METRIC
A-A-59585A
23 January 2001
SUPERSEDING
A-A-59585
7 August 2000

COMMERCIAL ITEM DESCRIPTION

BEARING, BALL, ANNULAR, SINGLE ROW, RADIAL, NON-FILLING SLOT, DIMENSION SERIES 03

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, single row, radial, non-filling slot, annular ball bearings for general-purpose use.

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

Class 2 - dimension series 03

Sizes - bearing dimensions (see table I)

Cage materials (see table II)

Shield and seal configurations (see table III)

Precision tolerances (see table IV)

Lubricant, preservative, and grease fill requirements (see table V)

3. SALIENT CHARACTERISTICS

3.1 Dimensions. Bearing boundary dimensions (and dynamic load ratings, see 3.4) 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 03 in American National Standards Institute/American Bearing Manufacturers Association (ANSI/ABMA) Standard 20, "Radial

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AMSC N/A FSC 3110

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 7.4(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 03).

Bearing size code	Bore diameter (mm)	Outside diameter (mm)	Width (mm)	Chamfer r/min (mm)	Minimum shaft shoulder diameter* (mm)	Dynamic load rating (minimum) (lb)
00	10	35	11	0.6	15	1,810
01	12	37	12	1.0	18	2,120
02	15	42	13	1.0	21	2,550
03	17	47	14	1.0	23	3,040
04	20	52	15	1.1	27	3,570
05	25	62	17	1.1	32	4,631
06	30	72	19	1.1	37	6,000
07	35	80	21	1.5	43.5	7,460
08	40	90	23	1.5	48.5	9,105
09	45	100	25	1.5	53.5	10,993
10	50	110	27	2.0	60	13,900
11	55	120	29	2.0	65	16,074
12	60	130	31	2.1	72	18,300
13	65	140	33	2.1	77	20,795
14	70	150	35	2.1	82	23,380
15	75	160	37	2.1	87	25,403
16	80	170	39	2.1	92	27,500
17	85	180	41	3.0	99	28,500
18	90	190	43	3.0	104	30,000
19	95	200	45	3.0	109	32,500
20	100	215	47	3.0	114	36,500
21	105	225	49	3.0	119	39,000
22	110	240	50	3.0	124	42,500
24	120	260	55	3.0	134	46,500
26	130	280	58	4.0	148	51,050
28	140	300	62	4.0	158	56,400
30	150	320	65	4.0	168	61,500
32	160	340	68	4.0	178	62,100
34	170	360	72	4.0	188	70,100
36	180	380	75	4.0	198	78,900
38	190	400	78	5.0	212	79,500

* 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 the American Society for Testing and Materials (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 no less than 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 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 and non-metallic cages shall meet the same bearing performance requirements. Cage materials shall operate from -65 to 230 °F (-54 to 110 °C). Unless otherwise specified in the acquisition order, the cage material shall be one of the optional coded types listed in table II (see 7.4(c)).

TABLE II. Cage materials.

Code[1]	Material type
J	Pressed steel
M	Machined bronze or brass
P	Molded plastic (nylon 66 or equal)
T	Machined non-metallic (phenolic)
Y	Pressed brass

[1] No significant change from FF-B-171/5.

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 7.4(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 material shall remain functionally effective at temperatures ranging from -65 to 230 °F (-54 to 110 °C). Unless otherwise specified in the acquisition order, the shield, seal, and snap ring configuration for the bearing shall be one of the coded options listed in table III (see 7.4(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
G	Open with snap ring
H	Single shield on snap ring side
J	Single shield opposite snap ring
K	Double shield with snap ring
X	Other (specify in acquisition order)

[1] No significant change from FF-B-171/5.

3.2.5 Snap ring. When used, the bearing snap ring and associated snap ring groove shall conform to the requirements specified in ANSI/ABMA Standard 20.

