

AEROSPACE MATERIAL SPECIFICATION

SAE AMS-7857

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Submitted for recognition as an American National Standard

COLUMBIUM ALLOY BARS, RODS, AND EXTRUSIONS 10Hf - 1.0Ti Recrystallization Annealed

UNS R04295

1. SCOPE:

1.1 Form: This specification covers a columbium alloy in the form of bars, rods, and extrusions.

1.2 Application: Primarily for parts requiring exposure at ultra-high temperatures. Applications in oxidizing atmospheres necessitate a protective coating.

2. APPLICABLE DOCUMENTS: The following publications form a part of this specification to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order.

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

2.1.1 Aerospace Material Specifications:

AMS-2809 - Identification, Titanium and Titanium Alloy Wrought Products

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2.2 ASTM Publications: Available from ASTM, 1916 Race Street, Philadelphia, PA 19103-1187.

ASTM E 3 - Preparation of Metallographic Specimens
 ASTM E 8 - Tension Testing of Metallic Materials
 ASTM E 8M - Tension Testing of Metallic Materials (Metric)
 ASTM E 18 - Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials
 ASTM E 112 - Determining of Average Grain Size
 ASTM E 384 - Microhardness of Materials

2.3 U.S. Government Publications: Available from Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.

2.3.1 Military Standards:

MIL-STD-163 - Steel Mill Products, Preparation for Shipment and Storage

3. TECHNICAL REQUIREMENTS:

3.1 Composition: Shall conform to the following percentages by weight; gaseous elements shall be determined by vacuum fusion gas analysis, carbon shall be determined conductometrically, columbium by difference, and other metallic elements by spectrochemical methods or other analytical methods acceptable to purchaser:

	min	max	Check Analysis Under min or over max
Hafnium	9.00	11.00	0.15
Titanium	0.70	1.30	0.07
Zirconium	--	0.70	0.05
Tungsten	--	0.50	0.03
Tantalum	--	0.50	0.05
Carbon	--	0.015	None
Oxygen	--	0.0225 (225 PPM)	None
Nitrogen	--	0.015 (150 PPM)	None
Hydrogen	--	0.0015 (15 PPM)	None
Other Elements, total (3.1.1)	--	0.3	None
Columbium	remainder		

3.1.1 Determination not required for routine acceptance.

3.2 Condition: Hot or cold worked, descaled, and recrystallization annealed.

3.3 Properties: The product shall conform to the following requirements: