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400 COMMONWEALTH DRIVE, WARRENDALE, PA 15096

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

AMS 7440C

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Superseding AMS 7440B

BALLS, LOW-CHROMIUM, HIGH-CARBON STEEL
Hardened and Tempered

1. SCOPE:

1.1 Type: This specification covers balls made of a low-chromium, high-carbon steel.

1.2 Application: Primarily for bearing balls. The particular alloy to be chosen depends on the size of the ball and the manufacturer's techniques.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of Aerospace Material Specifications shall apply. The applicable issue of other documents shall be as specified in AMS 2350.

2.1 SAE Publications: Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096.

2.1.1 Aerospace Material Specifications:

AMS 2350 - Standards and Test Methods
AMS 6440 - Steel Bars, Forgings, and Tubing, 1.45Cr (0.98 - 1.10C) (SAE 52100), for Bearing Applications, UNS G52986
AMS 6442 - Steel Bars, Forgings, and Tubing, 0.50Cr (0.98 - 1.10C) (SAE 50100), for Bearing Applications, UNS G50986
AMS 6449 - Steel Bars, Forgings, and Tubing, 1.02Cr (0.98 - 1.10C) (SAE 51100), for Bearing Applications, UNS G51986

2.2 ASTM Publications: Available from American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103.

ASTM E18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

2.3 U.S. Government Publications: Available from Commanding Officer, Naval Publications and Forms Center, 5801 Tabor Avenue, Philadelphia, PA 19120.

2.3.1 Military Standards:

MIL-STD-794 - Parts and Equipment, Procedures for Packaging and Packing of

3. TECHNICAL REQUIREMENTS:

3.1 Material: Shall conform to all applicable requirements of AMS 6440, AMS 6442, or AMS 6449. The particular steel to be used shall be dependent on the size of the bearing balls and the manufacturer's techniques, unless a specific steel is specified by purchaser.

3.2 Condition: Hardened by quenching from above the transformation range, tempered, and polished.

3.3 Properties: Balls shall conform to the following requirements:

3.3.1 Hardness: Shall be as specified on the part drawing. When not specified on the part drawing, hardness shall be 60 - 67 HRC, or equivalent, determined in accordance with ASTM E18.

3.4 Quality: Balls, as received by purchaser, shall be free from cracks, pits, rust, and foreign materials and from imperfections detrimental to usage of the balls.

3.5 Tolerances: Shall be as specified on the drawing or as agreed upon by purchaser and vendor.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection: The vendor of balls shall supply all samples Ø for vendor's tests and shall be responsible for performing all required tests. Results of such tests shall be reported to the purchaser as required by 4.4. Purchaser reserves the right to sample and perform any confirmatory testing deemed necessary to ensure that the balls conform to the requirements of this specification.

4.2 Classification of Tests: Tests to determine conformance to all technical Ø requirements of this specification are classified as acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling: Shall be in accordance with the following; a lot shall be all Ø balls of the same size or part number from one heat of steel heat treated in one furnace charge and presented for vendor's inspection at one time.

4.3.1 Composition: At least one sample from each heat of steel.

4.3.2 Hardness: At least three samples from each lot.
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4.4 Reports: The vendor of finished or semi-finished parts shall furnish with Ø each shipment a report showing the purchase order number, AMS 7440C, composition used, contractor or other direct supplier of product, part number, and quantity. When product for making balls is produced or purchased by the parts vendor, that vendor shall inspect each lot of product to determine conformance to the requirements of this specification, and shall include in the report either a statement that the product conforms or copies of laboratory reports showing the results of tests to determine conformance.

4.5 Resampling and Retesting: If any specimen used in the above tests fails to meet the specified requirements, disposition of the balls may be based on the results of testing three additional specimens for each original nonconforming specimen. Failure of any retest specimen to meet the specified requirements shall be cause for rejection of the balls represented and no additional testing shall be permitted. Results of all tests shall be reported.

5. PREPARATION FOR DELIVERY:

5.1 Packaging and Identification:

5.1.1 Balls shall be handled and packaged in such a manner that they will be protected, during shipment and storage, against mechanical injury and exposure to moisture.

5.1.2 Balls of each different part number shall be packed in separate containers.

5.1.3 Each container shall be marked with not less than the following information:

BALLS, LOW-CHROMIUM, HIGH-CARBON STEEL
AMS 7440C
PART NUMBER _____
PURCHASE ORDER NUMBER _____
QUANTITY _____
MANUFACTURER'S IDENTIFICATION _____

5.1.4 Containers of balls shall be prepared for shipment in accordance with Ø commercial practice and in compliance with applicable rules and regulations pertaining to the handling, packaging, and transportation of the balls to ensure carrier acceptance and safe delivery. Packaging shall conform to carrier rules and regulations applicable to the mode of transportation.

5.1.5 For direct U.S. Military procurement, packaging shall be in accordance with MIL-STD-794, Level A or Level C, as specified in the request for procurement. Commercial packaging as in 5.1.1, 5.1.2, and 5.1.4 will be acceptable if it meets the requirements of Level C.

6. ACKNOWLEDGMENT: A vendor shall mention this specification number and its revision letter in all quotations and when acknowledging purchase orders.