MILITARY SPECIFICATION

PACKING, V RING

This specification has been approved by the Bureau of Aeronautics, Department of the Navy.

1. SCOPE

1.1 Scope.- This specification covers V ring packing for catapults, arresting gear and similar ship installation equipment.

2. APPLICABLE DOCUMENTS

2.1 The following specifications, standards and publications of the issue in effect on date of invitation for bids, form a part of this specification.

SPECIFICATIONS

Federal

NN-P-515	Plywood, Container Grade
LLL-B-631	Boxes, Fiber, Corrugated (For Domestic Shipment)
LLL-B-636	Boxes, Fiber, Solid (For Domestic Shipment)
PPP-B-566	Boxes, Folding, Paperboard
PPP-B-585	Boxes; Wood, Wirebound
PPP-B-591	Boxes, Fiberboard, Wood-Cleated
PPP-B-601	Boxes, Wood, Cleated-Plywood
PPP-B-621	Boxes, Wood, Nailed and Lock-Corner
PPP-B-676	Boxes, Set-Up, Paperboard

Military

JAN-P-108	Packaging and Packing For Overseas Shipment- Boxes, Fiberboard (V-Board and W-Board
MIL-B-10377	Boxes; Wood-Cleated, Veneer, Paper Overlaid
MIL-L-10547	Liners, Case, Waterproof

STANDARDS

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage

(When requesting specifications, standards, and drawings refer to both title and number. Copies of this specification and applicable specifications, standards, and drawings may be obtained upon application to the Commanding Officer, Naval Aviation Supply Depot, 700 Robbins Avenue, Philadelphia 11, Pa., Attention: Code ODPT.)

OTHER PUBLICATIONS

American Society for Testing Materials Standard

D676-55T	Method of test for measuring durometer hardness
D395-55	Method of test for measuring compression set
D412-51T	Method of test for measuring tensile strength and elongation
D573-53T	Method of test for measuring physical properties after air aging
D471-55T	Method of test for measuring change in physical properties

(Copies of the above publications may be obtained from the American Society for Testing Materials, 1916 Race Street, Philadelphia 3, Pennsylvania.)

3. REQUIREMENTS

3.1 Preproduction tests.- The packing furnished under this specification shall be a product which has passed the preproduction tests specified herein.

3.2 Materials.- The materials used shall be suitable for use with hydraulic oil, nonflammable hydraulic fluid, ethylene glycol, glycerine and water, by containing no substance which, when in contact with the fluid, will adversely affect properties of the fluid or molded packing. The packing shall not contain any substances which will corrode steel or aluminum or shall not form compounds with the specified fluids which would corrode steel or aluminum.

3.2.1 The material shall be homogeneous to insure consistent swell, strength, and hardness characteristics throughout the entire batch.

3.2.2 Filler rings, when provided, shall be fabricated of extruded rubber which shall be cut, fitted and assembled with the V ring.

3.3 Design and construction.-

3.3.1 Shape and dimensions.- The size shall conform to the applicable part number. The detail packing and filler ring shapes, dimensions and tolerances shall be in accordance with the manufacturer's shape drawing. Unless otherwise specified, rings shall be solid (not split).

3.3.2 Surfaces.- Sealing edges shall be clean and sharp without any irregularities, nicks, cuts, or blemishes within 1/32 of the sealing edge. Bearing and supporting surfaces of packing shall be smooth and true. The molded packing shall contain no cuts, laps, blisters, cracks, seams, or other defects. Mold flash shall be removed in such a manner as not to cause leakage nor interference upon installation. Raised marking, that might change stack height dimensional tolerances are not permissible.

3.4 Physical properties.- Physical properties shall be as specified in Table I. The term "as determined" means that the value shall be determined, but irrespective of what the value may be, it will not be cause for rejection.

3.4.1 Temperature.- Unless otherwise specified, all tests shall be conducted at a temperature between 70°F and 85°F.

Table I

Physical Properties

Property	V Packing	Filler Ring
Original		
Durometer Hardness	90 ± 5	60 ± 5
Tensile Strength, psi	1500 (min.)	1500 (min.)
Elongation, percent	-	400
Compressibility, 1000 psi	5 to 15 percent	-
Recovery, percent	50 (min.)	-
After exposure 72 hours,-40°F		
Durometer Hardness	As determined	As determined
Tensile Strength, psi	As determined	As determined
Elongation, percent	-	As determined
Compressibility, 1000 psi	As determined	As determined
Recovery, percent	As determined	As determined
Immersion ASTM Oil #3, 70 hours at 212°F		
Durometer Hardness Change, Points	-	-20 (max.)
Tensile Change, percent	-50 (max.)	-50 (max.)
Elongation Change, percent	-	-50 (max.)
Volume Change, percent	45 to 65	30 to 40

