

M35 3243 Steel

Designation by Standards

Mat. No.	DIN	EN	AISI/SAE
1.3243	S6-5-2-5 †	HS6-5-2-5	M35

Chemical Composition (in weight %)

C	Cr	Mo	V	W
0.92	4.10	5.00	1.90	6.0

Description

M35 is molybdenum high speed steel. Very high resistance to wear and to softening at elevated temperatures. High resistance of cutting edge and good toughness. Deep hardening response. High hot hardness.

Applications

Highly stressed drills, milling cutters, profile cutting tools, thread cutting drills and cold forming tools.

Physical properties (average values) at ambient temperature

Modulus of elasticity [$10^3 \times \text{N/mm}^2$]: 217

Density [g/cm^3]: 8.1

Thermal conductivity [W/m.K]: 19.0

Electric resistivity [$\text{Ohm mm}^2/\text{m}$]: 0.60

Specific heat capacity [J/g.K]: 0.46

Coefficient of Linear Thermal Expansion $10^{-6} \text{ }^\circ\text{C}^{-1}$

20-100°C	20-200°C	20-300°C	20-400°C	20-500°C	20-600°C	20-700°C
9.7	10.5	11.0	11.4	11.5	12.0	12.5

Soft Annealing

Heat to 820-880°C, cool slowly in furnace. This will produce a maximum Brinell hardness of 230-300.

Stress Relieving

Stress relieving to remove machining stresses should be carried out by heating to 650°C, holding for one hour at heat, followed by air cooling. This operation is performed to reduce distortion during heat treatment.

Hardening

Heat to 450-600°C, preheat to 850°C and then to 1050°C. Harden from a temperature of 1210-1250°C followed by oil, air quenching or warm bath 550°C. Hardness after quenching is 64-66 HRC.

Transformation temperatures: $A_{c1}=824^\circ\text{C}$, $A_{c3}=853^\circ\text{C}$.

Tempering

Tempering temperature: 3 x 1 hour at 540-570°C.

Tempering Temperature (°C) vs. Hardness (HRC)

200°C	300°C	400°C	500°C	525°C	550°C	575°C	600°C	650°C	700°C
63	61	62	64	64.5	65	64	63	55	46

Tempering Diagram

