

Broder Aerospace

AMS5663

COMMON NAMES:

Alloy 718

UNS N07718

FORM & USE:

AMS5662 is a corrosion and heat resistant nickel alloy. We stock round bar in the annealed condition. The material is typically used in aerospace, oil and gas and general engineering applications which require high resistance to creep and stress rupture up to 704° C and oxidation resistance up to 982°C. The material can be welded. After forming or welding, the material can be precipitation heat treated to meet AMS5663.

We supply material in the hot finished, solution and precipitation heat treated, and descaled, ground or turned condition.



GENERAL:

Tolerances in accordance with AMS2261

Bars are not cut from plate.

SIZES STOCKED:

12.7 mm diameter – 241.3 mm diameter.

CHEMISTRY:

C	Mn	Si	P	S	Cr	Ni	Mo	Nb (Cb)	Ti
<0.08	<0.35	<0.35	<0.015	<0.015	17.00 -	50.00 -	2.80 -	4.75 -	0.65 -
					21.00	55.00	3.30	5.50	1.15
Al	Co	B	Cu	Pb	Bi	Se	Fe		
0.20 - 0.80	<1.00	<0.006	<0.30	<0.0005 (5ppm)	<0.00003 (0.3ppm)	<0.0003 (3ppm)	Balance		

MELTING PRACTICE:

Material is multiple melted using consumable electrode practice in the remelt cycle OR is induction melted under vacuum. If consumable electrode remelting is not performed in vacuum, electrodes which have been produced by vacuum induction are used for remelting.

HEAT TREATMENT:

Solution heat treated by heating to 941°C – 1010°C, holding at temperature for a time commensurate with cross-sectional thickness, and cooling in air (faster methods permitted)

Precipitation heat treatment by heating to 718°C – 760°C, holding at temperature for approximately 8 hours, then cool at 48°C – 64°C per hour to a temperature within range 621°C – 649°C, then holding at temperature for approximately 8 hours and finally cool in air. Instead of the cooling rate of 48°C – 64°C, the material may be furnace cooled at any rate, provided that the total precipitation heat treatment time is adjusted to approximately 18 hours.

Pyrometry in accordance with AMS2570.

FINISH:

Material is supplied hot finished, annealed, ground or turned.

MATERIAL PROPERTIES:

Grain Size:

Determined in accordance with ASTM E112.

Up to 58cm² in cross-sectional area – ASTM No. 5 or finer (up to 20% of material permitted to have average grain size of ASTM No 3 to 5)

From 58cm² to 503cm² cross-sectional area – ASTM No. 4 or finer (up to 20% of material permitted to have average grain size of ASTM No 2 to 4)

Microstructure:

Product is free from Laves phase. Banding of acicular phase and the amount of acicular phase are determined by the purchaser. If not specified, material is sold as is.

Tensile Properties: determined in accordance with ASTM A370 on specimens taken in the longitudinal direction from product less than 254 mm in diameter.

	Minimum Tensile Strength Ksi	Minimum Yield strength at 0.2% Offset Ksi	Minimum Elongation in 2" or 4d %	Minimum Reduction of Area %	Hardness
At room temperature					
Longitudinal up to 254 mm dia	185	150	12	15	<331 HB
Transverse up to 127 mm dia	180	150	6	8	<331 HB
Transverse from 127 mm – 254 mm dia	180	145	6	8	<331 HB
At 1200°F (649°C)					
Longitudinal up to 127 mm dia	145	125	12	15	-
Longitudinal 127 mm dia up to 254 mm dia	145	122	12	15	-
Transverse up to 127 mm dia	140	125	6	8	-
Transverse from 127 mm – 254 mm dia	140	122	6	8	-

A “-“ indicates no requirement for the property.

The AMS standard states that material shall not be rejected on hardness if the tensile properties are acceptable.

Stress Rupture Properties:

Performed in accordance with ASTM E292 (notched specimens and smooth-and-notched specimens) or ASTM E139 (smooth specimens).

ASTM E292: a notched specimen at 649°C with a load sufficient to produce an axial stress of 100 ksi (or higher) is applied continuously. Stress rupture to occur in not less than 23 hours. Test is continued to rupture without change of load. Elongation after rupture (measured at room temperature) is not less than 4% in 4D for product 127 mm and under in diameter.

Incremental loading - after 23 hours a further +6 ksi load can be applied at 8 hourly intervals until rupture.

Production, distribution, and procurement of metal stock complies with AMS6279.

Full material traceability, with anti-counterfeit measures, is maintained at all times, and full certification is provided, including producer's name and country where the material was melted.

For a quotation please telephone ++44 (0)114 232 9243, email sales@broder-aerospace.com or use the quotation page on our website: <http://www.broder-aerospace.com>