Incoloy 800H Pipe & Tube (UNS N08810 / WNR 1.4958)

Incoloy 800H, is also known as "Alloy 800H". It has almost the similar chemical composition as Incoloy 800 except that it requires a higher carbon addition resulting in improved high-temperature properties. Its higher strength results from close control of carbon, aluminum and titanium contents in conjunction with a high temp anneal. The modification of Alloy 800H was to control carbon (0.05 to 0.10%) and grain size to (>ASTM 5) to optimize stress rupture properties.

It has better creep and stress-rupture characteristics in the 1100°F to 1800°F temperature range compared to **Incoloy 800.** It should be annealed at approximately 2100°F. It has a coarser average grain size in accordance with ASTM 5.

Incoloy 800H Characteristics

- Resistance to prolonged exposure to elevated temperatures
- Excellent resistance to oxidation, sulfidation, and carburization
- Added Carbon and annealing treatment allows for higher creep and rupture properties above 1100°F (600°C)
- Resistant to high temperature corrosion
- Readily machined by standard methods
- Best joined/welded using products for high temperature situations
- Resistance to aqueous corrosion at moderate temperatures

Incoloy 800H Applications

- Pallets, frames and fixtures used in heat treatment plants
- Steel wire split annealing and shoot tube, high-speed gas burner, wire mesh belt in industrial furnace
- Isolation tank in nitrogen reforming and catalytic support grid in nitric acid manufacturing
- Exhaust system components
- Combustion chamber of solid waste incinerator
- Pipe support and soot handling parts
- Exhaust gas detoxification system components
- Oxygen reheater

Incoloy 800H Mechanical Properties

Tensile Strength, min.		Yield Strength, min.		Elongation, min	Hardness, min.
Mpa	ksi	Mpa	ksi	%	HB
600	87	295	43	44	138

Incoloy 800H Physical Properties

Density	Melting Range		Specific Heat		Electrical Resistivity
g/cm^3	°C	°F	J/kg. k	Btu/lb.°F	μΩ·m
7.94	1357-1385	2475-2525	460	0.11	989

Incoloy 800H Chemical Composition

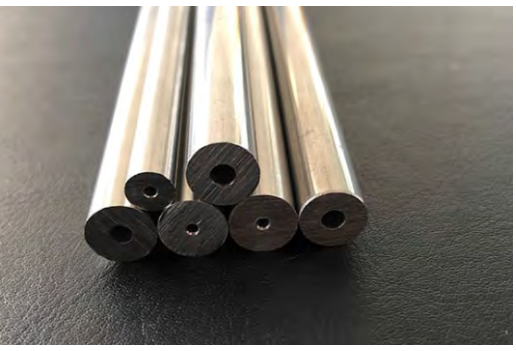
Element	%
Carbon	0.05-0.10
Manganese	≤1.50
Sulfur	≤0.015
Silicon	≤1.00
Chromium	19.0-23.0
Aluminum	0.15-0.60
Titanium	0.15-0.60
Nickel	30.0-35.0
Iron	≥39.5
Copper	≤0.75
Al+Ti	0.30-1.20

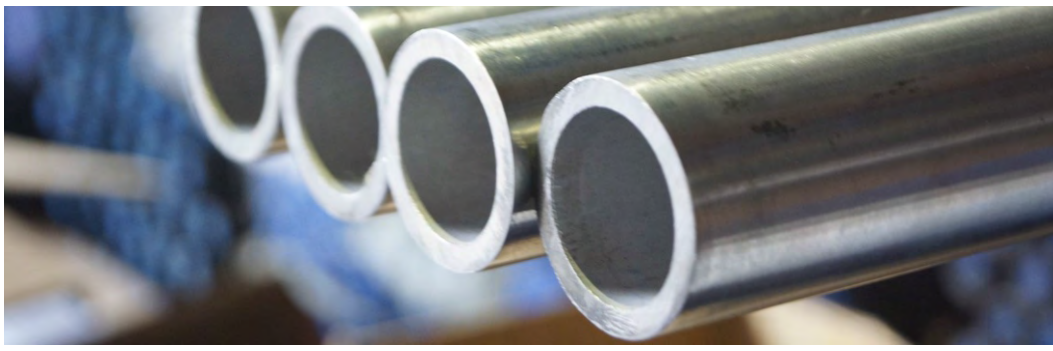
Incoloy 800 Corrosion Resistance

It has high nickel and chromium contents which results in excellent resistance to carburization, oxidation, and sulfidation. The high nickel content also increases nitriding resistance, although resistance could be lower than other alloys containing a higher percentage of nickel, such as alloy 600.

Incoloy 800 Fabrication and Heat Treatment

Its hot-working temperatures should be between 1600°F and 2200°F with heavy forming to be performed at temperatures above 1850°F. No forming should be performed between 1200°F to 1600°F and preheating of tools and dies to 500°F is suggested to avoid chill. Cooling after hot working should be as quick as possible, avoiding extensive time at temperatures between 1000°F and 1400°F. Cold working should be performed in the annealed condition. An additional stress relieving or annealing heat treatment may be necessary by the amount of strain induced by cold work during fabrication. Because excessive grain growth it can negatively affect mechanical properties so proper attention must be taken while selecting an annealing temperature and time at temperature for the process. If material is to be deformed more than 20% and a final anneal is desired, fine-grain material should be considered for the starting stock. Stress relief is performed between 1000°F to 1600°F and should be at temperature for 1 hour per inch of material or for a minimum of 1½ hours at 1600°F, whichever is greater. Recrystallization anneal is achieved at temperatures between 2100°F to 2200°F.





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