

INCH-POUND

MIL-PRF-32034(SH)

28 October 1998

## PERFORMANCE SPECIFICATION

## VALVE PACKING MATERIAL, NON-ASBESTOS

This specification is approved for use by 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 establishes the requirements for classification of non-asbestos packing for valves handling various fluids and gases on naval ships, in the sizes and forms as specified (see 6.2).

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, SEA 03Q, Naval Sea Systems Command, Department of the Navy, 2531 Jefferson Davis Highway, Arlington, VA 22242-5160 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 5330

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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## AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM D 129 - Standard Test Method for Sulphur in Petroleum Products (General Bomb Method). (DoD adopted)
- ASTM D 512 - Standard Test Methods for Chloride Ion in Water. (DoD adopted)
- ASTM D 1179 - Standard Test Methods for Fluoride Ion in Water. (DoD adopted)
- ASTM D 1246 - Standard Test Method for Bromide Ion in Water. (DoD adopted)
- ASTM D 3850 - Standard Test Method for Rapid Thermal Degradation of Solid Electrical Insulating Materials by Thermogravimetric Method (TGA). (DoD adopted)
- ASTM E 144 - Standard Practice for Safe Use of Oxygen Combustion Bombs.
- ASTM F 146 - Standard Test Methods for Fluid Resistance of Gasket Materials. (DoD adopted)
- ASTM F 152 - Standard Test Methods for Tension Testing of Nonmetallic Gasket Materials. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959).

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

#### 3.2 Material.

3.2.1 Composition. The packing material and construction shall conform to that of the sample subjected to first article inspection (see 4.2).

3.2.2 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements, and promotes economically advantageous life cycle costs.

#### 3.3 Performance characteristics.

3.3.1 Flexibility. The packing shall be flexible enough to be readily formed into coils to fit a rod with a diameter which is equal to five times the size (cross-sectional width) of the packing. Any signs of voids or separations between the rod and the packing shall be cause for disqualification (see 4.5.1).

3.3.2 Packing and fluid compatibility. The packing material shall be immersed in the fluids specified in table I and shall meet the requirements of 3.3.2.1 through 3.3.2.4.

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TABLE I. Immersion fluids for compatibility tests.

Fluid type
Distilled water
ASTM no. 1 oil
ASTM reference fuel B
ASTM no. 3 oil

3.3.2.1 Flexibility and fluid compatibility. Fluid media effect on flexibility shall be determined before and after fluid immersion (see 4.5.2.1). Any signs of voids or separations between the rod and the packing shall be cause for disqualification of a material for use in the fluid which caused the change.

3.3.2.2 Dimensional stability and fluid compatibility. Fluid media effect on dimensional stability shall be determined by comparing cross-sectional dimensions of a sample of 1/2-inch square packing after fluid immersion with packing dimensions before immersion (see 4.5.2.2). A 2 percent or greater change from the original dimensions shall be cause for disqualification of a material for use in the fluid which caused the change.

3.3.2.3 Tensile strength and fluid compatibility. Fluid media effect on tensile strength shall be determined by comparing tensile strength measurements before and after fluid immersion (see 4.5.2.3). A tensile strength which is less than 95 percent of the tensile strength of the reference (pre-immersion) material shall be cause for disqualification of a material for use in the fluid which caused the change.

3.3.2.4 Loss of lubricating substance. Fluid media effect on lubricating substance shall be determined by measuring the amount of lubricant lost after fluid immersion (see 4.5.2.4). Any loss in weight greater than 10 percent shall be cause for disqualification of a material for use in the fluid which caused the change.

3.3.3 Thermogravimetric analyzer (TGA) analysis. Thermogravimetric analyses shall be conducted to determine weight loss as a function of heat (see 4.5.3). Material weight loss as a function of heat shall be recorded and compared with original (pre-heating) material measurements. If weight loss exceeds 10 percent at a temperature which is less than the applicable temperature specified in table II, the material shall be disqualified.

TABLE II. Applicable temperatures for intended service.

