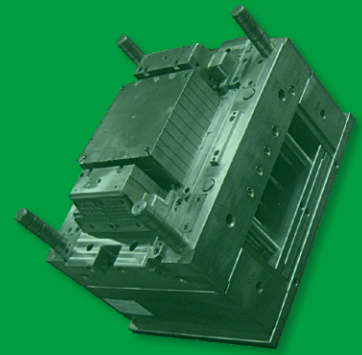


# VR200

## Plastic mould steel



### 1 Main characteristics and applications

VR200 is a prehardened plastic mold steel with hardening penetration up to 600mm, for medium size molds and tool with excellent machinability.

To be used for plastic dies with excellent surface finish properties, compression moulding, plastic injection moulds core and cavities, moulds for automotive industry with texturing.

VR200 is designed to provide improved performance and offer the following advantages:

- uniform hardness across the full thickness up to 600 mm.
- good polishability.
- good machinability.
- good suitability for texturing.
- good toughness.

### 2 Chemical composition (typical; in weight %)

C	Mn	Si	P	S	CR	Mo	Ni	B
0.27	1.30	Max 0.15	0.010	0.003	1.3	0.4	0.34	0.003

### 3 Production technology

EAF - LF - VD- Forging - Rolling - Heat treatment QT

### 4 US specification

In according to standard

- ASTM A578-S9 2 mm and EFBH up to 407 mm
- ASTM A578-S9 3,2 mm and EFBH over 407 mm

### 5 Delivery condition

VR200 is delivered in quenched and tempered condition:

VR200, Standard version: hardness range 290 - 320 HB (30 - 34 HRC)

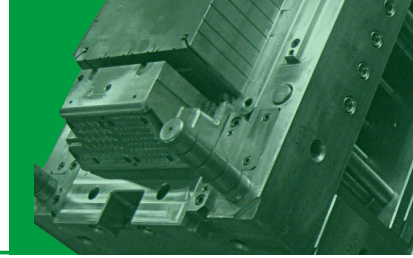
VR200HH High hardness: hardness range 320 - 350HB (34 - 38 HRC)

### 6 Physical properties (reference values)

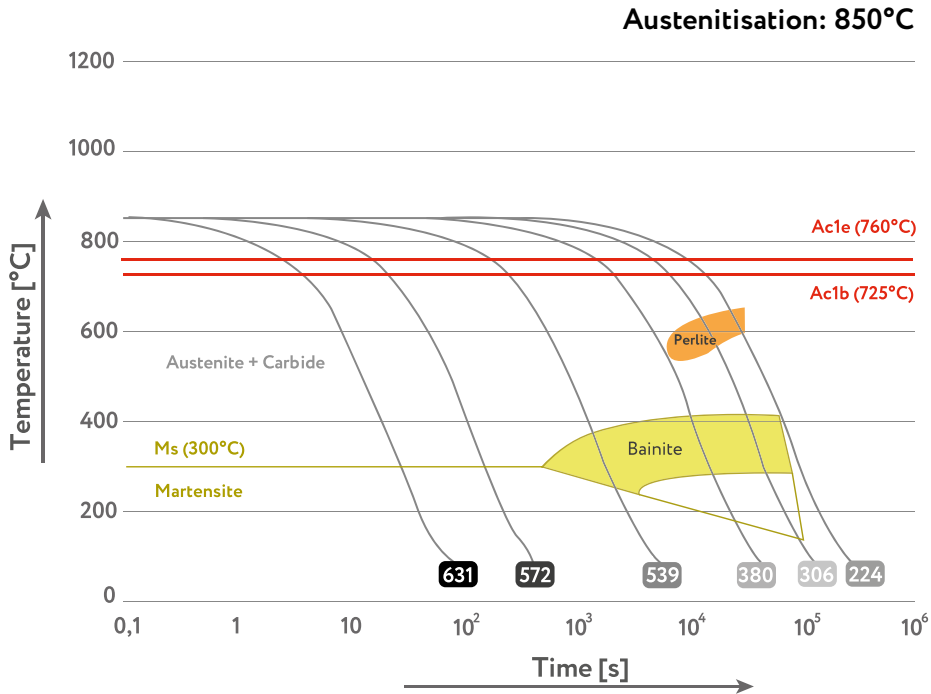
	20°C	100°C	250°C	500°C
Thermal expansion coefficient (10 <sup>-6</sup> /K)	11.3	11.8	12.3	13.6
Thermal conductivity (W/mk)	40.0	39.2	38.3	35.1
Young modulus (Kn/mm <sup>2</sup> )	205	201	182	-

### 7 Heat treatment

TREATMENT	TEMPERATURE	HOLDING TIME (HT)	COOLING	COMMENTS
Annealing	Heat to 650 - 700 °C	Min. H.T. for 2 minute /mm	Air or furnace	In order to obtain hardness lower than 250 HB ( 24 HRC) to improve machinability
Stress relieving	Heat to 500 - 550 °C	Min. H.T. for 2 minute /mm	Air or furnace	To be carried out after machining, is recommended to eliminate the residual stresses induced by mechanical working
Hardening	Heat to 860 - 900 °C	Min. H.T. for 1 minute /mm	Polymer	-
Tempering	Heat to 530 - 610 °C	Min. H.T. for 3 minute /mm	Air or furnace	To be carried out after hardening. 2nd Tempering must be performed to max 30°C below tempering temperature



### 8 C.C.T. curve



### 9 Tempering curve

