

METRIC

A-A-59600

27 September 2000

SUPERSEDING

FF-B-171/14

30 November 1993

COMMERCIAL ITEM DESCRIPTION

BEARING, BALL, ANNULAR, DOUBLE ROW, RADIAL, INTERNAL SELF-ALIGNING, DIMENSION SERIES 23

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, double row, radial, internal self-aligning, ball bearings for general-purpose use.
2. **CLASSIFICATION.** The ball bearings shall be classified by the class, sizes, cage materials, shield and snap ring configurations, precision tolerances, and lubricant and preservative compounds listed below:

Class 7 - dimension series 23

Size - bearing dimensions (see table I)

Cage materials (see table II)

Bore design (see table III)

Precision tolerances (see table IV)

Lubricant and preservative compounds (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. The listed dimensions conform to the requirements specified for the listed bearing sizes from dimension series 23 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

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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 dimensional and dynamic load rating requirements should also be specified in the acquisition order.

TABLE I. Dimensional requirements (ABMA series 23).

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	17	0.6	15	1,750
01	12	37	17	1.0	18	1985
02	15	42	17	1.0	21	2060
03	17	47	19	1.0	23	2500
04	20	52	21	1.1	27	3085
05	25	62	24	1.1	32	4135
06	30	72	27	1.1	37	5300
07	35	80	31	1.5	43.5	6635
08	40	90	33	1.5	48.5	7590
09	45	100	36	1.5	53.5	9280
10	50	110	40	2.0	60	11070
11	55	120	43	2.0	65	12780
12	60	130	46	2.1	72	14865
13	65	140	48	2.1	77	16058
14	70	150	51	2.1	82	17625
15	75	160	55	2.1	87	19380
16	80	170	58	2.1	92	21910
17	85	180	60	3.0	99	23665
18	90	190	64	3.0	104	25420
19	95	200	67	3.0	109	27920
20	100	215	73	3.0	114	31140
21	105	225	77	3.0	119	32995
22	110	240	80	3.0	124	35055

* 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. 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	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)

3.3 Bore design. All self-aligning bearings shall have either a cylindrical or tapered bores (taper 1:12) and shall be identified by one of the codes listed in table III. The bore design shall be specified in the acquisition order (see 7.4(d)).

TABLE III. Bore designs.

Code	Configuration option
C	Cylindrical bore (no shields or seals)
T	Tapered bore (no shields or seals)

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3.4 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)).

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)

3.5 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).

3.6 Lubrication and preservation. Unless otherwise specified in the acquisition order, the bearing lubricant shall be as selected from the approved coded options listed in table V (see 7.4(f)).

TABLE V. Codes for lubricant and preservative compounds.

Code	Lubricant or preservative compound
A	Grease in accordance with MIL-PRF-81322
B	Grease in accordance with DOD-G-24508
C	Grease in accordance with MIL-PRF-23827
D	Grease in accordance with SRI-2 or qualified equivalent
E	Preservation compound in accordance with MIL-DTL-197

3.7 Grease fill requirements. The bearing shall be filled with lubricant in accordance with one of the coded options listed in table VI. The amount of grease fill shall be specified in the acquisition order (see 7.4(g)). The percentage of fill is based on the internal empty space of an assembled bearing.

TABLE VI. Grease fill requirement.

Code	Percentage (%) of fill
A	0 - 15.00
B	15.01 - 30.00
C	30.01 - 45.00
D	45.01 - 65.00
E	65.01 - 80.00
X	Other (specify in 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.

