METRIC

A-A-59581B
23 September 2003
SUPERSEDING
A-A-59581A
23 January 2001

COMMERCIAL ITEM DESCRIPTION

BEARING, BALL, ANNULAR, SINGLE ROW, RADIAL, NON-FILLING SLOT, BORE DIAMETERS UNDER 10 MM

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

1. SCOPE. This commercial item description (CID) covers metric, small bore (under 10 mm), non-filling slot, radial, single row, annular ball bearings for general-purpose use. These bearings are not intended for use in critical aeronautical or critical special precision applications.

2. CLASSIFICATION. The ball bearings shall be classified by the class, sizes, cage materials, shield and seal configurations, precision tolerances, and lubricant and preservative requirements listed below:

Class 1 - dimension series 02
2 - dimension series 03
4 - dimension series 10

Size - bearing dimensions (see table I)

Cage materials (see table II)

Shield and seal configurations (see table III)

Precision tolerances (see table IV)

Lubricant and preservative requirements (see table V)

3. SALIENT CHARACTERISTICS

3.1 Dimensions. Bearing boundary dimensions shall conform to the requirements specified in table I for each of the coded bearing sizes. The listed dimensions conform to the requirements specified for the listed bearing sizes from dimension series 02, 03, and 10 in American Bearing

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.

AMSC N/A

FSC 3110

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Manufacturers Association (ABMA) Standard 20, "Radial Bearings of Ball, Cylindrical Roller, and Spherical Roller Types, Metric Design" (DoD adopted). The bearing size shall be as specified in the acquisition order (see 7.3(b)). For unlisted bearing sizes, the associated dimensional and dynamic load rating requirements should also be specified in the acquisition order.

TABLE I. Dimensional requirements (ABMA series 02/03/10).

Bearing size code	Bore diameter (mm)	Outside diameter (mm)	Width (mm)	Chamfer r/min. (mm)	Minimum shaft shoulder diameter[1] (mm)	Dynamic load rating, minimum (lbs.)
Class 1 (dimension series 02)						
24	4	13	5	0.2	5.6	219
25	5	16	5	0.3	7	250
26	6	19	6	0.3	8	387
27	7	22	7	0.3	9	731
28	8	24	8	0.3	10	753
29	9	26	8	0.3	13	1020
Class 2 (dimension series 03)						
34	4	16	5	0.3	6	250
35	5	19	6	0.3	7	387
Class 4 (dimension series 10)						
07	7	19	6	0.3	9	387
08	8	22	7	0.3	10	731
09	9	24	7	0.3	11	753

[1]Listed for reference purposes only. Shoulder height shall be determined to provide sufficient clearance for the direct application of bearing removal force against the bearing inner ring. If the required minimum clearance is not available, an alternative non-destructive bearing removal capability shall be provided.

3.2 Materials.

3.2.1 Rings. The bearing ring material shall be chromium-alloy steel 52100 (UNS G52986) as specified in ASTM International (ASTM) A 295, "Standard Specification for High-Carbon and Roller Bearing Steel" (DoD adopted). The finished rings shall not exceed the associated billet material inclusion rating which is also specified in ASTM A 295. 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" (DoD adopted). The grain size of the ring material shall be determined in accordance with ASTM E 112, "Standard Methods for Determining Average Grain Size" (DoD adopted).

3.2.2 Balls. The bearing ball material shall be chromium-alloy steel 52100 (UNS G52986) as specified in ASTM A 295. The finished balls shall not exceed the associated billet material

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inclusion rating, which is also specified in ASTM A 295. Balls shall be through-hardened no less than 60 HRC and no more than 67 HRC as defined in ASTM E 18. The grain size of the ball material shall be determined in accordance with ASTM E 112.

3.2.3 Cage. The bearing cage material shall be impervious to deterioration from any lubricant, preservative, solvent, or other chemical substance expected to contact the bearing during normal use or storage. Similarly, the material shall not cause any chemical deterioration of any other bearing component. Metallic cage materials shall operate from -40 °F to 250 °F (-40 °C to 121 °C). Non-metallic cage materials shall operate from -20 °F to 250 °F (-30 °C to 121 °C). Unless otherwise specified in the acquisition order, the cage material shall be one of the optional coded types listed in table II (see 7.3(c)).

TABLE II. Cage materials.

Code[1]	Material type
J	Pressed steel
M	Machined bronze or brass
P	Molded plastic (nylon 6/6 or equal)
T	Machined non-metallic (phenolic)
Y	Pressed brass
X	Other

[1]No significant changes from FF-B-171/1.

