

METRIC

MIL-V-24695(SH)

28 October 1987

## MILITARY SPECIFICATION

VALVE, AND HOSE ASSEMBLY, VENT AND TEST  
HYDRAULIC SERVICE  
GENERAL SPECIFICATION FOR (METRIC)

This specification is approved for use within the Naval Sea Systems Command, Department of the Navy, and is available for use by all Departments and Agencies of the Department of Defense.

## 1. SCOPE .

1.1 Scope. This specification covers vent and test valves and hose assemblies suitable for hydraulic service to a maximum operating pressure of 310 bar (4,500 pounds per square inch (lb/in<sup>2</sup>)).

1.2 Classification. Vent and test valves and hose assemblies shall be furnished in the configuration and sizes listed in the applicable specification sheet (see 3.1).

## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. The following specifications and standards form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 4810

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## SPECIFICATIONS

## FEDERAL

- QQ-A-225 - Aluminum and Aluminum Alloy Bar, Rod, Wire, or Special Shapes; Rolled, Drawn, or Cold Finished; General Specification for.
- QQ-A-225/8 - Aluminum Alloy 6061, Bar, Rod, Wire and Special Shapes; Rolled, Drawn or Cold Finished.
- QQ-N-281 - Nickel-Copper Alloy Bar, Rod, Plate, Sheet, Strip, Wire, Forgings, and Structural and Special Shaped Sections.
- QQ-S-763 - Steel Bars, Wire, Shapes, and Forgings, Corrosion-Resisting.
- UU-P-268 - Paper, Kraft, Wrapping.
- PPP-C-850 - Cushioning Material, Polystyrene, Expanded, Resilient (For Packaging Uses).
- PPP-C-1120 - Cushioning Material, Uncompressed Bound Fiber for Packaging.

## MILITARY

- MIL-V-3 - Valves, Fittings, and Flanges (Except for Systems Indicated Herein); Packaging of.
- MIL-S-901 - Shock Tests, H.I. (High-Impact); Shipboard Machinery, Equipment and Systems, Requirements for.
- MIL-C-5501 - Caps and Plugs, Protective, Dust and Moisture Seal, General Specification for.
- MIL-R-6130 - Rubber, Cellular, Chemically Blown.
- MIL-L-17331 - Lubricating Oil, Steam Turbine and Gear, Moderate Service.
- MIL-H-17672 - Hydraulic Fluid, Petroleum, Inhibited.
- MIL-H-19457 - Hydraulic Fluid, Fire-Resistant, Non-Neurotoxic.
- MIL-R-20092 - Rubber or Plastic Sheets and Assembled and Molded Shapes, Synthetic, Foam or Sponge, Open Cell.
- MIL-H-22072 - Hydraulic Fluid, Catapult, Nato Code Number H-579.
- MIL-P-26514 - Polyurethane Foam, Rigid or Flexible, for Packaging.
- MIL-R-83248 - Rubber, Fluorocarbon Elastomer, High Temperature, Fluid, and Compression Set Resistant.
- MIL-R-83248/2 - Rubber, Fluorocarbon Elastomer, High Temperature, Fluid, and Compression Set Resistant, O-rings, Class 2, 90 Hardness.
- MIL-V-24695/1 - Valve, Vent and Test Hydraulic Service.
- MIL-V-24695/2 - Vent and Test Valve Hose Assembly Hydraulic Service.

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## STANDARDS

## MILITARY

- MIL-STD-129 - Marking for Shipment and Storage.
- MS21344 - Fittings-Installation of Flared Tube, Straight Threaded Connectors, Design Standard for.
- MS33514 - Fitting End, Standard Dimensions for Flareless Tube Connection and Gasket Seal.
- MS33649 - Bosses, Fluid Connection-Internal Straight Thread.

(Copies of specifications and standards required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted shall be those listed in the issue of the DoDISS specified in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS shall be the issue of the nongovernment documents which is current on the date of the solicitation.

## AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

- B46.1 - Surface Texture (Surface Roughness, Waviness, and Lay). (DoD adopted)
- Y14.5 - Dimensioning and Tolerancing. (DoD adopted)

(Application for copies should be addressed to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.)

## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- A 582 - Standard Specification for Free-Machining Stainless and Heat-Resisting Steel Bars, Hot-Rolled or Cold-Finished. (DoD adopted)

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

## SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

- SAE J 514 - Hydraulic Tube Fittings. (DoD adopted)
- SAE ARP 603 - Impulse Testing of Hydraulic Hose, Tubing, and Fitting Assemblies. (DoD adopted)
- SAE MA 1696 - Screw Threads, Metric Buttress - MJB Profile.

(Application for copies should be addressed to the Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.)

(Nongovernment standards and other publications are normally available from the organizations which prepare or which distribute the documents. These documents also may be available in or through libraries or other informational services.)

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2.3 Order of precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification shall take precedence. Nothing in this specification, however, shall supersede applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 Specification sheets. The individual item requirements shall be as specified herein and in accordance with the applicable specification sheet. In the event of any conflict between the requirements of this specification and the specification sheet, the latter shall govern.

3.2 Qualification. Valve and hose assemblies furnished under this specification shall be products which are authorized by the qualifying activity for listing on the applicable qualified products list at the time set for opening of bids (see 4.3 and 6.3).

3.3 Materials.

3.3.1 Compatibility. The valve and hose assembly shall be constructed of materials that will not adversely affect or be affected by hydraulic fluid conforming to MIL-H-17672, MIL-H-19457 and MIL-H-22072 or by lubricating fluid conforming to MIL-L-17331.

3.3.2 Prohibited materials. The following materials shall not be used:

- (a) Toxic materials.
- (b) Zinc or zinc plated materials.
- (c) Mercury.
- (d) Magnesium or magnesium base alloys.
- (e) Radioactive materials.
- (f) Asbestos.
- (g) Cadmium.
- (h) Beryllium.

3.3.3 Recovered materials. Unless otherwise specified herein, all equipment, material, and articles incorporated in the products covered by this specification shall be new and may be fabricated using materials produced from recovered materials to the maximum extent practicable without jeopardizing the intended use. The term "recovered materials" means materials which have been collected or recovered from solid waste and reprocessed to become a source of raw materials, as opposed to virgin raw materials. None of the above shall be interpreted to mean that the use of used or rebuilt products is allowed under this specification unless otherwise specifically specified.

3.3.4 Alloys. Alloys for use in pressure containing valve parts shall be limited to the following:

- (a) Aluminum alloy: QQ-A-225 and QQ-A-225/8, 6061-T6
- (b) Copper-nickel alloy: QQ-N-281, class A

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3.3.5 CRES. The use of chromium-nickel austenitic steel in pressure containing valve parts shall be limited to AISI type 302, 304, 304L, 316, 316L in accordance with QQ-S-763, or type 303 in accordance with ASTM A 582.

3.3.6 Plastics. The use of plastics shall be limited to secondary pressure containment.

3.3.7 O-rings. Internal O-ring seals shall be compatible with all fluids specified herein. External O-ring seals shall be fluorocarbon elastomer in accordance with MIL-R-83248 and MIL-R-83248/2 and shall be provided with the valve.

### 3.4 Construction.

3.4.1 Valves. Vent and test valves shall be constructed as specified herein and in the applicable specification sheet. The vent and test valves furnished under this specification shall seal by means of a spring loaded check valve. A probe, integral to the end fitting of the hose and conforming to the configuration identified in the applicable specification sheet shall be used to open the check valve by depressing the ball or poppet, opening the flow passage. The valve shall pass a minimum of 250 milliliters (mL) per minute at a pressure differential of 10 bars (145 lb/in<sup>2</sup>).

3.4.1.1 Strength. The valves shall withstand the structural loads imposed by the test requirements of this specification. Valves shall withstand the wrench loads required for installation in accordance with MS21344. The use of aluminum alloys for threaded applications is prohibited.

3.4.1.2 Clearance. Within the most adverse dimensions, there shall be clearance of moving parts at 0 and at 70 degrees Celsius (°C). The room temperature reference point shall be 20°C.

