

## Efficient

### Plastic Mould Steel Efficient

	C	Si	Mn	P	S	Cr	Ni	Mo
■ <b>Typical analysis</b>	0,36	0,30	1,45	0,020	0,003	2,00	0,50	0,20

Figures in % by mass.

■ <b>Standards</b>	
Register of European Steels (SEL)	~ 40 CrMnMo 7 + Ni
DIN EN ISO 4957	~ 40 CrMnMo 7 + Ni
AFNOR	~ 40 CMD 8 + Ni
AISI	~ P 20 + Ni
BS	~ P 20 + Ni

#### ■ **Characteristics**

Mould steel for thickness  $\leq 600$ mm (width upon request). Properties as for grade 2311 ISO-BM, but with improved through-hardening.

Nitridable, hard chrome plateable, flame hardenable, polishable, grain-reliable as delivered.

In an extreme dimensional range, and where there is a requirement for:

- Higher hardness and better through-hardenableability.
- Polishability > 320 grit.
- Sensitive etch-graining designs (e.g. HNO<sub>3</sub>, fine or textile graining).
- Higher thermal conductivity we recommend grade 2738 mod.TS(HH).

#### ■ **Applications**

Small and medium-sized injection moulds, press moulds and mould frames up to 600mm thick.

#### ■ **Delivered condition**

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

■ <b>Physical properties (reference values)</b>			
Thermal expansion coefficient (10 <sup>-6</sup> /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; we offer no quality guarantee with higher hardness requirements.

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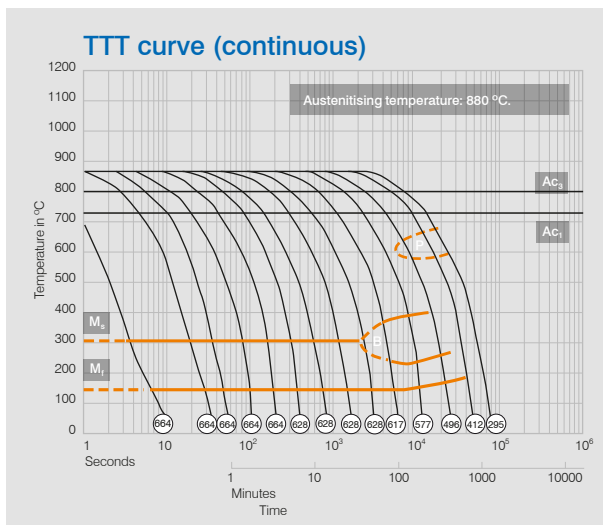
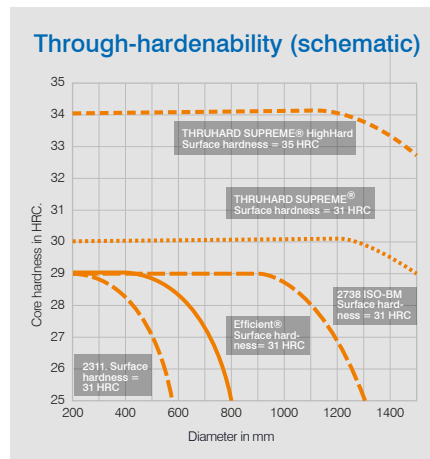
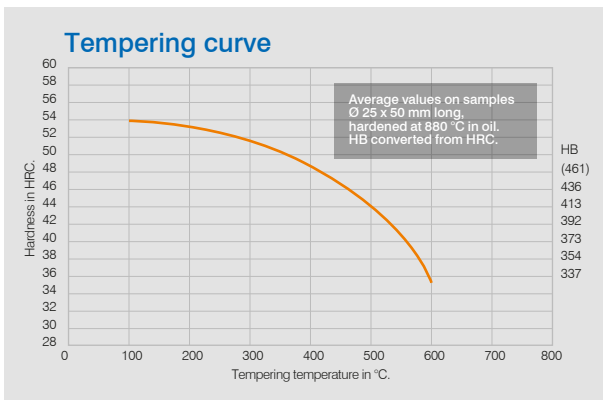
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# Sermetal

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■ Heat Treatment		
Stress relieving	Temperature:	Approx. 500 °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	Max. 280+325 HB	



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