

## Material

Equivalent designation: GH20, UNS N08800, W.Nr.1.4876, Incoloy 800\*

\*Note that the designation "Incoloy 800" is registered trademark of the Special Metals Corporation group of companies.

## Overview

Alloy 800 series, a heat and corrosion resistant alloy with a relatively low nickel content, maintaining the ultimate chemical properties for high-temperature strength and resistance to oxidation, carburization and other types of high-temperature corrosion, has set the industry standard in high temperature applications requiring optimum creep and rupture properties.

## Application

Alloy 800 is used in a variety of applications involving exposure to corrosive environments and high temperatures. It is used for heat-treating equipment such as baskets, trays, fixtures, heat exchanger, heat transfer, boiler, etc.

## Chemical composition

wt%	Fe	Ni	Co	Cr	Mo	Ti	V	B
≥	39.55	30.00		19.00	/	0.15	/	/
≤		35.00	2.00	23.00	/	0.60	/	/

  

wt%	Cu	C	Al	Mn	Si	P	S
≥			0.15				
≤	0.75	0.10	0.60	1.50	1.00	0.030	0.015

## Physical property

(1) Density: 7.94 g/cm<sup>3</sup>

(2) Melting point: 1357-1385°C

(3) Processing: Various mill forms of Alloy 800 can be fabricated into finished articles and equipment by standard procedures. The alloy is readily formed by either hot working or cold working, and it has good weldability and machinability.

## Micro structure

Alloy 800 is an austenitic, solid-solution alloy. Titanium nitrides, titanium carbides, and chromium carbides normally appear in the alloy's microstructure. The nitrides are stable at all temperatures below the melting point and are therefore unaffected by heat treatment.

## Heat treatment

Because of the readiness with which chromium is oxidized into a refractory oxide by air, carbon dioxide or water vapor, Alloy 800 cannot be bright annealed in the usual industrial annealing furnace. Under closely controlled conditions, the alloy can be bright annealed in dry, pure hydrogen (dew point of -73°F (-58°C) or lower, less than 0.004% by volume water, and less than 0.007% by volume air).

Alloy 800 is normally annealed in box or muffle furnaces using prepared reducing atmospheres. A satisfactory atmosphere is formed by the products of combustion from low-sulfur natural gas burned with a deficiency of air. It produces a thin, adherent, green-black film of oxide on the material. Oxidizing atmospheres produce a heavy black scale that is difficult to remove. Removal of such scale often requires considerable grinding.

Specific annealing procedures depend on the amount of cold work and cross section of the material. The mechanical properties of heavily cold-worked material are only slightly affected by temperatures below 1000°F (540°C). Stress relief begins at about 1000°F (540°C) and is virtually complete after 1½ hours at 1600°F (870°C). Softening by annealing begins at about 1400°F (760°C) and is reasonably complete after 10 to 15 minutes at 1800°F (980°C). Appreciable grain growth may occur at temperatures over 1800°F (980°C). A satisfactory anneal, however, can usually be obtained by 2 to 5 minutes heating at 1900°F (1040°C).

## Product forms

Seamless tubes and pipe

Size range: OD 5.0~610mm x WT 0.5~40.0mm

Special tubular could be customized

## Tech. norms

ASTM B829 / ASME SB-829

ASTM B407 / ASME SB-407

[[Stainless steel]] ● [[Duplex Stainless Steel]] ● [[Super Duplex Stainless Steel]]  
[[CRA]] ● [[Nickel]] ● [[Nickel Alloy]] ● [[Nitinol]]

---

Customized Solutions Provider For Metal Tubes & Pipes

TOP 3 THE BEST IN CHINA

[www.sincoometal.com](http://www.sincoometal.com)

