MILITARY SPECIFICATION

BEARINGS, FIBER REINFORCED PLASTIC, SLEEVE, PLAIN AND FLANGED, SELF-LUBRICATING; GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification defines the requirements for fiber reinforced plastic (FRP) composite plain and flanged sleeve bearings that are self-lubricating and which are compatible with graphite-epoxy composites.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications and standards. Unless otherwise specified, the following specifications and standards of the issue listed in the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation, form a part of this specification to the extent specified herein.

SPECIFICATIONS

MILITARY

MIL-P-116	Preservation, Methods of
MIL-B-197	Bearings, Antifriction, Associated Parts and Subassemblies, Preparation for Delivery of
MIL-H-5606	Hydraulic Fluid, Petroleum Base, Aircraft, Missile and Ordnance

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Engineering Specifications and Standards Department (Code 93), Naval Air Engineering Center, Lakehurst, NJ 08733, by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

SPECIFICATIONS (Continued)

MILITARY (Continued)

MIL-L-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-H-83282	Hydraulic Fluid, Fire Resistant Synthetic Hydrocarbon Base, Aircraft
MIL-B-85560/1	Bearing, Fiber Reinforced Plastic, Sleeve, Plain, Self-Lubricating, +250°F
MIL-B-85560/2	Bearing, Fiber Reinforced Plastic, Sleeve, Flanged, Self-Lubricating, +250°F

STANDARDS

MILITARY

MIL-STD-105	Sampling Procedures and Tables for Inspection by Attributes
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U. S. Military Property
MIL-STD-1599	Bearings, Control System Components, and Associated Hardware Used in the Design and Construction of Aerospace Mechanical Systems and Subsystems

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

2.1.2 Other publications. The following documents form a part of this specification to the extent specified herein. The issues of the documents which are indicated as DoD adopted shall be the issue listed in the current DoDISS and the supplement thereto, if applicable.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI B46.1	Surface Texture, Surface Roughness, Waviness and Lay

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

UNIFORM CLASSIFICATION COMMITTEE

Uniform Freight Classification Rules

(Application for copies of the above publication should be addressed to the Uniform Classification Committee, Room 1106, 222 South Riverside Plaza, Chicago, IL 60606.)

2.1.3 Order of precedence. In the event of a conflict between the text of this document and the references cited, the order of precedence shall be as follows:

1. MIL-B-85560/1 or /2.
2. MIL-B-85560.
3. All other references cited herein.

3. REQUIREMENTS

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

3.2 Qualification. The bearings furnished under this specification shall be products which are qualified for listing on the applicable Qualified Products List (QPL) at the time set for opening of bids (see 4.3 and 6.3).

3.2.1 Retention of qualification. To maintain status on a Qualified Products List (QPL), certification shall be submitted to indicate continued compliance with the requirements of this specification (see 4.3.3).

3.2.2 Product change. Any change in product design, description, materials or processing procedures (see 6.4) shall require requalification of the product to the extent determined by the qualifying activity.

3.3 Materials. Unless otherwise specified in the specification sheet, the materials used in the base composite shall be at the option of the bearing manufacturer. The materials shall be compatible with graphite-epoxy composite and meet the requirements of this specification. The materials shall be recorded in the certified test report (see 4.3.2). The self-lubricating portion of the bearing shall be incorporated in the bore of the bearing and, in flanged bearings, at the outer flange face in accordance with the applicable specification sheet. The self-lubricating material shall contain tetrafluoroethylene (TFE) and may be in the form of a liner bonded to a composite substrate or be an integral part of the composite.

3.4 Design. Bearing design shall conform to that shown in specification sheets MIL-B-85560/1 and MIL-B-85560/2.

3.5 Construction. The bearings shall be constructed in accordance with the manufacturer's process specifications and quality control documents. The manufacturing specifications shall be recorded by name and date in the certified test report (see 4.3.2). Except as otherwise specified on the applicable specification sheet, the details of the construction shall be optional.