3.2.4 Shields and seals. When used, the shield or seal material shall be as recommended by the manufacturer, unless otherwise specified in the acquisition order (see 7.3(d)). The material shall be impervious to deterioration from any lubricant, preservative, solvent, or other chemical substance expected to contact the bearing during normal use or storage. Similarly, the material shall not cause any chemical deterioration of any other bearing component. The shield or seal shall remain functionally effective at a minimum temperature range of -20 °F to 250 °F (-30 °C to 121 °C) for non-metallic and -40 °F to 250 °F (-40 °C to 121 °C) for metallic materials. Unless otherwise specified in the acquisition order, the shield and seal configuration for the bearing shall be one of the coded options listed in table III (see 7.3(e)).

TABLE III. Shield and seal configurations.

Code[1]	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)

[1]No significant changes from FF-B-171/1.

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3.3 Precision tolerance. The bearing precision tolerance level shall conform to Annular Bearing Engineers Committee (ABEC) class ABEC-1, ABEC-3, ABEC-5, or ABEC-7 as defined in ABMA Standard 20. The tolerance class and associated radial internal clearance shall be one of the coded options listed in table IV (see 7.3(f)).

3.3.1 Bearing precision tolerance levels and internal clearances may be affected by the addition of shields and/or seals. Manufacturers/suppliers should be consulted for availability of desired precision tolerances when shields and/or seals are required.

TABLE IV. Precision tolerance requirements.

Code	Tolerance class	Radial internal clearance
A	ABEC-1	Group 2 (less than normal)
B		Group N (normal)
C		Group 3 (greater than normal)
D		Group 4 (greater than group 3)
T		Group 5 (greater than group 4)
E	ABEC-3	Group 2 (less than normal)
F		Group N (normal)
G		Group 3 (greater than normal)
H		Group 4 (greater than group 3)
U		Group 5 (greater than group 4)
J	ABEC-5	Group 2 (less than normal)
K		Group N (normal)
L		Group 3 (greater than normal)
M		Group 4 (greater than group 3)
V		Group 5 (greater than group 4)
N	ABEC-7	Group 2 (less than normal)
P		Group N (normal)
R		Group 3 (greater than normal)
S		Group 4 (greater than group 3)
W		Group 5 (greater than group 4)

3.4 Lubrication and preservation requirements. Unless otherwise specified in the acquisition order, the bearing lubricant or preservative requirement shall be as selected from the approved coded options listed in table V (see 7.3(g)). When grease fill is required, the bearing void (the airspace between the inner and outer rings of the assembled bearing) shall be 25 to 50 percent filled. Bearing preservative shall be in accordance with MIL-DTL-197, "Packaging of Bearings, Associated Parts and Subassemblies".

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TABLE V. 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 the acquisition order)

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).

4.2 Unless otherwise indicated in the solicitation and resulting contract, the foreign acquisition restrictions in Section 225.7019 of the Defense Federal Acquisition Regulation Supplement (DFARS) apply to products described by this CID.

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, packing, and marking. Unless otherwise specified in the acquisition order, the bearings supplied shall be preserved, packed, and marked in accordance with MIL-DTL-197 (see 7.3(h)).

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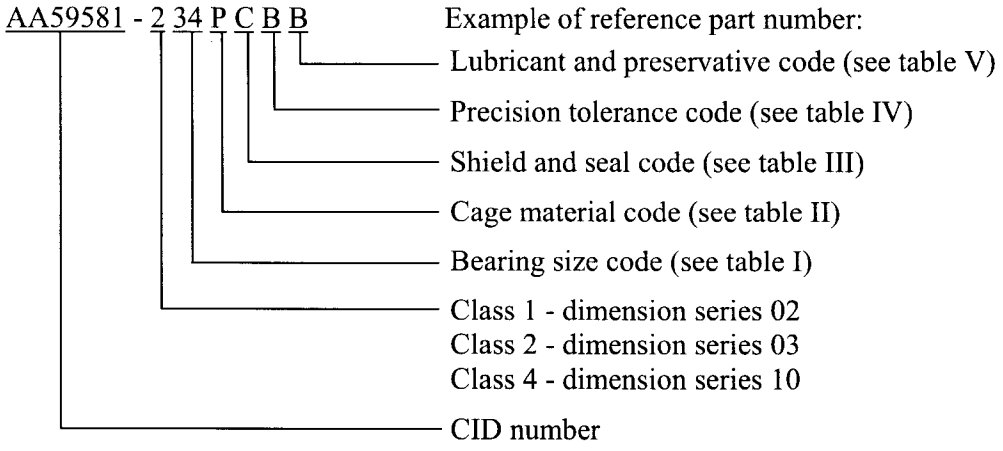
7. NOTES

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



AA59581 - 2 34 P C B B indicates: boundary dimension series 03; bore diameter 4 mm, outside diameter 16 mm, width 5 mm; molded plastic cage; double shield; ABEC-1 tolerance class, normal radial internal clearance; filled with grease in accordance with MIL-PRF-81322.