Table I

Physical Properties (Cont'd)

Property	V Packing	Filler Ring
Immersion Hydraulic Fluid Specification MIL-F-7083		
70 hours at room temperature		
Durometer Change, Points	-	-5 to +5
Tensile Change, percent	-35 (max.)	-15 (max.)
Elongation Change, percent	-	-15 (max.)
Volume Change, percent	-2 to +5	0 to +5
70 hours at 200°F		
Durometer Change, Points	-	-5 to -15
Tensile Change, percent	-60 (max.)	-60 (max.)
Elongation Change, percent	-	-60 (max.)
Volume Change, percent	0 to 7	10 to 20
Immersion Ethylene Glycol Specification MIL-E-5559		
70 hours at room temperature		
Durometer Change, Points	-	-5 to +5
Tensile Change, percent	-15 (max.)	-15 (max.)
Elongation Change, percent	-	-15 (max.)
Volume Change, percent	-2 to +5	-2 to +5
70 hours at 200°F		
Durometer Change, Points	-	0 to -10
Tensile Change, percent	-30 (max.)	-15 (max.)
Elongation Change, percent	-	-20 (max.)
Volume Change, percent	-2 to +5	5 to 12
Immersion 50% Glycerine, 50% Water		
70 hours at room temperature		
Durometer Change, Points	-	-5 to +5
Tensile Change, percent	-30 (max.)	-15 (max.)
Elongation Change, percent	-	-15 (max.)
Volume Change, percent	-2 to +5	-2 to +5
70 hours at 200°F		
Durometer Change, Points	-	-5 to +5
Tensile Change, percent	-40 (max.)	-15 (max.)
Elongation Change, percent	-	-15 (max.)
Volume Change, percent	-2 to +5	0 to 7
Immersion Distilled Water		
70 hours at room temperature		
Tensile Change, percent	-35 (max.)	-
Volume Change, percent	-2 to +5	-
70 hours at 200°F		
Tensile Change, percent	-60 (max.)	-
Volume Change, percent	0 to +10	-
Compression Set, 70 hours, 212°F, 30 percent deflection, percent set	-	25 (max.)
Air Aged, 70 hours, 212°F		
Tensile Change, percent	-25 (max.)	-
Durometer Change, points	+15 (max.)	-
Immersion ASTM Oil #3, 70 hours at room temperature		
Tensile Change, percent	-15 (max.)	-
Volume Change, percent	0 to +5	-

3.5 Workmanship.- The packing and filler rings shall be uniform in quality and shall be free from irregularites which would adversely affect the appearance or serviceability of the packing.

4. QUALITY ASSURANCE PROVISIONS

4.1 Classification of tests.- The inspection and testing of packing shall be classified as follows:

(a) Preproduction tests.- Preproduction tests are those tests performed on samples representative of the production of the item after the award of contract, to determine that the production meets the requirements of this specification.

(b) Acceptance tests.- Acceptance tests are those tests performed on individual lots which have been submitted for acceptance.

4.2 Preproduction tests.- Preproduction tests shall consist of all the tests of this specification.

4.2.1 Sampling instructions.- The preproduction test samples shall consist of platen press sheets (1/8 by 6 by 12 inches) and ASTM hardness test discs (1/4 inch thick by 1 inch diameter) and one complete stack of V-rings with end rings, when ordered. Platen press sheets and hardness test discs shall have the same compounding and equivalent cure as the accompanying packings, and the packings shall represent the manufacturer's production product, particularly with respect to stock preparation, mold design, and molding technique. When a Contractor is in continuous production of packing conforming to this specification submission of further preproduction samples on additional contracts may be waived at the discretion of the Procuring Activity. Approval of preproduction samples or the waiving of preproduction tests does not preclude the requirements of submitting packing to the Acceptance Tests.

4.2.2 Test report.- After the contractor has completed the Preproduction tests, he shall prepare a Preproduction test report and furnish two certified copies of the report to the procuring activity. The report shall include all values for each sample tested as well as the average value, when required.

4.2.3 Preproduction test sample for the procuring activity.- Along with the Preproduction test report, the contractor shall submit samples to the procuring activity.