Medium	Maximum system temperature (°F)
Superheated steam	1050
Boiler feedwater	475
Saturated low pressure steam	495
Lube oil	250
Navy distillate fuel	225
Hydraulic oil	150
Low-pressure air	550

#### 3.4 Detrimental materials.

3.4.1 Halogen concentration. The packing material shall be tested for halogen concentration (that is, the sum of total bromide, total chloride, and total fluoride ions) (see 4.5.4.1). The following limits shall apply:

- (a) Either total halogens shall not exceed 250 parts per million (ppm), or

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- (b) Halogen concentration excluding fluoride shall not exceed 250 ppm and the packing manufacturer shall attest that the only intentionally-added, fluoride-bearing ingredient is polytetrafluoroethylene, or
- (c) The sum of water-leachable halogens shall be less than 250 ppm when tested as specified in 4.5.4.1.1.

3.4.2 Total sulfur concentration. Packing materials shall be tested for total sulfur concentration (see 4.5.4.2), which shall not exceed 700 ppm unless otherwise approved (see 6.8).

3.4.3 Mercury. During manufacturing, fabrication, handling, and packaging, the valve packing, shall not come into contact with mercury or mercury compounds.

3.4.4 Other detrimental materials. For packing materials, the maximum concentrations specified in table III also apply (see 4.5.4.3).

TABLE III. Other detrimental materials.

Material	Maximum concentration(ppm)
Cadmium	250
Lead	250

3.4.5 Asbestos and polychlorinated biphenyls (PCBs). No asbestos or PCBs shall be used in the packing material.

3.5 Simulated service testing. Packing materials shall be tested as specified in 4.5.5 for the duration of 100 hours and shall meet the requirements of 3.5.1, 3.5.3, and 3.5.4.

3.5.1 Packing gland leakage rates. All packing must form a 100 percent seal during hydrostatic tests and maintain seal with zero leakage during the 100-hour test.

3.5.2 Addition of packing rings. Additional packing rings may be added in accordance with the procedure specified in appendix A, A.3.3.2, step 2.

3.5.3 Compression of packing rings. When tested as specified in appendix A, the compression of packing rings greater than 50 percent shall be cause for rejection.

3.5.4 Torque values. When tested as specified in appendix A, cycling torque and break away torque shall be not greater than 320 inch-pound (in-lb). Failure to meet these requirements shall be cause for rejection.

3.6 Size. Packing shall be furnished in the size specified (see 6.2). Allowable tolerances of the square cross-sectional dimensions shall be as specified in table IV.

TABLE IV. Allowable tolerances of packing.

Packing cross-sectional dimensions (inch)	Allowable tolerance (inch)
up to 1/4	+1/64
1/4 to 1/2	+1/32
1/2 and above	+1/16

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3.7 Form. The packing shall be furnished in the form of spools or reels in sizes and lengths as specified (see 6.2). The packing shall be uniformly coiled on spools or reels according to the following:

<u>Packing size (inches)</u>	<u>Package</u>
1/8 through 7/16	1 or 5 pound spools
3/8 through 3/4	5 or 10 pound spools
3/4 through 1	25, 50 or 100 pound reels
1-1/8 through 2	50 or 100 pound reels

3.8 Visual examination and dimensions. A visual examination of the packing material shall be conducted to detect defects in workmanship and dimension that could affect its serviceability (see 4.4.1.1).

## 4. VERIFICATION

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

- (a) First article inspection (see 4.2).
- (b) Conformance inspection (see 4.3).

4.1.1 Inspection conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions specified in 4.4 and 4.5.

4.2 First article inspection. First article inspection shall consist of examinations and tests as specified in table V.

TABLE V. First article inspection.

Inspection	Requirement	Test method
Flexibility	3.3.1	4.5.1
Fluid compatibility	3.3.2	4.5.2
Flexibility	3.3.2.1	4.5.2.1
Dimensional stability	3.3.2.2	4.5.2.2
Tensile strength	3.3.2.3	4.5.2.3
Loss of lubricating substance	3.3.2.4	4.5.2.4
TGA analysis	3.3.3	4.5.3
Halogen concentration	3.4.1	4.5.4.1
Total sulfur concentration	3.4.2	4.5.4.2
Other detrimental materials	3.4.4	4.5.4.3
Simulated service testing	3.5	4.5.5
Packing gland leakage rates	3.5.1	4.5.5
Compression of packing rings	3.5.3	4.5.5
Torque values	3.5.4	4.5.5

4.3 Conformance inspection. Conformance inspection shall consist of examinations and tests as specified in table VI (for groups A, B, and C).

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TABLE VI. Conformance inspection.

