METRIC
A-A-59631
27 June 2001
SUPERSEDING
FF-B-171/27
30 November 1993

COMMERCIAL ITEM DESCRIPTION

BEARING, BALL, ANNULAR, SINGLE ROW, ANGULAR CONTACT, CONTACT ANGLE 23º THROUGH 32º, DIMENSION SERIES 04

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, angular contact, contact angle 23º through 32º, 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, lubricant, preservative, and grease fill requirements, and duplex mounting configurations listed below:

Class 3 - dimension series 04

Size - 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)

Duplex mounting configuration (see table VI)

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 04 in the American National Standards Institute/American Bearing Manufacturers Association (ANSI/ABMA) Standard 20, "Radial Bearings of Ball, Cylindrical Roller, and

Beneficial comments, recommendations, additions, deletions, clarifications, etc. and any data that may improve this document should be sent to: Defense Supply Center Richmond (DSCR), ATTN: DSCR-VBD, 8000 Jefferson Davis Highway, Richmond, VA 23297-5610.

AMSC N/A FSC 3110

Spherical Roller Types, Metric Design" (DoD adopted). The bearing size shall be specified in the acquisition order (see 7.4(b)). For unlisted bearing sizes, the dimensional and dynamic load rating requirements should also be specified in the acquisition order.

TABLE I. Dimensional requirements (ABMA series 04).

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	25	80	21	1.5	34	6,430
06	30	90	23	1.5	39	8,305
07	35	100	25	1.5	44	10,535
08	40	110	27	2.0	50	11,385
09	45	120	29	2.0	55	14,835
10	50	130	31	2.1	62	16,780
11	55	140	33	2.1	67	19,305
12	60	150	35	2.1	72	20,960
13	65	160	37	2.1	77	22,650
14	70	180	42	3.0	84	26,070
15	75	190	45	3.0	89	27,860
16	80	200	48	3.0	94	31,355
17	85	210	52	4.0	1.3	33,245
18	90	225	54	4.0	108	37,535

* 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 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 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
X	Other (specify in acquisition order)

[1] No significant change from FF-B-171/27.

3.2.4 Shields and seals. The shield and seal configuration shall be the coded option listed in table III (see 7.4(d)).

TABLE III. Shield and seal configurations.

Code[1]	Mounting configurations
A	Open (no shield or seal)

[1] No significant change from FF-B-171/27.

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(e)).

3.4 Dynamic load rating. The listed ratings 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(f)). The percentage of fill is based on the internal empty space of an assembled bearing.

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)

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
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

3.6 Duplex mounting. When required, the adjoining faces of bearings used in duplex applications shall be match ground and marked for proper mounting. The duplex mounting configuration shall be one of the coded options listed in table VI. If required, the duplex mounting configuration shall be specified in the acquisition order (see 7.4(g)).

TABLE VI. Duplex mounting.

Code	Configuration option
F	Face to face
B	Back to back
T	Tandem
U	Universal (F, B, or T)

3.7 Preload. Preload requirements shall be listed in the acquisition order (see 7.4(h)).

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.

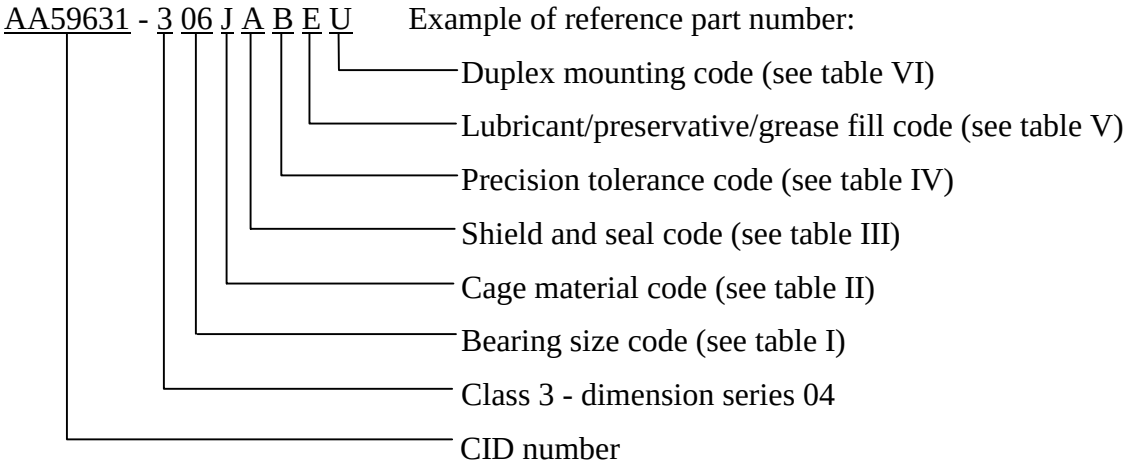
5.2 Market acceptability. The product offered must have been previously sold either to the government or on the commercial market.

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(i)).

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.



AA59631 - 3 06 J A B E U indicates: boundary dimension series 04; bore diameter 30 mm, outside diameter 90 mm, width 23 mm; pressed steel cage; open (no shields or seals); ABEC-1 tolerance class, normal radial internal clearance; filled 25% to 50% with grease in accordance with DOD-G-24508; universal duplex mounting.

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 Government documents. Copies of FAR, DFARS, and military detail and federal specifications may be obtained from the U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328. Electronic copies of military detail specifications and federal specifications may be obtained from http://astimage.daps.dla.mil/quicksearch/.

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

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

The Torrington Company
Torrington, CT 06790

MRC Bearings
Jamestown, NY 14702

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 configuration (see 3.2.4)
e. Precision tolerance requirements (see 3.3)
f. Lubricant/preservative/grease fill requirement (see 3.5)
g. Duplex mounting requirement, if required (see 3.6)
h. Preload requirement, if required (see 3.7)
i. Preservation, packing, and marking requirements (see 6.1)

7.5 Codes cross-reference. Tables VII, VIII, and IX contain cross-reference data for the part identification number information as listed in FF-B-171/27 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 VII lists the FF-B-171 slant sheets, the corresponding dimension series, the CID class codes, and the replacement CIDs.

TABLE VII. 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 VIII. Radial internal clearance and ABEC tolerance codes.

FF-B-171/27 codes			A-A-59631 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 IX. Lubricant, preservative, and grease fill requirements codes.

FF-B-171/27 codes		A-A-59631 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
		S	No fill	0.00
		T	Preservation compound IAW MIL-DTL-197	N/A
		X	Other (specify in the acquisition	As specified

7.6 Subject term (key word) listing.

ABEC
cage
dynamic load rating
lubricant
precision tolerance
rings

MILITARY INTERESTS:

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

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

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA - 7FXE

Preparing activity:
DLA - GS4

(Project 3110-1211)