

BRODER METALS – 718 API

UNS N07718 (Nickel Alloy 718 otherwise known as Inconel 718 Nickel Alloy) is a precipitation-hardened nickel alloy. The addition of niobium, molybdenum, aluminum and titanium provides a metal that is strength, with excellent creep-stress, rupture strength and good corrosion resistance. It is easy to weld and durable at high temperatures, although has a spread of operating temperatures of between 200°C and +500°C

Equivalents/Common Names/Standards		
UNS	N07718	
Standard	API6ACRA	Age-hardened Nickel-based Alloys for Oil and Gas Drilling and Production Equipment
	API20F	Processing requirements for corrosion resistant alloys used for bolting.
Werkstoffe	2.4668	
Other Bodies	NACE MRO175	Heat treatment and hardness limits for use in our service
	ISO 15156-1	Petroleum and natural gas industries – materials for use in H ₂ S-containing environments in oil and gas production – part 1: general principles for selection of cracking-resistant materials
	ISO 15156-3	Petroleum and natural gas industries – materials for use in H ₂ S-containing environments in oil and gas production – part 3: general principles for selection of cracking-resistant CRAs



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Broder Metals Group stocks Alloy 718 roundbar compliant to API 6A CRA in sizes from ½" (12.7mm) to 12" (304.8mm) in diameter.

Our stock is bought to meet API 6A CRA to the material designation 120K* and NACE MRO175/ISO 151156 and as such meets most application uses for the oil industry.

However, we are used to comparing our material to industry end-user specifications, and retesting (under 3.2 conditions if required) to show compliance.

*The designation refers to the latest API 6A CRA split of Alloy 718 into two classes according to the minimum requirement of the 0.2% yield strength, being either 120 KSI or 140 KSI, and hardness of 32-40 HRC. However, a recent NACE addition permitted a yield strength of above 150KSI and hardness of up to 45HRC subject to meeting specific melting times and temperature. We are currently evaluating whether to stock this option – please contact us if you are interested.

Alloy 718 is dual melted to provide a clear and fine grain structure – usually VIM (Vacuum Induction Melted) & VAR (Vacuum Arc Remelted) or ESR (ElectroSlag Remelted), while Alloy 718 chemistry reflects the superior make-up which provides the large range of benefits accruing from the material.



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Alloy 718 API BA CRA Chemistry:

Alloy 718 API 6A CRA		
	Min	Max
Nickel	50.000	55.000
Chromium	17.000	21.000
Niobium + Tantalum	4.870	5.200
Molybdenum	2.800	3.300
Titanium	0.800	1.150
Aluminium	0.400	0.600
Carbon	-	0.045
Cobalt	-	1.000
Manganese	-	0.350
Silicon	-	0.350
Phosphorus	-	0.010
Sulphur	-	0.010
Boron	-	0.006
Copper	-	0.230
Lead	-	0.001
Selenium	-	0.0005
Bismuth	-	0.00005
Calcium	-	0.003
Magnesium	-	0.006
Iron	Balance	

Nikel Alloy 718 density is 8.22g/cm³ in the aged condition



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