Inconel800 - Technical Specification

1. Product Description:-

Inconel 800 is a high-performance, nickel-chromium-iron alloy designed for applications that require resistance to oxidation and carburization at elevated temperatures, as well as excellent mechanical properties. This alloy is commonly used in industries such as chemical processing, aerospace, power generation, and heat treating, where components are exposed to high-temperature and corrosive environments.

2. Chemical Composition:-

Element	Composition Range
Nickel (Ni)	30-35%
Chromium (Cr)	19-23%
Iron (Fe)	Balance
Manganese (Mn)	1.0-1.5%
Silicon (Si)	0.5% max
Carbon (C)	0.05% max
Sulfur (S)	0.015% max
Phosphorus (P)	0.015% max
Titanium (Ti)	0.15-0.60%

3. Mechanical Properties:-

Property	Value
Tensile Strength (Ultimate)	70-95 ksi (480-655 MPa)
Yield Strength	30-45 ksi (205-310 MPa)
Elongation (in 2 inches or 50mm)	30% min
Hardness (Rockwell B)	85-95 HRB
Modulus of Elasticity	28 x 10^3 ksi (193 GPa)
Poisson's Ratio	0.3

4. Physical Properties:-

Property	Value
Density	7.90 g/cm^3 (0.285 lb/in^3)
Melting Point	1370-1410°C (2500-2570°F)
Thermal Conductivity	14.9 W/m·K at 100°C
Specific Heat Capacity	0.43 J/g·K

5. Heat Treatment:-

- Solution Annealing**:** Heat the material to 1020-1100°C (1870-2012°F), then cool rapidly in water or air.
- Age Hardening: Inconel 800 is generally not age-hardened, but may be subjected to stress relief or solution annealing to improve stress properties.

6. Applications:-

- Chemical Processing: Equipment such as reactors, heat exchangers, and furnace components exposed to high temperatures and corrosive environments.
- Aerospace and Power Generation: Used in gas turbines, exhaust systems, and other high-temperature components.
- Petrochemical Industry: Components exposed to high-temperature, corrosive environments such as heaters, tubes, and pipelines.
- Heat Treating Industry: Components in industrial furnaces, heating equipment, and heat exchangers.

7. Corrosion Resistance:-

- Oxidation Resistance: Excellent resistance to oxidation at temperatures up to 1100°F (593°C).
- Carburization Resistance: Outstanding resistance to carburization at high temperatures.
- Sulfidation Resistance: Good resistance to sulfidation.
- Corrosion Resistance: Performs well in many corrosive environments, including gases, acids, and water environments, though it may be prone to localized corrosion in certain conditions (e.g., in chlorides).