

S151 / S151D (Jethete M152 / MSRR 6503) [Stainless Steel](#)

BS S151 (Jethete M152) is a high-performance precipitation-hardening [stainless steel](#) designed for aerospace applications. It offers exceptional creep resistance, corrosion resistance, and mechanical strength at elevated temperatures (up to 560°C). Commonly used in turbine blades, discs, and fasteners.

Applications

- Turbine blades & discs
- High-stress bolts (AMS 5719)
- Aerospace fasteners (MSRR 6503)
- Exhaust systems (up to 560°C)

Equivalent or Similar Grades - Chemical Composition

Element	Min (%)	Max (%)	Typical (%)
C	-	0.12	0.08
Cr	11.0	13.0	12.0
Ni	2.0	3.0	2.5
Mo	1.0	2.0	1.5
Mn	-	1.0	0.5
Si	-	1.0	0.3
P	-	0.04	0.02
S	-	0.03	0.01
Fe	Balance		~82.0

Mechanical Properties

Room Temperature Properties (Tempered Condition - BS S151D)

Property	Value (Typical)	Test Standard
Tensile Strength (UTS)	850-1000 MPa	ASTM E8
Yield Strength (0.2%)	700-850 MPa	ASTM E8
Elongation (% in 50mm)	15-20%	ASTM E8
Hardness (HRC)	28-35	ASTM E18

Property	Value (Typical)	Test Standard
Impact Toughness (Charpy)	50-70 J	ASTM E23

Elevated Temperature Properties

Temperature (°C)	Creep Rupture Strength (1000h, MPa)	Oxidation Resistance
500	300	Excellent
560	200	Good
600	120	Limited

Physical Properties

Property	Value
Density (g/cm³)	7.8
Melting Range (°C)	1400-1450
Thermal Conductivity (W/m·K @ 20°C)	15.0
Electrical Resistivity (Ω·m)	0.75×10^{-6}
Magnetic Permeability	Austenitic (Non-magnetic)

Heat Treatment

- **Softening (BS S151A):** 670-720°C × 6h, air cool
- **Hardening:** 1050°C ±10°C, air cool
- **Tempering (BS S151D):** 650°C ±5°C, air cool

Processing Performance

- **Machinability:** 60% of AISI 304 (use carbide tools, low speeds)
- **Welding:** TIG/MIG possible with matching filler (post-weld heat treatment required)
- **Forging:** 1050-900°C (avoid <850°C to prevent cracking)