



BRODER METALS GROUP 718

Alloy 718 is a precipitation hardenable nickel chromium alloy. As the major alloy elements are molybdenum, niobium + tantalum, aluminium and titanium, Alloy 718 gives exceptionally high yield, good corrosion resistance, tensile and creep rupture properties at temperatures up to 700C (1300F).

Broder Metals Group stocks Alloy 718 in sizes from 1/2" (12.7 mm) to 4" (101.6 mm) backed up by key sizes above this core range. Our stock is bought to API 6A 718 and NACE and as such meets most application uses for the oil industry to maximise resistance to stress corrosion cracking or treated to give maximum strength and high creep resistance and weldability.

Ideal applications for Alloy 718 are in oil tools, such as gate valves, choke stems, etc., and high strength applications such as fasteners and turbines.

However, our experience allows us to stock and supply Alloy 718 round bar to the full range of the following specifications:

API 6A 718 (December 2009)

ASTM B637

AMS 5662

AMS 5663

UNS N07718

NACE MR0175/ISO 15156-3

Our Alloy 718 bar stock sizes start at 12.7 mm and we can supply in a variety of forms including rings, blocks, discs, black forgings and pre-machined bar.

Nominal Chemical Composition by Percent:

	Ni	Cr	Fe	Cb+Ta	Mo	Ti	Al	C	Co	Mn	
Min	50.0	17.0	Bal	4.87	2.80	0.8	0.4	-	-	-	%
Max	55.0	21.0	-	5.2	3.30	1.15	0.6	0.045	1.0	0.35	%

	Si	P	S	B	Cu	Pb	Se	Bi	Ca	Mg	
Min	-	-	-	-	-	-	-	-	-	-	%
Max	0.35	0.01	0.01	0.006	0.23	0.001	0.0005	0.00005	0.003	0.006	%

Melt Practice: according to API 6A 718, usually VIM+ESR

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Heat Treatment

Cycle	Temperature	Time	Cooling Medium
Solution Anneal	1021-1052 deg C	1-2.5 hours	Air, Water, Polymer or Oil to ambient temp.
Age harden	774-802 deg C	6-8 hours	Air cool or faster to ambient temp.

Heat treatment temperatures are monitored either by contact surface thermocouple or heat sink.

Typical Mechanical Properties

Solution Annealed & Precipitation Treated (Aged)	KSI	MPa	%	
Tensile Strength, min	150	1034	-	
Yield Strength (0.2% offset) range	120 - 145	827-1000	-	
Elongation in 2" (or 50mm) or 4D, min	-	-	20	
Reduction of Area min	-	-	35*	
Hardness (Rockwell)	-	-	-	32-40 HRC 298-363 HBW
Grain Size (ASTM E112)				2 or finer
Charpy V Notch	Test Temperature: -60° C < 76.2 mm – longitudinal, min single 61 J, Average 68 J 76.2 – 254 mm – transverse, min single 47 J			

*QTC cross section <= 25.4mm. If =>25.4mm R of A should be 25% min.

No topological duplex grain size (ASTM E1181) allowed, material is free from deleterious phases.

We have our own certified NDT ultrasonic operators on site and can offer examinations to API 6A PSL 3 or ISO 10423 (to method ASTM A388)

Alloy 718 is just one of the nickel alloys stocked by Broder Metals Group Ltd – please see our website for the full range stocked: www.broder-metals-group.com

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