

MIL-V-22549D(SHIPS)  
20 September 1968  
SUPERSEDING  
MIL-V-22549C(SHIPS)  
28 November 1966  
(See 6.3)

MILITARY SPECIFICATION  
VALVES, ANGLE , RELIEF,  
FOR GAS AND OXYGEN SERVICE  
(SIZES 2-INCHES IPS AND BELOW); NAVAL SHIPBOARD

1. SCOPE

1.1 Scope. - This specification covers angle relief valves of pressure tight spring housing construction for gas and oxygen service.

1.2 Ratings. - Valves shall have nominal pressure ratings of 400, 1500, 3000, and 6000 pounds per square inch gage (psig) (see 6.2).

2. APPLICABLE DOCUMENTS

2.1 The following documents of the issue in effect on date of invitation for bids or request for proposal, form a part of the specification to the extent specified herein.

SPECIFICATIONS

FEDERAL

QQ-N-281 - Nickel-Copper-Alloy, Bar, Plate, Rod, Sheet, Strip, Wire, Forgings and Structural and Special Shaped Sections.

QQ-N-288 - Nickel-Copper-Alloy and Nickel-Copper-Silicon Alloy Castings.

QQ-S-764 - Steel Bar, Corrosion-Resisting, Free Machining.

MILITARY

MIL-S-901 - Shock Tests, H. I. (High-Impact); Shipboard Machinery, Equipment and Systems, Requirements for

MIL-D-1000/2 - Drawings, Engineering and Associated Lists.

MIL-F-1183 - Fittings, Tube, Cast Bronze, Silver Brazing.

MIL-M-15071 - Manuals, Equipment and Systems.

MIL-B-23921 - Bronze, Nickel-Aluminum Castings for Seawater Service.

MIL-B-24059 - Bronze, Nickel Aluminum; Rod, Flat Products with Finished Edges, Shapes and Forgings.

STANDARDS

MILITARY

MIL-STD-129 - Marking for Shipment and Storage.

MIL-STD-167 - Mechanical Vibrations of Shipboard Equipment.

MIL-STD-1330 - Cleaning and Testing of Oxygen and Nitrogen Gas Piping Systems.

DRAWINGS

MILITARY

810-1385884 - Unions, Fittings and Adapters, Butt and Socket Welding, 6000 PSI, WOG. IPS.

810-1385943 - Unions, Silver Brazing, 3000 PSI, IPS, WOG for UT Inspection.

810-1385946 - Unions, Bronze Silver Brazing, WOG, for UT Inspection.

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(Copies of specifications, standards and drawings required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. - The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

AMERICAN IRON AND STEEL INSTITUTE (AISI)  
Steel Products Manual

(Application for copies should be addressed to the American Iron and Steel Institute, 150 East Forty-Second Street, New York, New York 10017).

AMERICAN SOCIETY FOR TESTING MATERIALS (ASTM)

- B21 - Naval Brass, Rod, Bar and Shapes.
- B61 - Steam or Value Bronze Castings
- B148 - Aluminum Bronze Sand Castings
- B150 - Aluminum Bronze Rod, Bar and Shapes.

(Application for copies should be addressed to the American Society for Testing Materials, 1916 Race Street, Philadelphia, Pa. 19103).

NATIONAL BUREAU OF STANDARDS  
Handbook H-28 - Screw-Thread Standards For Federal Services.

(Application for copies should be addressed to Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402).

AMERICAN SOCIETY OF MECHANICAL ENGINEERS  
Boiler and Pressure Vessel Code.

(Application for copies should be addressed to the American Society of Mechanical Engineers, 345 East 47th Street, New York, New York 10017).

(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal Agencies).

