygen only nonrechargeable batteries shall be provided and they shall comply with one of the following standards:

a) Standard for Lithium Batteries, UL 1642 or

b) Standard for Household and Commercial Batteries, UL 2054.

PERFORMANCE

8 General

8.1 Representative samples of an accessory shall comply with the applicable performance requirements indicated in Table 8.1.

Table 8.1
Required tests

Tests	Pressure gauges	Flow indicators	Flow indicators with metering or shut-off valves	Flow indicators with batteries	Valves	Shut-off valves	Relief devices
Torque Test, Section 9	X	X	X	X	X	X	X
External Leakage Test, Section 10	X	X	X	X	X	X	X
Hydrostatic Strength Test, Section 11	X	X	X	X	X	X	
Excess Pressure Test, Section 12	X	X	X	X	X	X	X
Volume Change and Weight Loss Tests, Section 13	X	X	X	X	X	X	X
Accelerated Aging Test for Elastomers, Section 14	X	X	X	X	X	X	X
Comparative Corrosion Test, Section 15	X	X	X	X	X	X	X
Accelerated Aging Test for Nonmetallic Tubes of Flow Meters, Section 16		X	X	X			
Endurance Test for Valves, Section 17			X		X	X	
Seat Leakage Test, Section 18			X			X	

Table 8.1 Continued on Next Page

Table 8.1 Continued

Tests	Pressure gauges	Flow indicators	Flow indicators with metering or shut-off valves	Flow indicators with batteries	Valves	Shut-off valves	Relief devices
Start-to-Discharge and Burst Test, Section 19							X
Drop Test, Section 19A				X			
Mold Stress Test, Section 19B				X			
Impact Test, Section 19C				X			
NOTE – An X indicates test is to be performed as applicable to a specific product design.							

8.2 Additional samples of parts constructed of nonmetallic materials, such as valve seats and "O" rings are required for the tests specified in the Volume Change and Weight Loss Tests, Section 13, and the Accelerated Aging Test for Elastomers, Section 14.

8.3 Test pressures for the External Leakage Test, Section 10; the Hydrostatic Strength Test, Section 11; and the Endurance Test for Valves, Section 17, are to be based on the manufacturer's maximum rated operating pressure for the product.

8.4 Each product that has electrical components shall be provided with an enclosure that houses all of them. This enclosure may be provided with openings measuring 5 mm (0.19 in) maximum in any dimension. An enclosure and a part of an enclosure such as a door, cover, or similar parts shall be provided with means for firmly securing it in place.

Exception: If the electrical circuitry within the device is considered intrinsically safe without reliance upon infallible creepage or clearance separations and the circuit does not contain protective components, then the enclosure does not need to comply with the enclosure tests in this standard unless required for the battery.

8.5 When used in a hazardous (classified) location the product shall be evaluated to the applicable requirements for the intended end use area classification. Marking of the product must include those associated to the type of explosion protection used in the design.

9 Torque Test

9.1 Joints in a compressed gas regulator accessory shall not leak, nor shall there be evidence of loosening, distortion, or other damage resulting from the stresses imposed on pipe-threaded sections due to the turning effects exerted by assembling to piping or tubing.

9.2 This test is to be conducted on one sample of each joint type under ambient temperature conditions maintained within the range of 59°F to 95°F (15°C to 35°C).

9.3 The sample accessory used in this test is to be rigidly anchored or otherwise supported by a tool that fits snugly about the body of the accessory, or to a section of the shank shaped for a wrench, when such section is provided, adjacent to the end into which the pipe is to be connected. A section of unused Schedule 80 pipe (as specified in the Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless, ASTM A53) of sufficient length for wrench engagement is to be connected to the female pipe threaded section of the body, the male threads having first been lubricated with SAE No.

10 machine oil (as specified in the Engine Oil Viscosity Classification, ANSI/SAE J300). Each pipe section is then to be tightened to the applicable torque specified in Table 9.1.

Table 9.1
Torque requirements for pipe connections

Nominal pipe size, inch[a]	Torque, inch-pounds	(N·m)
1/8	170	15.2
1/4	250	28
3/8	450	51
1/2	800	90
3/4	1000	113

[a] ANSI/ASME B1.20.1, Pipe Threads, General Purpose (Inch).

9.4 After the torque has been applied to each connected pipe, the test sample is to be subjected to the External Leakage Test, Section 10. If leakage is noted at the threaded joint between the pipe and the accessory body, the joint is to be remade using a pipe joint sealing compound and the sample is to be retested for external leakage.