3.5.1 Dimensions and tolerances. Dimensions and tolerances shall be as specified on the applicable specification sheet. Dimensions not shown shall be at the option of the manufacturer.

3.5.2 Surface texture. The surface texture shall be in accordance with the applicable specification sheet. Bearings shall be free of any surface defects that may be detrimental to satisfactory installation, performance, or bearing life.

3.5.3 Lubrication. Lubrication with grease or oil shall not be permitted.

3.5.4 Liner condition and bond integrity.

3.5.4.1 Visual examination. The visual appearance of the exposed surface of the self-lubricating portion of the sleeve shall be uniform in texture and shall contain no imbedded contaminants. If a liner is used, it shall be positioned uniformly within the bore and on the flange face and shall be free of folds.

3.5.4.2 Bond integrity. The liner condition shall exhibit a degree of workmanship consistent with proper manufacturing process controls (see 4.6.6). The liner edge condition and setback shall meet the applicable drawing requirements. The liner shall be tightly adherent to the substrate over at least 90 percent of the contact area and shall exhibit a peel strength of two pounds per inch minimum. No void shall be allowed which cannot be fully included within a circumscribing circle with a diameter equal to 25 percent of the race width or 0.25-inch, whichever is smaller.

3.6 Performance.

3.6.1 Radial static loads.

3.6.1.1 Limit load. After the radial static load listed in table I has been applied, the permanent set shall not be greater than 0.003-inch and the deflection shall not be greater than 0.010-inch at room temperature (see 4.6.1 and 4.6.1.1).

3.6.1.2 Ultimate load. There shall be no crushing of the composite material when 1-1/2 times the radial static limit load listed in table I has been applied at room temperature (see 4.6.1 and 4.6.1.2).

TABLE I. Load values.

Bearing size	Static limit load (lb)	Dynamic load (lb)
(0.500" bore, 0.375" L)	6,875	3,440
(1.000" bore, 0.500" L)	20,000	10,000
(1.500" bore, 0.500" L)	30,000	15,000

3.6.1.3 Creep load. After 2/3 of the radial static load listed in table I has been applied and held for 336 hours at room temperature, the amount of creep (see 6.4) shall be not greater than 0.003-inch and there shall be no crushing of the composite (see 4.6.1 and 4.6.1.3).

3.6.2 Oscillation under radial load. When tested under the dynamic load specified in table I, the total wear of the bearing shall not be greater than 0.0045-inch after 25,000 cycles and there shall be no crushing of the composite portion of the sleeve. If a bonded liner is used in the bore, there shall be no separation of the liner from the composite substrate. The bond integrity shall be as specified in 3.5.4.2. The measured loaded breakaway torque shall be measured and recorded before and upon completion of the oscillation test (see 4.6.2).

3.6.3 Fluid compatibility. When tested under the dynamic load specified in table I, the bearings shall be compatible with the fluids listed in 4.6.3. The total bearing wear shall not be greater than 0.0045-inch after 25,000 cycles and there shall be no crushing of the composite portion of the sleeve. If a bonded liner is used in the bore, there shall be no separation of the liner from the composite substrate. The bond integrity shall be as specified in 3.5.4.2.

3.6.4 High temperature. When tested under the dynamic load specified in table I at +250°F, the total bearing wear shall not be greater than 0.0045-inch after 25,000 cycles and there shall be no crushing of the composite portion of the sleeve (see 4.6.4). If a bonded liner is used in the bore, there shall be no separation of the liner from the composite substrate. The bond integrity shall be as specified in 3.5.4.2.

3.6.5 Subzero temperature. When tested under the dynamic load specified in table I at -10°F, the total bearing wear shall not be greater than 0.006-inch after 25,000 cycles and there shall be no crushing of the composite portion of the bearing (see 4.6.5). If a bonded liner is used in the bore, there shall be no separation of the liner from the composite substrate. The bond integrity shall be as specified in 3.5.4.2.

3.7 Interchangeability. All parts having the same part marking shall be interchangeable with each other with respect to installation and performance.

3.8 Identification of product. Each bearing shall be permanently and legibly marked with the manufacturer's identification. Where space permits, other information as specified on the specification sheet shall be marked on the bearing. Metal impression stamping shall not be allowed.

3.9 Workmanship. The bearings shall be free of tool marks, chatter waves, grinding scratches, interlayer fracture and other defects that may adversely affect the serviceability of the bearing.

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 ensure supplies and services conform to prescribed requirements.

4.1.1 Qualification test records. The manufacturer shall maintain a record showing quantitative results for all tests required by this specification. The record shall be available to the purchaser and shall be signed by an authorized representative of the manufacturer or the testing laboratory, as applicable.

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

1. Qualification inspection (see 4.3).

2. Quality conformance inspection (see 4.4).

4.3 Qualification inspection. Qualification inspection shall be as specified in table II.

4.3.1 Sampling instructions. Qualification inspection samples shall consist of 35 bearings with 1.000-inch bore, 0.500-inch length and 15 bearings of each of the additional bore diameters and widths specified below for which qualification is desired. Bearings necessary for tests specified herein shall be furnished by the manufacturer. Samples shall be identified as required (see 3.8) and forwarded to the activity designated in the letter of authorization (see 6.3 and 6.3.1). Because of the preponderance of tests performed on the 1.000 inch bore, 0.500-inch length bearing, this size must be approved before any other sizes may be approved.

Approval of bearings with 0.500-inch bore, 0.375-inch length will qualify bearings on MIL-B-85560/1 and MIL-B-85560/2 with dash numbers 04 to 09, inclusive.

Approval of bearings with 1.000-inch bore, 0.500-inch length will qualify bearings on MIL-B-85560/1 and MIL-B-85560/2 with dash numbers 10 to 18, inclusive.

Approval of bearings with 1.500-inch bore, 0.500-inch length will qualify bearings on MIL-B-85560/1 and MIL-B-85560/2 with dash numbers 20 to 32, inclusive.

TABLE II. Qualification inspection.

Inspection	Requirement paragraph	Test method paragraph	Samples to be inspected
Examination of product	3.5.4.1	4.5.1	5
Bond integrity	3.5.4.2	4.6.6	3
Radial static limit	3.6.1.1	4.6.1.1	6
Radial static ultimate load	3.6.1.2	4.6.1.2	6
Radial static creep load	3.6.1.3	4.6.1.3	3 (1.000" bore, 0.500" L)
Oscillation under radial load	3.6.2	4.6.2	3
Fluid compatibility	3.6.3	4.6.3	18 (1.000" bore, 0.500" L)
High temperature	3.6.4	4.6.4	3 (1.000" bore, 0.500" L)
Subzero temperature	3.6.5	4.6.5	3 (1.000" bore, 0.500" L)

4.3.2 Certified test report. The manufacturer shall furnish a certified test report showing that the manufacturer's product satisfactorily conforms to this specification (see 6.3.1). The test report shall include, as a minimum, actual results of tests specified herein, materials (see 3.3), and a list of the manufacturing process specifications used in the manufacture of the bearing (see 3.5). When the report is submitted, it shall be accompanied by a dated drawing that completely describes the manufacturer's product by specifying all dimensions, tolerances and materials. The manufacturer's part number for each size shall be included on the drawing.

4.3.3 Retention of qualification. The continued listing of a product on the Qualified Products List is dependent upon a periodic verification of the manufacturer's continued compliance with the requirements of this specification and with standardization regulations. As part of that verification process, each manufacturer must complete DD Form 1718 during May of each even numbered year. This form, supplied

by the qualifying activity, is to be signed by a responsible official of management and sent to the Naval Air Engineering Center, ESSD Code 9311, Lakehurst, NJ 08733.

4.4 Quality conformance inspections. The quality conformance inspections shall be as specified in table III.

TABLE III. Quality conformance inspections.

