



Quick Facts

- Nickel Iron Chromium alloy
- Available in the hot worked and solution annealed condition
- Excellent corrosion resistance in a range of media
- Low strength
- Resistant to chloride-ion stress corrosion cracking
- Used in applications up to approx. 540°C (1000°F)

Alloy 825 is a nickel-iron-chromium alloy that resists general corrosion, pitting and crevice corrosion, intergranular corrosion and stress corrosion cracking. Additions of molybdenum and copper resist reducing agents and acids. Nickel levels are sufficient for resistance to chloride-ion stress-corrosion cracking. Molybdenum aids resistance to pitting and crevice corrosion. Chromium provides resistance to oxidising conditions and titanium stabilises the alloy against sensitization to intergranular corrosion.

Alloy 825 has good mechanical properties from cryogenic to moderately high temperatures around 540°C. It also has good impact strength at room temperature and retains its strength at cryogenic temperatures. This alloy can be strengthened substantially by cold working.

Typical Applications

Typical applications include chemical processing, propeller shafts, marine exhaust systems with sulphur containing gases, sour gas and oil wells and nuclear reprocessing and handling of radioactive wastes.

Stock Range

We stock a comprehensive range of round bar sizes between 12.7mm (1/2") and 260mm (10.25") diameter. We can also supply flat bar, rings, blocks and slabs.

Primarily manufactured in Europe and USA

Material Condition

Alloy 825 is supplied in the hot worked and annealed condition. Annealing is used to stabilise the material before use.



Industry Specifications

- ASTM B425
- UNS N08825
- BS 3076 NA 16 - 1989
- Werkstoff Nr. 2.4858

Material may also be supplied to Customer specifications, subject to enquiry

Heat Treatment

Typically annealed around 940°C (1724°F), with the softest structure obtained by treating at 980°C, followed by a rapid cool, with heavier sections being quenched to avoid sensitisation.

Chemical Analysis

Typical analysis:

	C	Mn	Si	S	Cr	Ni	Cu	Ti	Al	Mo	Fe	-
Min	-	-	-	-	19.5	38.0	1.5	0.6	-	2.5	22.0	%
Max	0.05	1.0	0.5	0.03	23.5	46.0	3.0	1.2	0.2	3.5	-	%

Machinability

Alloy 825 can be readily machined in the annealed condition.

Mechanical Properties

Tensile PSI (MPa) min	Yield (0.2% offset), PSI (MPa) Min	Elongation in 2" or 4D min%	Hardness Rockwell Max
85,000 (586)	35,000 (241)	30	35 (hardness is typically 200-240 HBW - if used for seals 160HBW max)



Physical Properties

Typical properties at room temperature

Melting Range	1370°C - 1400°C (2500°F- 2550°F)
Room Temp Density	8.14 Mg/m ³ (0.294 lb/in ³)
Young's Modulus	196 GPa
Shear Modulus	76 GPa
Poisson's Ratio	0.29
Thermal Conductivity	11.1W/m.K
Specific Heat	440 Joules/kg-C (0.105 Btu/lb°F)
PREN	40.8
Magnetic Permeability @ 200 Oersted	1.005

All material we supply has full traceability with inspection certification in accordance with BS EN 10402 3.1. We can supply material with intent of BS EN 10402 3.2 inspection certification on request.

We have onsite PCN and SNT Level II inspectors who can test material to your requirements.

All information included in this sheet is intended as a guide only and is correct to the best of our knowledge.