

## H10 DIN 2365

	C	Si	Mn	P	S	Cr	Mo	V
Typical analysis	0.40	0.30	0.40	0.030	0.030	3.40	2.50	0.50
Chemical composition (%)	0.28–0.35	0.10–0.40	0.15–0.45	≤ 0.030	≤ 0.030	2.70–3.20	2.60–3.00	0.40–0.70

Figures in % by mass

Register of European Steels (SEL)	32 CrMoV 12-28
DIN EN ISO 4957	32 CrMoV 12-28
AFNOR	30 CDV 12-30
AISI	H 10
BS	BH 10

### Characteristics

Tungsten-free special hot work tool steel on a CrMoV base with good toughness. Insensitive to thermal shock, and thus not susceptible to heat cracking. Particularly suitable for water cooling.

### Applications

Extruder tools including pipe extruders, such as extrusion stems, liners and die holders. Particularly suitable for water-cooled pipe mandrels, hot drawing mandrels. Part stamping dies for non-ferrous heavy metals, forging die and press die inserts, forging tools for Hatebur presses. Die-casting moulds for non-ferrous heavy metal pressure die-casting.

### Delivered condition

Annealed to max. 229 HB

### Physical properties (reference values)

Thermal expansion coefficient (10 <sup>-6</sup> /K)	20–100 °C	20–250 °C	20–500 °C
	10.7	11.5	12.3
Thermal conductivity (W/mK)	20 °C	250 °C	500 °C
	30.0	33.0	30.1
Young's modulus (GPa)	20 °C	250 °C	500 °C
	210	195	176

### High-temperature yield strength

Hardened and tempered state	0.2 % yield strength in MPa at temperature			
	450 °C	500 °C	550 °C	600 °C
~ 1570 MPa	1080	960	800	640
~ 1370 MPa	930	870	710	590
~ 1230 MPa	790	730	510	340

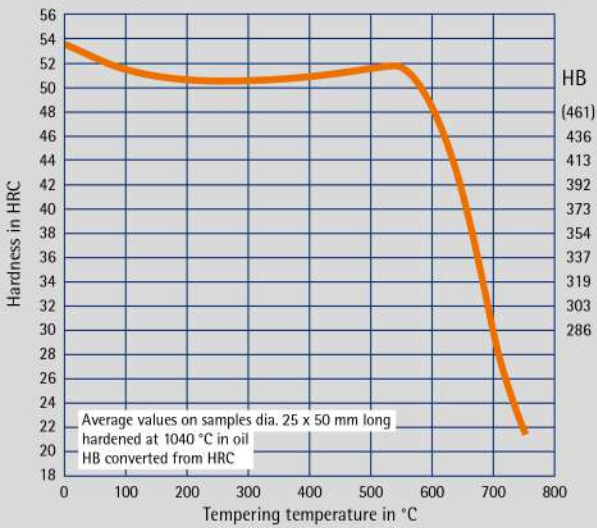
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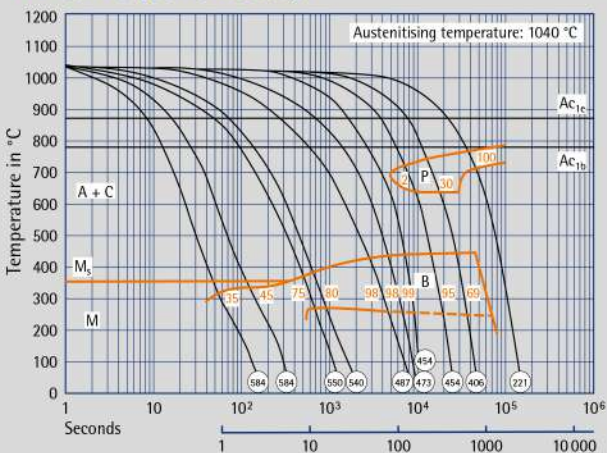
## Heat treatment

Stress relieving	Temperature: Approx. 650 °C in the annealed state Approx. 550 °C in the hardened and tempered state
	Duration: 1 hour per 50 mm wall thickness
	Cooling: Furnace
Soft annealing	Temperature: 800 °C
	Duration: 1 hour per 25 mm wall thickness
	Cooling: Furnace
Hardening	Temperature: 1040 °C
	Duration: 30 seconds per mm wall thickness
Quenching hardness	Max. 52 HRC in oil, hot bath, protective atmosphere, vacuum or air
Tempering	Temperature: See tempering curve
	Duration: 1 hour per 25 mm wall thickness
	Cooling: Air
Working hardness	30–48 HRC pre-heating of the tools = 250–350 °C

## Tempering curve



## TTT curve (continuous)



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