### 3. REQUIREMENTS

3.1 Definitions. - The following definitions are applicable to this specification.

- # 3.1.1 Set pressure. - The pressure at which the valve pops. Expressed in pounds per square inch gage (psig).
- # 3.1.2 Set pressure tolerance. - The permissible plus or minus deviation from the specified set pressure. Expressed in pounds per square inch (psi) or as a percent of the set pressure.
- # 3.1.3 Set pressure range. - The range over which the set pressure can be adjusted with the installed spring.
- 3.1.4 Accumulation. - The increase in pressure, above the set pressure required to pass rated flow. Expressed in psi or as a percent of the set pressure.
- # 3.1.5 Accumulation pressure. - The set pressure plus the accumulation. Expressed in psig.
- # 3.1.6 Blowdown. - The decrease in pressure, below the set pressure, required for the valve to reseal. Expressed in psi or as a percent of the set pressure. The accumulation and blowdown establish the operating band of the relief valve at a particular setting.
- 3.1.7 Blowdown pressure. - The set pressure minus the blowdown. Expressed in psig.

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# 3.2 Valve description. - The valves shall be self-contained, single seated, spring loaded relief valves where the inlet pressure is sensed under and directly operates the spring loaded disc. Where operationally advantageous, other self-contained designs (such as inverted, expanded area, or pilot operated) which conform to the basic requirements of this specification, may be permitted. However, all of these alternate designs shall be of the fail-open design and approval for their use is required by the Auxiliary Equipment Branch of the Naval Ship Engineering Center.

# 3.3 Materials of construction. - Materials shall be as specified hereinafter. They shall be suitable for the intended pressure and shall be selected to prevent galling, seizing, or excessive wear between operating parts.

#### 3.3.1 Gas service. -

3.3.1.1 Body and spring housing. - The body and spring housing shall be one of the following basic materials:

- (a) 18-8 corrosion resistant (stainless) steel - AISI 303, 304 or 316.
- (b) Aluminum bronze - Grade 9BHT of ASTM B-148, alloy 2 of ASTM B-150, MIL-B-23921 or MIL-B-24059. When castings are used, the body shall be cast as a solid billet. Coring will not be permitted.
- (c) Bronze - ASTM B-61.
- (d) Naval brass - Alloy B of ASTM B-21.

3.3.1.2 Springs. - Springs shall be manufactured from corrosion-resistant steel or carbon-steel. Where carbon-steel springs are used, they shall be electroplated with cadmium or zinc.

3.3.1.3 Non-metallic disc inserts, diaphragms, gaskets and similar parts. - All non-metallic parts shall be compatible with the fluid media specified (see 6.2). These parts shall also be compatible with both petroleum base and phosphate ester type fluids, and shall be as approved by the command or agency concerned.

3.3.1.4 Valve stems. - Valve stems shall be manufactured from nickel-copper alloy (monel) or corrosion-resistant steel.

3.3.1.5 Nuts, bolts, washers, bushings, guides, bellows and similar parts. - All materials used in the construction of nuts, bolts, washers, bushings, guides, bellows and similar parts shall be of the quality best suited for the intended purpose and shall be in strict accordance with the material specification shown on the approved drawing.

#### 3.3.2 Oxygen service. -

3.3.2.1 Body and spring housing. - The body and spring housing shall be of monel (nickel-copper alloy) in accordance with QQ-N-281 or QQ-N-288.

3.3.2.2 Springs. - Springs shall be manufactured from one of the following materials:

- (a) Bronze
- (b) Monel (nickel-copper-alloy)
- (c) Copper-nickel-alloy (70-30).

3.3.2.3 Valve stems. - Valve stems shall be manufactured from monel (nickel-copper-alloy) or copper nickel-alloy (70-30).

3.3.2.4 Valve disc inserts. - Valve disc inserts shall be manufactured from Teflon.

3.3.2.5 Diaphragms, "O" rings, gaskets and similar parts. - Diaphragms, "O" rings, gaskets and similar parts shall be in accordance with the requirements specified in 3.3.1.3 (see 6.2).

3.3.2.6 Nuts, bolts, bushings, guides and similar parts. - Nuts, bolts, bushings, guides and similar parts shall be in accordance with the requirements specified in 3.3.1.5.

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## 3.4 Design and construction. -

# 3.4.1 Pressure-temperature ratings. - The pressure-temperature ratings for valves covered by this specification shall be as specified in 3.4.1.1 and 3.4.1.2. The term "valve body" shall refer to all portions of the pressure containing envelope subject to inlet pressure and the term "spring housing" shall refer to all portions of the pressure containing envelope subject to outlet or discharge pressure.

