

INCH-POUND

A-A-59647A
28 September 2006
SUPERSEDING
A-A-59647
30 October 2001

COMMERCIAL ITEM DESCRIPTION

BEARINGS, BALL, ANNULAR, SINGLE ROW, RADIAL, NON-FILLING SLOT, LIGHT SERIES (LS - SERIES)

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. **SCOPE.** This commercial item description (CID) establishes the government acquisition requirements for single row, radial, non-filling slot, light series (LS - series), annular ball bearings for general purpose use.

2. **CLASSIFICATION.** The bearings shall be classified and identified by the following sizes, cage materials, shield and seal configurations, lubricants and preservatives, and tolerance classes and radial internal clearances:

Sizes (see [table I](#))

Cage materials (see [table II](#))

Shield and seal configurations (see [table III](#))

Lubricants and preservatives (see [table IV](#))

Tolerance classes and radial internal clearances (see [table V](#))

3. SALIENT CHARACTERISTICS

3.1 **Dimensions.** Bearing boundary dimensions and dynamic load ratings (see [3.5](#)) shall conform to the requirements specified in [table I](#) for each of the coded bearing sizes. These dimensions conform to the requirements specified for the listed bearing sizes in ABMA Standard 20, "Radial Bearings of Ball, Cylindrical Roller and Spherical Roller Types Metric Design".

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: STDZNMGT@dla.mil or Defense Supply Center Richmond (DSCR), ATTN: DSCR-VEB, 8000 Jefferson Davis Highway, Richmond, VA 23297-5616.

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TABLE I. Boundary dimensions.¹

Size code	Bore diameter (inch)	Bore diameter (mm)	Outside diameter	Width	Chamfer min. ²	Dia. series ³	Dynamic load rating (lbs.)
01	0.5000	12.7000	1.3125	0.3750	0.031	2	1,311
02	0.6250	15.8750	1.5625	0.4375	0.047	2	2,014
03	0.7500	19.0500	1.8750	0.5625	0.062	2	2,622
04	0.8750	22.2250	2.0000	0.5625	0.062	2	2,993
05	1.0000	25.4000	2.2500	0.6250	0.062	2	3,002
06	1.1250	28.5750	2.5000	0.6250	0.062	2	4,123
07	1.2500	31.7500	2.7500	0.6875	0.062	2	4,470
08	1.3750	34.9250	3.0000	0.6875	0.062	2	5,434
09	1.5000	38.1000	3.2500	0.7500	0.093	2	6,175
10	1.6250	41.2750	3.5000	0.7500	0.093	3	6,916
11	1.7500	44.4500	3.7500	0.8125	0.093	3	7,410
12	1.8750	47.6250	4.0000	0.8125	0.093	3	7,964
13	2.0000	50.8000	4.0000	0.8125	0.093	2	7,964
14	2.2500	57.1500	4.5000	0.8750	0.093	3	9,239
15	2.5000	63.5000	5.0000	0.9375	0.093	2	12,212
16	2.7500	69.8500	5.2500	0.9375	0.093	2	12,978
17	3.0000	76.2000	5.7500	1.0625	0.093	3	14,072
18	3.2500	82.5500	6.0000	1.0625	0.093	2	16,495
19	3.5000	88.9000	6.5000	1.1250	0.125	2	17,382
20	3.7500	95.2500	6.7500	1.1250	0.125	2	17,263
21	4.0000	101.6000	7.2500	1.2500	0.125	2	20,023
22	4.2500	107.9500	7.5000	1.2500	0.125	2	20,952
23	4.5000	114.3000	8.0000	1.3125	0.125	2	23,992
24	4.7500	120.6500	8.2500	1.3125	0.125	2	23,873
25	5.0000	127.0000	9.0000	1.3750	0.125	2	27,001
26	5.5000	139.7000	9.5000	1.3750	0.125	2	28,083

¹ All dimensions are in inches unless otherwise specified.² The chamfer on bearings will clear a maximum fillet radius equal to a minimum chamfer.³ Diameter series is a soft metric conversion of the inch outside diameter and width in comparison with the boundary dimension in ABMA Standard 20.

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3.2 Materials.

3.2.1 Ring and ball materials. The ring and ball material shall be chromium alloy steel 52100 (G52986) as specified in the ASTM A 295/A 295M, "Standard Specification for High-Carbon Anti-Friction Bearing Steel".

3.2.2 Cages. The cage material shall be compatible with and shall be resistant to deterioration due to lubricant, preservative, hydraulic fluid, solvents, or other substances and chemicals that can be expected to come into contact with the bearing, and shall cause no deterioration of the same. Non-metallic cages shall meet the same inspections and performance requirements as those conducted on bearings with metallic cages. Materials shall operate from -65 to 230 °F (-54 to 110 °C). The cage material shall be one of the coded options listed in [table II](#).

TABLE II. Cage materials.

Code	Cage material
A	Corrosion resistant steel ¹
B	Molded plastic
C	Machined brass or bronze
D	Machined non metallic (phenolic)
E	Chromium alloy steel ¹
F	Other (specify in acquisition order)

¹ One piece crown or two piece ribbon.