3.4.2 Hose assemblies. The hose assembly shall have a probe which is integral to the reverse buttress thread end fitting. An O-ring seal, located within the valve, shall seal against the probe. Dimensions shall conform to the applicable specification sheet. The probe shall be used to depress the check valve ball or poppet, opening the flow passage. The minimum hose internal diameter shall be not less than 1.0 millimeter (mm). Hose concentricity shall be maintained within 0.2 mm total indicator reading.

3.5 Performance. Valves and hose assemblies, shall perform as follows (see 4.3).

#### 3.5.1 Valves.

3.5.1.1 Proof pressure. The valve shall withstand a proof pressure of 465 bars (6,750 lb/in<sup>2</sup>) without signs of external leakage, failure, or permanent set.

3.5.1.2 Shock. The valve shall meet the shock requirements as specified in MIL-S-901 for grade A, class I equipment (see 4.3.4.3).

3.5.1.3 Leakage. Leakage through the valve shall be insufficient to form a drop (see 4.3.4.4 and 4.3.4.5).

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3.5.1.4 Operation. The torque required to couple the hose assembly to the valve under the maximum operating pressure of 310 bars (4,500 lb/in<sup>2</sup>) shall not exceed 1.4 newton-meters (12 inch-pounds).

3.5.1.5 Endurance. The valves shall withstand 10,000 operating cycles at an operating pressure of 310 bars (4,500 lb/in<sup>2</sup>) at room temperature (see 4.3.4.6).

3.5.1.6 Vibration. The vent valves shall operate as specified herein after being subjected to exploratory, variable frequency and resonance dwell sinusoidal vibration tests in each of three mutually perpendicular axes. Any of the following conditions resulting from vibration are considered unacceptable:

- (a) Damage to parts.
- (b) Loosening of parts.
- (c) Degradation of operational performance below specification requirements.
- (d) Leakage of one drop or more from the uncapped valve during the vibration test.

3.5.1.7 Burst pressure. The valve shall withstand a burst pressure of 620 bars (9,000 lb/in<sup>2</sup>) without any sign of rupture or permanent deformation (see 4.3.4.8).

3.5.2 Hose assembly.

3.5.2.1 Proof pressure. The hose assembly shall withstand a proof pressure of 620 bars (9,000 lb/in<sup>2</sup>) (see 4.3.5.2).

3.5.2.2 Flexibility. The hose assembly shall exhibit no evidence of permanent deformation when pressurized at a bend radius of 40 mm (see 4.3.5.3).

3.5.2.3 Impulse. The hose assembly shall withstand 200,000 impulse cycles (see 4.3.5.4). There shall be no sign of permanent deformation or leakage.

3.5.2.4 Leakage. The hose assembly shall show no sign of leakage after 2 hours under an operating pressure of 310 bars (4,500 lb/in<sup>2</sup>) (see 4.3.5.5).

3.5.2.5 Burst pressure. The hose assembly shall withstand a burst pressure of 1240 bars (18,000 lb/in<sup>2</sup>) with no sign of leakage (see 4.3.5.6).

3.6 Marking. Each valve and each hose assembly shall be identified with a metal or plastic tag bearing the following information:

- (a) Manufacturer's name, trademark, or logo.
- (b) Specification sheet part number.
- (c) Manufacturer's part number.
- (d) Assembly date (by quarter and year).

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3.7 Interchangeability. In no case shall parts be physically interchangeable or reversible unless such parts are also interchangeable or reversible with regard to function, performance and strength.

3.8 Workmanship. Valve and hose assemblies shall be free from porosity, roughness, or any other defect which might affect their serviceability.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or purchase order, the contractor 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.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material.

4.2 Classification of inspections. The inspection requirements specified herein are classified as follows:

- (a) Qualification inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).

4.3 Qualification inspection. Qualification inspection shall be conducted at a laboratory acceptable to the Naval Sea Systems Command (NAVSEA). Qualification inspection shall consist of the tests and examinations as specified in 4.3.1 through 4.3.6 and shall be conducted in the order as shown in tables I and II.

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TABLE I. Valve qualification inspection.

