ALLOY 625

AMS 5599 / AMS 5666 / UNS N06625 / UNS N06626-625LCF

Inconel® 625 (AMS 5599, UNS N06625) is a nickel-based superalloy with excellent resistance to oxidation and corrosion. The nickel-chromium matrix of this material is reinforced by the addition of molybdenum and niobium, which is alloyed through solid solution strengthening. This process allows alloy Inconel® 625 to maintain high strength and toughness at temperatures ranging from cryogenic up to 1800°F (982°C). It is non-magnetic, austenitic, and displays high tensile strength, fabricability, and brazeability. Due to its high nickel content, this alloy is nearly immune to chloride ion stress-corrosion cracking and pitting, which is commonly found in thin-walled seawater applications like heat exchangers, fasteners, and cable sheathing. We sell alloy 625 materials in sheet, coil, plate and round bar.

Products & Sizes				
Coil	Sheet	Plate	Bar	Precision Reroll Strip
0.016" - 0.130"	0.016" - 0.130"	0.1875" - 2.000"	0.375" - 8.750"	0.0008" - 0.015"

625 Chemical Composition			
	Element	Min	Max
C	Carbon	-	0.010
Mn	Manganese	-	0.50
P	Phosphorus	-	0.015
S	Sulfur	-	0.015
Si	Silicon	-	0.50
Cr	Chromium	20.00	23.00
Ni	Nickel	-	Balance
Mo	Molybdenum	8.00	10.00
Nb	Columbium	3.15	4.15
Ti	Titanium	-	0.40
Al	Aluminum	-	0.40
Ta	Tantalum	-	0.05
Fe	Iron	-	5.00

Industry Standards

- EMS95377
- EN 2.4856
- EN 10204
- DFARS Compliant
- RR SABRe Edition 2
- GE Aircraft Engine (GT193)
- GE Aviation S-SPEC-35 AeDMS S-400
- PWA LCS

Industry Applications

- Aerospace components
- Fasteners
- Chemical Processing
- Propeller blades
- Submarine propulsion motors
- Utility boat exhaust ducts
- Steam-line bellows
- Heat Exchangers
- Flue gas desulfurization scrubbers
- Chemical processing equipment for oxidizing and reducing acids
- Marine components exposed to seawater, such as fasteners and cable connectors

Related Industries

Physical Properties

Property	Value
Density	0.303 lb/in^3 (8.44 g/cm^3)
Specific Gravity	8.44
Melting Range	2350 - 2460°F (1280 - 1350°C)
Specific Heat	0.098 Btu/lb x °F (410 Joules/kg x °K)
Magnetic Permeability (75°F, 200 oersted)	1.0006

Thermal Conductivity					
Temperature Range		Linear Coefficients of Thermal Expansion[1] · 10^{-6}		Thermal Conductivity[2 3]	
°C	°F	/°C	/°F	W/m·K	Btu/(hr/ft²/in/°F)
-157	-250	-	-	7.3	4.2
-129	-200	-	-	7.4	4.3
-73	-100	-	-	8.3	4.8
-18	0	-	-	9.2	5.3
21	70	-	-	9.9	5.7
38	100	-	-	10.0	5.8
93	200	12.8	7.1	10.7	6.3
204	400	13.1	7.3	12.6	7.3
316	600	13.3	7.4	14.2	8.2
427	800	13.7	7.6	15.7	9.1
538	1000	14.0	7.8	17.5	10.1
649	1200	14.8	8.2	19.0	11.0
760	1400	15.3	8.5	20.8	12.0
871	1600	15.8	8.8	22.8	13.2
927	1700	16.2	9.0	-	-
982	1800	-	-	25.3	14.6

1. Average coefficient from 70°F (21°C) to temperature shown
2. Measurements made at Battelle Memorial Institute
3. Material annealed 2100°F (1149°C)

Electrical Resistivity		
Temperature		microhm-cm
°C	°F	
21	70	128.9
38	100	129.6
93	200	131.9
204	400	133.9
316	600	134.9
427	800	135.9
538	1000	137.9
649	1200	137.9
760	1400	136.9
871	1600	135.9
982	1800	134.9
1093	2000	133.9

Mechanical Properties

Mechanical Properties and Yield Strength of Alloy 625						
Temperature		0.2% Yield Strength		Ultimate Tensile Strength		Elongation Percent
°F	°C	psi	MPa	psi	MPa	
1920	1065	63,000	430	136,000	940	51.5