

## Description

Alloy Steel Grade 8630M/1.6523 is a low-alloy steel known for its toughness, strength, and wear resistance, which are enhanced by the addition of molybdenum. This grade is primarily used in the oil and gas industry for critical components such as wellhead equipment, drilling tools, and subsea applications. The "M" in 8630M indicates the inclusion of molybdenum, which improves hardenability and enhances the mechanical properties of the steel, particularly in thick sections.

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## Chemical Composition

- Carbon (C): 0.28 - 0.33%
  - Manganese (Mn): 0.70 - 0.90%
  - Silicon (Si): 0.20 - 0.35%
  - Chromium (Cr): 0.40 - 0.60%
  - Nickel (Ni): 0.40 - 0.70%
  - Molybdenum (Mo): 0.15 - 0.25%
  - Phosphorus (P):  $\leq 0.025\%$
  - Sulfur (S):  $\leq 0.025\%$
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## Mechanical Properties

- Tensile Strength: 930 - 1080 MPa
  - Yield Strength: 700 MPa (min)
  - Elongation: 18% (min)
  - Reduction of Area: 45% (min)
  - Impact Strength (Charpy V-notch): 35 Joules at -40°C
  - Hardness: 235 - 277 HB
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## Thermal & Physical Properties

- Density: 7.85 g/cm<sup>3</sup>
- Melting Point: 1425 - 1460°C

- Thermal Conductivity: 42.7 W/m·K at 20°C
  - Specific Heat Capacity: 486 J/kg·K at 25°C
  - Modulus of Elasticity: 210 GPa
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## Other Designations

- DIN: 1.6523
  - ASTM: A519, A29
  - UNS: G86300
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## Fabrication and Heat Treatment

- Machinability: Alloy 8630M is readily machinable using conventional techniques, particularly in the annealed or normalized condition.
  - Weldability: It can be welded using traditional methods; however, preheating and post-weld heat treatment are recommended to prevent cracking.
  - Heat Treatment:
    - Annealing: Heat to 830°C - 870°C, hold until uniform temperature, and then furnace cool.
    - Normalizing: Heat to 900°C - 950°C, air cool.
    - Quenching and Tempering: Heat to 860°C - 900°C, quench in oil or water, and temper at 600°C - 700°C depending on the desired mechanical properties.
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## STAINLESS STEEL WIRES & BARS

### Applications

- Oil & Gas Industry: Wellhead components, subsea equipment, valves, and drilling tools.
  - Aerospace: High-strength structural components.
  - Automotive: Gears, shafts, and other critical parts requiring high toughness.
  - Heavy Machinery: Components subject to high stress and wear.
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## Supplied Forms

- Bars
  - Forgings
  - Fittings
  - Custom machined parts
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## Features

- High Strength and Toughness: Ideal for applications requiring high mechanical strength and resistance to impact.
- Wear Resistance: Suitable for environments where components are subjected to friction and wear.
- Good Hardenability: Ensures uniform hardness throughout thicker sections.
- Enhanced Durability: Molybdenum content provides better performance in challenging environments.

