Inconel 825 Pipe & Tube (UNS N08825/WNR 2.4858)

Inconel 825 is a nickel-iron-chromium alloy with additions of copper, molybdenum, and titanium. It can be supplied in the hot worked and annealed condition. It attains good mechanical properties from cryogenic to medium-high temperatures (540°C) and can be outstandingly strengthened through cold working.

It has high nickel content which ensures stress corrosion cracking resistance, combined with copper and molybdenum to strongly resist reducing environments such as chromium, sulphuric and phosphoric acids, to resist oxidising environments such as nitric acid, titanium to inhibit intergranular corrosion, and overall pitting and crevice corrosion resistance.

Inconel 825 Features

- Good stress corrosion cracking resistance
- Good resistance to pitting and crevice corrosion
- Good oxidation resistance and non-oxidizing thermal acid performance
- Good mechanical properties at room temperature and high temperatures up to 550°C
- With the certification of the pressure vessel manufacturing temperature up to 450°C

Inconel 825 Corrosion Resistance

It is a general engineering alloy, which has resistance to acid and alkali metal corrosion in both reduction and oxidation environments. The high nickel content makes it have effective resistance to stress corrosion cracking. It has good corrosion resistance in various media, such as nitric acid and organic acids, phosphoric acid, sulfuric acid, and alkali metals such as hydrochloric acid solutions, sodium hydroxide and potassium hydroxide. The high comprehensive performance of it is displayed in nuclear combustion dissolvers with various corrosive media, such as nitric acid, sulfuric acid, and sodium hydroxide, which are all processed in the same equipment.

Inconel 825 Applications

- Valves
- Flanges
- Pipe fittings
- Heat exchange tubes
- Food engineering, chemical process
- Air heat exchanger in petroleum refining
- Flame retardant alloy for high pressure oxygen application
- Heat exchanger, evaporator, washing, dip tube, etc. in phosphoric acid production
- Heating pipes, containers, baskets and chains used in sulfuric acid pickling plants
- Sea water cooling heat exchanger, marine product pipeline system, acid gas environment pipeline

Incoloy 825 Physical Properties

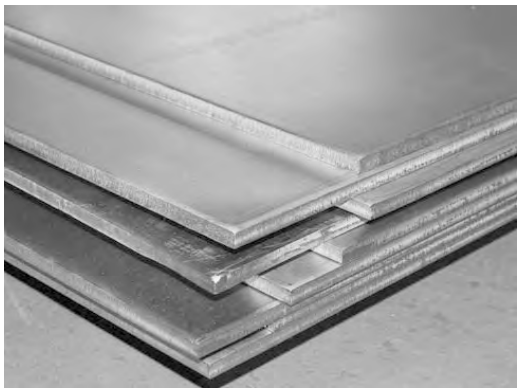
Density	Melting Range		Specific Heat		Electrical Resistivity
g/cm^3	°C	°F	J/kg. k	Btu/lb.°F	μΩ·m
8.14	1370-1400	2500-2550	440	0.105	1130

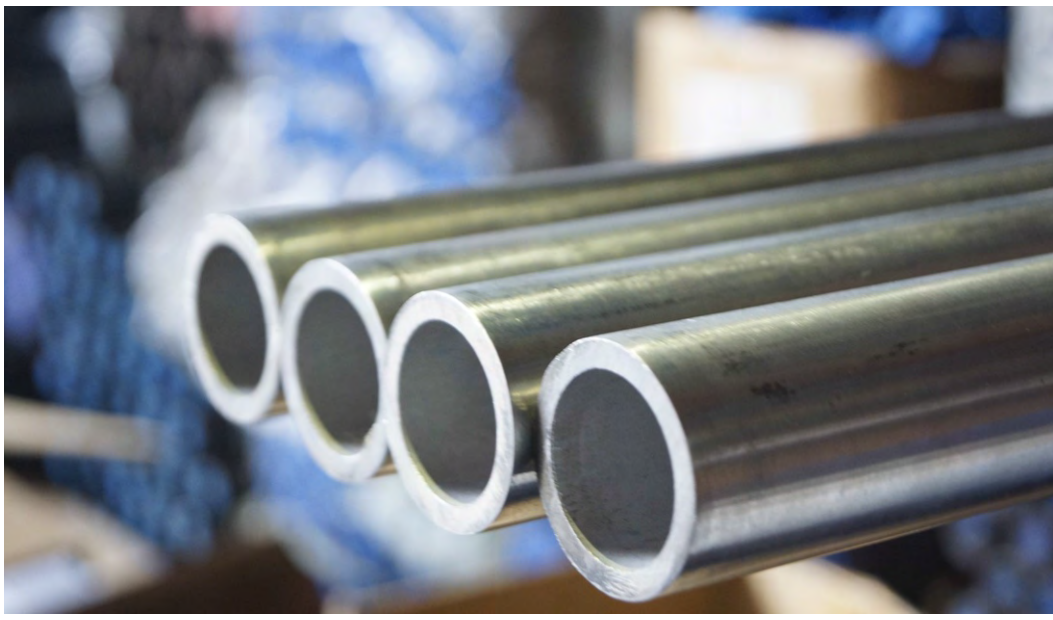
Incoloy 825 Mechanical Properties

Tensile Strength, min.		Yield Strength, min.		Elongation, min	Elastic Modulus	
Mpa	Ksi	Mpa	ksi	%	Gpa	106psi
690	100	310	45	44	206	29.8

Incoloy 825 Chemical Composition

Element	%
Carbon	≤0.05
Manganese	≤1.00
Chromium	19.5-23.5
Molybdenum	2.5-3.5
Sulfur	≤0.030
Silicon	≤0.50
Aluminum	≤0.20
Copper	1.5-3.0
Titanium	0.6-1.2
Nickel	38.0-46.0
Iron	≥22.0





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