

Description

AISI 4340 is a medium carbon, low alloy steel known for its high strength, toughness, and impact resistance. It belongs to the family of nickel chromium molybdenum steels and is often used in applications requiring high strength and wear resistance.

Chemical Composition

The typical chemical composition of AISI 4340 is as follows:

Element	Composition (%)
Carbon (C)	0.38 - 0.43
Manganese (Mn)	0.65 - 0.85
Silicon (Si)	0.15 - 0.35
Chromium (Cr)	0.70 - 0.90
Nickel (Ni)	1.65 - 2.00
Molybdenum (Mo)	0.20 - 0.30
Phosphorus (P)	0.015 max

Sulfur (S)	0.008 max
Iron (Fe)	Balance

Mechanical Properties

The mechanical properties of AISI 4340 steel are as follows:

Property	Value
Yield Strength (MPa)	934.2 min
Tensile Strength (MPa)	862 - 1931
Elongation (%)	4 min
Reduction of Area (%)	20 min
Hardness (HB)	187 - 322
Impact Toughness (J)	14.2 - 52.7 J @ RT

Thermal & Physical Properties

- Density: Approximately 7.85 g/cm³
- Melting Point: About 1425°C (2600°F)
- Thermal Conductivity: 46 W/m·K

Other Designations

AISI 4340 is equivalent to several international standards, including:

- DIN: 36CrNiMo4
- EN: EN24
- BS: 817M40
- JIS: SNCM439

Fabrication and Heat Treatment

AISI 4340 can be fabricated using various methods, including machining, welding (fusion and resistance), and forming.

Heat Treatment Processes:

- Annealing: Heat to 844°C (1550°F) and cool slowly.
- Tempering: Tempering temperatures vary based on desired strength levels, typically between 232°C (450°F) and 510°C (950°F).
- Quenching: Can be quenched in oil or water depending on the required hardness.

Applications

AISI 4340 is widely used in high-stress applications, including:

- Aerospace components
- Automotive parts such as gears and shafts
- Heavy machinery
- Tooling and dies

Supplied Form

AISI 4340 is available in various forms, including:

- Round bars
- Forgings

Features

- Excellent toughness and fatigue resistance
- Good ductility and machinability
- High hardenability, making it suitable for applications requiring high strength

This datasheet provides a comprehensive overview of AISI 4340 steel, highlighting its properties and applications, making it a preferred choice in various engineering fields.

