AEROSPACE MATERIAL SPECIFICATION

AMS5024™	REV. J

Issued	1940-01
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Reaf. Noncur.	2015-12
Stabilized	2020-04

Superseding AMS5024H

Steel, Bars, Forgings, and Tubing, Free-Cutting
1.5Mn (0.32 - 0.39C) (SAE 1137)

UNS G11370

RATIONALE

AMS5024J has been stabilized as mature technology.

STABILIZED NOTICE

AMS5024J has been declared "STABILIZED" by SAE AMS Committee E Carbon and Low Alloy Steels. This document will no longer be updated and may no longer represent standard industry practice. This document was stabilized because this document is no longer state of the art and other documents contain similar but not necessarily equivalent requirements. Previously this document was Non-Current. The last technical update of this document occurred in January 2001. Users of this document should refer to the cognizant engineering organization for disposition of any issues with reports/certifications to this specification; including exceptions listed on the certification. NOTE: In many cases, the purchaser may represent a sub tier supplier and not the cognizant engineering organization.

AMS Committee E recommends that the following similar but not identical specifications may be considered for future procurement. This listing does not constitute authority to substitute these specifications for the “STABILIZED” specification.

ASTM A29/A29M Standard Specification for Steel Bars, Carbon and Alloy, Hot-Wrought, General Requirements for

ASTM A108 Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

ASTM A311/A311M Standard Specification for Cold-Drawn, Stress-Relieved Carbon Steel Bars Subject to Mechanical Property Requirements

ASTM A510 Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel

ASTM A519 Standard Specification for Seamless Carbon and Alloy Steel Mechanical Tubing

ASTM A521 Standard Specification for Steel, Closed-Impression Die Forgings for General Industrial Use

ASTM A576 Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality

ASTM A711 Standard Specification for Steel Forging Stock

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
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SAE WEB ADDRESS: **http://www.sae.org**

For more information on this standard, visit
https://www.sae.org/standards/content/AMS5024J/

1. SCOPE:

1.1 Form:

This specification covers a free-cutting carbon steel in the form of bars, forgings, mechanical tubing, and forging stock.

1.2 Application:

These products have been used typically for parts requiring moderate strength and where free machining qualities are desirable, but usage is not limited to such applications.

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 2231	Tolerances, Carbon Steel Bars
MAM 2231	Tolerances, Metric, Carbon Steel Bars
AMS 2253	Tolerances, Carbon and Alloy Steel Tubing
MAM 2253	Tolerances, Metric, Carbon and Alloy Steel Tubing
AMS 2259	Chemical Check Analysis Limits, Wrought Low-Alloy and Carbon Steels
AMS 2370	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steels, Wrought Products and Forging Stock
AMS 2372	Quality Assurance Sampling and Testing, Carbon and Low-Alloy Steel Forgings
AMS 2806	Identification, Bars, Wire, Mechanical Tubing, and Extrusions, Carbon and Alloy Steels and Heat and Corrosion Resistant Steels and Alloys
AMS 2808	Identification, Forgings

2.2 ASTM Publications:

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

ASTM E 10	Brinell Hardness of Metallic Materials
ASTM E 350	Chemical Analysis of Carbon Steel, Low-Alloy Steel, Silicon Electrical Steel, Ingot Iron, and Wrought Iron

3. TECHNICAL REQUIREMENTS:

3.1 Composition:

Shall conform to the percentages by weight shown in Table 1, determined by wet chemical methods in accordance with ASTM E 350, by spectrochemical methods, or by other analytical methods approved by purchaser.

TABLE 1 - Composition

Element	min	max
Carbon (3.1.1)	0.32	0.39
Manganese	1.35	1.65
Phosphorus	--	0.040
Sulfur	0.08	0.13

3.1.1 When permitted by purchaser, carbon may be 0.37 to 0.44.

3.1.2 Check Analysis: Composition variations shall meet the applicable requirements of AMS 2259.

3.2 Condition:

The product shall be supplied in the following condition:

3.2.1 Bars and Mechanical Tubing 2.50 Inches (62.5 mm) and Under in Nominal OD or Least Distance Between Parallel Sides: Cold finished, suitable for machining on high speed automatic screw machines.

3.2.2 Bars and Mechanical Tubing Over 2.50 Inches (62.5 mm) in Nominal OD or Least Distance Between Parallel Sides: Hot finished, and normalized or otherwise heat treated to produce best machining qualities.

3.2.3 Forgings: Normalized or otherwise heat treated to produce best machining qualities.

3.2.4 Forging Stock: As ordered by the forging manufacturer.

3.3 Properties:

The product shall conform to the following requirements; hardness testing shall be performed in accordance with ASTM E 10 on the surface except on rounds, where a flat as necessary for Brinell accuracy may be made:

3.3.1 Hardness: The product shall have hardness as follows, or equivalent (See 8.2):

3.3.2 Bars and Mechanical Tubing:

TABLE 2

Nominal OD or Least Distance Between Parallel Sides Inches	Nominal OD or Least Distance Between Parallel Sides Millimeters	Brinell Hardness HB min	Brinell Hardness HB max
Up to 0.625, incl	Up to 15.75, incl	207	255
Over 0.625 to 1.000, incl	Over 15.75 to 25.00, incl	187	255
Over 1.000 to 3.000, incl	Over 25.00 to 75.00, incl	170	241
Over 3.000	Over 75.00	149	217

3.3.3 Forgings: 163 to 229 HB, or equivalent (See 8.2).

3.4 Quality:

The product, as received by purchaser, shall be uniform in quality and condition, sound, and, consistent with the type of steel involved, free from foreign materials and from imperfections detrimental to usage of the product.

3.5 Tolerances:

Shall conform to all applicable requirements of the following:

3.5.1 Bars: AMS 2231 or MAM 2231.

3.5.2 Mechanical Tubing: AMS 2253 or MAM 2253.

4. QUALITY ASSURANCE PROVISIONS:

4.1 Responsibility for Inspection:

The vendor of the product 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 product conforms 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 as follows:

4.3.1 Bars, Mechanical Tubing and Forging Stock: In accordance with AMS 2370.

4.3.2 Forgings: In accordance with AMS 2372.

4.4 Reports:

The vendor of the product shall furnish with each shipment a report showing the results of tests for chemical composition of each heat and for hardness of each lot, and stating that the product conforms to the other technical requirements. This report shall include the purchase order number, heat and lot numbers, AMS 5024J, size, and quantity. If forgings are supplied, the size and melt source of stock used to make the forgings shall also be included.

4.5 Resampling and Retesting:

Shall be as follows:

4.5.1 Bars, Mechanical Tubing and Forging Stock: In accordance with AMS 2370.

4.5.2 Forgings: In accordance with AMS 2372.

5. PREPARATION FOR DELIVERY:

5.1 Sizes:

Except when exact lengths or multiples of exact lengths are ordered, straight bars and mechanical tubing will be acceptable in mill lengths of 6 to 20 feet (2 to 6 m) but not more than 10% of any shipment shall be supplied in lengths shorter than 10 feet (3 m).

5.2 Identification:

The product shall be as follows:

5.2.1 Bars and Mechanical Tubing: In accordance with AMS 2806.

5.2.2 Forgings: In accordance with AMS 2808.

5.2.3 Forging Stock: As agreed upon by purchaser and vendor.