Inspection	Order of tests	Requirement	Test
Examination	1	3.4.1	4.3.4.1
Assembly flow rate	2	3.4.1	4.3.6
Proof pressure	3	3.5.1.1	4.3.4.2
Shock	4	3.5.1.2	4.3.4.3
Leakage - uncapped	5	3.5.1.3	4.3.4.4
capped		3.5.1.3	4.3.4.5
Operation	6	3.5.1.4	4.3.4.6
Endurance	7	3.5.1.5	4.3.4.6
Vibration	8	3.5.1.6	4.3.4.7
Burst pressure	9	3.5.1.7	4.3.4.8

TABLE II. Hose assembly qualification inspection.

Inspection	Order of tests	Requirement	Test
Examination	1	3.4.2	4.3.5.1
Proof pressure	2	3.5.2.1	4.3.5.2
Flexibility	3	3.5.2.2	4.3.5.3
Impulse	4	3.5.2.3	4.3.5.4
Leakage	5	3.5.2.4	4.3.5.5
Burst pressure	6	3.5.2.5	4.3.5.6

4.3.1 Samples for qualification. Samples for the qualification tests shall consist of one valve and two hose assemblies for each part number as specified on the applicable specification sheet.

4.3.1.1 Extension of qualification. Qualification of one hose assembly length can be extended to all lengths provided that the end fittings are identical for each assembly and only the hose length varies. For valves whose only difference is the end fitting configuration, qualification can be extended provided a burst pressure test is conducted.

4.3.2 Data submission. Before test authorization (preferably together with application for qualification) the manufacturer shall submit two sets of assembly drawings for each vent valve or hose assembly for which approval to conduct qualification tests is requested. The following data shall be furnished on, or together with, the assembly drawings:

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- (a) Outline dimensions of the complete assembly.
- (b) Dimensional location of ports, and port sizes.
- (c) Bill of material, listing specifications, grade, and condition, or other data needed to identify the material. Part numbers shall be provided for maintenance replaceable parts.

Dimensioning and tolerancing on drawings shall be in accordance with ANSI Y14.5.

4.3.3 Test conditions. Unless otherwise specified herein, the hydraulic fluid used for all tests shall conform to MIL-H-17672, 2135TH. The fluid shall be maintained at a minimum temperature of 45°C.

#### 4.3.4 Valves.

4.3.4.1 Examination. Each valve shall be examined for conformance to the requirements of this specification, applicable specification sheets and manufacturer's drawings.

4.3.4.2 Proof pressure. The valve shall withstand proof pressure of 465 bars (6,750 lb/in<sup>2</sup>) applied to the inlet with the outlet port blocked without evidence of permanent deformation, malfunction, or leakage other than a slight wetting at seals. Proof pressure shall be applied for at least two successive times and held 2 minutes for each pressure application. The valve shall be operated between pressure applications. The pressure shall be reduced to zero between applications.

4.3.4.3 Shock. The valve shall be subjected to high-impact mechanical shock tests in accordance with the requirements for grade A, subsidiary component, class 1, lightweight, type B, fixture 4A of MIL-S-901. A valve shall be considered as having failed the shock test if it does not meet the leakage test of 4.3.4.4, or shows any signs of external or internal damage when examined in accordance with 4.3.4.1. The valve shall be pressurized to the maximum operating pressure of 310 bars (4,500 lb/in<sup>2</sup>) during the test.

4.3.4.4 Leakage. The valve shall be uncapped and subjected to the operating pressure of 310 bars (4,500 lb/in<sup>2</sup>). The valve shall then be actuated with the probe and the operating pressure maintained for 2 hours. There shall be no leakage other than a slight wetting of the seal. During connection to the probe, one drop shall be allowed. The test shall be repeated at 50 percent of the specified operating pressure and at 0.35 bars (5 lb/in<sup>2</sup>). The valve shall automatically close after disconnection from the probe without leakage.

4.3.4.5 Leakage (capped valve). The cap shall prevent leakage at 310 bars (4,500 lb/in<sup>2</sup>) in the event of total valve failure. This pressure shall be held for 2 hours. During this time, leakage shall be insufficient to form a drop. This test may be accomplished on a separate valve at any time in the testing sequence.