Inspection	Requirement paragraph	Test method paragraph	AQL
(a) Dimensions	3.5.1	4.5.1	4.0
(b) Identification of product	3.8	4.5.1	1.0
(c) Workmanship	3.5.4.1, 3.9	4.5.1	1.0
(d) Inspection for packaging		4.6.7	1.0
(e) Liner condition	3.5.4.1	N/A	10.0
(f) Bond integrity	3.5.4.2	4.6.6	2.5

4.4.1 Inspection lot. The inspection lot shall consist of finished bearings having a single part number, manufactured according to the same procedures as the parts originally qualified and produced as one continuous run or order or portion thereof.

4.4.2 Sampling.

4.4.2.1 Sample for quality conformance tests (a) through (e). The sample bearings shall be selected from each inspection lot in accordance with MIL-STD-105, inspection level II.

4.4.2.2 Sample for quality conformance test (f). The sample bearings shall be selected from each inspection lot in accordance with MIL-STD-105, inspection level S-2.

4.4.3 Quality assurance certification. For each inspection lot, the manufacturer shall maintain for seven years and supply to the purchaser upon demand:

a. Certified copies of all records of quality conformance inspections specified in 4.4 and the purchase order.

b. Certification that the materials, manufacturing procedures, and processes used in producing the bearings are the same as those of the bearings originally qualified.

These records and certifications shall identify the manufacturer of the bearings, the address of the plant where they were manufactured, the purchaser, and the purchase order number.

4.5 Examinations.

4.5.1 Examination of product. The bearings shall be examined to determine conformance to this specification and the applicable specification sheet for material, dimensions, finish, identification of product, workmanship and requirements not covered by tests.

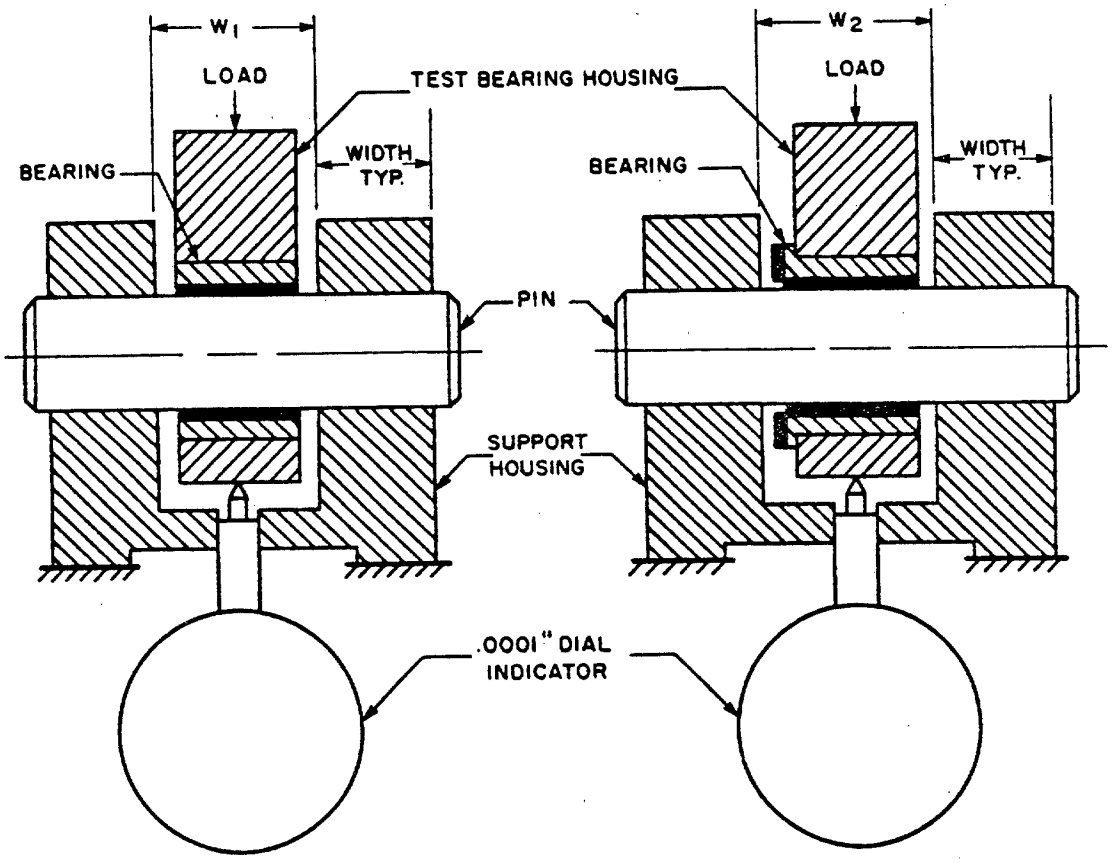
4.6 Test methods. Unless otherwise specified, all tests shall be conducted at room temperature.

