

**MIL-P-18324D****21 NOVEMBER 1966****SUPERSEDING****MIL-P-18324C****16 MAY 1962****(SEE 6.6)****MILITARY SPECIFICATION**

**PLASTIC MATERIAL, LAMINATED PHENOLIC,  
FOR BEARINGS  
(WATER OR GREASE LUBRICATION)**

*This specification is mandatory for use by all Departments and Agencies of the Department of Defense.*

**1. SCOPE**

1.1 This specification covers laminated phenolic resin cotton fabric base material. The material is available in the form of sheets or shapes. This specification is applicable only to sizes such that polished  $\frac{1}{2}$  inch cubes may be prepared from the material. Requirements for other sizes should be as specified (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-286 — Nickel-Copper-Aluminum Alloy, Wrought (K-Monel).
- RR-S-366 — Sieves, Standard for Testing Purposes.

- 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-640 — Boxes, Fiberboard, Corrugated, Triple-Wall.

**STANDARDS****MILITARY**

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

**DRAWINGS****MILITARY**

- 810-1385664 — Bearings, Stern Tube and Strut.

FSC 9330
----------

**MIL-P-18324D**

S2200-921759 — Bearing, Laminated  
Phenolic Stave  
Type Rudder,  
Arrgts. and Stave.

S2200-921760 — Bearing, Laminated  
Phenolic Stave  
Type Rudder,  
Table of Dimen-  
sions.

U. S. NAVY MARINE ENGINEERING  
LABORATORY

12753 — Bench Wear Tester.

(Copies of specifications, standards, drawings, and publications 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 document forms 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.

**OFFICIAL CLASSIFICATION COMMITTEE**

Uniform Freight Classification Rules.

(Application for copies should be addressed to the Official Classification Committee, 1 Park Avenue at 39rd Street, New York, N. Y. 10016.)

**3. REQUIREMENTS**

**3.1 Qualification.** The laminated thermosetting plastic bearing furnished under this specification shall be products which are qualified for listing on the applicable qualified products list at the time set for opening of bids (see 4.2 and 6.3).

**3.2 Material.** Bearing material shall be laminated phenolic thermosetting plastic, consisting of layers of woven cotton fabric thoroughly impregnated with thermosetting

resin, laminated and molded under controlled heat and pressure so that the resulting product will be dense and homogeneous.

**3.3 Dimensions of sheets (see 6.2).**

**3.3.1 Length and width.** Unless otherwise specified in the contract or order or in detailed specifications, the manufacturer's standard sizes between 28 and 50 inches in width and between 36 and 96 inches in length will be acceptable. The length and width of sheets may vary 1 inch over or under the manufacturer's standard size. Nonuniform standard sheet dimensions caused by cutting specimens for tests required by this specification shall not be cause for rejection, provided the test specimens are cut from one corner and the material removed for test purposes is no larger than 12 by 12 inches square by the thickness of the piece being sampled.

**3.3.2 Thickness.** Sheets shall be furnished in thicknesses as specified (see 6.2). Sheets or pieces cut or punched from sheets, shall be within the tolerances specified in table I. At least 90 percent of the area of the sheet shall be within the tolerances specified, and at no point shall the thickness vary from the nominal by a value greater than 125 percent of this specified tolerance.

TABLE I. Tolerances on thickness of sheets

Nominal thickness	Tolerance (plus only)	Nominal thickness	Tolerance (plus only)
Inches	Inch	Inches	Inch
$\frac{1}{8}$	0.053	3	0.130
$\frac{3}{8}$	.058	3½	.146
$\frac{1}{2}$	.062	4	.163
1	.065	4½	.179
1½	.069	5	.190

**MIL-P-18324D****TABLE I. Tolerances on thickness of sheets—Cont'd**

Nominal thickness	Tolerance (plus only)	Nominal thickness	Tolerance (plus only)
Inches	Inch	Inches	Inch
1 1/4	.073	5 1/2	.210
1 3/4	.077	6	.230
1 1/2	.081	6 1/2	.240
1 5/8	.085	7	.260
1 3/4	.089	7 1/2	.280
1 7/8	.093	8	.290
2	.097	8 1/2	.310
2 1/4	.105	9	.320
2 1/2	.113	9 1/2	.340
2 3/4	.121	10	.360

Note 1. On sheets of nominal thickness not listed above, the tolerance shall be the same as specified for the next greater thickness.