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4.3.4.6 Valve operation. The torque required to connect the hose to the valve against the maximum operating pressure of 310 bars (4,500 lb/in<sup>2</sup>) shall not exceed 10 inch-pounds. In addition, the valve shall operate satisfactorily after 10,000 open-close cycles at 310 bars. After cycling, the leakage test of 4.3.4.4 shall be performed. Leakage shall not exceed one drop during the 2 hour holding period.

4.3.4.7 Vibration. The valve shall be mounted on a resonance-free fixture for testing. The vibration input accelerometer shall be mounted on the fixture close to the mounting point of the valve to the fixture. A second accelerometer shall be mounted directly on the valve for monitoring resonant frequencies. Valves shall be pressurized for the tests. If a valve is symmetrical about a principal axis, vibration testing need only be accomplished along two orthogonal axes, one of which shall be the principal axis of symmetry.

4.3.4.7.1 Exploratory test for resonance frequencies. Resonant frequencies of the valve shall be determined by varying the frequency of applied vibration slowly throughout the range specified in table III. For frequencies from 4 to 33 hertz (Hz) the table vibratory single amplitude shall be  $0.25 \pm 0.05$  mm. Above 33 Hz, the table vibratory single amplitude shall be  $0.10 \pm 0.02$  mm. The change in frequency shall be made in discrete frequency intervals of 1 Hz up to 50 Hz and maintained at each frequency for about 15 seconds. From 50 to 2000 Hz, a logarithmic sweep of at least 10 minutes duration shall be made. As an alternative, a logarithmic sweep from 4 to 2000 Hz back to 4 Hz may be conducted. The total time of the ascending plus descending sweep shall be not less than 40 minutes.

TABLE III. Vibratory displacement, single amplitude.

Frequency (Hz)	Table amplitude	
	(mm (minimum))	(inches (minimum))
4 to 15	1.25	0.05
16 to 25	1.00	.04
26 to 33	0.75	.03
34 to 40	.50	.02
41 to 50	.25	.01
50 to 2000	.25	.01

For Government-conducted tests, the maximum amplitude will not exceed the minimum required amplitude by more than 20 percent.

4.3.4.7.2 Variable frequency test. The valves shall be vibrated from 4 (or lowest obtainable frequency) to 2000 Hz at the amplitude specified in table II. From 4 to 50 Hz the valves shall be vibrated in discrete frequency intervals of 1 Hz for 1 minute, minimum, at each frequency. From 50 to 2000 Hz, a logarithmic ascending and descending sweep of not less than 20 minutes total shall be conducted.

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**4.3.4.7.3 Resonance dwell test.** Test valves shall be vibrated along each axis at the most severe resonant frequencies determined in 4.3.4.7.1 at the amplitudes specified in table IV. The dwell test time shall be divided equally between the significant resonant frequencies. If more than four significant resonant frequencies are found for any one axis, the four most severe resonant frequencies shall be chosen for the dwell test. Total test time shall be 2 hours for each axis. If no resonant frequencies are identified, the valve shall be tested at 50 Hz.

TABLE IV. Test procedure and time schedule.

Vibration level		Frequency band, Hz				
Part 1	2.5 mm (0.1 inch) double amplitude	5 to 14				
	1.0 g (9.8 m/s <sup>2</sup> )	14 to 23				
	0.9 mm (0.035 inch) double amplitude	23 to 74				
	10.0 g (98 m/s <sup>2</sup> )	74 to 2000				
Part 2	5.0 mm (0.2 inch) double amplitude	5 to 10				
	1.0 g (9.8 m/s <sup>2</sup> )	10 to 18				
	1.5 mm (0.06 inch) double amplitude	18 to 81				
	20.0 g (196 m/s <sup>2</sup> )	81 to 2000				
Vibration time schedule - (time per one axis)						
Part 1	Number of resonances	0	1	2	3	4
	Total vibration time at each resonance (hours)	0	1/2	1	1-1/2	2
	Cycling time (hours)	2	1-1/2	1	1/2	0
Part 2	30 minutes cycling per axis - no resonance dwell					

**4.3.4.8 Burst pressure.** Pressure shall be applied to the valve at a rate not to exceed 1,725 bars (25,000 lb/in<sup>2</sup>) per minute until 620 bars (9,000 lb/in<sup>2</sup>) burst pressure is obtained. After this pressure has been held for 2 minutes, the valve shall show no sign of leakage. The pressure may be further increased to determine the actual burst pressure.

