

AEROSPACE MATERIAL SPECIFICATION

SAE AMS7445

REV. D

Issued 1951-03
Revised 2001-10
Reaffirmed 2012-02
Superseding AMS7445C

Balls, Steel, Corrosion-Resistant
17Cr
Annealed

(Composition similar to UNS S44002,
UNS S44003, UNS S44004)

RATIONALE

AMS7445D has been reaffirmed to comply with the SAE five-year review policy.

1. SCOPE:

1.1 Form:

This specification covers balls made of high-carbon corrosion-resistant steel of three carbon ranges.

1.2 Application:

These products have been used typically for bearing balls, but usage is not limited to such applications.

1.3 Classification:

One of three compositions, designated herein as 51440A, 51440B and 51440C may be specified on the part drawing. When not otherwise specified, manufacturer may select the composition with the carbon range appropriate to the ball size and manufacturing process.

2. APPLICABLE DOCUMENTS:

The issue of the following documents in effect on the date of the purchase order forms a part of this specification to the extent specified herein. The supplier may work to a subsequent revision of a document unless a specific document issue is specified. When the referenced document has been canceled and no superseding document has been specified, the last published issue of that document shall apply.

2.1 SAE Publications:

Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

AMS 2248 Chemical Check Analysis Limits, Corrosion and Heat-Resistant Steels and Alloys,
Maraging and Other Highly-Alloyed Steels, and Iron Alloys

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be revised, reaffirmed, stabilized, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2012 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: Tel: 877-606-7323 (inside USA and Canada)
Tel: +1 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: <http://www.sae.org>

**SAE values your input. To provide feedback
on this Technical Report, please visit
<http://www.sae.org/technical/standards/AMS7445D>**

2.2 ASTM Publications:

Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.

ASTM E 18 Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials

ASTM E 353 Chemical Analysis of Stainless, Heat-Resisting, Maraging, and Other Similar Chromium-Nickel-Iron Alloys

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to one of the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 353, by spectrochemical methods, or by other analytical methods acceptable to purchaser.

TABLE 1 - Composition

Element	51440A min	51440A max	51440B min	51440B max	51440C min	51440C max
Carbon	0.60	0.75	0.75	0.95	0.95	1.20
Manganese	--	1.00	--	1.00	--	1.00
Silicon	--	1.00	--	1.00	--	1.00
Phosphorus	--	0.040	--	0.040	--	0.040
Sulfur	--	0.030	--	0.030	--	0.030
Chromium	16.00	18.00	16.00	18.00	16.00	18.00
Nickel	--	0.75	--	0.75	--	0.75
Molybdenum	--	0.75	--	0.75	--	0.75
Copper	--	0.50	--	0.50	--	0.50

3.1.1 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2248.

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: When not otherwise specified, hardness shall be 55 to 64 HRC, or equivalent (See 8.2), determined in accordance with ASTM E 18.

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 shall supply all samples for vendor's tests and shall be responsible for the performance of all required tests. Purchaser reserves the right to sample and to perform any confirmatory testing deemed necessary to ensure that the balls conform to specified requirements.

4.2 Classification of Tests:

All technical requirements are acceptance tests and shall be performed on each heat or lot as applicable.

4.3 Sampling and Testing:

Shall be in accordance with the following; a lot shall be all 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.

4.4 Reports:

The vendor of the balls shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for the hardness of each lot, and stating that the balls conform to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS 7445D, composition used, size, and quantity.

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 Identification:

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

BALLS, STEEL, CORROSION RESISTANT

AMS 7445D

PART NUMBER _____

PURCHASE ORDER NUMBER _____

QUANTITY _____

MANUFACTURER'S IDENTIFICATION _____

5.2 Packaging:

5.2.1 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.

5.2.2 Containers of balls shall be prepared for shipment in accordance with 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.

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

6. ACKNOWLEDGMENT:

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

7. REJECTIONS:

Balls not conforming to this specification, or to modifications authorized by purchaser, will be subject to rejection.

8. NOTES:

8.1 A change bar (I) located in the left margin is for the convenience of the user in locating areas where technical revisions, not editorial changes, have been made to the previous issue of this specification. An (R) symbol to the left of the document title indicates a complete revision of the specification, including technical revisions. Change bars and (R) are not used in original publications, nor in specifications that contain editorial changes only.

8.2 Hardness conversion tables for metals are presented in ASTM E 140.

8.3 Terms used in AMS are clarified in ARP1917.