9.5 Upon removal of the pipe from the test sample, the assembly is to be examined for loosening of body joints.

10 External Leakage Test

10.1 An accessory shall not leak externally when tested with air or nitrogen gas at a pressure of 1-1/2 times the maximum rated operating pressure, but not less than 1/2 psig (3.5 kPa), with any valves in the open position and the outlet closed.

Exception: Relief valves are tested at the maximum rated set point pressure.

10.2 This test is to be conducted before and after the Endurance Test for Valves, Section 17, when the Endurance Test is applicable. Also, this test is to be conducted after the Torque Test, Section 9, when the Torque Test is applicable.

10.3 The inlet of the accessory is to be connected to a system capable of supplying oil-free air or nitrogen gas at the specified test pressure. The air or nitrogen gas is to be maintained at the test pressure for 1 minute.

10.4 An accessory complies with the requirement when the fluid-containing parts of the accessory are submerged in water to a depth of 1 inch (25.4 mm) while under the test pressure, no bubble indicating leakage is observed within 1 minute after the parts are submerged.

11 Hydrostatic Strength Test

11.1 All parts of a compressed gas regulator accessory that are subjected to pressure during intended operation are to be tested hydrostatically to determine that the part is capable of withstanding, without rupture, a pressure equal to five times the maximum rated operating pressure of the accessory.

11.2 Prior to the beginning of this test, the accessory shall have been determined to comply with the requirements of the Torque Test, Section 9, whaen applicable.

11.3 The accessory is to be tested by connecting the inlet to a hydraulic system. Valves are to be tested in the open position. With the outlet of the accessory sealed, the pressure is to be raised slowly to the required test pressure and held for a period of 1 minute.

11.4 External leakage observed during this test is permitted when, following this test, the valve complies with the requirements for external leakage specified in 10.2.

12 Excess Pressure Test

12.1 When all passages and chambers of a compressed gas regulator accessory are subjected to the sudden application of the pressure defined for the regulator class on which the accessory is intended to be installed (see Table 12.1), the accessory shall either retain or release the pressure without rupture or throwing of parts.

Table 12.1
Test pressure for excess pressure test

Regulator class[a]	Test pressure, psi	(MPa)
I	200	1.38
II	375	2.55
III	500	3.45
IV	1800	12.41
V	3000	20.68
VI	4000	27.58
VII	5500	37.92

[a] For those regulator classes not specifically noted, the test pressure is to be the maximum pressure defined for the Foreign National Standard or the CGA connection provided on the regulator on which the accessory is intended to be installed. The pressure rating for the test is based on a cylinder pressure at 120°F (49°C).

12.2 To determine compliance with 12.1, two samples of each construction are to be tested. The method of conducting the test is not prohibited from differing from that described in 12.4, as long as the end results are the same.

12.3 Prior to the test removable relief devices are to be removed and the body openings plugged. Bolted-on components are not to be removed, and are to be tested as part of the assembly.

12.4 The accessory inlet is to be connected to the air side of a piston-type hydraulic accumulator. For Class I, II, III, and IV accessories, not more than 10 feet (3.05 m) of 1/4-inch (6.35-mm) outside diameter metal tubing having an inside diameter of at least 0.190 inch (4.82 mm) shall be used. For Class V, VI, and VII regulators, not more than 10 feet of schedule 80 pipe shall be used. The piping and tubing shall have the appropriate pressure rating for the desired test pressure. Pipe and fittings used to connect the accessory to the tubing are to be such that the internal volume of the connection is as small as possible. The accumulator is to have a volume of approximately 600 cubic inches (9800 cm^3) and be provided with a 1/4-turn full-open valve at the air-inlet port. The air-inlet port is to be charged with air or nitrogen from a conventional cylinder and compressed to the appropriate pressure specified in Table 12.1 by applying hydrostatic pressure at the hydraulic inlet port. The 1/4-turn valve to the accessory is then to be opened as suddenly as possible.

13 Volume Change and Weight Loss Tests

13.1 General

13.1.1 A synthetic-rubber part intended to be in contact with the gases specified in Table 13.1 shall not show a change in volume of not more than 25 percent swelling or 1 percent shrinkage and a weight loss (extraction) of not more than 10 percent, when evaluated on the basis of its intended function, following immersion for 70 hours in the specified test liquid.

Exception: Specimens immersed in IRM 903 oil are not required to be evaluated for weight loss.

Table 13.1
Test liquids for synthetic-rubber materials

Gas in contact with part	Test liquid
LP-Gas	n-Hexane
Manufactured and Natural Fuel Gases	IRM 903 Oil and n-Hexane
Methylacetylene-Propadiene Stabilized (MPS)	Liquid MPS

13.1.2 If the volume change or weight loss exceeds the values specified in 13.1.1, the complete accessory is to be filled with the specified test liquid for 70 hours and then be subjected to and shall comply with the requirements for the External Leakage Test, Section 10; the Seat Leakage Test, Section 18; or both, as applicable. The complete accessory shall also operate as intended.