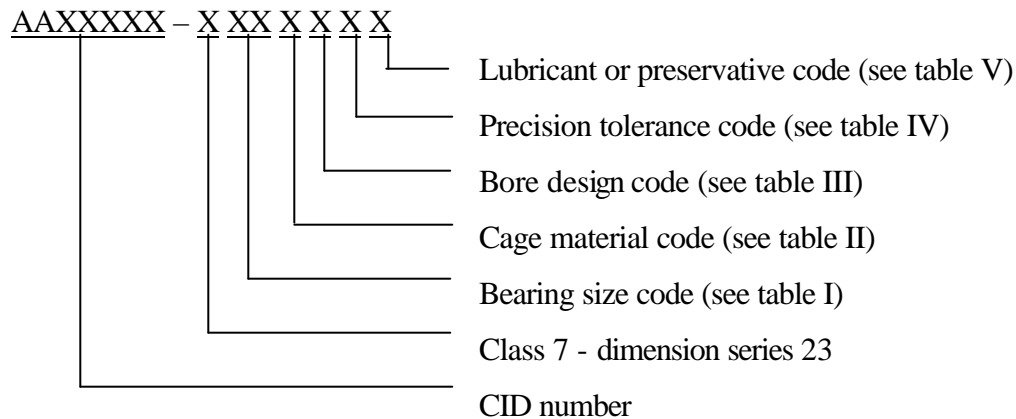
6. PACKAGING

6.1 Preservation, packing, and marking. For acquisition purposes, the bearings supplied shall be preserved, packed, and marked as specified in the acquisition order (see 6.4(h)).

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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.



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 characteristics requirements of this document. Competition is not limited to the listed firms.

FAG Bearings Corporation
Danbury, CT 06813-1933

NTN Bearing Corporation of
Mt. Prospect, IL 60056

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

NSK Corporation
Ann Arbor, MI 48106

SKF USA, Inc.
Kulpsville, PA 19443

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. Bore design (see 3.3)
- e. Precision tolerance requirement (see 3.4)
- f. Lubricant (see 3.6)
- g. Grease fill requirement (see 3.7)
- h. Packaging and marking requirements (see 6.1)

6.5 Codes cross-reference. Tables VII, VIII, IX, and X contain cross-reference data for the part identification number information as listed in FF-B-171/14 and this CID.

TABLE VII. Cage codes.

FF-B-171/14 codes		A-A-59600 codes	
Code	Cage	Code	Cage
J	Pressed steel	J	Pressed steel
M	Machined bronze or brass	M	Machined bronze or brass
P	Molded plastic (nylon 66 or equal)	P	Molded plastic (nylon 66 or equal)
T	Machined non-metallic (phenolic)	T	Machined non-metallic (phenolic)
Y	Pressed brass	Y	Pressed brass
	Not listed	X	Other

TABLE VIII. Bore design.

FF-B-171/14 codes		A-A-59600 codes	
Code	Design	Code	Configuration option
C	Open (no shields or seals), cylindrical bore	C	Cylindrical bore (no shields or seals)
T	Open (no shields or seals), tapered bore	T	Tapered bore (no shields or seals)

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TABLE IX. Radial internal clearance and ABEC tolerance codes.

FF-B-171/14 codes			A-A-59600 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
	Not listed		E	ABEC 3	Symbol 2
	Not listed		F		Symbol 0
	Not listed		G		Symbol 3
	Not listed		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
	Not listed		N	ABEC-7	Symbol 2
	Not listed		P		Symbol 0
	Not listed		R		Symbol 3
	Not listed		S		Symbol 4

TABLE X. Lubrication codes.

FF-B-171/14 codes		A-A-59600 codes	
Code	Lubricant or preservative compound	Code	Lubricant or preservative compound
A	Grease IAW MIL-PRF-81322	A	Grease IAW MIL-PRF-81322
B	Grease IAW DOD-G-24508	B	Grease IAW DOD-G-24508
C	Grease IAW MIL-PRF-23827	C	Grease IAW MIL-PRF-23827
D	Grease IAW SRI-2 or qualified equivalent	D	Grease IAW SRI-2 or qualified equivalent
E	Preservation compound IAW MIL-DTL-197	E	Preservation compound IAW MIL-DTL-197

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MILITARY INTERESTS:

Custodians:

Army - AT

Navy - OS

Air Force - 99

Reviewers:

Army - AR, EA, GL, MI

Navy - SH

Air Force - 11, 84

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA - 7FXE

Preparing activity:

DLA - GS

(Project 3110-1198)