# 3.4.1.1 Pressure-temperature rating (valve body). - The pressure-temperature rating for the valve body shall be in accordance with table I.

Table I - Pressure-temperature rating.

Nominal pressure rating (psi)	Design pressure (psig)	Design temperature (°F)	Proof pressure (psig)
400	480	165	600
1500	1800	165	2250
3000	3600	165	4500
6000	7200	165	9000

3.4.1.2 Pressure-temperature rating (spring housing). - Unless otherwise specified (see 6.2), all parts of the pressure tight spring housing shall be designed to withstand the higher of the following:

- (a) 150 percent of maximum system back pressure.
- (b) 100 psig.

3.4.1.2.1 The design temperature of these parts shall be as specified in table I.

# 3.4.2 Spring housings. - The valves shall have a pressure tight spring housing. There shall be one spring housing for each valve body of a particular nominal size and rating. It shall be designed to house all the springs required to span the applicable set pressure ranges specified in 3.5.1.

# 3.4.3 End preparation. -

# 3.4.3.1 Valves for gas service. - All valves for other than oxygen service shall be provided with union end connections (threadpieces, tailpieces and nuts) in accordance with table II. Union threadpieces shall be cast or forged integral with the valve body or secured to the body with a straight thread and O-ring seal. Pipe threads shall not be used. Only the pertinent dimensions of the documents listed in table II apply. The material for the union tailpieces shall be specified (see 6.2). Materials for the union threadpiece and union nut should be selected by the valve manufacturer, from the materials specified herein, to prevent galling. The following materials, in addition to those specified in the documents listed in table II, may be used for union threadpieces and union nuts:

- (a) H-Monel (QQ-N-288, Composition B)
- (b) CRES ( QQ-S-764 Composition 303Se or 416Se)

Table II - End preparation (valves for gas service).

National Pressure rating (psi)	Drawing or specification
400	MIL-F-1183 (see 3.4.3.1.1)
1500	810-1385946
3000	810-1385943
6000	810-1385884

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- # 3.4.3.1.1 Where specified, union end connections in accordance with Drawing 810-1385946 may be used on 400 psig rated valves, to give superior shock resistance.
- # 3.4.3.2 Valves for oxygen service. - Valves for oxygen service shall have 6-inch nipples welded directly to the valve body in both the inlet and outlet. Material of nipples shall be of the same basic material as the body. End preparation shall be as specified (see 6.2).
- # 3.4.4 Internal trim. - A gasket or O-ring sealed seat ring shall be provided which is either threaded-in or retained by a cage construction. The stem or stem and disc assembly shall be top guided. Guiding surfaces (bushings and posts) shall have the proper hardness, finish, concentricity, parallelism, clearances, length and rigidity to prevent binding or seizing and to insure proper seating under all operating conditions. These alignment requirements shall be maintained with interchangeable parts and under any tolerance stack-up condition. A nonmetallic seating feature shall be incorporated in either the disc or seat.
- # 3.4.5 Body construction. - The valve shall be designed and constructed so that the seat will not become distorted, relative to the disc, and valve operation is not adversely affected by internal pressure.
- # 3.4.6 Springs. - Springs shall be designed so that they will not be compressed solid during any normal operation or adjustment of the valve. When removed and compressed solid, the spring shall not exhibit a permanent set exceeding 0.010 inch per inch of spring length, measured ten minutes after release of the spring. Spring ends shall be squared and ground.
- # 3.4.7 Threads. - All threads shall conform to Handbook H28. Where necessary, provisions shall be incorporated to prevent the accidental loosening of threaded parts. Pipe threads shall not be used.
- # 3.4.8 Bearing surfaces. - Bearing surfaces of nut and bolt heads and their respective mating surface on the valves shall be finished machined.
- # 3.4.9 Interchangeability. - All parts having the same manufacturer's part number shall be directly interchangeable with each other with respect to installation and performance and shall not require selection, fitting, or machining of any kind.
- # 3.4.10 Stem packing. - A stuffing box on the valve stem will not be permitted.
- # 3.4.11 Hand lifting device. - Where specified (see 6.2), valves shall be designed so that they may be operated by hand for testing purposes with an inlet pressure of 75 percent of the set pressure. The necessary lever or tool shall be furnished as part of the valve.
- # 3.4.12 Gagging device. - Where required for system test purposes, a gagging device shall be specified to be supplied with the valve (see 6.2). Valves shall be capable of being gagged without alteration of the set point. The gagging screw shall be provided with a knurled or wing nut type head to discourage the use of wrenches when gagging the valve. The gagging device shall be designed to minimize the possibility of overlooking its removal after test and shall include a tag or other warning to this effect.
- # 3.4.13 Accessibility. - Valves shall be designed to permit adjustment and repair without removal from the line.
- # 3.4.14 Valve adjustment. - Means shall be provided for adjusting the setting with the valve under pressure. The adjusting screw shall have right hand threads so that clockwise rotation increases the set pressure. The adjusting device shall be provided with a locknut and cap, or other suitable means, to prevent accidental change of adjustment.
- # 3.5 Performance. -
- # 3.5.1 Range of adjustment. - Valves shall be capable of being adjusted over the set pressure range specified in table III. If required, more than one spring may be used to accomplish this.