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 ANSI/ABMA Standard 20. The tolerance class and associated radial internal clearance shall be one of the coded options listed in table IV (see 7.4(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	Symbol 2 (less than normal)
B		Symbol 0 (normal)
C		Symbol 3 (greater than normal)
D		Symbol 4 (greater than symbol 3)
E	ABEC-3	Symbol 2 (less than normal)
F		Symbol 0 (normal)
G		Symbol 3 (greater than normal)
H		Symbol 4 (greater than symbol 3)
J	ABEC-5	Symbol 2 (less than normal)
K		Symbol 0 (normal)
L		Symbol 3 (greater than normal)
M		Symbol 4 (greater than symbol 3)
N	ABEC-7	Symbol 2 (less than normal)
P		Symbol 0 (normal)
R		Symbol 3 (greater than normal)
S		Symbol 4 (greater than symbol 3)

3.4 Dynamic load rating. The listed ratings listed in table I conform to the requirements specified in ANSI/ABMA Standard 9, "Load Ratings and Fatigue Life for Ball Bearings" (DoD adopted).

3.5 Lubrication, preservation, and grease fill requirements. Unless otherwise specified in the acquisition order, the bearing lubricant or preservative and grease fill requirement shall be as selected from the approved coded options listed in table V (see 7.4(g)). The percentage of fill is based on the internal empty space of an assembled bearing.

TABLE V. Lubricant, preservative, and grease fill requirements.

Code	Lubricant or preservative compound	Percentage (%) of grease fill
A	Grease in accordance with MIL-PRF-81322	Up to 25.00
B		25.01 - 50.00
C		50.01 - 80.00
D	Grease in accordance with DOD-G-24508	Up to 25.00
E		25.01 - 50.00
F		50.01 - 80.00
G	Grease in accordance with MIL-PRF-23827	Up to 25.00
H		25.01 - 50.00
J		50.01 - 80.00
K	Grease in accordance with SRI-2 or qualified equivalent	Up to 25.00
L		25.01 - 50.00
M		50.01 - 80.00
N	Grease with Mobilith SHC 100	Up to 25.00
P		25.01 - 50.00
R		50.01 - 80.00
S	No fill	0.00
T	Preservation compound in accordance with MIL-DTL-197	N/A
X	Other (specify in the acquisition order)	As specified

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.

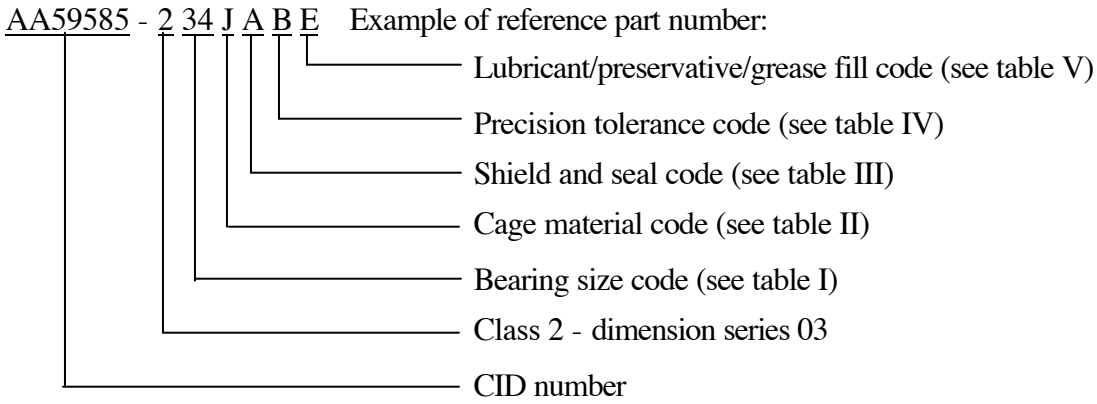
5.2 Market acceptability. The product offered must have been previously sold either to the government or on the commercial market.

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 7.4(h)).

7. NOTES

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



AA59585 - 2 34 J A B E indicates boundary dimension series 03; bore diameter 170 mm, outside diameter 360 mm, width 72 mm; pressed steel cage; open; ABEC-1 tolerance class, normal; filled 25-50% with grease in accordance with DOD-G-25508.