4.6.1 Radial static loads. The bearings shall be exposed to 95 percent relative humidity at 120° ±5°F for not less than ten days and not more than fourteen days before limit load and ultimate load testing. Humidity exposure is to verify that the bearing composite is not excessively affected by high humidity conditions. The test shall be initiated within one hour after removal of the bearing from the humidity chamber. The bearings shall be installed in a test fixture as shown in figure 1 using a 0.0001- to 0.0016-inch interference fit with the housing and a 0.0005- to 0.0030-inch loose fit with the pin.

4.6.1.1 Limit load. A preload of four percent to six percent of the radial static limit load shall be applied to the bearing for three minutes, and the measuring device set at zero. The load shall then be increased at the rate of one percent of the specified radial static limit load per second until it equals the specified radial static limit load value. The limit load shall be maintained for three minutes. The bearing deflection shall then be recorded. The load shall then be reduced at the same rate to the preload value. The permanent set shall be the measuring device reading at the preload value. The true bearing deflection shall be defined as the difference between the measuring device reading after three minutes at the limit load and the measuring device reading from the control test on a metallic bushing of the same size at the same load (see 4.6.1). Upon completion of the limit load test, the ultimate load test shall be conducted on the same test sample.

4.6.1.2 Ultimate load. The ultimate radial load shall be applied at the rate of one percent of the specified load per second and the load then removed at the same rate.

4.6.1.3 Creep load. Using a new test sample bearing that has had the specified humidity exposure, the radial creep load shall be applied at the rate of one percent of the specified load per second. When the specified load has been obtained, the indicator shall be set at zero. This load shall be maintained for 336 hours at room temperature with periodic indicator readings taken to make a plot of time versus deflection.



PIN: DIAMETER = (SEE PARA. 4.6.1)
MATERIAL = STEEL 50 Rc MIN
FINISH = 8μ" MAX AND SHALL BE HONED, POLISHED OR SIMILARLY FINISHED SUBSEQUENT TO GRINDING.
NOTE: TAPER ONE END 1/2" MIN LENGTH, TAPERED END TO EXTEND BEYOND SUPPORT HOUSING WHEN ASSEMBLED

TEST BEARING HOUSING: BORE = (SEE PARA. 4.6.1)
WIDTH = L MAX + .002 −.000
LENGTH = 2 D MIN

SUPPORT HOUSING: BORE = PIN DIA MAX + (.0002 TO .0027)
MIN SUPPORT WIDTH = L NOMINAL
LENGTH = (2) (PIN DIA MIN)
W_1 = L +. (.025 TO .030)
W_2 = L + F + (.025 TO .030)

FIGURE 1. Radial load test fixture.