#### 4.3.5 Hose assembly.

**4.3.5.1 Examination.** Each hose assembly shall be examined for conformance to the requirements of this specification, applicable specification sheets, and manufacturer's drawings.

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4.3.5.2 Proof pressure. The hose assembly shall withstand proof pressure of 620 bars (9,000 lb/in<sup>2</sup>) without evidence of permanent deformation or external leakage. The proof pressure shall be applied at least twice and held for 2 minutes at each application. The pressure shall be reduced to zero between applications.

4.3.5.3 Flexibility. The hose assembly shall be pressurized to the 310 bars (4,500 lb/in<sup>2</sup>) operating pressure. The assembly shall be flexed to the minimum bend radius of 40 mm, and the pressure increased to the applicable proof pressure. Pressure shall be reduced to zero, and the test repeated. Any evidence of permanent deformation or leakage shall constitute failure of this test.

4.3.5.4 Impulse. The hose assembly shall be impulse tested based on a rated operating pressure of 310 bars (4,500 lb/in<sup>2</sup>) in accordance with SAE ARP 603 using MIL-H-17672 hydraulic fluid. The assembly shall be subjected to 200,000 cycles at room temperature. Any evidence of permanent deformation or leakage shall constitute failure of this test.

4.3.5.5 Leakage. The hose assembly shall be subjected to the 310 bars (4,500 lb/in<sup>2</sup>) operating pressure. After 2 hours there shall be no evidence of leakage.

4.3.5.6 Burst pressure. Pressure shall be applied to the hose assembly at a rate not to exceed 1,725 bars (25,000 lb/in<sup>2</sup>) per minute until the 1,240 bars (18,000 lb/in<sup>2</sup>) burst pressure is obtained. After this pressure has been held for 2 minutes, the hose and end fittings shall show no sign of leakage. The pressure may be further increased to determine the actual burst pressure.

4.3.6 Valve flow rate. It shall be demonstrated that the valve has a minimum flow rate of 250 mL per minute at a differential pressure of 10 bars (145 lb/in<sup>2</sup>).

4.4 Quality conformance inspection. Quality conformance inspection shall consist of the examination of 4.4.2.1 and the tests of 4.4.2.2. Each valve and each hose assembly shall be subjected to quality conformance inspection.

4.4.1 Certificate of compliance. When specified in the contract or order, a certificate of compliance shall be prepared (see 6.2.2).

4.4.2 Examination and tests.

4.4.2.1 Examination.

4.4.2.1.1 Valves. Each valve shall be visually and dimensionally examined to determine conformance to the applicable specification sheet and any other requirements of this specification not involving tests.

4.4.2.1.2 Hose assembly. Each hose assembly shall be visually and dimensionally examined to determine conformance to the applicable specification sheet and any other requirements of this specification not involving tests.

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4.4.2.2 Tests.4.4.2.2.1 Valves.

4.4.2.2.1.1 Proof pressure. The valve shall withstand proof pressure of 465 bars (6,750 lb/in<sup>2</sup>) applied to the inlet with the outlet port blocked without evidence of permanent deformation, malfunction or leakage other than a slight wetting at seals. The proof pressure shall be applied once.

4.4.2.2.1.2 Leakage. The valve shall be uncapped, actuated, and then subjected to a pressure of 310 bars (4,500 lb/in<sup>2</sup>) with no leakage other than wetting of the seal.

4.4.2.2.2 Hose assembly. The hose assembly shall withstand proof pressure of 620 bars (9,000 lb/in<sup>2</sup>) without evidence of permanent deformation or external leakage. Proof pressure shall be applied once.

4.5 Inspection of packaging. Sample packages and packs, and the inspection of the preservation-packaging, packing and marking for shipment and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

## 5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging requirements of referenced documents listed in section 2, see 6.4.)

5.1 Preservation, packaging, and marking. Valves shall be individually preserved and packaged level A or C, packed level A, B, or C and marked in accordance with MIL-V-3, as specified (see 6.2.1).

