



# ALLOY 825

## UNS N08825



C	CR	FE	NI	AL	TI	CU	MO	MN	SI	S
MAX		MAX		MAX			MAX	MAX	MAX	MAX
0.05	19.5 - 23.5	22.0	38.0 - 46.0	0.2	0.6 - 1.2	1.5 - 3.0	2.5 - 3.5	1.00	0.50	0.03

**CHEMICAL COMPOSITION %**

## DESCRIPTION

Alloy 825 is a Nickel-iron-chromium alloy with additions of molybdenum, copper and titanium. The alloy's chemical composition provides exceptional resistance to many corrosive environments. The Nickel content is sufficient for resistance to Chloride-ion stress corrosion cracking. The nickel, combined with molybdenum and copper, also gives outstanding resistance to reducing environments such as those containing sulfuric and phosphoric acid. The molybdenum also aids resistance to pitting and crevice corrosion. The alloys Chromium content confers resistance to a variety of oxidizing substances such as nitric acid, nitrates and oxidizing salts. The titanium addition, with appropriate heat treatment, will stabilize the alloy against sensitization to intergranular corrosion.

## DESIGN FEATURES

- Good resistance to stress corrosion cracking.
- Satisfactory resistance to pitting and crevice corrosion.
- Good resistance to oxidizing and non-oxidizing hot acids.
- Good mechanical properties at both room and elevated temperatures up to approximately 550° C (1020° F).
- Permission for pressure-vessel use at wall temperature up to 425° C (800° F).

## TYPICAL APPLICATIONS

- Components such as heating coils, tanks, crates, baskets and chains in sulfuric acid pickling plants
- Fuel element dissolvers-the alloy withstands the different media (sulfuric and nitric acids, caustic hydroxide etc.) used in processing
- Sea water cooled heat exchangers; offshore product piping systems tubes and components in sour gas service - resistant to chloride-ion stress-corrosion cracking
- Pipelines carrying wet sulphur dioxide gas and pulp digesters in the papermaking process
- Heat exchangers, evaporators, scrubbers, etc. used in phosphoric acid production
- Air cooled heat exchangers used in the processing of liquid petroleum gas (LPG)

AVAILABILITY	SPECS	
SEAMLESS PIPE	1/2" - 8"	B423
WELDED PIPE	8" - 12"	B423
BUTT-WELD FITTINGS	1/2" - 8"	B366
FLANGES	1/2" - 8"	B425, B564, B16.5
BAR	1" - 6"	B425, B564
FORGINGS		B564

TENSILE REQUIREMENTS	
TENSILE STRENGTH	(KSI) 85
YIELD STRENGTH	(KSI) 35
ELONGATION	30% MIN.

Grain size 5 or coarser

KSI can be converted to MPA (Megapascals) by multiplying by 6.895.

**ALLOY 800H / 800HP**  
UNS N08810 / UNS N08811