

H11

H11 is a 5% chromium hot-work tool steel that is characterized by high hot tensile strength, toughness, good thermal conductivity and insusceptibility to hot cracking.

Can be water-cooled to a limited extent.

Typical applications: besides the application area of hot-work steels, this grade is especially used for ejector pins, tool holders, bridge kind tools, liner holders, forging dies, hot work punches, shrink work chucks, etc.

1. Chemical Composition

C	Mn	Si	S	P	Cr	V	Mo	Fe
0.33-0.43	0.20-0.60	0.80-1.25	≤0.030	≤0.030	4.75-5.50	0.30-0.60	1.10-1.60	Rest

2. Physical Properties

Density, g/cm ³	7.81	Coefficient of thermal expansion, $\alpha \times 10^{-6}/K$	100°C	11.80
Modulus of elasticity, GPa	210		200°C	12.40
Thermal conductivity at 20°C, W/mk	29.80		300°C	12.60
Thermal conductivity at 350°C, W/mk	30.00		500°C	12.80
Hardness, HRC	54		700°C	12.90

3. Heat Treatment

Heat Treatment	Temperature, °C	Cooling / Quenching	Remarks
Soft annealing	750-800 °C	Furnace	Furnace cooling to 600°C at a rate 10-20°C/hour, farther cooling in air. Maximum hardness 230 HB.
Stress relieving	600-650 °C	Furnace	After heating to hold in neutral atmosphere for 1-2 hours.
Hardening	1000-1030 °C	Air, oil, or salt bath 500-550°C	Holding after temperature equalization 15-30 minutes. Hardness after quenching 54 HRC.
Tempering	100 - 700 °C	Air	Tempering °C 100 200 300 400 500 550 600 650 700 HRC 52 52 52 52 54 52 48 38 31 It is recommended to temper at least two times. For the purpose of stress relieving third tempering circle can be made.

Note: All information enclosed in this datasheet is based on our best knowledge and is given as indicative. Other special requirements are subject to prior discussion and approval of Vojay. Please contact us for any additional information or request.