Inspection	Requirement	Test method
<u>Group A</u>		
Visual examination	3.8	4.4.1.1
Dimensions	3.8	4.4.1.1
<u>Group B</u>		
Flexibility	3.3.1	4.5.1
Fluid compatibility	3.3.2	4.5.2
Flexibility	3.3.2.1	4.5.2.1
Dimensional stability	3.3.2.2	4.5.2.2
Tensile strength	3.3.2.3	4.5.2.3
Loss of lubricating substance	3.3.2.4	4.5.2.4
TGA analysis	3.3.3	4.5.3
Halogen concentration	3.4.1	4.5.4.1
Total sulfur concentration	3.4.2	4.5.4.2
Other detrimental materials	3.4.4	4.5.4.3
<u>Group C</u>		
Simulated service testing	3.5	4.5.5
Packing gland leakage rates	3.5.1	4.5.5

4.3.1 Lot. For purposes of conformance and test sampling, a lot is defined as all finished packing of one size, produced in one facility, using the same production processes and materials, and being offered for delivery at one time.

4.3.2 Sampling for conformance inspection.

4.3.2.1 Sampling for visual examination of gasket material. At a minimum, the contractor shall randomly select samples from each lot of completed spools or reels as specified in table VII, and inspect them as specified in 4.4.1.1 (see 6.6).

TABLE VII. Sampling for visual examination of packing material.

Lot size	Sample size
up to 4	all
5 to 50	5
51 to 90	7
91 to 150	11
151 to 280	13
281 to 500	16
501 to 1,200	19
1,201 to 3,200	23
3,201 to 10,000	29
10,001 to 35,000	35

4.3.2.2 Sampling for tests. At a minimum, the contractor shall randomly select a sample quantity from each lot of completed packing material as specified in table VIII, and test them as specified in 4.4 and 4.5 (see 6.6).

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TABLE VIII. Sampling for tests.

Lot size	Sample size
2 to 25	2
26 to 50	5
51 to 90	6
91 to 150	7
151 to 280	10
281 to 500	11
501 to 1,201	15
1,201 to 3,200	18
3,201 to 10,000	22
10,001 to 35,000	29

4.4 Conformance tests.

4.4.1 Group A tests. Group A tests shall be performed for all conformance inspections (see 4.4.1.1).

4.4.1.1 Visual examination and dimensions. Packing material shall be carefully examined by visual inspection to detect defects in workmanship and dimensions. For each spool or reel of packing material, major defects such as a rip, tear, hole, void, crease, crimp, gouge, or extraneous particulate matter on the surface shall be cause for rejection of that spool or reel. Minor surface defects not affecting the serviceability of the packing material shall not be cause for rejection. Cross-sectional dimensions shall be measured at no less than two-foot intervals along the length of two adjacent sides of the spool or reel, using a metal ruler graduated to 1/64-inch (see 3.6 and 3.8).

4.4.2 Group B tests. Group B tests may be omitted only if both of the following are true:

- (a) Within two years preceding the date current lot will be delivered by the contractor, the material has been tested and found in conformance with the group B requirements of table V.
- (b) The material offered for delivery is manufactured the same in all respects as the sample subjected to first article inspection.

4.4.3 Group C tests. Group C tests may be omitted only if one the following is true:

- (a) Within three years preceding the date current lot will be delivered by the contractor, the material has been tested and found in conformance with the group C requirements of table V.
- (b) The material offered for delivery is manufactured the same in all respects as the sample subjected to first article inspection.

4.4.4 Composition or process change. Any changes in composition or process shall be promptly reported to the contracting activity.

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4.5 Test methods.

4.5.1 Flexibility. The packing shall be coiled by hand around a rod with a diameter which is equal to five times the size of the packing. A visual examination shall then be made to determine whether the packing conforms to the curvature of the rod with no voids or separation between the packing and the rod (see 3.3.1).

4.5.2 Packing and fluid compatibility. Packing shall be immersed in the control fluids specified in table I for 1000 hours (see 3.3.2).

4.5.2.1 Flexibility and fluid compatibility. The flexibility test (see 4.5.1) shall be performed after immersion and the results compared with pre-immersion test results (see 3.3.2.1).

4.5.2.2 Dimensional stability and fluid compatibility. Prior to immersion in the control fluids, cross-sectional measurements shall be taken along a 3-inch length of packing and averaged. Three additional cross-sectional measurements shall be taken at 90 degrees to the first measurements and averaged. Following the 1000-hour immersion, the same measurements shall again be taken. Pre- and post-immersion averaged cross-sectional measurements shall be compared for swelling or shrinkage (see 3.3.2.2).