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Table III - Range of adjustment.

Nominal pressure rating (psig)	Minimum required set pressure (psig)	Maximum required set pressure (psig)
400	--	460
1500	460	1725
3000	1725	3450
6000	3450	6875

- # 3.5.2 Operation. - Where properly installed in accordance with limitations specified by the valve manufacturer, relief valves shall operate over entire flow range without chatter. Valves shall open with a clear sharp pop at the pressure for which they are set. Valve closure shall be clean and sharp when the inlet pressure is reduced to the blowdown pressure, after the valve has passed full rated flow or any intermediate flow.
- # 3.5.3 Proof pressure. - The valve shall show no signs of external leakage, permanent deformation or structural failure when subjected to the proof test of 4.2.
- # 3.5.4 Set pressure tolerance. - The set pressure tolerance, plus or minus, shall not exceed 2 psi or 2 percent of the set pressure, whichever is greater.
- # 3.5.5 Accumulation. - Valves shall be sized to pass the capacity specified (see 6.2) without permitting the inlet pressure to exceed the accumulation limit specified in figure 1. The valve shall show no signs of instability as a result of the accumulation test of 4.2.
- # 3.5.6 Blowdown. - Valves shall operate satisfactorily with a blowdown setting not exceeding that permitted by figure 1.
- # 3.5.7 Seat tightness. - With an inlet pressure at or above the minimum allowable blowdown pressure, the valve shall seat tightly. Allowable leakage under this condition shall not exceed 15 standard cubic inches per hour per inch of seat diameter.
- # 3.5.8 Installation limitations. - Unless otherwise specified (see 6.2), valve operation shall not be adversely affected by an inlet pressure loss up to 25 percent of the relief valve blowdown, a discharge pressure buildup up to 10 percent of the set pressure, or both. Where the installation will subject the valve to greater piping restrictions, this information must be included in the ordering data.
- # 3.5.9 Endurance. - The valve shall show no signs of damage to the seating surface, instability, no leakage in excess of the amount specified in 3.5.7 and the set pressure shall remain within the tolerance specified in 3.5.4 after subjection to the endurance test of 4.2.
- # 3.6 Mechanical shock and vibration. - Valves shall be designed to conform to the mechanical shock requirements of MIL-S-901 and the vibration requirements of MIL-STD-167. Requirements for shock and vibration testing shall be as specified (see 6.2).
- # 3.7 Marking. -
- # 3.7.1 Body markings. - All valve bodies shall have the nominal pressure rating and manufacturer's name or trademark cast or forged integral with the valve body. When employed as a means of marking, metal stamping shall be permitted on valve body surfaces that are not subjected to high stress in service.
- # 3.7.2 Identification plates. - An identification plate made of CRES, brass, or anodized aluminum, shall be permanently fastened to a part of the valve not subject to working pressure, and shall contain the following data or a space therefor:
- (a) Manufacturer's name or trademark.
  - (b) Body material composition.