Note 2. Where closer tolerances are required, the maximum and minimum thicknesses shall be as specified (see 6.2).

**3.4 Dimensions of tubes (see 6.2).**

**3.4.1 Length.** Tubes may be furnished in manufacturer's standard lengths.

**3.4.2 Standard diameters.** The steps shown in table II shall be considered standard for inside and outside diameter sizes of round tubing.

**TABLE II. Nominal tubing sizes**

Nominal inside and outside diameters	By steps of
Inches	Inch
1-1/16 to 3, inclusive	1/16
3-1/2 to 6, inclusive	1/2

**TABLE II. Nominal tubing sizes—Cont'd**

Nominal inside and outside diameters	By steps of
6 1/4 to 8, inclusive	1/4
8 1/2 to 36, inclusive	1/2

**3.4.3 Tolerances, inside and outside diameters.** Round tubing shall conform to the specified dimensions for nominal inside and outside diameters, within the tolerances specified in table III.

**TABLE III. Tolerances on tubing diameters**

Tolerance (plus or minus)		
Nominal diameters	Inside diameter	Outside diameter
Inches	Inch	Inch
1-1/16 to 1-15/16, inclusive	0.004	0.005
2 to 4, inclusive	.008	.008
4 1/2 to 12, inclusive	.010	.025
12 1/2 to 18, inclusive	.030	.030
18 1/2 to 24, inclusive	.040	.035
24 1/2 to 36, inclusive	.060	.040

**3.5 Dimensions of other shapes.** Dimensions and tolerances of other shapes shall be as specified (see 6.2). Typical stern tube strut and rudder bearing stave sizes and details are shown on Drawings 810-1385664, S2200-921759, and S2200-921760.

**3.6 Material properties.**

**3.6.1 Swelling.** The average dimensional increase (swelling) of the specimens shall be not greater than 0.025 inch per inch in the direction perpendicular to the laminations when tested as specified in 4.7.1.

**MIL-P-18324D**

**3.6.2 Hardness.** The average hardness of the bearing material (Rockwell M scale) shall be within the limits as shown in table IV when tested as specified in 4.7.2.

TABLE V. *Hardness*

Condition	Rockwell M hardness	
	Minimum	Maximum
As received.	-----	110
After boiling in water for 120 hours	70	-----

**3.6.2 Compressive strength.** The average compressive strength shall not be less than 15,000 pounds per square inch (p.s.i.) when tested as specified in 4.7.3.

**3.6.4 Abrasive wear.** The average wear shall not be more than 0.170 inch when tested as specified in 4.7.4.

**3.7 Workmanship.** The workmanship shall be first class in every respect.

#### 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, the supplier may utilize his own facilities or any commercial laboratory acceptable to 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.

<sup>1</sup> Application for Qualification tests shall be made in accordance with "Provisions Governing Qualification" (see 6.3 and 6.4).

**4.2 Qualification tests.<sup>1</sup>** Qualification tests shall be conducted at a laboratory satisfactory to the Naval Ship Engineering Center. Qualification tests shall consist of the following:

- (a) Swelling, after 120 hours in boiling water (see 4.7.1).
- (b) Hardness, as received (see 4.7.2).
- (c) Hardness, after 120 hours in boiling water (see 4.7.2).
- (d) Compressive strength, after 120 hours in boiling water (see 4.7.3).
- (e) Abrasive wear (see 4.7.4).

**4.2.1 Samples for qualification tests.** The samples for qualification tests shall be of convenient shape and size suitable for the preparation of one inch cube specimens. Convenient shapes and sizes for plate or sheet material are listed in table V.

TABLE V. *Convenient shapes and sizes for qualification tests*

Type	Quantity <sup>1</sup>	Dimensions		
		Width	Thickness	Length
		Inches	Inches	Inches
Plate or sheet	1	12	1½	12
Slave	8	1½	1½	12

<sup>1</sup> The quantity of material represents the amount of material required to permit adequate sampling and the preparation of cubes for test as follows:

- (a) 5 for "as received" hardness tests.
- (b) 5 for hardness and swelling tests after 120 hours in boiling water.
- (c) 6 for compressive strength tests after 120 hours in boiling water.
- (d) 10 for abrasive wear tests.

