ATT DIAMOND (THRUHARD DIAMOND - HHH)

CHEMICAL ANALYSIS (PERCENTAGE BY MASS)

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

CHARACTERISTICS

Remelted hardened and tempered plastic mould steel for the most demanding surface finish requirements. ATT Diamond is based on the successful development of the patented ATT 2738 MOD TS with the following improved characteristics:

- Further refined composition of ATT Diamond yielding even higher hardness of approximately 40 HRC
- Microstructure that is both more homogeneous and finer
- Extremely high degree of purity
- 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.

APPLICATION

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

Quenched and tempered to 360 - 405 HB

PHYSICAL PROPERTIES

Thermal Conductivity (W/m.K) at	20°C 37.4	250°C 41.3	500°C 39.8
Thermal Expansion (µm/m) from 20°C to	100°C 10.8	250°C 12.2	500°C 13.9
Young's modulus (GPa)	20°C 204	250°C 188	500°C 160

* Surface hardness in Brinell, converted to DIN EN ISO 18265

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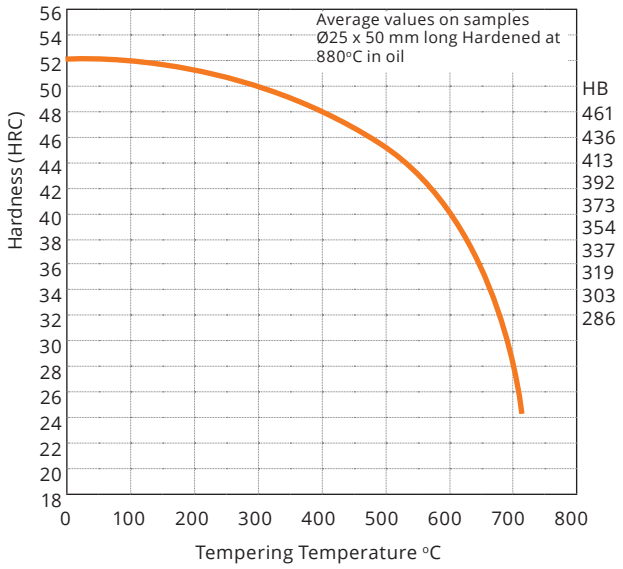
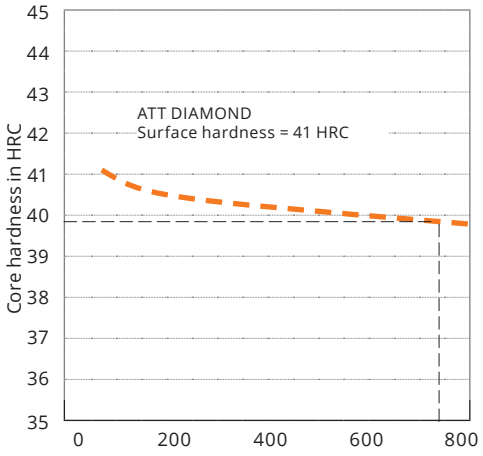
HEAT TREATMENT

Stress relieving	Temperature	Approx. 520°C
	Duration	1 hour per 50 mm wall thickness
	Cooling	Furnace
Soft annealing	Temperature	720°C
	Duration	1 hour per 25mm 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	Temperature	See tempering curve
	Duration	1 hour per 25 mm wall thickness
	Cooling	Air
Working hardness	360-415 HB	

Tempering curve



Through- hardenability (schematic)



Calculation example:
Bar dimension 800 x 500 mm = cross section during quenching 400,000 mm^2 corresponding to a bar diameter of 713 mm i.e. core hardness 39.7 HRC approx.

TTT curve (continuous)