MSS SP-150-2015

Valves for Use in Hydrogen Peroxide Service

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

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

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VALVES FOR USE IN HYDROGEN PEROXIDE SERVICE

1. SCOPE

This Standard Practice contains requirements for material, design, fabrication, pressure testing, marking, and preparation for shipment of valves for use in hydrogen peroxide (H_2O_2) service.

2. DEFINITIONS

2.1 C*avity* Any area in the valve that has the potential to entrap pressure when the valve is opened or closed.

2.2 C*avity Vent* A method for release of entrapped pressure in cavities that may occur when the valve is opened or closed.

2.3 ***Hydrogen Peroxide*** A chemical compound with the formula H_2O_2. Thermal and other precautions should be observed. See the applicable material safety data sheet (MSDS).

2.4 ***Passivation*** The process of making a material non-reactive (passive) in relation to another material prior to using the materials together.

2.5 ***Other Definitions*** Other definitions may be found in MSS SP-96.

3. GENERAL REQUIREMENTS

3.1 Pressure boundary parts of the valve and all internal parts that can contact the media contained within the valve shall be made of the materials specified herein.

3.2 External parts that do not normally come into contact with the media contained inside the valve (such as glands, packing nut, external bolting) shall be made of materials compatible with the pressure boundary parts.

3.3 Valves containing cavities that may entrap hydrogen peroxide when the valve is fully open or shut (such as ball and gate valves) shall have cavity vent holes machined in the parts to enable release of pressure. Cavity vent holes shall be a minimum of 1/8 inch (3 mm). A flow direction arrow shall be marked on the valve body if the cavity vent hole(s) permit shut-off in only one direction of flow.

3.4 Passivation, cleaning, assembly, inspection, post-clean testing, marking, and packaging shall be conducted by properly trained and qualified personnel knowledgeable of this Standard Practice and the materials utilized.

4. MATERIALS OF CONSTRUCTION

4.1 Valve bodies and trim parts shall be made from either:

(1) 356 high purity aluminum alloy, or

(2) 304 austenitic stainless steel, or

(3) 316 austenitic stainless steel, or

(4) wrought or cast equivalents of above.

4.1.1 Low carbon Type 304L and 316L Grades shall be used if the valve construction requires fabrication welds.

4.2 Wetted surfaces of parts made from cast material shall be free of blow holes, inclusions or porosity that could contain or entrap incompatible debris.

4.3 Valve seats and seals shall be either pure Polytetrafluoroethylene (PTFE), glass filled PTFE, or Polychlorotrifluorethylene (PCTFE). Fluoroelastomer O-rings and gaskets can also be used for seals.

4.4 Graphitic seals are generally considered incompatible with hydrogen peroxide. Graphite will increase the rate of decomposition of hydrogen peroxide.

NOTE: Use of graphitic seals may be necessary for fire-safe valve construction and may be acceptable for some applications. Graphitic seals may only be used when fire-safe valve construction is requested, and use of graphitic material is approved by the purchaser.

4.5 Certain combined fluorine/chlorine or comparable lubricants may be compatible with hydrogen peroxide. Compatible lubricants shall only be used where necessary for proper function of the valve. If used, they shall be used sparingly, only applying the minimum required for proper function.

NOTE: Lubricants that may come into contact with the media inside the valve may only be used when approved by the Purchaser.

4.5.1 Proper care shall be used in determining the applicability and compatibility of a lubricant for use with hydrogen peroxide and for the intended service. Care should be taken to consult the lubricant manufacturer's technical data, including thermal stability and precautionary information, before selection.

5. PASSIVATION

5.1 Any marking or stamping of parts shall be done before passivation.

5.2 All stainless steel parts are to be passivated with nitric acid as per ASTM A967, Section 6. When requested by the purchaser, testing to verify the effectivity of passivation shall be completed as per ASTM A967, Practice D (Copper Sulfate Test) or Practice E (Potassium Ferricyanide-Nitric Acid Test).

5.3 Aluminum parts are to be passivated by immersion in 35% nitric acid at room temperature for two (2) hours.

6. CLEANING

6.1 All metallic parts must be individually washed to remove all wax and oil by using an alkaline based detergent, per instructions provided by the cleaning agent manufacturer.

6.1.1 A suitably shaped brush shall be used to reach completely into crevices and cavities, such as stem bores and threaded holes.

6.2 All non-metallic parts are to be washed using an alkaline based detergent, per instructions provided by the cleaning agent manufacturer, with a clean lint-free cloth to remove any oil and grease.

6.3 During and after washing, parts must be handled while wearing clean rubber or plastic gloves.

6.4 After cleaning, thoroughly rinse residual detergent from parts with clean, deionized water.

6.5 After rinsing, thoroughly dry part by blowing with clean oil-free air or Nitrogen.

6.6 Some cleaning agents may damage parts of a valve. The cleaning agent manufacturer should be consulted for compatibility with valve part materials, or sample parts should be tested to ensure the cleaning agent is not harmful to the part.