**MIL-P-18324D**

**4.3 Sampling for quality conformance inspection.** Sampling for quality conformance inspection shall be performed in accordance with the provisions set forth in MIL-STD-105, except where otherwise indicated hereinafter. For purposes of sampling, an inspection lot for inspection and tests shall consist of all material of the same form and thickness offered for delivery at one time.

**4.4 Quality conformance inspection.**

**4.4.1 Examination.** Examination shall be made in accordance with the classification of defects, inspection levels and acceptable quality levels (AQLs) set forth below. The lot size, for purpose of determining the sample size in accordance with MIL-STD-105, shall be expressed in units of sheets or shapes for examination in 4.4.1.1, 4.4.1.2, and in units of shipping containers for examination in 4.4.1.3.

**4.4.1.1 Examination for defects in appearance and workmanship of the plastic material.** The sample unit for this examination shall be one sheet or shape of the plastic material.

<i>Examine</i>	<i>Defect</i>
Appearance and workmanship	Not homogeneous and dense.
	Presence of foreign matter, grit, or abrasives.
	Any separation of laminations.
	Any crack, break, bulge, chip, surface imperfection or irregularities.
	Laminations not as specified.
	Ragged or rough edges or sides.

**4.4.1.2 Examination for defects in dimensions.** The sample unit for this examination shall be one sheet or shape of the plastic material.

<i>Examine</i>	<i>Defect</i>
Sheets, cut Length and width	Varies by more than -1 inch, or +1 inch from size specified (see 3.3.1).
	Thickness
	Varies by more than -0 inches, or plus the tolerance specified in 3.3.2 and table I.
Tubes Length	Varies by more than -0 inches, or ¼ inch from size specified.
	Diameter (inside or outside)
	Varies by more than ± the applicable tolerance specified in table III.
Shapes	Dimensions varies by more than the applicable tolerance specified.

**4.4.1.3 Examination for defects in preparation of delivery.** An examination shall be made to determine that the packaging, packing, and marking comply with the requirements of section 5 of this specification. The sample unit for this examination shall be one shipping container fully packed, selected just prior to the closing operation. Shipping containers fully prepared for delivery shall be examined for closure defects.

<i>Examine</i>	<i>Defect</i>
Packaging	Unit package not packaged as specified.
	Packaging material not as specified.
Packing	Not in accordance with contract requirements.
	Container not as specified, closures not accomplished by specified or required methods or materials.
	Inadequate application of components; such as incomplete closures of case liners, container flaps, loose or inadequate strappings, bulged or distorted containers.

**MIL-P-18324D**

<i>Examine</i>	<i>Defect</i>	<i>Examination paragraph</i>	<i>Inspection level</i>	<i>AQL</i>
Count	Less than specified or indicated quantity.	4.4.1.1	I	1.5
Weight	Gross or net weight exceeds specified requirements.	4.4.1.2	S-2	2.5
Markings	Interior or exterior marking (as applicable) omitted, illegible, incorrect, incomplete, or not in accordance with contract requirements.	4.4.1.3	S-2	4.0

**4.4.1.4 Inspection levels and acceptable quality levels (AQLs) for examination.** The inspection levels for determining the sample size, and the acceptable quality levels (AQLs) expressed in defects per 100 units, shall be as follows:

**4.4.2 Quality conformance testing.** Quality conformance testing shall be conducted in accordance with table VI for the characteristics as indicated herein on each lot offered for delivery. The sample unit shall consist of 10 inches square of the plastic material. The sample size shall be two. There shall be no evidence of failure to meet the specified requirements.

**TABLE VI. Instruction for testing**

Characteristic	Specification reference		Requirements applicable to individual unit	Number determinations per unit	Results reported as numerically to nearest <sup>1</sup>
	Requirement	Test method			
Swelling	3.6.1	4.7.1	X	Average of 5	0.001 inch
Hardness As received	3.6.2	4.7.2	X	Average of 20	Rockwell hardness value
After 120 hours boiling water)	3.6.2	4.7.2	X	Average of 20	Rockwell hardness value
Compressive strength					
After 120 hours (boiling water)	3.6.3	4.7.3	X	Average of 6	p.s.i.

