

INCH- POUND

A-A-50602

5 April 1993

## COMMERCIAL ITEM DESCRIPTION

## SELF-LUBRICATED BEARINGS

The General Services Administration has authorized the use of this Commercial Item Description (CID).

1. Abstract. This CID covers self-lubricated journal or spherical bearings intended to replace grease lubricated bearings on submarines in underwater, oscillatory applications.

2. Salient characteristics. Bearings furnished under this CID shall comply with the following requirements, when tested as specified in section 4, Quality Assurance Provisions.

2.1 Materials of construction.

2.1.1 Journal bearings shall consist of:

- (a) A high strength backing and a low friction (metallic or nonmetallic) liner. The liner shall be not less than 0.010 inch thick.
- (b) A homogeneous low friction nonmetallic material.

2.1.2 Spherical bearings shall consist of the same materials as the journal bearings. Low friction material shall be utilized between the ball OD and the outer ring and between the ball ID and the mating surface.

2.1.3 When metallic backed bearings are provided with the metallic material in direct contact with surrounding structural material, the metallic material shall be galvanically compatible with alloy steel per MIL-S-23284, class 1 and MIL-S-16216.

2.2 Radial static limit load. The radial static limit load shall be not less than 35,000 psi. Permanent set shall be less than 0.010 inch.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, SEA 05Q42, Naval Sea Systems Command, National Center Building 3, Washington, DC 20362-5160 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

FSC 3120

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## A-A-50602

- 2.3 Axial static limit load. For spherical bearings, the axial static limit load shall not be less than 6,000 pounds. Permanent set shall be less than 0.005 inch.
- 2.4 Self-alignment requirement. Spherical bearings shall be self-aligning and shall permit at least 3 degrees angular misalignment.
- 2.5 Friction. The coefficient of friction of a journal bearing pre-loaded to 5000 psi shall be not more than 0.13.
- 2.6 Wear. Total wear for any one sample shall not exceed 0.005 inch following testing IAW (see 4.6).
- 2.7 Water absorption. After submersion in salt water (see 4.7), weight gain shall be not more than 1.5 percent, and swell shall be not more than 0.5 percent.
- 2.8 Liner peelability and bond integrity. After completion of water absorption testing, the same samples shall be tested for liner peelability and bond integrity. The liner shall be evaluated as per MIL-B-81934. The liner shall be tightly adhered to the backing over at least 90 percent of the contact area and shall exhibit an average peel strength of not less than 2.0 pounds per inch for fabric type liners. The remaining adhesive on the backing after peeling the liner shall have no voids with diameters larger than 25 percent of the race width or 0.25 inch whichever is smaller. In the event the liner cannot be removed without employing chipping scraping or abrasive techniques, the liner shall be considered to be properly bonded and free of voids and shall be classed as non-peelable. Not applicable for bearings constructed per 2.1.1(b).
- 2.9 Creep. Bearing shall be loaded per 4.6 and held at 25,000 psi for 1000 hours and shall have a total permanent set over that period not greater than 0.003 inch.
- 2.10 Shock. The bearing material will pass applicable shock requirements by successfully completing the radial static load test.
3. Contractor certification. The contractor shall certify and maintain substantial evidence that the product offered meets the salient characteristics of the Commercial Item Description and that the product conforms to the producer's own drawings, specifications, standards, and quality assurance practices. The Government reserves the right to require proof of such conformance prior to first delivery and thereafter as may be otherwise provided for under the provisions of the contract.
4. Quality assurance provisions. Unless otherwise specified, to determine compliance with the requirements of the salient characteristics section perform the following tests on condidate bearings. Journal bearings should be

## A-A-50602

sized per MS1934/1-16X016. Spherical bearings should be sized per MS14102-16. Tolerances specified in MS1934 and MS14102 are not required to be met for testing candidate bearings.

- 4.1 Material of construction. Examine materials used in construction and determine thicknesses of layers.
- 4.2 Radial static limit load. Determine the radial static limit load for a journal bearing as specified in the MIL-B-81934 radial static load test. For spherical bearings the radial static load test specified in MIL-B-81820 axial static load test. The radial static limit load and permanent set shall be as defined in 2.2.
- 4.3 Axial static limit load. Determine the axial static limit load on a spherical bearing as specified in the MIL-B-81820 axial static load test. The axial static limit load and permanent set shall be as defined in 2.3.
- 4.4 Self-alignment requirement. Spherical bearings must be self-aligning as defined in 2.4.
- 4.5 Friction. Preload a journal bearing to 5000 psi (based on projected area) in ASTM D 1141 synthetic seawater, and determine the frictional coefficients by measuring the breakaway torque.
- 4.6 Wear. Determine wear by the following procedure using a test rig in accordance with 4.6.1.1.
  - 4.6.1 Procedure. Load the samples to 1000 psi based on projected area. Oscillate the shaft at plus or minus 45 degrees for 100,000 cycles. One cycle shall consist of a shaft rotating from zero to plus 45 degrees, return through zero to minus 45 degrees, then to zero. Samples shall be tested at a rate of 20 cycles a minute minimum. Load new samples to 5000 psi. For these samples, oscillate the shaft at plus or minus 45 degrees for 20,000 cycles. Determine the wear in these samples by comparing before and after thicknesses.
    - 4.6.1.1 Use a test rig similar to the one specified for radial static limit load testing in MIL-B-81934 for journal bearings or MIL-B-81820 for spherical bearings. The test rig should be modified so the bearing under test is immersed in ASTM D 1141 synthetic seawater. The bearing under test shall be installed into a steel housing using a class FN2 fit per ANSI B4.1. A hardened shaft (R 50 minimum) with a surface finish of 16 rms polished shall be used. The shaft shall be sized to provide a class RC6 fit per ANSI B4.1.