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- (c) Size of valve and rated capacity in SCFM at the applicable setting and accumulation.
- (d) Set pressure (psig) blowdown pressure (psig) and accumulation pressure (psig).
- (e) Range of set pressure adjustment available with installed spring.
- (f) Installation limitations of valve (maximum permissible inlet pressure loss and maximum permissible back pressure buildup for which valve is designed).
- (g) Manufacturer's model or part number and drawing number.
- (h) Space for nine digit CID number.

### 3.8 Drawings. -

3.8.1 Preliminary drawings. - Preliminary drawings which are sufficient to permit evaluation of the design and approval of materials shall be submitted with bids to the procuring activity. These drawings shall show the following:

- (a) A sectional assembly of the valve and details of the seat, and disc and stem assembly.
- (b) Finishes of all guiding and seating surfaces.
- (c) Bill of materials listing specification, grade, condition, and any other data required to fully identify the properties of the materials proposed.
- (d) Installation dimensions, end connection detail, and clearance dimensions required for disassembly.
- (e) Performance characteristics, estimated weight, and any limitations on installation.
- (f) Note any previous shock, vibration, or First Article inspection approval.
- (g) Tabulation of data for all springs required to meet adjustment limits specified in 3.5.1.
- (h) Recommended assembly torques, or other equivalent procedures, for making up all joints and threaded dimensions.

# 3.8.2 Final drawings. - Final drawings and certification data sheets shall be submitted to the procuring activity for approval within 60 days after date of contract. These drawings shall be in accordance with type II and III of MIL-D-1000/2, except for extent of detail. Only the information required in 3.8.1 need be furnished for the type II drawings. The following data, in addition to that required in MIL-D-1000/2, shall be furnished for the type III drawings:

- (a) Valve description
- (b) Set pressure and adjustable set pressure range
- (c) Required capacity
- (d) Rated capacity (at accumulation pressure)
- (e) Maximum allowable accumulation
- (f) Accumulation (at rated capacity)
- (g) Maximum allowable blowdown
- (h) Blowdown (if adjustable, list adjustable blowdown range as well as actual blowdown setting)
- (i) Installation limitations of valve (maximum permissible inlet pressure loss and maximum permissible back pressure buildup for which valve is designed).

# 3.8.3 Limited rights legend. - When the Government has only limited rights in the data shown on the drawings, as determined by the contractual provisions regarding rights in technical data, the drawings furnished may be marked with the following restrictive legend:

"Furnished under United States Government Contract No. \_\_\_\_\_. Shall not be either released outside the Government, or used, duplicated or disclosed in whole or in part for manufacture or procurement without the written permission of \_\_\_\_\_, except for (a) emergency repair or overhaul work by or for the Government where the item or process concerned is not otherwise reasonably available to enable timely performance of the work; or (b) release to a foreign Government, as the interests of the United States may require; provided that in either case the release, use, duplication or disclosure hereof shall be subject to the foregoing limitations. This legend shall be marked on any reproduction hereof in whole or in part."

# 3.9 Manuals. - Manuals shall be furnished in accordance with type I of MIL-M-15071. The quantity and distribution of manuals shall be as specified (see 6.2). The following, in addition to that required for type I of MIL-M-15071, shall be included as part of the manual contents:

- (a) The approved engineering drawings for the valve (including certification data sheet). These drawings shall be supplemented by additional illustrations where necessary to adequately

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illustrate operation and maintenance. These additional illustrations may consist of blowouts, partial or full sections, and so forth, and may eliminate extraneous lines and details to clarify the interaction of parts.

- (b) Table listing wrench sizes and assembly torques (or other equivalent procedures) for making up all joints and threaded assemblies.
- (c) Instructions to permit overhaul by shipyard or other repair facility. These should include procedures for checking all critical dimensions subject to wear or change and the acceptable dimensional limits, surface finish condition, and so forth. Also the appropriate procedure (for example part replacement, correction at repair facility, or repair at manufacturer's facility) which should be followed to correct each case of damage or wear.
- (d) Detailed disassembly and reassembly procedures. In addition to providing procedures for the complete disassembly and reassembly of the valve maintenance and troubleshooting sections shall contain, or refer to, only the limited disassembly and reassembly required to accomplish each particular operation. This is intended to reduce the possibility of unnecessary disassembly and unnecessary disturbance of adjustments when performing specific or limited maintenance or troubleshooting operations.
- (e) Adjustment procedures.