<sup>1</sup> Test reports shall include all values on which results are based.

**4.5 Comparison inspection.** Comparison inspection tests shall be conducted under the supervision of the Government inspector at the manufacturer's plant or at a laboratory satisfactory to the Naval Ship Engineering Center and shall consist of the same tests and procedures specified for the qualification

tests in 4.2 and 4.7. Five copies of the comparison inspection test reports shall be forwarded to the Naval Ship Engineering Center. If the tests are conducted at the manufacturer's plant, the Government inspector shall certify that the tests were conducted under his supervision and in accordance with

**MIL-P-18324D**

the test procedures specified in this specification. Action to maintain the approval of the material will be taken by the Naval Ship Engineering Center on the basis of the test results. If comparison inspection test results are not received before the expiration of five years from the date of a qualification or prior comparison inspection approval, such approval will automatically be withdrawn, and the product removed from the Military Qualified Products List.

**4.6 Preparation of test specimens.** Specimens for use in hardness, swelling, compressive strength and abrasive wear tests shall be selected and prepared as follows:

**4.6.1 Location of specimens, plate material.** Specimens shall be cut from sheets being procured from stock so as to remove no more than a 12 by 12 inch square from one corner. The two original edges of the sheet shall be identified and any cubes cut from the square within 4½ inches of these original sheet edges shall be "edge" specimens. Specimens cut from the remainder of the square shall be "central" specimens. Each cube shall be numbered and its orientation, as cut from the original sheet, shall be maintained throughout all finishing and testing procedures (see figure 1).

**FIGURE 1.** *Specimen sampling and orientation diagram.*

**4.6.2 Orientation of specimens.** The orientation of the faces of all cubes is as follows (see figure 1):

- (a) Face 1 — Surface of plate selected for the numbering of specimens.
- (b) Face 2 — Opposite surface of plate.
- (c) Face 3 — Top side of cube.
- (d) Face 4 — Right side of cube.
- (e) Face 5 — Bottom side of cube.
- (f) Face 6 — Left side of cube.

When  
looking  
at face 1.



**MIL-P-18324D**

**4.6.3 Selection of specimens for test.** The selection of the specimens for the individual tests shall be random from within the "edge" and "central" areas as listed in table VII.

TABLE VII. Selection of specimens for test

Test	No. from "edge"	No. from "central"
As received hardness	2	3
Hardness and swelling after 120 hours in boiling water	2	3
Compressive strength after 120 hours in boiling water	2	4
Abrasive wear	4	6

**4.6.4 Location of specimens, shapes or forms other than plate material.** Specimens shall be cut from shaped or formed material so that the plane of laminations (or tangent thereto) is parallel to one face of each cube and that the sides of each cube are parallel to the two directions of the cloth weave.

**4.6.5 Finishing of specimens.** Specimens shall be finish machined to cubes approximately 1-inch on an edge. If the material is not thick enough to provide 1-inch cubes, 1/2 inch cubes may be used (except for abrasive wear tests). All faces of the specimen shall be machined to remove the molded surfaces. The machined surfaces shall be lapped on 1/0 and 3/0 emery cloth until all noticeable lint is removed. All machining and polishing operations shall be performed in such a manner as to prevent overheating of the specimens.

**4.6.6 Specimen condition.** "As received" specimens shall be tested at the temperature and humidity prevailing in the testing room at the time tests are made. Specimens immersed in boiling water for 120 hours shall be cooled to room temperature in a stream of running tap water for a minimum period of 1-hour, blotted to remove free surface moisture, and test begun within five minutes after removal from the tap water. The final water temperature shall be 75°F.  $\pm$  5°F. During the boiling and tap water immersion periods, care shall be taken to prevent any cube face from adhering to any other flat surface. The specimens shall be supported on screens above the bottom of the test chamber and be separated from each other by 1/4 inch or more to provide for adequate circula-

FIGURE 2. Wear test specimens.