3.2.3 Closures. Shields and seals shall be fabricated from the manufacturer's recommended materials or as specified in the acquisition order (see [7.3\(b\)](#)). Materials shall be compatible with and resistant to deterioration due to lubricants, preservatives, hydraulic fluid, solvents, and other substances or chemicals that can be expected to come in contact with the bearing, and shall cause no deterioration of the same. Closures shall not affect the specified dimensional tolerance, nor shall they inhibit the free rotation of the bearing rings, and may be either removable or non-removable. Seals shall be impervious contact type. Closure materials shall operate from -65 to 230 °F (-54 to 110 °C). The closure configuration for the bearing shall be one of the coded options listed in [table III](#).

TABLE III. Shield and seal configurations.

Code	Configuration option
A	Open
B	Single shield
C	Double shield
D	Single seal
E	Double seal
F	Single shield and seal
X	Other (specify in acquisition order)

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3.3 Lubrication and preservation. When grease fill is required, the bearing void shall be 25 to 50 percent filled. The bearing part number shall include the appropriate code from [table IV](#). Preservative compound shall be applied to all open and single closure bearings that have no lubricant requirement. If a preservative compound is required for packing or storage, the compound shall be in accordance with MIL-DTL-197, "Packaging of Bearings, Associated Parts and Subassemblies", or as specified in the acquisition order (see [7.3\(c\)](#)).

TABLE IV. Lubricant and preservative requirements.

Code	Lubricant or preservative compound
B	Grease in accordance with MIL-PRF-81322
E	Grease in accordance with DOD-G-24508
H	Grease in accordance with MIL-PRF-23827
L	Grease with SRI-2 or qualified equivalent
S	No fill
T	Preservation compound in accordance with MIL-DTL-197
X	Other (specify in acquisition order)

3.4 Precision tolerance. The bearing precision tolerance level shall conform to Annular Bearing Engineers Committee (ABEC) class ABEC-1, ABEC-3, or ABEC-5 as defined in ABMA Standard 20. The tolerance class and associated radial internal clearance shall be specified in the acquisition order using the codes listed in [table V](#).

TABLE V. Tolerance class and radial internal clearance.

Code	Tolerance class	Radial internal clearance	Clearance in 0.0001 inches
A	ABEC-1	Tight	1 - 3
B		Normal	2 - 5
C		Loose	5 - 8
D		Extra-loose	8 - 11
E	ABEC-3	Tight	1 - 3
F		Normal	2 - 5
G		Loose	5 - 8
H		Extra-loose	8 - 11
J	ABEC-5	Tight	1 - 3
K		Normal	2 - 5
L		Loose	5 - 8
M		Extra-loose	8 - 11

3.5 Dynamic load rating. The listed ratings in [table I](#) conform to the requirements specified in ABMA Standard 9, "Load Ratings and Fatigue Life for Ball Bearings" (see [3.1](#)).

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3.6 Hardness. The finished ring hardness shall be at least 58 HRC as defined in ASTM E 18, "Standard Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials", and shall not vary more than three points on the Rockwell C scale on any one ring. The ball hardness shall be within 60-70 HRC in accordance with ASTM E 18. Case or work hardened balls shall not be acceptable.

3.7 Grain size. The grain size for the ring and ball material shall be in accordance with ASTM E 112, "Standard Test Methods for Determining Average Grain Size".

4. REGULATORY REQUIREMENTS

4.1 Recovered materials. The offeror/contractor is encouraged to use recovered materials to the maximum extent practicable, in accordance with paragraph 23.403 of the Federal Acquisition Regulation (FAR).

5. PRODUCT CONFORMANCE PROVISIONS

5.1 Product conformance. The products provided shall meet the salient characteristics of this commercial item description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance.

5.2 Market acceptability. The product offered must have been previously sold either to the government or on the commercial market.

6. PACKAGING

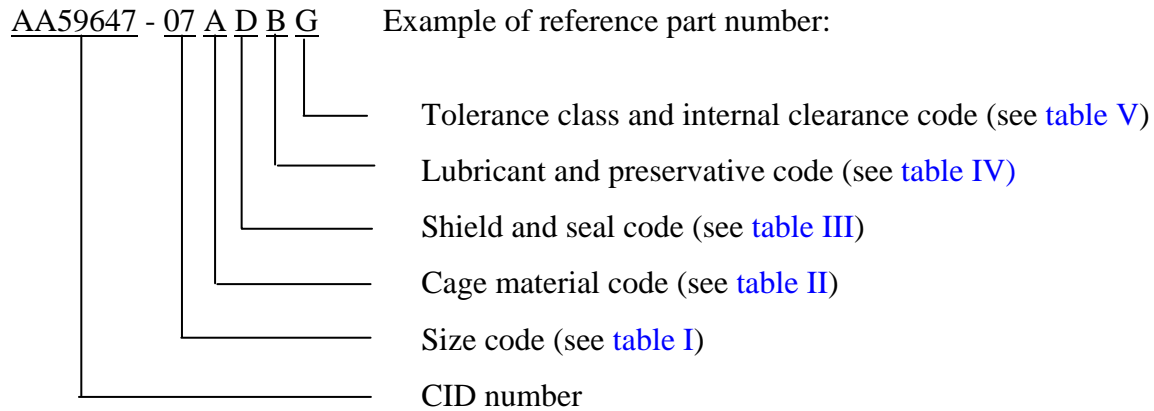
6.1 Preservation and packaging. The product shall be preserved and packaged as specified in the acquisition order (see [7.3\(d\)](#)).

