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2344 ISO-B
Hot Work Tool Steel

	C	Si	Mn	P	S	Cr	Mo	V
■ Typical analysis	0,38	1,05	0,40	0,025	0,003	5,20	1,30	1,00
■ Chemical composition as per SEL	0,33-	0,80-	0,25-	≤0,030	≤0,020	4,80-	1,10-	0,85-
	0,41	1,20	0,50			5,50	1,50	1,15

Figures in % by mass.

■ Standards	
Register of European Steels (SEL)	X 40 CrMoV 5-1
DIN EN ISO 4957	X 40 CrMoV 5-1
AFNOR	Z 40 CDV 5
AISI	H 13
BS	BH 13

■ Characteristics
CrMoV alloyed hot work tool steel with double V content compared to grade 2343 ISO-B. Very good tempering properties, good toughness, good hardness at high temperatures, very good compressivestrength, insensitive to thermal shock. Better wear resistance than grade 2343. Good machinability in the annealed state. Can be cooled in water with limitations.

■ Aplications
Extrusion tools including pipe extruders: highly stressed mould inserts, dummy blocks, extrusion stems, die holders, stem heads; especially for profi le dies, insert and bridge type tools for compacting light alloys, liners and line holders.
Highly stressed plastic moulds, mould inserts with abrasive stress, as occurs when processing thermo-setting plastics, thermo-plastics and composite materials.
Die-casting moulds and mould inserts, sliders, cores, ejectors and filling sleeves.

■ Delivered condition
Annealed to max. 229 HB.
Hardened and tempered to customer specification on request.

■ Physical properties (reference values)			
Thermal expansion coefficient (10-6/K)	20–100 °C 10,5	20–250 °C 11,3	20–500 °C 12,1
Thermal conductivity (W/mK)	20 °C 23,0	250 °C 25,0	500 °C 27,0
Young's modulus (GPa)	20 °C 210	250 °C 195	500 °C 172

■ High-temperature yiel strength				
Hardened and tempered state	0,2 % yield strength in MPa at temperature			
	450°C	500°C	550°C	600°C
~ 1570 MPa	1040	920	740	540
~ 1370 MPa	960	820	640	440
~ 1230 MPa	810	680	520	370

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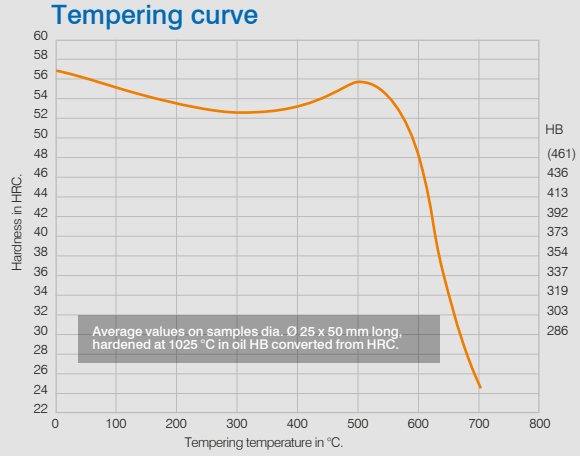
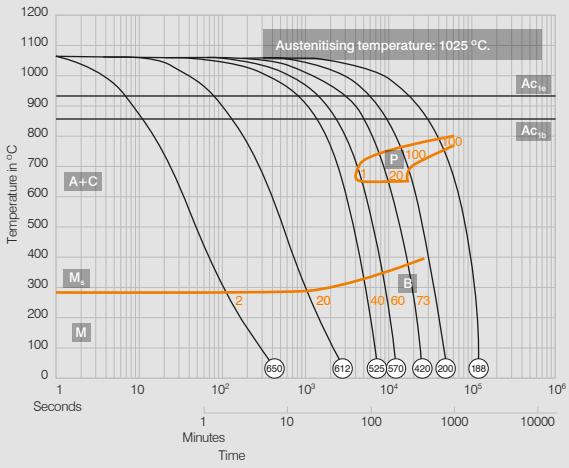
Heat Treatment		
Stress relieving	Temperature:	Approx. 650 °C in the annealed state. Approx. 550 °C in the hardenet and tempered state.
	Duration:	1 hour per 50 mm wall thickness.
	Cooling:	Furnace.
Soft annealing	Temperature:	820 °C
	Duration:	1 hour per 25 mm wall thickness.
	Cooling:	Furnace.
Hardening	Hardening:	1025 °C
	Duration:	30 segonds per mm wall thickness.
Quenching hardness	Max.64 HRC	In oil or vacuum
Tempering	Temperature:	See tempering curve
	Duration:	1 hour per 25 mm wall thickness.
	Cooling:	Air
Working Hardness	Max. 30-35 HB	

Note on hardening: o avoid pitting, holding at hardening temperature must not be done in salt baths, but packed or in a vacuum. Quenching in nitric salts should likewise be avoided with the hot bath method of vacuum hardening.

Tempering curve



TTT curve (continuous)



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