

Maraging 250 - Technical Specification

1. Product Description:- Maraging 250 is a cobalt-rich, ultra-high-strength, low-carbon maraging steel. It derives its name from the martensitic structure formed during aging. It exhibits excellent toughness, good weldability, and outstanding dimensional stability during heat treatment. It is widely used in aerospace, tooling, and nuclear applications.

2. Chemical Composition:-

Element	Percentage (%)
Iron (Fe)	Balance
Nickel (Ni)	17.0-19.0
Cobalt (Co)	7.0-8.5
Molybdenum (Mo)	4.6-5.2
Titanium (Ti)	0.3-0.5
Aluminum (Al)	0.05-0.15
Manganese (Mn)	0.10 max
Silicon (Si)	0.10 max
Carbon (C)	0.03 max
Sulfur (S)	0.01 max
Phosphorus (P)	0.01 max

3. Mechanical Properties:-

Property	Solution Annealed	Aged Condition
Tensile Strength	~200 ksi (1379 MPa)	~250 ksi (1724 MPa)
Yield Strength (0.2%)	~150 ksi (1034 MPa)	~230 ksi (1586 MPa)
Elongation	~15%	~10%
Hardness (Rockwell)	~C40	~C50

4. Physical Properties:-

Property	Value
Density	8.0 g/cm ³
Melting Range	~1425°C (2597°F)
Thermal Conductivity	~15 W/m·K (at 20°C)
Electrical Resistivity	~0.83 μΩ·m (at 20°C)

5. Heat Treatment:-

- **Solution Annealing:** Heat to ~815°C (1500°F), hold, then air cool or quench.
- **Aging:** Heat to ~480–510°C (896–950°F) for 3–6 hours, then air cool to achieve full strength.

6. Applications:-

- **Aerospace:** Rocket motor casings, landing gear components, and high-strength fasteners.
- **Tooling:** Die-casting molds, extrusion dies, and forming tools.
- **Nuclear Industry:** Components requiring high strength and reliability.
- **Defense:** Missile and ammunition parts, and military-grade hardware.

7. Corrosion Resistance:-

General Resistance:

- Performs well in dry and controlled environments.
- Moderate resistance to atmospheric corrosion but not suitable for marine or industrial environments without protection.

Localized Corrosion:

- Susceptible to pitting and crevice corrosion in chloride-rich environments.
- Protective coatings (e.g., nickel or chrome plating) are recommended.

Stress-Corrosion Cracking (SCC):

- Good resistance in non-chloride environments but prone to SCC in chloride-laden conditions.

Hydrogen Embrittlement:

- Excellent resistance, making it suitable for hydrogen-rich environments.

Acids and Bases:

- Limited resistance to strong acids and alkalis; suitable only for mild conditions.

Improvement Measures:

- Surface treatments like electroplating, passivation, and polymer coatings enhance corrosion resistance.