4.6.2 Oscillation under radial load. The bearing shall be installed in a steel housing, using a 0.0001- to 0.0016-inch interference fit with the housing and a 0.0005- to 0.003-inch loose fit with the pin. The bearing shall be so installed as to place the pin in double shear. A dial indicator or electronic pickup shall be so mounted that any radial movement of the pin or the bore of the bearing with respect to the bearing outside diameter can be measured. The dynamic load specified in table I shall be applied and held statically for 15 minutes. At the end of this time the indicating device shall be set at zero and the oscillating test shall be started. Wear readings shall include the wear from the fifth cycle on. The test shall be run in such a manner that the pin is oscillating +25 degrees, return through zero degrees to -25 degrees, and return to zero degrees at 20 cpm for 25,000 cycles. Sufficient readings during the test shall be recorded to plot a graph of wear (thousandths of an inch) versus life (cycles). The loaded breakaway torque shall be measured and recorded as specified in 3.6.2. Before and after measurements of the bushing bore with the bearing installed in the housing shall be made with tapered parallels for measuring bores or a similar type of tool. Where there is conflict between the dial indicator wear readings and the measured wear readings, the measured wear readings shall prevail.

The pin shall have a hardness of not less than Rc 45 and shall have a surface finish of not more than R_a 8. The surface shall be buffed, honed, polished, or similarly finished after grinding.

4.6.3 Fluid compatibility. Eighteen bearings with a 1.000-inch bore and 0.500-inch length (three for each fluid) shall be immersed for 24 hours in each of the following fluids at $160^{\circ} \pm 5^{\circ}$F, except for (a) which shall be at $110^{\circ} \pm 5^{\circ}$F:

a. JP-4 jet fuel.

b. MIL-L-7808 lubricating oil.

c. MIL-H-5606 hydraulic oil.

d. MIL-A-8243 anti-icing fluid.

e. MIL-H-83282 hydraulic fluid.

f. Distilled water.

Within one-half hour after removal from the test fluid and without removing the fluid from the bore surface, the bearing shall be tested in accordance with 3.6.3 and 4.6.2.

4.6.4 High temperature. Three bearings with a 1.000-inch bore and 0.500-inch length shall be subjected to the tests of 4.6.2, except that the bearing shall be heated in such a way that the pin sleeve interface is maintained at a temperature of not less than $+250^{\circ}$F.

4.6.4.1 Calibration of high temperature control system. Because it is impossible to measure the temperature at the pin/sleeve interface during an oscillation wear test, a temperature monitoring point slightly remote from the interface is necessary. To assure an accurate test, the remote sensing position shall be on either the pin or the sleeve and shall be calibrated against the actual interface temperature in a static test set-up. For the calibration, the interface shall be instrumented for temperature measurement by inserting a thermocouple between the sleeve and the pin. (A slit may be made in either the pin or the sleeve to accommodate the thermocouple.) The assembly shall be heated and the interface allowed to reach a steady temperature of not less than 250°F. When the interface and the remote sensing position have reached steady temperatures, the remote sensing position temperature shall be recorded. During actual high temperature testing, heating of the sleeve bearing shall be applied in the same manner as in the calibration except that there shall be no thermocouple installed between the sleeve and the pin. Heating shall be applied during testing so as to maintain the remote sensing point at the temperature recorded during the calibration.

4.6.5 Subzero temperature. Three bearings shall be subjected to the test in 4.6.2, except that the bearing shall be cooled during the test and the oscillation rate shall be 5 cpm. Intermittent operation of the test machine is allowable if necessary to counteract the effects of frictional heating. The first 1000 test cycles shall be conducted at room temperature followed by 24,000 cycles at low temperature. Upon completion of the first 1000 cycles, oscillation shall be stopped and the test bearing cooled in such a way that the pin/liner interface temperature is maintained at or below -10°F for the subzero temperature portion of the test. The bearing shall be allowed to cold soak at this temperature for not less than one-half hour after which time oscillation shall be continued until the remaining 24,000 cycles have been completed.

4.6.5.1 Calibration of subzero temperature control system. Because it is impossible to measure the temperature at the pin/sleeve interface during an oscillation wear test, a temperature monitoring point slightly remote from the interface is necessary. To assure an accurate test, the remote sensing position shall be on either the pin or the sleeve and shall be calibrated against the actual interface temperature in a static test set-up. For the calibration, the interface shall be instrumented for temperature measurement by inserting a thermocouple between the sleeve and the pin. (A slit may be made in either the pin or the sleeve to accommodate the thermocouple.) The assembly shall be cooled and the interface allowed to reach a steady temperature of -10°F. When the interface and the remote sensing position have reached steady temperatures, the remote sensing position temperature shall be recorded. During actual low temperature testing, cooling of the sleeve bearing shall be applied in the same manner as in the calibration except that there shall be no thermocouple installed between the sleeve and the pin. Cooling shall be applied during testing so as to maintain the remote sensing point at the temperature recorded during the calibration.