#### 4. Quality Assurance Provisions

**4.1 Responsibility for inspection.** - Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

# **4.2 First Article Inspection.** - The First Article inspection shall be conducted on the first valve of the same size, design, pressure rating, setting, and capacity, furnished under a contract or order and shall consist of the examination and tests specified in table IV. Acceptance criteria shall be as specified in table IV.

Table IV - First Article inspection.

Test	Test conditions	Purpose of test	Acceptance criteria
Visual examination	-	To verify conformance with the requirements of this specification.	Complete conformance.
Material examination	Valve shall be examined to determine conformance with applicable material specification. For nonpressure containing parts, certification by manufacturer may be accepted in lieu of examination.	To verify conformance of material to drawing and specification requirements.	Complete conformance.
Proof test	Valve gagged shut or disc and spring assembly removed and seat blanked off. Water or air at 1.5 times pressure rating applied to inlet.	To test strength and soundness of pressure containing envelope.	No external leakage, permanent deformation, or structural failure.



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Table IV - First Article inspection. — Continued

Test	Test conditions	Purpose of test	Acceptance criteria
Set pressure, blowdown, and seat tightness test (see note 1)	Air inlet pressure increased until valve lifts. Inlet pressure reduced until valve reseats. Check for leakage over a 3 minute period with an inlet pressure equal to the minimum blowdown pressure permitted by figure 1.	To determine set point and blowdown setting of valve. To test for seat tightness at the minimum allowable blowdown pressure.	Blowdown - see 3.5.8 Seat tightness - see 3.5.7 No damage to seating surfaces. No instability.
Accumulation test (see note 3)	Air inlet pressure increased until valve passes rated flow.	To verify relief valve capacity. To check for instability over operational range of valve.	Valve to pass rated flow without exceeding accumulation permitted by figure 1. No instability.
Set pressure repeatability and endurance test (see note 4)	Using air and cycle valve 50 times. After each 10 cycles check for leakage.	To verify that set pressure repeatability is within allowable limits. To verify ability of valve to withstand repetitive cycling.	Set pressure repeatability see 3.5.4 Seat tightness - see 3.5.7 No damage to seating surface caused by cycling impact. (see note 5) No instability.
H I Shock test (see note 6)	Grade A, class I of MIL-S-901. Valve pressurized during test.	To determine ability of the valve to withstand high-impact mechanical shock.	No structural damage or degradation to performance capability.
Vibration test (see note 6)	Type I of MIL-STD-167.	To determine effect of environmental vibration.	No resonant frequency 0-33 cps. No structural damage or degradation to performance.

## NOTES:

1. The test setup shall impose an inlet pressure loss and outlet pressure buildup equal to the maximums specified in 3.5.8 (25 percent of the blowdown and 10 percent of set pressure). Where greater losses are specified in the ordering data (see 6.2) they shall be imposed instead.

2. The performance requirements listed in table II are based on figure 1. If other parameters are specified in the ordering data (see 6.2) they shall be used instead.

3. Accumulation test may be waived providing that capacity data, obtained and certified in accordance with section VIII of the ASME Boiler and Pressure Vessel Code, is available.

4. This test may be waived providing certified test data is available showing that the same basic design and size has previously passed these tests.

5. Any damage caused by foreign particle entrapment on the seating surfaces shall be repaired prior to acceptance of the valve.

6. Shock and vibration tests will be required only when specified in the contract or order. Tests will not be required if the valve has been previously approved for shock and vibration.

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4.2.1 Degreasing. -

- # 4.2.1.1 Degreasing for gas service (prior to assembly and testing). - Prior to assembly for the tests, specified in 4.2 and 4.3, all parts shall be vapor degreased with tetrachloroethylene or other method, approved by the Hazardous Fluid Systems Section of the Naval Ship Engineering Center and then flushed with clean water.
- # 4.2.1.2 Degreasing for oxygen service (prior to assembly for testing). Prior to assembly for the tests specified in 4.2 and 4.3, valves for oxygen service shall be degreased in accordance with MIL-STD-1330.