4.5.2.3 Tensile strength and fluid compatibility. Tensile strength shall be measured in accordance with method A of ASTM F 152. Tensile strength of the individual packing strands shall be measured rather than the tensile strength of the cross-section of the braided packing material. Packing shall be unbraided, with three 6-inch-long strands removed from the braid for each of the control fluids for which the material is to be tested. Three strands shall be used for reference. The tensile strength of the immersed strands shall then be compared with that of the reference strands (average of three breaks) (see 3.3.2.3).

4.5.2.4 Loss of lubricating substance. Pre- and post-immersion weight of packing materials shall be measured in accordance with ASTM F 146 modified as follows: Add the following to the blotting instructions in the procedure for elevated temperature immersion in fluids: "specimens shall be placed on sheets of blotting paper and left for 24 hours" (see 3.3.2.4).

4.5.3 Thermogravimetric analyzer (TGA) analysis. Test in accordance with ASTM D 3850 (see 3.3.3).

4.5.4 Detrimental materials. Acceptable test methods and procedures are provided as guidance; however, testing methods are not limited to these exact procedures. Any standard test method may be used to determine total concentrations, as long as each element in all forms can be determined to levels below 250 ppm (see 3.4).

4.5.4.1 Halogen concentration. Any standard test method may be used (Suggested: Use an oxygen combustion bomb together with ASTM D 129 and ASTM E 144. Ignite approximately 0.5 grams of the sample under 30 atmospheres of oxygen pressure and dilute to a final volume of 100 milliliters (mL) with the baronate/bicarbonate buffer required for analysis by ion chromatography.) (see 3.4.1).

4.5.4.1.1 Leach test, 500-degree Fahrenheit (°F).

- (a) Cut two specimens, weighing approximately 20 grams each, from the selected sample, record their exact weight to 0.1 gram, and identify them as specimens A and B. This identification shall be maintained throughout the test.



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- (b) Each test specimen shall be transferred to a suitable pressure vessel (parr reaction vessel, or the equivalent), covered with enough distilled water to obtain a final volume of 500 mL, and simmered at  $500 \pm 10^{\circ}\text{F}$  for not less than 6 hours. The leach water shall then be separated by filtration and the filter rinsed. A control filtrate shall be run using similarly cleaned equipment and distilled water from the same source.
- (c) Using aliquots from the control filtrate and filtrates A and B, the concentration of bromide, chloride, and fluoride ions in each filtrate shall be determined by an appropriate method of ASTM D 1246, ASTM D 512, and ASTM D 1179, respectively, or by comparable methods. The concentration of water-leachable halide in the material shall be determined as follows:

Bromide, Chloride, or Fluoride, ug/g (ppm) = C multiplied by 500/M

where:

C = bromide, chloride, or fluoride concentration of filtrate, in milligrams per liter; and

M = grams of the test specimen, prepared per (a) above.

- (d) The total leachable halogen concentration is the sum of leachable bromide, chloride and fluoride concentrations. The halide concentrations for filtrates A and B shall be corrected by the results of the control filtrate.

4.5.4.2 Total sulfur concentration. Any standard test method may be used (the same suggested test method for halogen concentration specified in 4.5.4.1 may be used) (see 3.4.2).

4.5.4.3 Other detrimental materials. Any standard test method may be used (Suggested: Use oxygen combustion bomb digestions for metal analysis, analyze digestates of cadmium and lead by direct aspiration atomic absorption spectroscopy) (see 3.4.4).

4.5.5 Simulated service testing. The valve packing test methods shall be as specified in appendix A (see 3.5).

## 5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

## 6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

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6.1 Intended use. Packing is primarily intended for general shipboard service in valves handling various fluids and gasses.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- (a) Title, number and date of the specification.
- (b) Spool or reel size required (see 1.1 and 3.7).
- (c) Size and form required (see 1.1, 3.6, and 3.7).
- (d) Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2).
- (e) When first article is required (see 3.1).
- (f) Packaging requirements (see 5.1).

6.3 Material safety data sheet (MSDS). Contracting officers will identify those activities requiring an MSDS. Additional required Government information is contained in FED-STD-313. In order to obtain the MSDS, FAR clause 52.223-3 must be in the contract.

6.4 Packing substitutions. Table IX has been prepared to facilitate substitution of non-asbestos packing materials for asbestos packing materials. The asbestos-containing packings are identified by military specifications, designators, and application information.