## MIL-P-18324D

tion of the water. Specimens for the abrasive wear tests shall be conditioned for 24 hours at 210°F. and then kept in a desiccator for a minimum of 2-hours or until removal for test.

**4.6.7 Wear test specimens.** In addition to the preparational procedures specified in 4.4 through 4.6.6, the specimens selected for the abrasive wear tests shall be machined as indicated in figure 2.

**4.6.7.1** Two  $\frac{1}{8}$  inch wide by  $\frac{1}{4}$  inch deep saw kerfs shall be cut across the test face of each specimen (perpendicular to the plane of the laminations) spaced to provide a central "land" that shall be 0.440 inch wide  $\pm 0.005$  inch.

#### 4.7 Methods of tests.

**4.7.1 Swelling.** Swelling shall be determined by the difference in measurements of 1-inch polished cubes, when adequate material thickness is available, prepared in accordance with 4.6, before and after immersion in boiling water 212°F. for 120 hours. In case the material is not sufficiently thick to provide 1-inch cubes,  $\frac{1}{2}$  inch cubes may be used. The results shall be expressed as swelling in inches per inch of original dimension. Measurements shall be made with an instrument to the nearest 0.001 inch. The instrument shall be accurate to plus or minus 0.001 inch. Two measurements shall be made of each cube in the direction perpendicular to the plane of the laminations at the mid-points of two adjacent edges (from face 1 to face 2 across face 3 and across face 4 (see figure 1). The arithmetical average of the ten differential measurements shall be used to determine the swelling value. The swelling of each specimen representing the sample and the average value shall be reported.

**4.7.2 Hardness.** The Rockwell hardness values shall be determined by using the M-scale,  $\frac{1}{4}$  inch ball penetrator, minor load of 10 kilograms, and a major load of 100 kilo-

grams. Specimens prepared as specified in 4.6 shall be tested on edge or parallel to lamination. The machine shall be so adjusted that the major load will be fully applied within 6 to 8 seconds. The major load shall be removed within 1 second after the crank handle mechanism has come to a stop. Care shall be taken that the test is not made so near the edge of the specimen that it will break out when the major load is applied. Two separate hardness tests shall be made on face 3 and two on face 4 of each specimen (see figure 1). The readings shall be taken on the red scale. The 20 individual readings and the average hardness of the specimens representing the sample shall be reported both "as received" and after 120 hours in boiling water. The same cubes, boiled for 120 hours, may be used first for the swelling measurements and second for the hardness tests if the specimens are kept in room temperature water 75°  $\pm$  5°F. between tests.

**4.7.3 Compressive strength.** The compressive strength after 120 hours in boiling water shall be determined from crushing tests of specimens prepared as specified in 4.6. Either a mechanical or hydraulic testing machine may be used provided it is accurate to within  $\pm 1$  percent of the lowest crushing load anticipated. The specimens shall be loaded in the directions parallel to the plane of the laminations (edge grain). Two "central" and one "edge" area specimens shall be loaded on face 3 and a like number on face 4 (see figure 1). One end of the specimen being tested shall bear upon an accurately centered spherical bearing block, located at the top whenever practicable. Loading heads used for standard compressive tests of wood or concrete specimens are satisfactory for this test. The load shall be applied by maintaining a uniform rate of head travel. This rate shall not exceed 0.050 inch per minute. Measurements of the two dimensions of each cube perpendicular to the direction of the applied load shall be recorded in the "as received" condition and shall be used to calculate the compressive strength of the cube

**MIL-P-18324D**

from the maximum load observed during the test to the nearest 100 pounds per square inch. The six individual compressive strength (p.s.i.) values and the arithmetical average of the specimens representing the samples shall be reported.

**4.7.4 Abrasive wear.**

**4.7.4.1 Bearing specimens.** The specimens shall be prepared as specified in 4.6 except that only 1-inch cubes shall be used for the wear tests. Three "central" and two "edge" area specimens shall be tested on face 3 and a like number on face 4 (see figure 1).

