

AEROSPACE MATERIAL SPECIFICATION

Submitted for recognition as an American National Standard

Aluminum Alloy 6066, Bar, Rod, Shapes,
Tube, and Wire, Extruded

UNS A96066

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The complete requirements for procuring aluminum alloy 6066 bar, rod, shapes, tube, and wire extruded described herein shall consist of this document and the latest issue of AMS-QQ-A-200.

1. SCOPE AND CLASSIFICATION:

1.1 Scope:

This specification covers the specific requirements for aluminum alloy 6066 bar, rod, shapes, tube, and wire produced by extrusion.

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1.2 Classification:

1.2.1 Tempers: Bar, rod, shapes, tube, and wire are classified in the following tempers as specified (See 6.2): O, T4, T42, T4510, T4511, T6, T62, T6510, or T6511. Definitions of tempers are specified in AMS-QQ-A-200.

1.2.2 Tubing: Tubing shall be additionally classified as follows:

<u>Type</u>	<u>Description</u>
I	- Tubing extruded from hollow billets using die and mandrel (See AMS-QQ-A-200).
II	- Tubing extruded from solid billets using a porthole or spider die or similar tooling (See AMS-QQ-A-200).

2. APPLICABLE DOCUMENTS:

See AMS-QQ-A-200.

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
Magnesium	0.8	1.4
Silicon	0.9	1.8
Iron	-	0.50
Copper	0.7	1.2
Titanium	-	0.20
Manganese	0.6	1.1
Zinc	-	0.25
Chromium	-	0.40
Other Elements, each	-	0.05
Other Elements, total <u>2/</u>	-	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 amounts greater than the specified limits, further analysis shall be made to determine that these elements are not present in excess of specified limits.

2/ The sum of those "Others" metallic elements 0.010 percent or more each, expressed to the second decimal before determining the sum.

3.2 Mechanical Properties:

3.2.1 Mechanical Properties of Material as Supplied: The mechanical properties in the direction of extrusion shall conform to requirements specified in Table II (See AMS-QQ-A-200 for exceptions to elongation requirements).

TABLE II. Mechanical Properties

Temper	Thickness, (bar and shapes); diameter, (rod and wire); wall thickness, (tube) Inches	Area Square Inches	Tensile Strength Minimum ksi	Yield Strength at 0.2 percent Offset or at extension indicated		Elongation in 2 inches or 4 times D ^{1/} Minimum percent
				Minimum ksi	Extension under load, inch per inch	
O	All	All	<u>2/</u>	<u>2/</u>	0.0038	16
T4, T4510, T4511 <u>3/</u>	All	All	40.0	25.0	0.0045	14
T42 <u>4/</u>	All	All	40.0	24.0	0.0044	14
T6, T6510, T6511 <u>3/</u>	All	All	50.0	45.0	0.0065	8
T62 <u>4/</u>	All	All	50.0	42.0	0.0062	8

^{1/} D represents specimen diameter.

^{2/} No minimum. Maximum tensile and yield strengths shall be 29.0 ksi and 18.0 ksi, respectively.

^{3/} For stress-relieved tempers, the characteristics and properties, other than those specified, may differ somewhat from the corresponding characteristics and properties of material in the basic temper.

^{4/} Material in the T42 and T62 tempers is not available from material producers.

3.2.2 Mechanical Properties After Heat Treatment: In addition to conforming to requirements of 3.2.1, materials identified in the following paragraphs shall, after having been heat-treated to other tempers also identified therein, have properties in the extrusion direction conforming to those specified in Table II, as applicable.

3.2.2.1 Material in the O Temper: Material in the O temper, without the subsequent imposition of cold work or forming operations, shall, after proper solution heat treatment and natural aging, develop the properties specified in Table II for the T42 temper.

3.2.2.2 Material in the T4, T4510, T4511, T6, T6510, and T6511 Tempers: Material in the T4, T4510, T4511, T6, T6510, and T6511 tempers shall, without the subsequent imposition of cold work or forming operations, be capable of being re-solution heat treated and naturally aged to the properties specified for the T42 temper. Such capability shall be demonstrated when specified (See 6.2).