5.2 Cushioning and wrapping materials. Use of excelsior, newspaper, shredded paper (all types, including wax paper) and similar hygroscopic or non-neutral materials for applications such as cushioning, filler, stuffing, and dunnage for materials destined for shipboard stowage and use shall be prohibited. Cushioning and wrapping materials selected shall have properties and characteristics for resistance to fire in accordance with the following:

UU-P-268	- Paper, kraft, wrapping type II, grade C or D
PPP-C-850	- Polystyrene, expanded, grade SE, type I or II only
PPP-C-1120	- Bound fiber, uncompressed, grade I, type III or IV, class A
MIL-R-6130	- Cellular rubber, grade A
MIL-R-20092	- Cellular rubber, class 5
MIL-P-26514	- Polyurethane foam (rigid or flexible)

5.3 Talc or talcum. Talc or talcum used in packaging process of items shall be free of asbestos or asbestiform like material.

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5.4 Data. Data shall be prepared for delivery in such a manner as to ensure the required information is protected against deterioration, physical damage, or loss during shipment from the contractor to the receiving activity. Packages or shipping containers shall, as a minimum, conform to the level C requirements of 5.1.

5.5 Marking of shipments. Interior packages and exterior shipping containers shall be marked in accordance with MIL-STD-129 and, in addition, shall include the following:

- (a) Specification number
- (b) Specification sheet number
- (c) Complete part number as identified in the applicable specification sheet.
- (d) Month and year manufacture

## 6. NOTES

6.1 Intended use. The valves and hose assemblies covered by this specification are intended for use in hydraulic systems at a maximum operating pressure of 310 bars (4,500 lb/in<sup>2</sup>).

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents shall specify the following:

- (a) Title, number, and date of this specification.
- (b) Title, number, and date of the applicable specification sheet.
- (c) Specification sheet part number (see 1.2).
- (d) If certificate of compliance is required (see 4.4.1).
- (e) Level of preservation and packaging (see 5.1).

6.2.2 Data requirements. When this specification is used in an acquisition and data are required to be delivered, the data requirements identified below shall be developed as specified by an approved Data Item Description (DD Form 1664) and delivered in accordance with the approved Contract Data Requirements List (CDRL), incorporated into the contract. When the provisions of DoD FAR Supplement, Part 27, Sub-Part 27.475-1 (DD Form 1423) are invoked and the DD Form 1423 is not used, the data specified below shall be delivered by the contractor in accordance with the contract or purchase order requirements. Deliverable data required by this specification are cited in the following paragraph.

<u>Paragraph no.</u>	<u>Data requirement title</u>	<u>Applicable DID no.</u>	<u>Option</u>
4.4.1	Certificate of compliance	DI-E-2121	---

(Data item descriptions related to this specification, and identified in section 6 will be approved and listed as such in DoD 5010.12-L., AMSDL. Copies of data item descriptions required by the contractors in connection with specific acquisition functions should be obtained from the Naval Publications and Forms Center or as directed by the contracting officer.)

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6.2.2.1 The data requirements of 6.2.2 and any task in sections 3, 4, or 5 of this specification required to be performed to meet a data requirement may be waived by the contracting/acquisition activity upon certification by the offeror that identical data were submitted by the offeror and accepted by the Government under a previous contract for identical item acquired to this specification. This does not apply to specific data which may be required for each contract regardless of whether an identical item has been supplied previously (for example, test reports).

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time set for opening of bids, qualified for inclusion in Qualified Products List QPL-24695 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. The activity responsible for the Qualified Products List is the Naval Sea Systems Command, SEA 5523, Department of the Navy, Washington, DC 20362-5101 and information pertaining to qualification of products may be obtained from that activity. Application for qualification tests shall be made in accordance with "Provisions Governing Qualification SD-6" (see 6.3.1).

6.3.1 Copies of "Provisions Governing Qualification SD-6" may be obtained upon application to Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

6.4 Sub-contracted material and parts. The packaging requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

6.5 Subject term (key word) listing.

Aluminum alloy  
Burst pressure  
Copper-nickel alloy  
Impulse  
Leakage  
Proof pressure

Preparing activity:  
Navy - SH  
(Project 4810-N059)