**4.7.4.2 Journal specimens.** The material used for the journal specimens shall be cold drawn rods, annealed and age hardened in accordance with QQ-N-286 (K-Monel). From the rods, disc shaped specimens of 2.125 inches maximum diameter and  $\frac{1}{4}$ -inch wide shall be prepared. The specimens may be resurfaced and reused until the outside diameter becomes less than 2.000 inches. The width tolerance shall be plus or minus 0.006 inch with the sides parallel within 0.001 inch and the sides perpendicular to the centerline of rotation such that the runout at the outside edges of the journal is not more than 0.002 inch. The surface roughness of the journals shall be between 8 and 14 root mean square (r.m.s.) microinches at the start of each test. The journal test surface shall be thoroughly cleaned of all grease, fingerprints, dirt or similar conditions, prior to being placed in contact with the bearing specimen.

**4.7.4.3 Contact load.** The specimens shall be loaded by balance weights to produce a contact load of 4 pounds per inch of bearing "land" width. The load shall be calculated so that the weights applied will be accurate to the nearest 5 grams. The line of contact between the bearing and journal specimens shall be parallel to the plane of laminations and the direction of journal motion (tangent to the journal at the line of contact) shall be perpendicular to the plane

of the laminations. The line of contact shall be centered on the "land" to preclude the wear pattern from reaching an edge of the bearing specimen prematurely.

**4.7.4.4 Abrasive.** The abrasive shall be metered to the specimens at a rate of 75 plus or minus 2 grams per hour dry. The abrasive shall be commercially available aluminum oxide polishing grains specifically sized, so as to pass a number 50 standard sieve, in accordance with RR-S-366, and be held on a number 60 standard sieve.

**4.7.4.5 Lubricant.** The lubricant shall be tap water with the addition of 0.04 percent by volume of sulphonated oil (wetting agent), Triton X-100. The lubricant shall be distributed across the width of the journal specimen to form a film rotating with the journal plus an excess flowing in the direction opposite to that of the journal to wash off the used abrasive. The flow shall be adjusted to produce a stream of 70 to 75 cubic centimeters (cc.) per minute.

**4.7.4.6 Journal speed.** The journal shall rotate at 97 plus or minus 2 revolutions per minute.

**4.7.4.7 Duration of test.** Each test shall be one hour's duration as conducted in the machine shown on Drawing 12753.

**4.7.4.8 Measurement of wear.** The wear of the bearings shall be measured by means of a dial indicator having 0.001 inch graduations; the stem being fitted with a probe having a  $\frac{1}{8}$ -inch radius spherical surface. The bearing specimen shall be held on a surface plate and the wear recorded shall be the measurement from the undisturbed surface of the cube to the maximum depth of probe penetration within the worn area. Bearing specimens that are not worn uniformly across the width of the bearing "land" (islands of lesser amounts of wear visible) shall be considered as culls and substitute specimens selected from the appropriate areas shall be tested. The 10 individual

**MIL-P-18324D**

wear values and the arithmetical average of the specimens representing the sample shall be reported.

**5. PREPARATION FOR DELIVERY**

**5.1 Packaging.** Packaging shall be Level A or C, as specified (see 6.2).

**5.1.1 Level A.** Plastic material shall be wrapped, or interleaved in a manner to afford protection against abrasion, using not less than 25 pound (34X36-500) basis weight kraft paper.

**5.1.2 Level C.** Plastic material shall be packaged in accordance with the manufacturer's commercial practice.

**5.2 Packing.** Packing shall be Level A, B, or C, as specified (see 6.2).

**5.2.1 Level A.** Plastic material packaged as specified shall be packed in wood-cleated fiberboard, fiberboard, nailed wood or wood-cleated plywood boxes conforming to PPP-B-591 (overseas type), PPP-B-640 (overseas type), PPP-B-621 (class 2) PPP-B-601 (overseas type) at the option of the contractor. Fiberboard pads or liners shall be provided to protect the surfaces and edges of the plastic material. Box closure and strapping shall be in accordance with the applicable box specification or appendix thereto. The gross weight of wood or wood-cleated boxes shall not exceed 500 pounds. Wood or wood-cleated boxes exceeding 250-pounds shall be modified by the addition of skids in accordance with the applicable box specification.