4.6.6 Bond integrity. The liner shall be peeled away from the substrate and the bond shall be evaluated. A blade or scribe may be used to initiate removal. Evaluation shall determine the liner peel strength and the location and size of any voids in the bond. A void is an area where the adhesive bond breaks separating the liner from the substrate and leaving a smooth, clean interface surface. If the liner cannot be removed without employing chipping, scraping or abrasive techniques, the portions of the liner which cannot be removed shall be considered to be properly bonded and free of voids.

4.6.7 Inspection of packaging. The sampling and inspection of the preservation, packing and container marking shall be in accordance with Section 5.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be in accordance with level A or level C as specified in 6.2. The bearings will not tolerate cleaning solvent, grease or oil. Before packaging, bearings shall be cleaned in one of the following ways:

a. Clean, dry, compressed air in accordance with MIL-P-116.

b. Wiping with soft, clean cloth in accordance with MIL-P-116.

c. Manufacturer's established cleaning procedures for this bearing.

5.1.1 Level A. Packaging shall be in accordance with level A of MIL-B-197. The manufacturer's lot control number shall be marked on each package.

5.1.2 Commercial packaging. Packaging shall be in accordance with the manufacturer's commercial practice. The manufacturer's lot control number shall be marked on each package.

5.2 Packing.

5.2.1 Level A. Bearings packaged as specified in 5.1.1 shall be packed for overseas shipment and storage in accordance with MIL-B-197.

5.2.2 Level B. Bearings packaged as specified in 5.1.1 shall be packed for domestic shipment and storage in accordance with MIL-B-197.

5.2.3 Level C. Bearings packaged as specified in 5.1.2 shall be packed in a manner to insure carrier acceptance and safe delivery at destination. The containers shall be in accordance with the Uniform Freight Classification Rules or regulations of other carriers, as applicable to the mode of transportation.

5.3 Marking for shipment and storage. The shipment marking nomenclature shall be in accordance with MIL-STD-129 and include the following:

Bearings, Fiber Reinforced Plastic, Sleeve* (Plain or Flanged), Self-Lubricating.

* Applicable data to be entered by contractor.

6. NOTES

6.1 Intended use. The bearings are intended primarily for use in composite airframe structure applications of high loads and low rotational speeds. They shall also be suitable for use in metallic airframe structure applications. In most cases, they shall be retained by adhesive bonding. For specific design information on the capability of these bearings under particular load, speed and wear/life conditions the user is referred to MIL-STD-1599.

6.2 Ordering data.

6.2.1 Acquisition requirements. Acquisition documents should specify the following:

a. Title, number and date of this specification.

b. Military identifying part number.

c. Levels of packaging and packing (see 5.1 and 5.2).

d. Quality Assurance certification if required (see 4.4.3).

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 the applicable Qualified Products List, 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 Air Systems Command, Navy Department, Washington, DC 20361; however, information pertaining to qualification of products may be obtained from the Naval Air Development Center, Code 60611, Warminster, PA 18974.

6.3.1 Authorization for submittal of samples. A manufacturer seeking qualification approval of his product will be authorized to submit samples for such approval only upon presentation of certified tests reports and drawings indicating that his product conforms to this specification.

6.4 Definitions. Processing procedures - All bonding, curing, and postcuring procedures and all filament winding/wrapping techniques (see 3.2.2).

Custodians:
Army - AV
Navy - AS
Air Force - 11

Review Activities:
Army - AR
Navy - SH
Air Force - 99
DLA - IS

Preparing Activity:
Navy - AS
(Project No. 3120-0598)