## A-A-50602

- 4.7 Water absorption. Weigh and measure the size of the tested bearing. The bearings should then be placed in ASTM D 1141 synthetic seawater at 700 psi for three (3) months. Determine weight gain and dimensional swell.
- 4.8 Liner peelability and bond integrity. Determine liner peelability and bond integrity as specified in MIL-B-81934. Samples to be tested shall have completed water absorption testing prior to performing this test.
- 4.9 Creep. Load a bearing in a test rig as in 4.6 above to 25,000 psi and hold at pressure for 1000 hours. Determine the permanent set.
- 4.10 Shock. The bearing material will pass applicable shock requirements by successfully completing the radial static load test.
5. Metric products. Products manufactured to metric dimensions will be considered on an equal basis with those manufactured using inch-pound units, provided they fall within the tolerances specified using conversion tables contained in the latest revision of FED-STD-376, and all other requirements of this Commercial Item Description are met. If a product is manufactured to metric dimensions and those dimensions exceed the tolerances specified in the inch-pound units, a request should be made to the contracting officer to determine if the product is acceptable. The contracting officer has the option of accepting or rejecting the product.
6. Regulatory requirements. The offeror/contractor is encouraged to use recovered materials in accordance with Public Law 94-580 to the maximum extent practical.
7. Inspection of packaging. Sample packs and the inspection of packaging (preservation, packing and marking) for shipment, stowage and storage shall be in accordance with the requirements of packaging and the documents specified therein.
- 7.1 Packaging.
- 7.2 Commercial. Packaging and marking shall be in accordance with ASTM D 3951.
- 7.3 Military. The packaging (preservation, packing and marking) requirements shall be in accordance with MIL-B-197 for the level of preservation (A or C) the level of packing (A, B or C) and marking and other packaging acquisition options therein, as specified in the acquisition document. In addition for Navy acquisitions, the following shall apply:

## A-A-50602

- (a) Lumber and plywood. Unless otherwise specified in the contract or purchase order, all lumber and plywood including laminated veneer materials used in shipping container and pallet construction, members, blocking, bracing, and reinforcing shall be fire-retardant treated materials conforming to MIL-L-19140 as follows:

Level A and B                    - Type II - weather resistant  
Category 1 - general use

Level C and Commercial - Type I - Nonweather resistant  
Category 1 - general use

- (b) Fiberboard. Fiberboard used in the construction of interior (unit and intermediate) and exterior fiberboard boxes including interior packaging forms shall conform to the class-domestic/fire retardant or class-weather resistant/fire retardant materials requirements as specified in the contract or purchase order, of PPP-F-320 and amendments thereto.

## 8. NOTES

- 8.1 Ordering data. Purchaser must specify the following:

- (a) Title, number and date of this commercial item description.  
(b) Type of bearing desired (journal or spherical).  
(c) Dimensions of bearing desired.

- 8.2 Acceptable suppliers. The below listed manufacturers are currently qualified to this commercial item description. Manufacturers desiring listing of their products should submit test data that demonstrates compliance with this specification.

(a) Rexnord Corporation  
2324 Curtiss St.  
Downers Grove, IL 60515-4017

(b) Kamatics Corporation  
P O Box 3  
Bloomfield, CT 06002

- 8.3 Copies of the federal and military specifications, standards and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

A-A-50602

8.4 Unless otherwise specified, the issues of referenced documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

Custodians:

Army - AT

Navy - SH

Air Force - 99

Preparing activity:

Navy - SH

(Project 3120-0725)

# 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 the form.

**NOTE:** This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

<b>1. RECOMMEND A CHANGE:</b>	1. DOCUMENT NUMBER <b>A-A-50602</b>	2. DOCUMENT DATE (YYMMDD) <b>93-04-05</b>
3. DOCUMENT TITLE <b>SELF-LUBRICATED BEARINGS</b>		
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) (1) Commercial (2) AUTOVON (if applicable)	e. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME <b>TECHNICAL POINT OF CONTACT TPOC:</b> <b>MR. BOB HUGGINS (PMS390TB25)</b> <b>PLEASE ADDRESS ALL CORRESPONDENCE TO:</b>	b. TELEPHONE (Include Area Code) (1) Commercial <b>(703) 746-3419</b>	(2) AUTOVON <b>8-332-3419</b>
f. ADDRESS (Include Zip Code) <b>COMMANDER, SEA 05042</b> <b>NAVAL SEA SYSTEMS COMMAND</b> <b>2531 JEFFERSON DAVIS HWY</b> <b>ARLINGTON, VA 22242-5160</b>	g. IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	