

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 (Δ approx. 950–1100 MPa)*

Annealed on request

Physical properties (reference values)

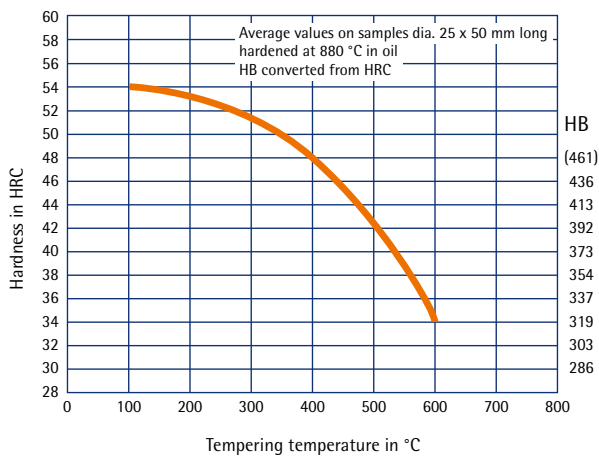
Thermal expansion coefficient ($10^{-6}/K$)	20–100 °C	20–250 °C	20–500 °C
	11.6	12.8	14.3
Thermal conductivity (W/mK)	20 °C	250 °C	500 °C
	34.0	33.5	33.0
Young's modulus (GPa)	20 °C	250 °C	500 °C
	212	197	175

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

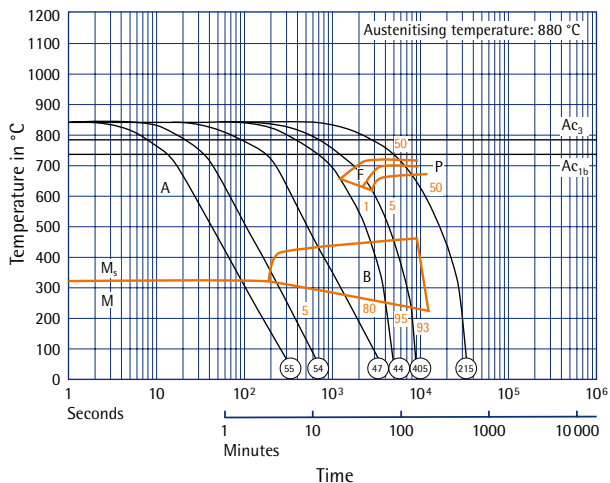
2312

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

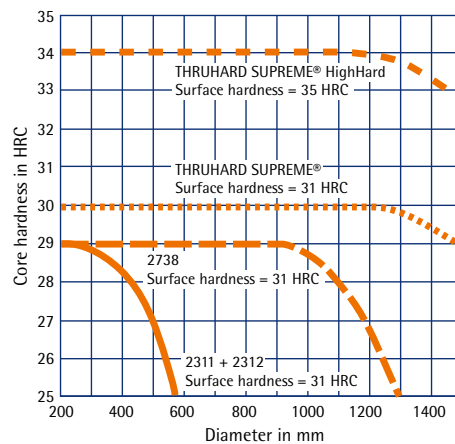
Tempering curve



TTT curve (continuous)



Through-hardenability (schematic)



Legal notice: Buderus Edelstahl GmbH has taken every possible care in compiling this information; the data is nevertheless subject to intervening changes. Buderus Edelstahl GmbH disclaims all liability and any warranty as regards the accuracy, currency, correctness and completeness of the information provided. The information provided is merely descriptive and indicative in nature, and binding only when expressly agreed as undertakings in a contract made with Buderus Edelstahl GmbH. Buderus Edelstahl GmbH moreover reserves the right to make changes at any time without prior notice. Buderus Edelstahl GmbH disclaims all liability for loss or damage of any kind, including consequential loss, arising in connection with use of the information provided. © Buderus Edelstahl GmbH, Wetzlar, 06/2014