13.1.3 The volume change and weight loss are to be determined in accordance with the Standard Test Method for Rubber Property – Effect of Liquids, ASTM D471, except as modified by 13.2.1 – 13.3.5.

13.2 Tests using n-Hexane and IRM 903 Oil

13.2.1 Three specimens are to be used for each test liquid used. Each specimen is to be placed on a small-diameter wire hook. The volume of each specimen is then to be determined by weighing it first in air (M_1) and then in water (M_2). The specimens are then to be wiped dry and placed in the test liquid for 70 hours. The temperature of the test liquid is to be maintained at 23 ±2°C (73 plus 4°F, minus 3°F).

13.2.2 The specimens are to be individually removed from the liquid, immediately wiped dry, and weighed in air while on the same hook (M_3). The weight is to be obtained within 30 seconds after removal from the test liquid. The final weight in water (M_4) is to be determined immediately thereafter. Before obtaining the weights in water (M_2 and M_4), each specimen is to be dipped in ethyl alcohol, then dipped in water, in order to eliminate surface air bubbles.

13.2.3 The change in volume is to be calculated as follows:

$$Volume\ Change\ (percent) = \frac{(M_3 - M_4) - (M_1 - M_2)}{(M_1 - M_2)} \times 100$$

13.2.4 The specimens are then to be allowed to reach constant weight by conditioning in air at a temperature of 23 ±2°C (73 plus 4, minus 3°F) for 70 hours. The specimens are then again to be weighed in air (M). The loss in weight is to be calculated as follows:

$$Weight\ Loss\ (percent) = \frac{M_1 - M}{M_1} \times 100$$

in which:

M_1 is the original weight in air, see 13.2.1.

13.2.5 The resulting volume-change and weight-loss values for the three specimens are to be averaged.

13.3 Tests using liquid MPS

13.3.1 The test is to be conducted at outside air temperatures within the range of minus 30°C to 40°C (minus 22° F to 104° F). The volume of each of three specimens is to be determined by weighing as described in 13.2.1, except that (M_2) is to be obtained by weighing in ethyl alcohol instead of water.

13.3.2 After weighing, the specimens are to be wiped dry and placed in a closed chamber having its inlet connected to a cylinder of MPS. With the discharge valve from the chamber open, liquid MPS is to be allowed to flow through the chamber until the air is displaced. The discharge valve is then to be closed. With the inlet connection to the cylinder open, exposure is to continue for 70 hours.

13.3.3 The specimens are then to be removed from the chamber and immediately placed in a stoppered flask. The specimens are to be individually removed and weighed in air (M_3). The weight is to be obtained within 30 seconds after removal from the flask. The final weight in ethyl alcohol (M_4) is to be determined immediately thereafter.

13.3.4 The specimens are then to be conditioned in air at a temperature of 23 ±2°C (73 plus 4°F, minus 3°F) for 70 hours and weighed. This final weight is to be used for calculating the weight loss.

13.3.5 The volume change and weight loss values are to be calculated as described in 13.2.3 and 13.2.4.

14 Accelerated Aging Test for Elastomers

14.1 A part made of an elastomer which is exposed to oxygen during intended use shall not crack nor show visible evidence of deterioration following exposure for 96 hours to oxygen at a pressure of 300 ±10 psig (2.07 ±0.07 MPa) and at a temperature of 70.0 ±1.0°C (158.0 ±1.8°F) when tested in accordance with the Standard Test Method for Rubber-Deterioration by Heat and Oxygen, ASTM D572.

14.2 An elastomer part not exposed to oxygen during intended use is to be subjected to an accelerated air oven aging test. The elastomers are to be exposed for 70 hours at 100°C (212°F) in a Type IIA oven as specified in the Standard Specification for Gravity-Convection and Forced-Ventilation Ovens, ASTM E145.

Exception: Elastomer parts exposed to oxygen as specified in 14.1 are not required to be subjected to this test.

15 Comparative Corrosion Test

15.1 General

15.1.1 When subjected to comparative corrosion tests as described in 15.1.2 – 15.4.2, a protective coating shall provide protection against corrosion at least equivalent to that provided by the zinc coatings specified in 6.5.

15.1.2 Two samples of a protective coating system applied to steel, and two comparison samples of the appropriate zinc-coated steel are to be subjected to each of the corrosive mediums as specified in 15.2.1 – 15.4.2.