4.3 Quality conformance inspection. - Each valve shall be subjected to quality conformance examination and tests. These shall consist of the visual examination, material examination, proof and set pressure, blowdown and seat tightness tests, outlined in table IV. Any discrepancies or failures shall be corrected prior to acceptance.

## 5. PREPARATION FOR DELIVERY

(The preparation for delivery requirements specified herein apply only for direct Government procurements.)

5.1 Sub-contracted material and parts. - The preparation for delivery requirements of referenced documents listed in Section 2 do not apply when material and parts are procured by the supplier for incorporation into the equipment and lose their separate identity when the equipment is shipped.

5.2 Degreasing. - After degreasing and testing as specified in 4.2.1, the valves shall be drained and dried with clean dry air or nitrogen. The valve ends shall be capped and the valves shall be individually packaged. All repair (spare) parts shall be hermetically sealed to prevent contamination while not in use.

5.3 Preservation, packaging and packing. - Unless otherwise specified (see 6.2), preservation, packaging and packing of valve assemblies shall be in accordance with the manufacturer's commercial practice.

5.3.1 Use of polystyrene (loose-fill) material. -

5.3.2 For domestic shipment and early equipment installation and level C packaging and packing. - Unless otherwise approved by the procuring activity (see 6.2), use of polystyrene (loose-fill) material for domestic shipment and early equipment installation and level C packaging and packing applications such as cushioning, filler and dunnage is prohibited. When approved, unit packages and containers (interior and exterior) shall be marked and labelled as follows:

## "CAUTION

Contents cushioned etc. with polystyrene (loose-fill) material.  
Not to be taken aboard ship.  
Remove and discard loose-fill material before shipboard storage.  
If required, recushion with cellulosic material bound fiber,  
fiberboard or transparent flexible cellular material."

5.3.3 For level A packaging and level and B packing. - Use of polystyrene (loose-fill) material is prohibited for level A packaging and level A and B packing applications such as cushioning, filler and dunnage.

5.4 Marking. - In addition to any special marking required by the contract or order or herein, interior and exterior shipping containers shall be marked in accordance with MIL-STD-129.

## 6. NOTES

6.1 Intended use. - All valves covered by this specification are intended for use in shipboard gas and oxygen systems.

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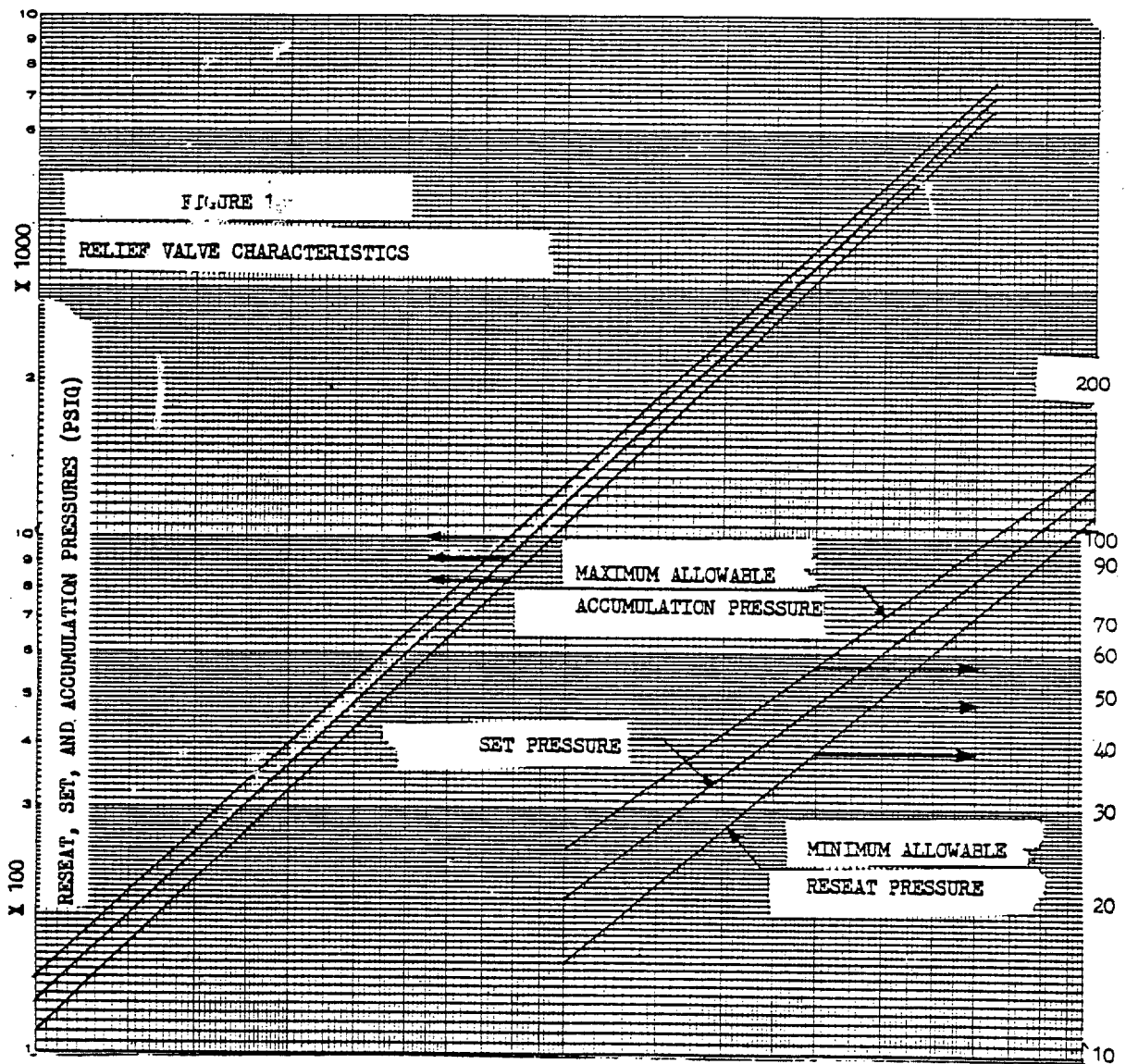
# 6.2 Ordering data - Procurement documents should specify the following:

- (a) Title, number and date of this specification.
- (b) Pressure rating required (see 1.2).
- (c) Line media (see 3.3.1.3 and 3.3.2.5).
- (d) Spring housing design pressure, if other than specified herein (see 3.4.1.2).
- (e) Quantity and size required (see 3.4.2).
- (f) Material required for the union tallpiece (see 3.4.3).
- (g) Nipple welding end preparation for oxygen valves (see 3.4.3.2).
- (h) If a hand lifting device is required to be supplied with valve (see 3.4.11).
- (i) If a gagging device is required to be supplied with valve (see 3.4.12).
- (j) Performance requirements (set pressure tolerance, accumulation, blowdown, and so forth) if other than specified in 3.5.
- (k) Set pressure and capacity required (see 3.5.5).
- (l) Data on inlet and outlet piping restrictions which will be imposed on valve by intended installation (see 3.5.8).
- (m) When shock and vibration tests are required (see 3.6).
- (n) Manuals (quantity and distribution) (see 3.9).
- (o) Preservation, packaging and packing required (see 5.3).
- (p) When polystyrene (loose-fill) material is approved (see 5.3.1).

6.3 CHANGES FROM PREVIOUS ISSUE. - THE OUTSIDE MARGINS OF THIS DOCUMENT HAVE BEEN MARKED "X" TO INDICATE WHERE CHANGES ( DELETIONS, ADDITIONS, ETC. ) FROM THE PREVIOUS ISSUE HAVE BEEN MADE. THIS HAS BEEN DONE AS A CONVENIENCE ONLY AND THE GOVERNMENT ASSUMES NO LIABILITY WHATSOEVER FOR ANY INACCURACIES IN THESE NOTATIONS. BIDDERS AND CONTRACTORS ARE CAUTIONED TO EVALUATE THE REQUIREMENTS OF THIS DOCUMENT BASED ON THE ENTIRE CONTENT AS WRITTEN IRRESPECTIVE OF THE MARGINAL NOTATIONS AND RELATIONSHIP TO THE LAST PREVIOUS ISSUE.

Preparing activity  
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MIL-V-22549D(SHIPS)



SH 9557

***(See Instructions – Reverse Side)***

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