ADOPTION NOTICE

SAE-AMS-QQ-A-225/6, "Aluminum Alloy, 2024, Bar, Rod, and Wire; Rolled, Drawn, or Cold Finished", was adopted on 30-JUN-98 for use by the Department of Defense (DoD). Proposed changes by DoD activities must be submitted to the DoD Adopting Activity: Commander, Defense Industrial Supply Center, 700 Robbins Avenue, Philadelphia, PA 19111-5096. DoD activities may obtain copies of this standard from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094. The private sector and other Government agencies may purchase copies from the Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096.

Custodians:
Army - MR
Navy - AS
Air Force - 11
DLA - IS

Adopting Activities:
DLA - IS
(Project 9525-0233-006)

FSC 9525

DISTRIBUTION STATEMENT A: Approved for public release; distribution is unlimited.

SAE The Engineering Society For Advancing Mobility Land Sea Air and Space®
INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE MATERIAL SPECIFICATION

SAE AMS-QQ-A-225/6

Issued JUL 1997

Submitted for recognition as an American National Standard

ALUMINUM ALLOY, 2024, BAR, ROD, AND WIRE; ROLLED, DRAWN, OR COLD FINISHED

UNS A92024

NOTICE

This document has been taken directly from Federal Specification QQ-A-225/6E, and Amendment 1 and contains only minor editorial and format changes required to bring it into conformance with the publishing requirements of SAE technical standards.

The original Federal Specification was adopted as an SAE standard under the provisions of the SAE Technical Standards Board (TSB) Rules and Regulations (TSB 001) pertaining to accelerated adoption of government specifications and standards. TSB rules provide for (a) the publication of portions of unrevised government specifications and standards without consensus voting at the SAE Committee level, (b) the use of the existing government specification or standard format, and (c) the exclusion of any qualified product list (QPL) sections.

The complete requirements for procuring 2024 aluminum alloy bar, rod, and wire, rolled, drawn, or cold finished shall consist of this specification and the latest issue of AMS-QQ-A-225.

1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers the specific requirements for 2024 aluminum alloy bar, rod and wire produced by rolling, drawing or cold finishing.

1.2 Classification:

1.2.1 Tempers: Bar, rod, and wire are of the following tempers as specified (See 6.2): O, T4, T6, T36, T42, T62, T351, or T851 temper. Definitions of these tempers are specified in AMS-QQ-A-225.

2. APPLICABLE DOCUMENTS:

See AMS-QQ-A-225.

QUESTIONS REGARDING THIS DOCUMENT: (412) 772-7154 FAX: (412) 776-0243
TO PLACE A DOCUMENT ORDER: (412) 776-4970 FAX: (412) 776-0790

3. REQUIREMENTS:

3.1 Chemical Composition:

The chemical composition shall conform to the requirements specified in Table I.

TABLE I. Chemical Composition 1/

Element	Percent	
	Minimum	Maximum
Copper	3.8	4.9
Magnesium	1.2	1.8
Manganese	0.30	0.9
Iron	-	0.50
Silicon	-	0.50
Zinc	-	0.25
Chromium	-	0.10
Titanium	-	0.15
Other Elements, each	-	0.05
Other Elements, total	-	0.15
Aluminum	Remainder	

1/ Analysis shall routinely be made only for the elements specifically mentioned in Table I. If, however, the presence of other elements is indicated or suspected in the course of routine analysis, further analysis shall be made to determine conformance to the limits specified for other elements.

3.2 Mechanical Properties:

3.2.1 Mechanical Properties of Material as Supplied: The mechanical properties in the direction of working shall conform to the requirements of Table II for the temper specified.

TABLE II. Mechanical Properties (See 6.4)

Temper	Diameter or Thickness Inches	Tensile Strength minimum ksi	Yield Strength at 0.2 percent Offset or at Extension Indicated 7/ minimum, ksi	Extension under Load, inch/inch	Elongation in 2 in. or 4 times diameter 7/ minimum percent
O	Up to 8.000, incl	35.0 2/	-	-	16
T4	Up to 0.499, incl	62.0	45.0 3/	0.0063	10
	0.500 through 4.500 4/	62.0	42.0 3/	0.0060	10
	4.501 through 6.500 5/	62.0	40.0	0.0058	10
	6.501 through 8.000 5/	58.0	38.0	0.0056	10
T6	Up to 6.500, incl 4/	62.0	50.0	0.0067	5
T36	Up to 0.375, incl	69.0	52.0	0.0069	10
T42 6/	Up to 6.500, incl 4/	62.0	40.0	0.0058	10
T62 6/	Up to 6.500, incl 4/	60.0	46.0	0.0064	5
T351 1/	0.500 through 6.500 4/	62.0	45.0	0.0063	10
T851 1/	0.500 through 6.500 4/	66.0	58.0	0.0074	5

1/ Tempers T351 and T851 are available only in bar and rod
2/ Maximum
3/ Minimum yield strength of coiled 2024-T4 wire and rod is 40.0 ksi
4/ For square, rectangular, hexagonal, or octagonal bar maximum thickness is 4 inches, and maximum cross-sectional area is 36 square inches
5/ Applicable to rod only
6/ Material in the T42 and T62 tempers are not available from the material producers
7/ See AMS-QQ-A-225 for yield strength and elongation requirement exceptions

3.2.2 Mechanical Properties for Aging Capability: In addition to conforming to the requirements of 3.2.1, material supplied in the tempers identified in the following paragraphs shall, after having been processed to tempers also identified therein, have properties conforming to those specified in Table II, as applicable, in the direction of work. Such capability shall be demonstrated when specified (See 6.2).

3.2.2.1 Material in the Annealed (O) Temper: Material up through 6.500 inches in diameter or 4 inches in thickness and 36 inches in cross-sectional area supplied in the O temper, without subsequent cold work or forming operations, shall, after proper re-solution and artificial aging or natural aging, develop the properties specified for the T62 or T42 tempers respectively.

3.2.2.2 Material in the T4, T6, T36, T351, and T851 Tempers: Material supplied in the T4, T6, T36, T351, and T851 tempers shall, without subsequent cold work or forming operations, be re-solution heat treatable and aged to the properties specified for the T62 or T42 tempers.

3.2.2.3 Material in the T4 and T351 Tempers: Material supplied in the T4 and T351 tempers shall be artificially aged to the properties specified for the T6 and T851 tempers, respectively. Such capability shall be demonstrated when specified (See 6.2).

3.2.3 Bending: When specified (See 6.2), the material shall withstand, without cracking, the bend test specified in AMS-QQ-A-225. The values for bend factor N are given in Table III.

TABLE III. Bend Test Factor "N"

Temper	Diameter, Thickness or Least Distance Between Parallel Faces, Inches	N
O	Up to 0.124, incl	1
T351, T4, T42	Up to 0.124, incl	3
	0.125 to 6.500, incl	6

3.3 Finish:

See AMS-QQ-A-225.

3.4 Marking:

In addition to marking required in AMS-QQ-A-225, material in the T4, T6, T36, T62, T351, and T851 tempers shall also be identified by a lot number marked in at least one location on each piece.