15.1.3 These tests are to be continued until the protective coating or the zinc coating on the comparison samples has broken down and significant amounts of corrosion products have formed on the underlying steel.

15.1.4 Samples are to be examined periodically during the tests for the appearance or progress of corrosion. The test chambers are to be operated throughout each day, except for the short time required for examination of the samples on working days, and incidental maintenance. The samples are not to be cleaned during the corrosion tests. Additional details of the apparatus and procedures used in these tests are specified in 15.2.1 – 15.4.2.

15.2 Tests in the presence of salt spray (fog)

15.2.1 Salt-spray tests are to be conducted using the apparatus and methods described in the Standard Practice for Operating Salt Spray (Fog) Apparatus, ASTM B117.

15.3 Tests in the presence of moist hydrogen sulfide-air mixture

15.3.1 The test samples are to be supported vertically in a closed chamber having openings for gas inlet and outlet.

15.3.2 Hydrogen sulfide is to be supplied to the test chamber from a commercial cylinder containing this gas under pressure. An amount of hydrogen sulfide equivalent to 1 percent of the volume of the test chamber is to be introduced into the chamber each working day after examining the samples, and after purging the test chamber for at least 15 minutes with compressed air at reduced pressure. A small amount of water is to be maintained at the bottom of the chamber.

15.4 Tests in the presence of moist sulfur dioxide-carbon dioxide-air mixture

15.4.1 The test samples are to be supported vertically in a closed chamber having openings for gas inlet and outlet.

15.4.2 Sulfur dioxide and carbon dioxide are to be supplied to the test chamber from commercial cylinders containing these gases under pressure. An amount of sulfur dioxide equivalent to 1 percent of the volume of the test chamber, and an equal volume of carbon dioxide are to be introduced into the chamber each working day after examining the samples, and after purging the test chamber for at least 15 minutes with compressed air at reduced pressure. A small amount of water is to be maintained at the bottom of the chamber.

16 Accelerated Aging Test for Nonmetallic Tubes of Flow Meters

16.1 Samples of a flow meter having nonmetallic-type tubes are to be subjected to conditioning for 30, 60, and 90 days in an air conditioning oven maintained at a temperature of 90°C (194°F). Two samples are to be subjected to each time period.

16.2 Following the conditioning, one sample is to be subjected to and shall comply with the Hydrostatic Strength Test, Section 11. The other sample is to be subjected to and shall comply with the Excess Pressure Test, Section 12.

16.3 When synthetic rubber materials deteriorate under this conditioning, they are to be replaced prior to conducting the tests described in 16.2.

17 Endurance Test for Valves

17.1 A valve shall comply with the requirements for external leakage and a shut-off valve shall also comply with the requirements for seat leakage before and after being subjected to this test.

17.2 The valve shall perform in its intended manner for 6000 cycles of operation while handling the gas the valve is intended to be used with and with maximum rated operating pressure across the valve seat. One cycle consists of rotation to and from the closed position.

17.3 For valves having a rotating stem, the stem is to be rotated from closed to open, or from closed to 360 degrees of rotation. For a hand-operated valve, the stem is to be closed with a torque as indicated in Table 17.1.

Table 17.1
Hand-operated valve torque requirements

Diameter of handwheel, inches	Closing torque, inch-pounds
1.0 or less	10
1.1 to 1.5	15
1.6 to 2.0	20
2.1 to 2.4	30
2.5 or greater	35

17.4 For a valve intended to handle more than one gas, the endurance test is to be conducted with the gas imposing the most severe service.

17.5 This test is to be conducted at a rate not faster than ten times per minute.

18 Seat Leakage Test

18.1 A shut-off valve shall not leak past the seat when tested at a pressure of 1/4 psig (1.7 kPa) and also at a pressure of 1-1/2 times the maximum operating pressure. The test pressures are to be maintained for 1 minute. The test is to be conducted using oil-free air, nitrogen or inert gases.

18.2 The shut-off valve is to be tested for seat leakage before and after the Endurance Test for Valves, Section 17.

18.3 To demonstrate compliance with the requirements in 18.1 and 18.2, the inlet of the test valve is to be connected to a gas system. The valve is to be in the closed position assumed as the result of normal operation. The pressure is to be maintained at the inlet to the valve at 1-1/2 times the maximum operating pressure differential and the test repeated at a pressure of 1/4 psig (1.7 kPa). An accessory complies with the requirement when the fluid-containing parts of the accessory are submerged in water to a depth of 1 inch (25.4 mm) while under the test pressure, no bubble indicating leakage is observed within 1 minute after the parts are submerged.