TABLE IX. Packing substitution table.

Asbestos-containing specification	Maximum differential pressure across packing (psi) <u>1/</u>	Max. system temp (°F)	Medium
MIL-P-17303 Class II, Type E	1250	1050	Superheated steam
MIL-P-24377 & MIL-P-24058	1200	475	Boiler feedwater
MIL-P-17303 Class II, Type C & Class II, Type E	650	495	Saturated low pressure steam
MIL-P-17303 Class II, Type C & MIL-P-17416	150	250	Lube oil
MIL-P-24377, MIL-P-17416 & MIL-P-17303 Class I, Type B	350	225	Naval distillate fuel
None Listed			
MIL-P-24377	150	150	Hydraulic oil
	200	550	Low-pressure air

1/ Pounds per square inch (psi).

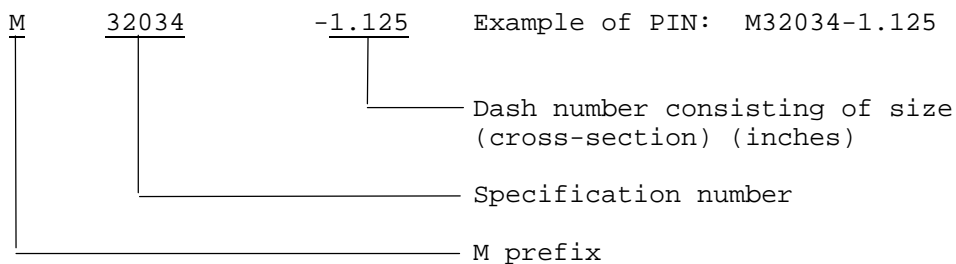
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6.5 Definitions.

- (a) Sample. A spool or reel of packing selected for first article or conformance inspection.
- (b) Sample size. The number of spools or reels to be randomly selected from.
- (c) Size of packing. The cross-sectional distance between parallel faces, for square and trapezoidal packings. In the case of rectangular packing, it is the distance between the longest parallel faces; for round or oval packing, it denotes the maximum diameter.

6.6 Lot rejection. If one or more defects are found in any sample, the entire lot should be rejected. The contractor has the option of screening 100 percent of the lot for the defective characteristic(s) or providing a new lot which should be inspected in accordance with the sampling plan contained herein. The contractor should maintain for a period of 3 years after contract completion all records of inspections, tests, and any resulting rejections.

6.7 Part or Identifying Number (PIN). The part numbering system is as follows:



6.8 NAVSEA approval and direction. Deviations from specified materials, procedures, and requirements and selection of specific alternative materials and procedures require NAVSEA approval or direction. Requests should include supporting documentation.

6.9 Subject term (key word) listing.

Fluid compatibility  
 Fluid handling  
 Gas handling  
 Valves

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## APPENDIX A

## COMPRESSION PACKING MATERIAL DYNAMIC LABORATORY TEST PROCEDURE

## A.1 SCOPE

A.1.1 Scope. This appendix details the laboratory performance tests which are designed to determine whether non-asbestos compression valve packing materials are capable of achieving and maintaining a proper seal in a simulated environment which meets operational safety requirements for naval applications. The tests outlined herein are intended to qualify valve packing materials for a variety of applications. This appendix is a mandatory part of the specification. The information contained herein is intended for compliance.

## A.2 APPLICABLE DOCUMENTS

## SPECIFICATIONS

## DEPARTMENT OF DEFENSE

MIL-F-16884 - Fuel, Naval Distillate.

MIL-L-17331 - Lubricating Oil, Steam Turbine and Gear, Moderate Service.

MIL-H-17672 - Hydraulic Fluid, Petroleum, Inhibited.

(Unless otherwise indicated, copies of the above specifications are available from the Defense Automated Printing Service (DAPs), 700 Robbins Avenue, Building 4D, Philadelphia, PA, 19111-5094.)

## A.3 PROCEDURE

A.3.1 Materials. The following tests shall be performed on non-asbestos compression materials according to their recommended use and temperature/pressure limitations. One-quarter-inch square packing material shall be specified for each test.

A.3.2 Conditioning. No preconditioning of materials shall be performed. It is desirable that the non-asbestos compression material be exposed to existing environmental conditions, as would be expected in supply storage aboard a naval vessel.

