

INCONEL® alloy 718 (UNS N07718/W.Nr. 2.4668) is a high-strength, corrosion-resistant nickel chromium material used at -423° to 1300°F. Typical composition limits are shown in Table 1.

The age-hardenable alloy can be readily fabricated, even into complex parts. Its welding characteristics, especially its resistance to postweld cracking, are outstanding.

The ease and economy with which INCONEL alloy 718 can be fabricated, combined with good tensile, fatigue, creep, and rupture strength, have resulted in its use in a wide range of applications. Examples of these are components for liquid fueled rockets, rings, casings and various formed sheet metal parts for aircraft and land-based gas turbine engines, and cryogenic tankage. It is also used for fasteners and instrumentation parts.

PHYSICAL CONSTANTS AND THERMAL PROPERTIES

Some physical constants of INCONEL alloy 718 are shown in Table 2. Modulus data appear in Tables 3 and 4, and thermal properties in Table 5. The values in these tables will vary slightly, depending on the composition and condition of the specimen tested. They are typical but are not suitable for specification purposes.

Table 1 - Limiting Chemical Composition^a, %

Nickel (plus Cobalt).....	50.00-55.00
Chromium.....	17.00-21.00
Iron.....	Balance*
Niobium (plus Tantalum).....	4.75-5.50
Molybdenum.....	2.80-3.30
Titanium.....	0.65-1.15
Aluminum.....	0.20-0.80
Cobalt.....	1.00 max.
Carbon.....	0.08 max.
Manganese.....	0.35 max.
Silicon.....	0.35 max.
Phosphorus.....	0.015 max.
Sulfur.....	0.015 max.
Boron.....	0.006 max.
Copper.....	0.30 max.

^aConforms to AMS specifications

*Reference to the 'balance' of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.

Table 2 - Physical Constants

Density, lb/in ³	
Annealed.....	0.296
Annealed and Aged.....	0.297
Melting Range, °F.....	2300-2437
°C.....	1260-1336
Specific Heat at 70°F, Btu/lb °F (at 21°C, J/kg °C).....	0.104 (435)
Curie Temperature, °F (°C)	
Annealed Material.....	<-320 (<-196)
Annealed and Aged Material.....	-170 (-112)
Permeability at 200 oersted and 70°F	
Annealed Material.....	1.0013
Annealed and Aged Material.....	1.0011