7.2 Sources of documents.

7.2.1 ANSI/ABMA standards. Copies of ANSI/ABMA standards may be obtained from the American Bearing Manufacturers Association, 1200 19th Street NW, Suite 300, Washington, DC 20036-2401.

7.2.2 ASTM standards. Copies of ASTM standards may be obtained from the American Society for Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

7.2.3 FAR and DFARS. The FAR and DFARS may be obtained from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402-0001.

7.3 Sources of supply. The manufacturers and/or suppliers listed below are known to supply products that meet the salient characteristic requirements of this document. Competition is not limited to the listed firms.

FAG Bearings Corporation
Danbury, CT 06813

KOYO Corporation of U.S.A
Westlake, OH 44145

NSK Corporation
Ann Arbor, MI 48106

MRC Specialty Bearings
Jamestown, NY 14702

NTN Bearing Corporation of America
Mt. Prospect, IL 60056

SKF USA, Inc.
Kulpsville, PA 19443

The Torrington Company
Torrington, CT 06790

7.4 Ordering data. Acquisition documents shall 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 and seal material (see 3.2.4)
e. Shield, seal, and snap ring configuration (see 3.2.4)
f. Precision tolerance requirement (see 3.3)
g. Lubricant/ preservative/ grease fill requirement (see 3.5)
h. Preservation, packaging, and marking requirements (see 6.1)

7.5 Codes cross-reference. Tables VI, VII, and VIII contain cross-reference data for the part identification number information as listed in FF-B-171/5 and this CID.

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

TABLE VI. Federal specification to CID cross-reference.

FF-B-171 slant 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

TABLE VII. Radial internal clearance and ABEC tolerance codes.

FF-B-171/5 codes			A-A-59585A codes		
Code	Radial internal clearance	Tolerance class	Code	Tolerance class	Radial internal clearance
1	Symbol 2	ABEC-1	A	ABEC-1	Symbol 2
2	Symbol 0		B		Symbol 0
3	Symbol 3		C		Symbol 3
4	Symbol 4		D		Symbol 4
			E	ABEC-3	Symbol 2
			F		Symbol 0
			G		Symbol 3
			H		Symbol 4
5	Symbol 2	ABEC-5	J	ABEC-5	Symbol 2
6	Symbol 0		K		Symbol 0
7	Symbol 3		L		Symbol 3
8	Symbol 4		M		Symbol 4
			N	ABEC-7	Symbol 2
			P		Symbol 0
			R		Symbol 3
			S		Symbol 4

TABLE VIII. Lubricant, preservative, and grease fill requirements codes.

FF-B-171/5 codes		A-A-59585A codes		
Code	Lubricant or preservative	Code	Lubricant or preservative	Grease fill %
A	Grease IAW MIL-PRF-81322	A	Grease IAW MIL-PRF-81322	Up to 25.00
B	Grease IAW DOD-G-24508	B		25.01 - 50.00
C	Grease IAW MIL-PRF-23827	C		50.01 - 80.00
D	Grease IAW SRI-2 or equivalent	D	Grease IAW DOD-G-24508	Up to 25.00
E	Preservation compound IAW MIL-DTL-197	E		25.01 - 50.00
		F		50.01 - 80.00
		G	Grease IAW MIL-PRF-23827	Up to 25.00
		H		25.01 - 50.00
		J		50.01 - 80.00
		K	Grease IAW SRI-2 or qualified equivalent	Up to 25.00
		L		25.01 - 50.00
		M		50.01 - 80.00
		N	Grease with Mobilith SHC 100	Up to 25.00
		P		25.01 - 50.00
		R		50.01 - 80.00
		S	No fill	0.00
		T	Preservation compound IAW MIL-DTL-197	N/A
		X	Other (specify in the acquisition	As specified

7.6 Key words.

ABEC
cage
dynamic load rating
lubricant
precision tolerance
rings

MILITARY INTERESTS:

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

Reviewers:
Army - AR, EA, GL, MI
Navy - SH
Air Force - 11, 84

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA - 7FXE

Preparing activity:
DLA - GS4

(Project 3110-1252)