A.3.3 Test procedures for valve packings. A valve packing device is required that consists of valves sized for 1-inch piping systems. Each fixture is to be designed for testing a minimum of four identical packing materials simultaneously. One of every four valves is to be equipped with a motorized valve stem and a load cell capable of measuring opening and closing torque. The remaining valves are to be manually operated. A heater and pressurizing device are required to provide temperatures and pressures specified in A.3.3.1. The test device must have the capability of supplying the necessary fluids for exposure to the packing material. The test device must be configured to permit data acquisition as described in this appendix. Figure 1 is one example of a valve packing test device; however, any suitable test device may be used, as long as it meets the requirements of this appendix.

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A.3.3.1 Test media, pressures, temperatures, and leakage rates. The following test conditions must be provided:

<u>Medium</u>	<u>Pressure (psig)</u>	<u>Temperature (°F)</u>
Superheated steam	1250	1050
Boiler feedwater	1200	475
Saturated low-pressure steam	650	495
Lube oil (MIL-L-17331 / 2190 TEP)	150	250
Naval Distillate fuel (MIL-F-16884)	350	225
Hydraulic oil (MIL-H-17672 / 2075-T-H)	150	150
Low-pressure air	200	550

Leakage rate goal values shall be zero.

A.3.3.2 Testing procedure. Install packing rings as specified in steps 1 and 2; test packings as specified in steps 3 and 4:

Step 1: Using a mandrel the same size as the shaft, wrap the packing around the mandrel and cut the rings to the proper size (measure after cutting the first ring).

Cut five packing rings using a butt joint cut. Number each packing ring for identification. Measure and record weight and cross-sectional dimensions of each packing ring.

Step 2: Install packing rings in each valve assembly, recording identified ring positions for each valve. Seat packing rings using the gland follower; tighten gland nuts finger-tight; measure and record the follower position. If necessary, add additional rings of packing and repeat seating the packing rings and tightening the gland nuts until a maximum amount of gland follower nut travel is available. The additional rings shall not extend beyond the stuffing box. Record the number of rings installed and the starting position of the gland follower.

Step 3: Apply 100 percent test pressure at ambient temperature and tighten gland nuts until pressure can be sustained for not less than 5 minutes. The applicable test media shall be used; water shall be used for steam applications. If necessary, add additional rings of packing and repeat step 2 until a maximum amount of gland follower is available. The additional rings shall not extend beyond the stuffing box. Record the number of rings installed and the starting position of the gland follower.

Failure to achieve a seal at 100 percent test pressure/ambient temperature shall be deemed cause for test termination. Operate the valve stem to ensure proper opening/closing force. Record the following information:

- (a) One manually-operated valve shall be left in the open position throughout the entire test, simulating a system emergency isolation valve. Breakaway torque of this valve at the end of the test is a required measurement.

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- (b) Two manually-operated valves shall be opened at the beginning of the test procedure/temperature cycle and closed at the beginning of the cool-down period. The valves simulate system flow control valves. Clockwise and counterclockwise stem rotation torque on each occasion are required measurements.
- (c) The motorized valve shall be operated for 150 cycles every 4 hours (a total of 3900 cycles) throughout the test cycle while system pressure and temperature are at test specifications. The motorized valve shall be left in the open position during cool-down periods. Rate of drive and number of open/close cycles shall be recorded. Torque transducer shall provide opening/closing torques throughout the operational period. This valve simulates a system flow control regulation valve and will provide indications of packing and shaft wear.

Step 4: During the test period, the following parameters shall be recorded: temperature, pressure, torque, adjustments and leakage, number of cycles, and total test duration. These data shall be recorded every hour for the first 8 hours and every 4 hours thereafter.

- (a) Adjustments and leakage: All adjustments and gland nut torque shall be noted. Any leakage must also be noted, since zero leakage is a test requirement.