4.3 Acceptance tests.- Acceptance tests shall consist of the Sampling tests and examination of product.

4.3.1 Sampling tests.- Sampling tests shall consist of Batch Control.

4.3.1.1 Batch control.- One ASTM Hardness Disc 1/4 thick by 1 inch diameter, minimum, shall be prepared from each batch of material and subjected to the Durometer Hardness test.

4.3.1.1.1 A batch shall be defined as the quantity of material run through a mill or mixer at one time.

4.3.2 Sampling for examination of product.- A random sample shall be selected from each inspection lot in accordance with MIL-STD-105. The unit of inspection shall be one packing ring. The AQL for minor defects shall be 4.5 percent defective and the AQL for major defects shall be 0.65 percent defective.

4.4 Examination of product.- Each sample packing ring shall be thoroughly examined to determine conformance to all the requirements of this specification and the applicable manufacturer's shape drawing.

4.4.1 Classification of defects.- Defects shall be classified as specified in Table I.

Table I

Classification of Defects

DEFECT	CLASSIFICATION MAJOR	MINOR
Damage which would impair the function of the packing	X	
Damage which would not impair the function of the packing		X
Faulty workmanship which would impair the appearance of the packing		X

4.5 Disposition of rejected lots.- The disposition of rejected lots shall be in accordance with Section 12 of MIL-STD-105.

4.6 Test methods.-

4.6.1 Durometer hardness.- The durometer hardness measurements shall be determined in accordance with test method ASTM D676-55T.

4.6.2 Tensile strength and elongation.- The tensile strength and elongation measurements shall be determined in accordance with test method ASTM D412-51T.

4.6.3 Compression set.- The compression set measurements shall be determined in accordance with test method ASTM D395-55.

4.6.4 Change in physical properties.- The change in physical properties measurements shall be determined in accordance with test method ASTM D471-55T.

4.6.5 After air aging.- The physical properties measurements after air aging shall be determined in accordance with test method ASTM D575-53T.

5. PREPARATION FOR DELIVERY

5.1 Application.- The packaging, packing, and marking requirements specified herein apply to direct purchases by or direct shipments to the Government.

5.2 Packaging.-

5.2.1 Level A.-

5.2.1.1 Unit package.- Each set of packing rings shall be unit packaged with a suitable wrap and placed in an unstressed condition and in a snug manner within an interior box conforming with Specification PPP-B-566 or PPP-B-676.

5.2.1.2 Intermediate package.- Intermediate packages shall contain the number of unit packages specified by the procuring activity. The intermediate packages shall be fiberboard boxes conforming to Specification LLL-B-631, LLL-B-636, or [illegible]P-108. Fiberboard boxes shall be sealed by the application of the tape specified in the applicable specifications.

5.2.2 Level C.- When level C is required, packaging shall conform to the manufacturer's commercial practice, unless the procuring activity determines a modification to the manufacturing commercial practice is required.

5.3 Packing.-

5.3.1 Level A.- Packing rings packaged as specified in 5.2.1, shall be packed in overseas type containers conforming to Specifications PPP-B-591, PPP-B-601, PPP-B-621, or MIL-B-10377, or PPP-B-585. If other than JAN-P-108 box is used as an intermediate container, the PPP-B-591, PPP-B-621, MIL-B-10377, and PPP-B-585 boxes shall be provided with a case liner conforming to Specification MIL-L-10547. Plywood, if used, shall conform to Specification NN-P-515 Type I or II, Class 2.

5.3.2 Level B.- Packing Rings packaged as specified in 5.2.1, shall be packed in domestic type containers conforming to Specifications PPP-B-591, PPP-B-601, PPP-B-621, MIL-B-10377, or PPP-B-585. When specified by the procuring activity, intermediate packages may be shipped under this level without over-packing.

5.3.3 Level C.- Packing rings packaged as specified in 5.2.1, shall be packed in accordance with the manufacturer's commercial practice and shall conform to the applicable carrier rules and regulations in effect at the time of shipment.

5.4 Marking.- Each unit package, intermediate package, and shipping container shall be marked in accordance with MIL-STD-129.

6. NOTES

6.1 Intended use.- Packings covered by this specification are intended for use in catapults and arresting gear equipment.

6.2 Ordering data.- Requisitions, contracts and orders should specify the quantity and sizes of packing and filler rings desired, number of unit packages in intermediate containers, and applicable levels of packaging and packing protection required (see Section 5).

6.2.1 Provisions for acceptance testing.- Normally, unless otherwise indicated by the bureau or technical activity concerned, contracts should state the acceptance testing to determine conformance with the specification requirements will be the responsibility of the Contractor.

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5. PROBLEM AREAS

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