

TECHNICAL DATA SHEET

Steel Grade: 38MnVS6

(EN 10267 – Micro-alloyed free-cutting steel)

General Description

38MnVS6 is a micro-alloyed, free-cutting steel with added vanadium and sulphur, used for high-speed machining applications. Thanks to its good machinability, consistent microstructure, and high fatigue strength, it's ideal for automated mechanical components, such as shafts, pins, bushings, and fittings. It is usually supplied in the hot rolled or peeled (drawn) condition, and can be quenched and tempered for improved mechanical performance.

CHEMICAL COMPOSITION (% by weight)

Element	C	Si (max)	Mn	P (max)	S	V
%	0.34–0.42	≤ 0.40	1.30–1.70	≤ 0.035	0.020–0.040	0.08–0.16

Vanadium improves toughness and refines the grain size; sulphur enhances machinability.

MECHANICAL PROPERTIES (hot rolled condition, typical values)

Property	Typical Value
Tensile Strength (Rm)	600–800 MPa
Yield Strength (Rp0.2)	≥ 400 MPa
Elongation (A5)	≥ 12%
Impact Toughness (ISO-V, +20°C)	≥ 27 J
Hardness (HBW)	~180–240 HB

Transformation temperatures

	Temperature °C
MS	330
AC1	720
AC3	780

Other properties (typical values)

Youngs module (GPa)	Poisson´s ratio (-)	Shear module (GPa)	Density (kg/m3)
210	0.3	80	7800
Average CTE 20-300°C (µm/m°K)	Specific heat capacity 50/100°C (J/kg°K)	Thermal conductivity Ambient temperature (W/m°K)	Electrical resistivity Ambient temperature (µΩm)
12	460 - 480	40 - 45	0.20 - 0.25

Advantages

- **High machinability** (optimized for automatic machining)
- **Good dimensional stability**
- **Enhanced fatigue performance** due to vanadium
- **Suitable for heat treatment** (quenching and tempering)

Standards and Equivalents

- **EN:** 38MnVS6 (1.1301)
- **DIN:** 38MnVS6
- **ISO:** 38MnVS6
- **SAE (approx.):** 1144 / 1141 (not exact equivalent)