**5.2.2 Level B.** Plastic material packaged as specified shall be packed in wood-cleated fiberboard, fiberboard, nailed wood or wood-cleated plywood boxes conforming to PPP-B-591 (domestic type), PPP-B-640 (domestic type), PPP-B-621 (class 1) or PPP-B- (domestic type) at the option of the contractor. Fiberboard pads or liners shall be provided to protect the surfaces and edges

of the plastic material. Box closure shall be as specified in the applicable box specification or appendix thereto. The gross weight of wood or wood-cleated boxes shall not exceed 500 pounds. Wood or wood-cleated boxes exceeding 250-pounds shall be modified by the addition of skids in accordance with the applicable box specification.

**5.2.3 Level C.** Plastic material, packaged as specified (see 6.2) shall be packed in containers which will insure acceptance by common carrier and safe delivery at destination. Shipping containers shall comply to the Uniform Freight Classification Rules or other regulations as applicable to the mode of transportation.

**5.3 Marking.** In addition to any special marking required by the contract or order, shipments shall be marked in accordance with MIL-STD-129.

**6. NOTES**

**6.1 Intended use.** The plastic material covered by this specification is intended for use for water or grease lubricated bearings.

**6.2 Ordering data.** Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Requirements for other sizes (see 1.1).
- (c) Dimensions required (see 3.3 to 3.5 inclusive).
- (d) Tolerances, if closer than specified in table I (see 3.3.2).
- (e) Selection of applicable level of packaging and packing (see 5.1 and 5.2).

**6.3** With respect to products requiring qualification, awards will be made only for products which are at the time set for open-

**MIL-P-18324D**

ing of bids, qualified for inclusion in applicable Qualified Products List QPL-18324 whether or not such products have actually been so listed by that date. The attention of the suppliers is called to this requirement, 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 orders for the products covered by this specification. The activity responsible for the qualified products list is the Naval Ship Engineering Center, Department of the Navy, Washington, D. C. 20360, 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" (see 6.4).

6.4 Copies of "Provisions Governing Qualification" may be obtained upon application to Commanding Officer, Naval Supply Depot, 5801 Tabor Avenue, Philadelphia, Pennsylvania 19120.

6.5 Procurement of tubes, rods and shapes may be made under this specification and should be limited to applications for water or grease lubricated bearings only. Dimensional tolerances listed in tables II and III will apply.

6.6 CHANGES FROM PREVIOUS ISSUE. THE EXTENT OF CHANGES (DELETIONS, ADDITIONS, ETC.) PRECLUDE THE ANNOTATION OF THE INDIVIDUAL CHANGES FROM THE PREVIOUS ISSUE OF THIS DOCUMENT.

**Custodians:**

Army—MR

Navy—SH

Air Force—11

**Review activities:**

Army—MR, MU

Navy—SH

Air Force—11, 69

**User activities:**

Army—EL, MD

Navy—AS, OS

**Preparing activity:**

Navy—SH

(Project No. 9330-0179)

CODE "C"

SPECIFICATION ANALYSIS SHEET		Form Approved Budget Bureau No. 119-R004
<p style="text-align: center;"><u>INSTRUCTIONS</u></p> <p>This sheet is to be filled out by personnel either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity (as indicated on reverse hereof).</p>		
SPECIFICATION		
ORGANIZATION (Of submitter)		CITY AND STATE
CONTRACT NO.	QUANTITY OF ITEMS PROCURED	DOLLAR AMOUNT \$
MATERIAL PROCURED UNDER A		
<input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT		
1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE?		
A. GIVE PARAGRAPH NUMBER AND WORDING.		
B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES.		
2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID		
3. IS THE SPECIFICATION RESTRICTIVE?		
<input type="checkbox"/> YES <input type="checkbox"/> NO IF "YES", IN WHAT WAY?		
4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity)		
SUBMITTED BY (Printed or typed name and activity)		DATE

FOLD

DEPARTMENT OF THE NAVY  
NAVAL SHIP ENGINEERING CENTER  
WASHINGTON, D. C. 20360

POSTAGE AND FEES PAID  
NAVY DEPARTMENT

OFFICIAL BUSINESS

COMMANDER, NAVAL SHIP ENGINEERING CENTER  
DOCUMENTS AND DOD PROGRAM  
DEPARTMENT OF THE NAVY  
WASHINGTON, D. C. 20360

FOLD