METRIC

COMMERCIAL ITEM DESCRIPTION

BEARING, BALL, ANNULAR, SINGLE ROW, RADIAL,
NON-FILLING SLOT, DIMENSION SERIES 02

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. 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

   Sizes - 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 in the American Bearing Manufacturers Association (ABMA) Standard 20, "Radial Bearings of Ball, Cylindrical Roller, and Spherical Roller Types, Metric Design". The bearing size shall be as specified in the

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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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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).

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) (lb.)
00	10	30	9	0.6	15	805
01	12	32	10	0.6	17	1,175
02	15	35	11	0.6	20	1,320
03	17	40	12	0.6	22	1,655
04	20	47	14	1.0	26	2,220
05	25	52	15	1.0	31	2,435
06	30	62	16	1.0	36	3,380
07	35	72	17	1.1	42	4,460
08	40	80	18	1.1	47	5,060
09	45	85	19	1.1	52	5,680
10	50	90	20	1.1	57	6,090
11	55	100	21	1.5	63.5	7,530
12	60	110	22	1.5	68.5	9,110
13	65	120	23	1.5	73.5	9,935
14	70	125	24	1.5	78.5	10,800
15	75	130	25	1.5	83.5	11,480
16	80	140	26	2.0	90	12,610
17	85	150	28	2.0	95	14,445
18	90	160	30	2.0	100	16,665
19	95	170	32	2.1	107	18,880
20	100	180	34	2.1	112	21,215
21	105	190	36	2.1	117	23,100
22	110	200	38	2.1	122	25,025
24	120	215	40	2.1	132	25,145
26	130	230	40	3.0	144	26,995
28	140	250	42	3.0	154	28,805
30	150	270	45	3.0	164	30,470
32	160	290	48	3.0	174	32,005
34	170	310	52	4.0	188	36,725
36	180	320	52	4.0	198	39,365
38	190	340	55	4.0	208	44,135

[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.

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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/A 295M, "Standard Specification for High-Carbon Anti-Friction Bearing Steel". The finished rings shall not exceed the associated billet material inclusion rating, which is also specified in ASTM A 295/A 295M. Ring hardness shall be at least 58 HRC as defined in ASTM E 18, "Standard Test Methods for Rockwell Hardness of Metallic Materials". The grain size of the ring material shall be determined in accordance with ASTM E 112, "Standard Methods for Determining Average Grain Size".

3.2.2 Balls. The bearing ball material shall be chromium-alloy steel 52100 (UNS G52986) as specified in ASTM A 295/A 295M. The finished balls shall not exceed the associated billet material inclusion rating, which is also specified in ASTM A 295/A 295M. 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-171/4.

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)).

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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
G	Open with snap ring
H	Single shield on snap ring side
J	Single shield opposite snap ring
K	Double shield with snap ring
L	Single seal on snap ring side
M	Single seal opposite snap ring
N	Double seal with snap ring
P	Single shield and seal (shield on snap ring side)
X	Other (specify in acquisition order)

[1]No significant changes from FF-B-171/4.

3.2.5 Snap Ring. When used, the bearing snap ring and associated snap ring groove shall conform to the requirements specified in 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 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.

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".

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).

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Table IV. Precision tolerance requirements.

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

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
P	Grease in accordance with A-A-59685
S	No fill
T	Preservation compound in accordance with MIL-DTL-197
X	Other (specify in the acquisition order)

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4.2 Unless otherwise indicated in the solicitation and resulting contract, the foreign acquisition restrictions in Section 252.225, Clause 252.225.7016 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.
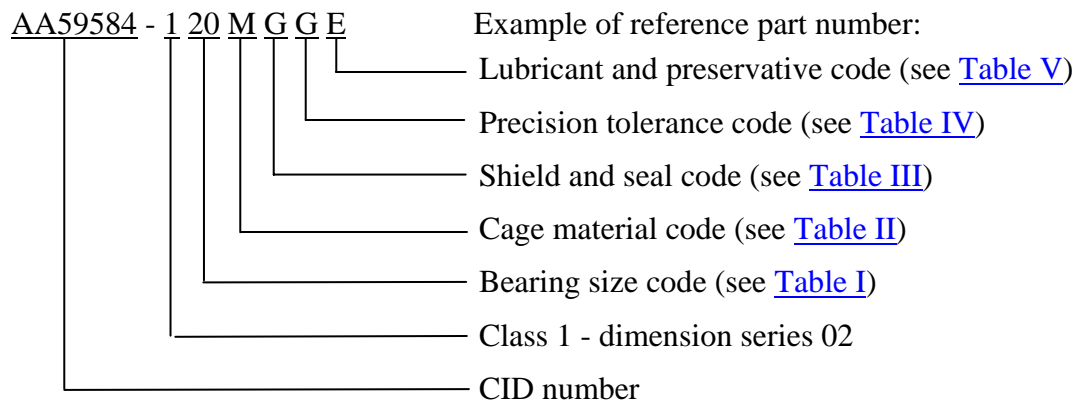
5.2 Market acceptability. The product offered must have been previously sold either to the government or on the commercial market.

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)).

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.

AA59584 - 1 20 M G G E   Example of reference part number:

Lubricant and preservative code (see Table V)

Precision tolerance code (see Table IV)

Shield and seal code (see Table III)

Cage material code (see Table II)

Bearing size code (see Table I)

Class 1 - dimension series 02

CID number

AA59584 - 1 20 M G G E indicates: boundary dimension series 02; bore diameter 100 mm, outside diameter 180 mm, width 34 mm; machined brass cage; open with snap ring; ABEC-3 tolerance class, greater than normal radial internal clearance; filled with grease in accordance with DOD-G-24508.

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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/.

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-171/4 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

Table VII. Radial internal clearance and ABEC tolerance codes.

FF-B-171/4 codes			A-A-59584 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-171/4 codes		A-A-59584 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
		P	Grease IAW A-A-59685
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 - GL, MI
  Navy - SH
  Air Force - 11, 84

CIVIL AGENCY
COORDINATING ACTIVITY:

GSA - FSS

Preparing Activity:
DLA - GS4

(Project 3110-2008-015)

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/.

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