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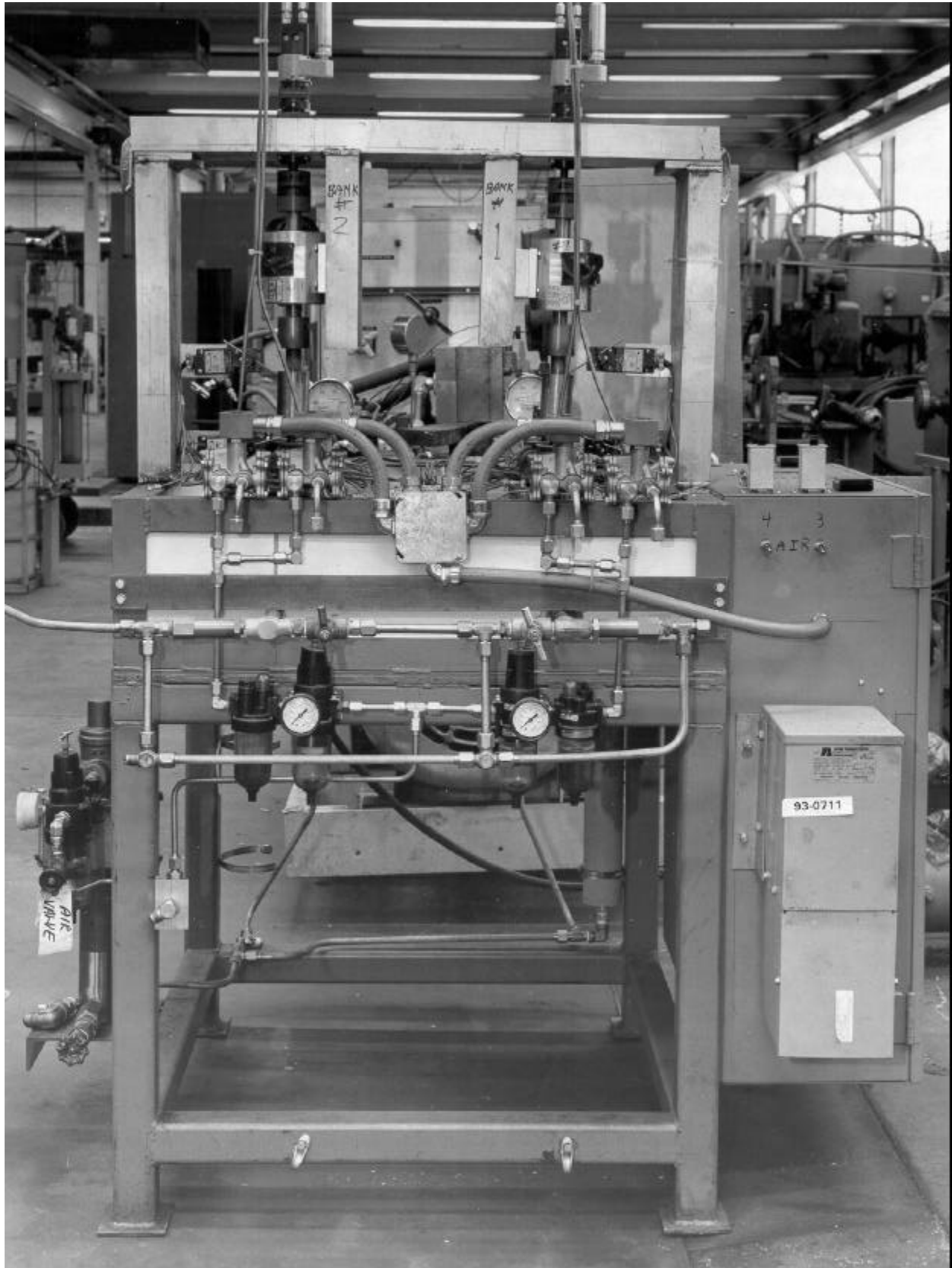


FIGURE 1. Valve packing test device.

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CONCLUDING MATERIAL

Preparing activity:  
Navy - SH  
(Project 5330-N168)



# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4,5,6, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of this form.

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### I RECOMMEND A CHANGE:

1. DOCUMENT NUMBER  
MIL-PRF-32034

2. DOCUMENT DATE (YYMMDD)  
981028

3. DOCUMENT TITLE

VALVE PACKING MATERIAL, NON-ASBESTOS

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*

b. ORGANIZATION

c. ADDRESS *(Include Zip Code)*

d. TELEPHONE *(Include Area Code)*

7. DATE SUBMITTED  
(YYMMDD)

(1) Commercial  
(2) AUTOVON  
*(if applicable)*

8. PREPARING ACTIVITY

a. NAME

Technical Point Of Contact (TPOC)

Mr. Richard L. Dempsey, SEA 03M3

b. TELEPHONE *(Include Area Code)*

(1) Commercial

(703) 602-0146 x223

(2) AUTOVON

332-0146 x223

c. ADDRESS *(Include Zip Code)*

Commander, Naval Sea Systems Command  
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