6.2 Marking. For military procurements, bearings with an outside diameter greater than 30mm shall be marked in accordance with MIL-STD-130, "Identification Marking of U.S. Military Property". Bearings with an outside diameter less than or equal to 30mm shall be marked in accordance with MIL-STD-1647, "Identification Markings for Domestically Manufactured Bearings, Ball, Annular for Instruments and Precision Components", (see [7.3\(e\)](#)).

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7. NOTES

7.1 Part or identification number (PIN). The following PIN procedure is for government purposes and does not constitute a requirement for the contractor.



AA59647-07 A D B G indicates: 1.2500 bore diameter; 2.7500 outside diameter; 0.6875 width; corrosion resistant steel cage; a single seal bearing lubricated in accordance with MIL-PRF-81322; ABEC-3 tolerance class, loose internal clearance.

7.2 Sources of documents.

7.2.1 FAR. Copies of the FAR may be obtained from the Superintendent of Documents, P.O. Box 371954, Pittsburgh, PA 15250-7954. Electronic copies of the FAR may be obtained from <http://www.arnet.gov/far/>.

7.2.2 Military specifications. Copies of military specifications may be obtained from Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. Electronic copies of military specifications may be obtained from <http://assist.daps.dla.mil/>.

7.2.3 ABMA standards. Copies of ABMA standards may be obtained from the American Bearing Manufacturers Association, 2025 M Street NW, Suite 800, Washington, DC 20036. Electronic copies of the ABMA standards may be obtained from <http://www.abma-dc.org/>.

7.2.4 ASTM standards. Copies of ASTM standards may be obtained from the ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959. Electronic copies of the ASTM standards may be obtained from <http://www.astm.org/>.

7.3 Ordering data. Acquisition documents should specify the following information:

- CID document number, revision, and CID PIN.
- Shield and seal material (see [3.2.3](#)).
- Preservative compound and specification, if required (see [3.3](#)).
- Preservation and packaging (see [6.1](#)).
- Marking (see [6.2](#)).

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7.4 Supersession data. Table VI contains cross-reference data between FF-B-2844 slant sheets and the superseding CID numbers.

TABLE VI. Document supersession data.

FF-B-2844 slant number	Replacement CID
FF-B-2844/01	A-A-59643
FF-B-2844/02	A-A-59644
FF-B-2844/03	A-A-59645
FF-B-2844/04	A-A-59643
FF-B-2844/05	A-A-59644
FF-B-2844/06	A-A-59646
FF-B-2844/07	A-A-59647
FF-B-2844/08	A-A-59648

7.5 Codes cross-reference. Table VII cross-references the bore codes listed in FF-B-2844/07 to the size codes of this CID.

TABLE VII. Cross-references.

FF-B-2844/07 bore codes	A-A-59647 size codes	Bore diameter	Outside diameter	Width
AA	01	0.5000	1.3125	0.3750
AB	02	0.6250	1.5625	0.4375
AC	03	0.7500	1.8750	0.5625
AD	04	0.8750	2.0000	0.5625
BA	05	1.0000	2.2500	0.6250
BB	06	1.1250	2.5000	0.6250
BC	07	1.2500	2.7500	0.6875
BD	08	1.3750	3.0000	0.6875
BE	09	1.5000	3.2500	0.7500
BF	10	1.6250	3.5000	0.7500
BG	11	1.7500	3.7500	0.8125
BH	12	1.8750	4.0000	0.8125
CA	13	2.0000	4.0000	0.8125
CB	14	2.2500	4.5000	0.8750
CC	15	2.5000	5.0000	0.9375
CD	16	2.7500	5.2500	0.9375
DA	17	3.0000	5.7500	1.0625
DB	18	3.2500	6.0000	1.0625
DC	19	3.5000	6.5000	1.1250
DD	20	3.7500	6.7500	1.1250
EA	21	4.0000	7.2500	1.2500
EB	22	4.2500	7.5000	1.2500

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TABLE VII. Cross-references - Continued.

FF-B-2844/07 bore codes	A-A-59647 size codes	Bore diameter	Outside diameter	Width
EC	23	4.5000	8.0000	1.3125
ED	24	4.7500	8.2500	1.3125
FA	25	5.0000	9.0000	1.3750
FB	26	5.5000	9.5000	1.3750

7.6 Subject term (key word) listing.

bore
cage
closures
hardness
load
lubrication
size code

MILITARY INTERESTS:

Custodians:

Navy - OS
Air Force - 99

Review Activities:

Air Force - 11, 84

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA - FSS

Preparing Activity:

DLA - GS4

(Project 3110-2006-017)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST database at <http://assist.daps.dla.mil/>.