

I Buderus Plastic Mould Steel Thruhard Diamond®-HHH

	C	Si	Mn	P	S	Cr	Ni	Mo	V
Typical analysis	0.28	0.10	1.45	0.015	0.002	1.25	1.05	0.70	0.15

Figures in % by mass

Characteristics

Remelted hardened and tempered plastic mould steel for the most demanding surface finish requirements. Thruhard Diamond® is based on the successful development of the patented Thruhard Supreme®, with the following improved characteristics:

- I Further refined composition of Thruhard Diamond® yielding even higher hardness of approximately 40 HRC
- I Microstructure that is both more homogeneous and finer
- I Extremely high degree of purity
- I Mirror-finish polishable using up to 3 µm diamond paste (e.g. surface finish classes SPI - A1 or ISO 1302-N1).

Laser hardenable or nitridable as supplied; the general high basic hardness of this steel gives it improved wear resistance and better supporting effect for surface coatings such as hard chrome plating or PVD coating.

Applications

Injection moulding and compression dies with the most demanding surface finish requirements for producing items such as transparent headlight components, automotive trim and radiator grille panels. Ideally suited for interior use both for polished surfaces and for extra fine-grained surfaces.

Delivered condition

- I Quenched and tempered to 360 – 405 HB (approx. 38.5 – 43 HRC)*

Physical properties (reference values)

Thermal expansion coefficient (10 ⁻⁶ /K)	20–100 °C	20–250 °C	20–500 °C
	10.8	12.2	13.9
Thermal conductivity (W/mK)	20 °C	250 °C	500 °C
	37.4	41.3	39.8
Young's modulus (GPa)	20 °C	250 °C	500 °C
	204	188	160

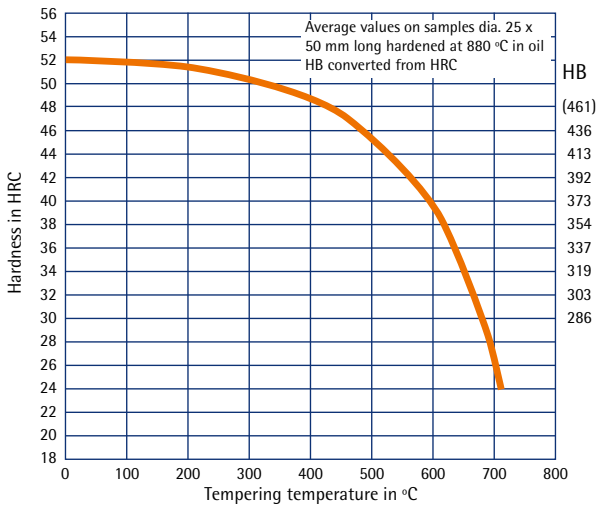
* Surface hardness in Brinell, converted to DIN EN ISO 18265, Table A.1



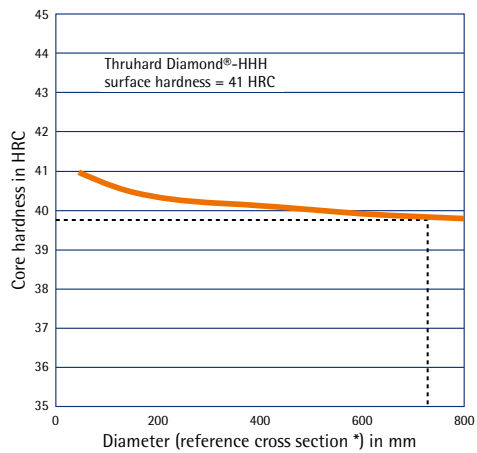
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Heat treatment	
Stress relieving	Temperature: 520 °C approx. Duration: 1 hour per 50 mm wall thickness Cooling: Furnace
Soft annealing	Temperature: 720 °C Duration: 1 hour per 25 mm wall thickness Cooling: Furnace
Hardening	Temperature: 880 °C Duration: 1 minute per mm wall thickness
Quenching hardness	max. 52 HRC in water, polymer, oil or vacuum
Tempering	Temperatur: See tempering curve Duration: 1 hour per 25 mm wall thickness Cooling: Air
Working hardness	360–415 HB

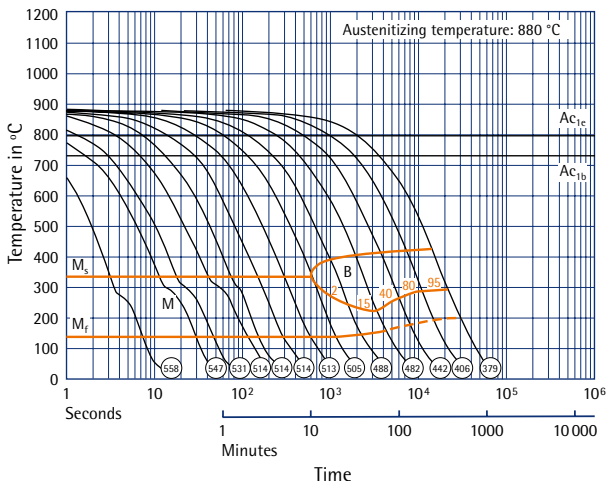
Tempering curve



Through-hardability (schematic)



TTT curve (continuous)



* Calculation example:
Bar dimension 800 x 500 mm = cross section during quenching 400,000 mm²;
corresponding to a bar diameter of 713 mm
i.e. core hardness 39.7 HRC approx.

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