

## I Buderus Plastic Mould Steel 2312

	C	Si	Mn	P	S	Cr	Mo
Typical analysis	0.38	0.30	1.50	0.020	0.070	2.00	0.20
Chemical composition as per SEL	0.35–0.45	0.30–0.50	1.40–1.60	≤ 0.030	0.050–0.100	1.80–2.00	0.15–0.25

Figures in % by mass

Register of European Steels (SEL)	40 CrMnMoS 8-6
DIN EN ISO 4957	40 CrMnMoS 8-6
AFNOR	40 CMD 8 S
AISI	~ P 20 + S
BS	~ P 20 + S

### Characteristics

Sulphur alloyed standard mould steel with very good machining properties, not suitable for polishing, etch-graining or hard chrome plating.

Through-hardening properties comparable to 2311 ISO-BM.

### Applications

For core parts of compression and injection-moulding dies with no surface requirements and low mechanical stress. Mould fittings, for mould frames subject to low stress.

**Note:** Because of its controlled sulphur content (economic to machine), this material has poor toughness properties.

### Delivered condition

Quenched and tempered to 280–325 HB ( $\Delta$  approx. 950–1100 MPa)\*

Annealed on request

### Physical properties (reference values)

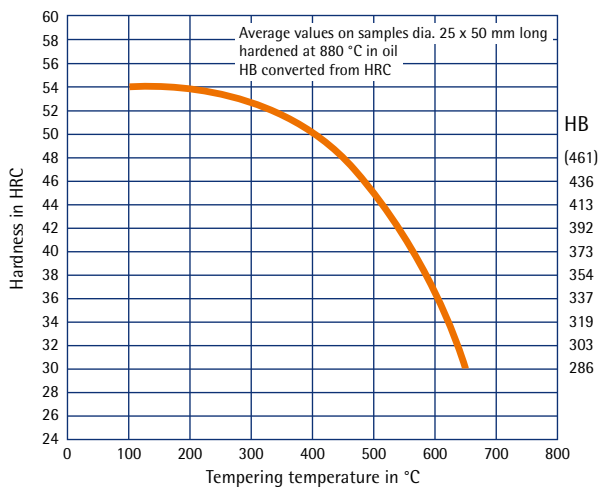
Thermal expansion coefficient ( $10^{-6}/K$ )	20–100 °C	20–250 °C	20–500 °C
	11.6	12.8	14.3
Thermal conductivity (W/mK)	20 °C	250 °C	500 °C
	34.0	33.5	33.0
Young's modulus (GPa)	20 °C	250 °C	500 °C
	212	197	175

\* Surface hardness in Brinell, converted to DIN EN ISO 18265, Table A.1

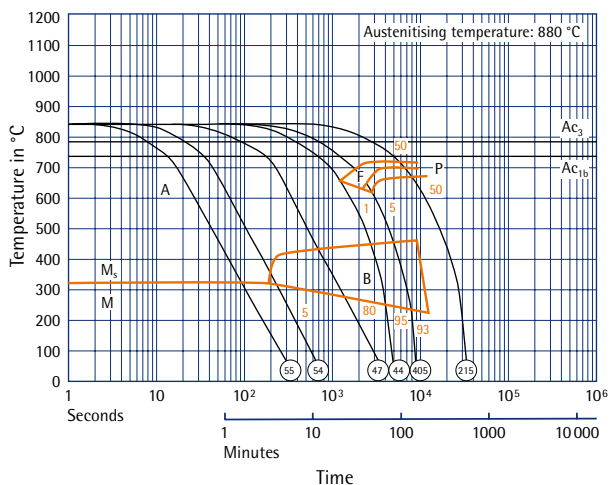
## 2312

Heat treatment	
Stress relieving	Temperature: Approx. 550 °C in the quenched and tempered state Duration: 1 hour per 50 mm wall thickness Cooling: Furnace
Soft annealing	Temperature: 720 °C Duration: 1 hour per 25 mm wall thickness Cooling: Furnace
Hardening	Temperature: 880 °C Duration: 1 minute per mm wall thickness
Quenching hardness	Max. 54 HRC in oil, hot bath or vacuum
Tempering	Temperature: See tempering curve Duration: 1 hour per 25 mm wall thickness Cooling: Air
Working hardness	280–325 HB

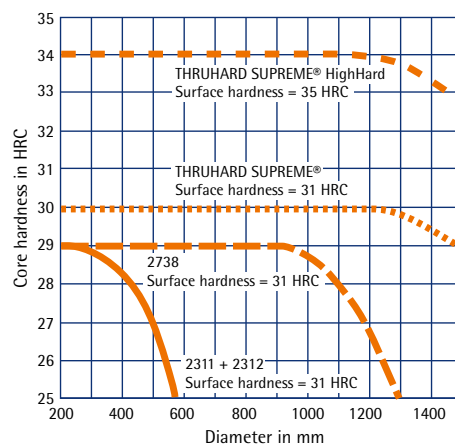
### Tempering curve



### TTT curve (continuous)



### Through-hardability (schematic)



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