7.2 Sources of documents.

7.2.1 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 ABMA standards may be obtained from http://www.abma-dc.org/.

7.2.2 ASTM standards. Copies of ASTM standards may be obtained from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959. Electronic copies of ASTM standards may be obtained from http://www.astm.org/.

7.2.3 FAR and DFARS. Copies of the FAR and DFARS 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/. Electronic copies of the DFARS may be obtained from http://www.acq.osd.mil/dp/dars/dfars.html.

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

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

a. CID document number, revision, and CID PIN.
b. Bearing size (with dimension/load requirements if size is unlisted) (see 3.1).
c. Cage material type (see 3.2.3).
d. Shield or seal material (see 3.2.4).
e. Shield and seal configuration (see 3.2.4).
f. Precision tolerance requirement (see 3.3).
g. Lubricant and preservative requirements (see 3.4).
h. Preservation, packing, and marking requirements (see 6.1).

7.4 Codes cross-reference. Tables VI, VII, and VIII contain cross-reference data for the PIN information as listed in FF-B-171/1 and this CID.

7.4.1 Bearing class designations. The CIDs replacing 33 of the 37 associated specification sheets of FF-B-171 have been assigned class codes corresponding to ABMA dimension series. Table VI lists the FF-B-171 specification sheets, the corresponding dimension series, the CID class codes, and the replacement CIDs.

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TABLE VI. Federal specification to CID cross-reference.

FF-B-171 specification sheets	ABMA dimension series	CID class codes	Replacement CID numbers
1	02, 03, 10	1, 2, 4	A-A-59581
2	19	5	A-A-59582
3	10	4	A-A-59583
4	02	1	A-A-59584
5	03	2	A-A-59585
6	04	3	A-A-59586
7	02	1	A-A-59587
8	03	2	A-A-59589
9	32	8	A-A-59595
10	33	9	A-A-59596
11	02	1	A-A-59597
12	03	2	A-A-59598
13	22	6	A-A-59599
14	23	7	A-A-59600
15	19	---	Canceled
16	10	---	Canceled
17	02	---	Canceled
18	03	---	Canceled
19	19	5	A-A-59623
20	10	4	A-A-59624
21	02	1	A-A-59625
22	03	2	A-A-59626
23	04	3	A-A-59627
24	10	4	A-A-59628
25	02	1	A-A-59629
26	03	2	A-A-59630
27	04	3	A-A-59631
28	10	4	A-A-59632
29	02	1	A-A-59633
30	03	2	A-A-59634
31	04	3	A-A-59635
32	32	8	A-A-59636
33	33	9	A-A-59637
34	32	8	A-A-59638
35	33	9	A-A-59639
36	32	8	A-A-59640
37	33	9	A-A-59641

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TABLE VII. Radial internal clearance and ABEC tolerance codes.

FF-B-171/1 codes			A-A-59581B codes		
Code	Radial internal clearance	Tolerance class	Code	Tolerance class	Radial internal clearance
1	Symbol 2	ABEC-1	A	ABEC-1	Group 2
2	Symbol 0		B		Group N
3	Symbol 3		C		Group 3
4	Symbol 4		D		Group 4
			T		Group 5
			E	ABEC-3	Group 2
			F		Group N
			G		Group 3
			H		Group 4
			U		Group 5
5	Symbol 2	ABEC-5	J	ABEC-5	Group 2
6	Symbol 0		K		Group N
7	Symbol 3		L		Group 3
8	Symbol 4		M		Group 4
			V		Group 5
			N	ABEC-7	Group 2
			P		Group N
			R		Group 3
			S		Group 4
			W		Group 5

TABLE VIII. Lubricant and preservative requirements codes.

FF-B-171/1 codes		A-A-59581B codes	
Code	Lubricant or preservative	Code	Lubricant or preservative
A	Grease IAW MIL-PRF-81322	B	Grease IAW MIL-PRF-81322
B	Grease IAW DOD-G-24508	E	Grease IAW DOD-G-24508
C	Grease IAW MIL-PRF-23827	H	Grease IAW MIL-PRF-23827
D	Grease with SRI-2 or equivalent	L	Grease with SRI-2 or qualified equivalent
E	Preservation compound IAW MIL-DTL-197	T	Preservation compound IAW MIL-DTL-197
		S	No fill
		X	Other (specify in the acquisition order)

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7.5 Subject term (key word) listing.

ABEC
cage
precision tolerance
rings

MILITARY INTERESTS:

Custodians:
Army - AT
Navy - OS
Air Force - 99

Review Activities:
Army - MI
Navy - SH
Air Force - 11, 84

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA - 7FLE

Preparing Activity:
DLA - GS4

(Project 3110-1277)

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