6.7 Used cleaning agents shall be disposed of in accordance with appropriate hazardous waste regulations.

6.8 Applicable MSDS information shall be consulted for proper handling of cleaning agents.

7. ASSEMBLY

7.1 Tools used for assembly must be cleaned per Section 6. Tools, such as presses used to press-fit parts together, shall have protective measures that prevent contamination of cleaned parts.

7.2 Special care must be taken to ensure minimum handling of parts after cleaning in order to prevent oil or other contamination from being introduced onto the parts. Clean rubber or plastic gloves shall be worn.

7.3 Assemble parts as per manufacturing instructions. Use compatible lubricant sparingly and only when necessary.

8. TESTING

8.1 Seat and shell testing shall be performed as per MSS SP-61 and manufacturers' standard, or as specified by purchaser.

8.2 Test area and test equipment must be cleaned as per Section 6. Tools and presses used for testing shall have protective measures that prevent contamination of the assembled valve.

8.3 If shell testing was successfully completed on the valve, which was subsequently disassembled for passivation and cleaning, then a shell test does not need to be repeated.

8.4 The final assembled valve shall be pressure tested per manufacturer's standard. Test media shall be oil-free air or Nitrogen.

9. PACKAGING

9.1 To keep the internal elements clean and uncontaminated, valves shall be protected immediately after assembly and testing by individually sealing them inside new, clean plastic bags.

9.1.1 Valve opening(s) should be covered with protective metal or plastic caps or plugs that have been cleaned as per this Standard Practice.

9.2 If required to prevent rusting from humidity, desiccant bags are to be placed inside the sealed plastic bag(s). The number of desiccant bags used shall be adequate for the enclosed volume inside the plastic bag.

10. MARKING

10.1 In addition to the valve being marked as per MSS SP-25, the outside of plastic bag shall be marked with the following information:

a) "Cleaned for Hydrogen Peroxide Service per MSS SP-150"
b) Manufacturer's name and product identification number
c) Date of packaging: *Month/Year*
d) "Keep sealed until required for use"

10.2 If desiccant bags are placed inside the sealed plastic bag, a tag or sticker identifying the presence of and number of desiccant bags inside shall be placed on the outside of the bag.

11. ACCEPTANCE CRITERIA

11.1 Valves may be inspected for passivation (see Section 5) per a random sampling plan, deemed acceptable by agreement between the purchaser and the manufacturer.

ANNEX A

Referenced Standards and Applicable Dates

This Annex is an integral part of this Standard Practice and is placed after the main text for convenience.

Standard Name	Description
ASTM	
A967/A967M-13	Specification for Chemical Passivation Treatments for Stainless Steel Parts
MSS; ANSI/MSS	
SP-25-2013	Standard Marking System for Valves, Fittings, Flanges, and Unions
SP-61-2013	Pressure Testing of Valves
SP-96-2011	Guidelines on Terminology for Valves and Fittings

The following organizations appear in the above list.

ANSI	American National Standards Institute 25 West 43rd Street, Fourth Floor New York, NY 10036-7406
ASTM	ASTM International 100 Barr Harbor Drive, P.O. Box C700 West Conshohocken, PA 19428-2959
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. 127 Park Street, NE Vienna, VA 22180-4602

MSS Standard Practices (SPs) related to or referenced in this publication:

ANSI/MSS SP-25	***Standard Marking System for Valves, Fittings, Flanges, and Unions***
ANSI/MSS SP-96	***Guidelines on Terminology for Valves and Fittings***
MSS SP-61	***Pressure Testing of Valves***

American National Standards Published by MSS, an ANSI-accredited Standards Developer:

ANSI/MSS SP-25	***Standard Marking System for Valves, Fittings, Flanges, and Unions***
ANSI/MSS SP-44	***Steel Pipeline Flanges*** (including 2011 Errata Sheet)
ANSI/MSS SP-55	***Quality Standard for Steel Castings for Valves, Flanges, Fittings, and Other Piping Components – Visual Method for Evaluation of Surface Irregularities***
ANSI/MSS SP-58	***Pipe Hangers and Supports - Materials, Design, Manufacture, Selection, Application, and Installation***
ANSI/MSS SP-96	***Corrosion Resistant Pipe Fittings Threaded and Socket Welding Class 150 and 1000***
ANSI/MSS SP-114	***Guidelines on Terminology for Valves and Fittings***
ANSI/MSS SP-134	***Valves for Cryogenic Service, including Requirements for Body/Bonnet Extensions***
ANSI/MSS SP-138	***Quality Standard Practice for Oxygen Cleaning of Valves and Fittings***
ANSI/MSS SP-144	***Pressure Seal Bonnet Valves***

About MSS

The Manufacturers Standardization Society (MSS) of the Valve and Fittings Industry is a non-profit technical association organized for development and improvement of industry, national and international codes and standards for Valves, Valve Actuators, Valve Modifications, Pipe Fittings, Flanges, Pipe Hangers and Supports, and Associated Seals. Since its establishment in 1924, MSS has been dedicated to developing standards for national and global applications, in cooperation with other standardizing bodies and regulatory authorities.

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