

**Hot work tool steel for universal application**

**Chemical composition**

Standard analysis in mass -%

C	Si	Mn	Cr	Mo	V
0.37	1.00	0.40	5.30	1.30	0.40

**Standards and designations**

DIN EN ISO 4967	SEL	AISI	B.S. <sup>1</sup>	AFNOR <sup>1</sup>	JIS	GOST	UNE <sup>1</sup>
X37CrMoV5-1	1.2343	H11	BH11	Z38CDV5	SKD6	4Ch5MFS	F.520.G

<sup>1</sup> obsolete standard

**Properties**

- Cr-Mo-V alloyed hot work tool steel with extras fine structure
- Excellent toughness
- Very good thermal shock resistance
- Good high temperature strength
- Good hot wear resistance
- Excellent polishing ability (Superclean)
- Highest isotropy and homogeneity when remelted (ESR→Thermodur®2343Superclean)

**Applications**

- Universally applicable tool steel
- Die casting tools and molds
- Extrusion dies
- Forging dies and die inserts
- Plastic molds and mold inserts
- Extruder screws and cylinders
- Ejector pins
- Mold holders and chucks
- Reinforcing rings

**Physical properties**

Coefficient of thermal expansion in 10 <sup>-6</sup> /K	
20 – 100 °C	11.9
20 – 200 °C	12.4
20 – 300 °C	12.6
20 – 400 °C	12.7
20 – 500 °C	12.8
20 – 600 °C	12.9
20 – 700 °C	12.9

Thermal conductivity in W/(mK)

	annealed	Hardened and tempered
20 °C	29.8	26.8
350 °C	30.0	27.3
700 °C	33.4	30.3

## Heat treatment

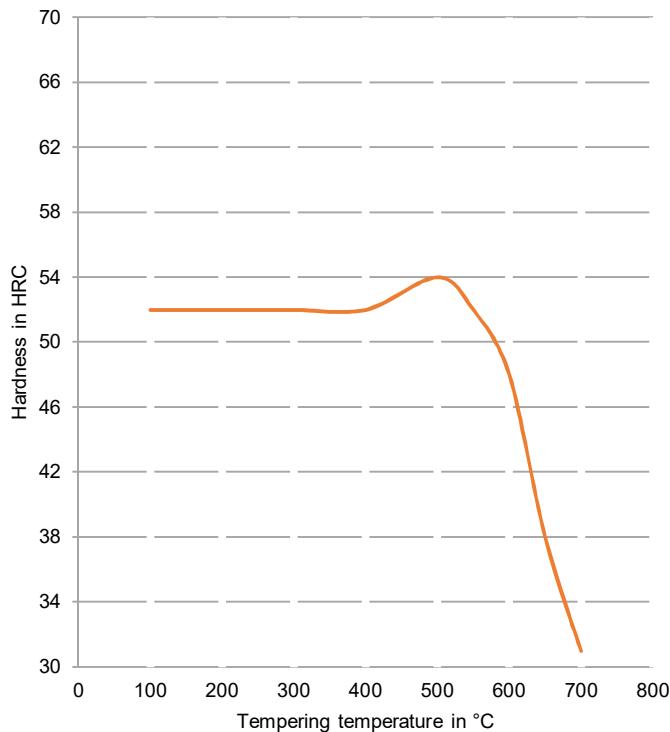
### Heat treatment parameters

	Temperature	Cooling / Quenching	Hardness
Soft annealing	750 – 800 °C	furnace	max. 229 BHN
Stress relieving	600 – 650 °C	furnace	
Hardening	1010 – 1030 °C	Air, N <sub>2</sub> , oil, salt bath (500 – 550 °C)	54 HRC (after quenching)

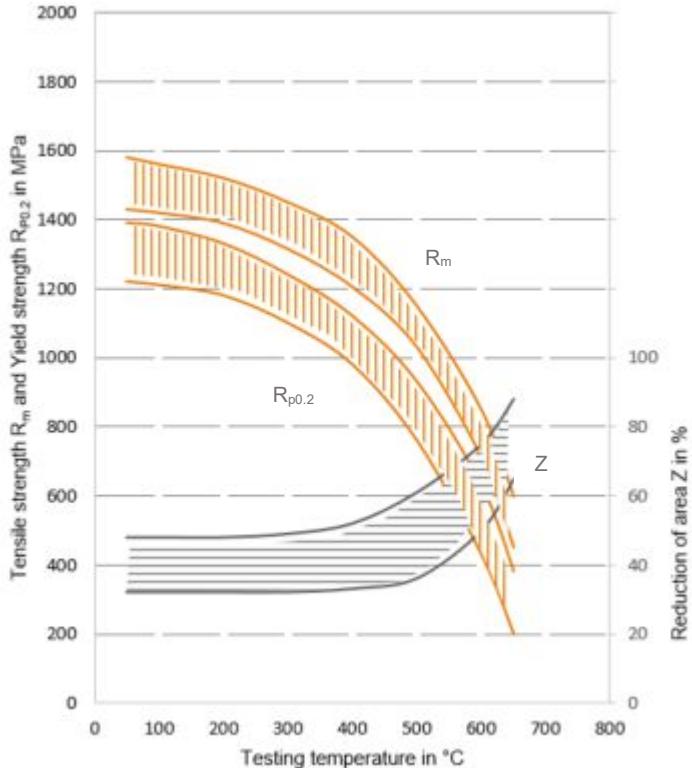
### Tempering

Temperature in °C	100	200	300	400	500	550	600	650	700
Hardness in HRC	52	52	52	52	54	52	48	38	31

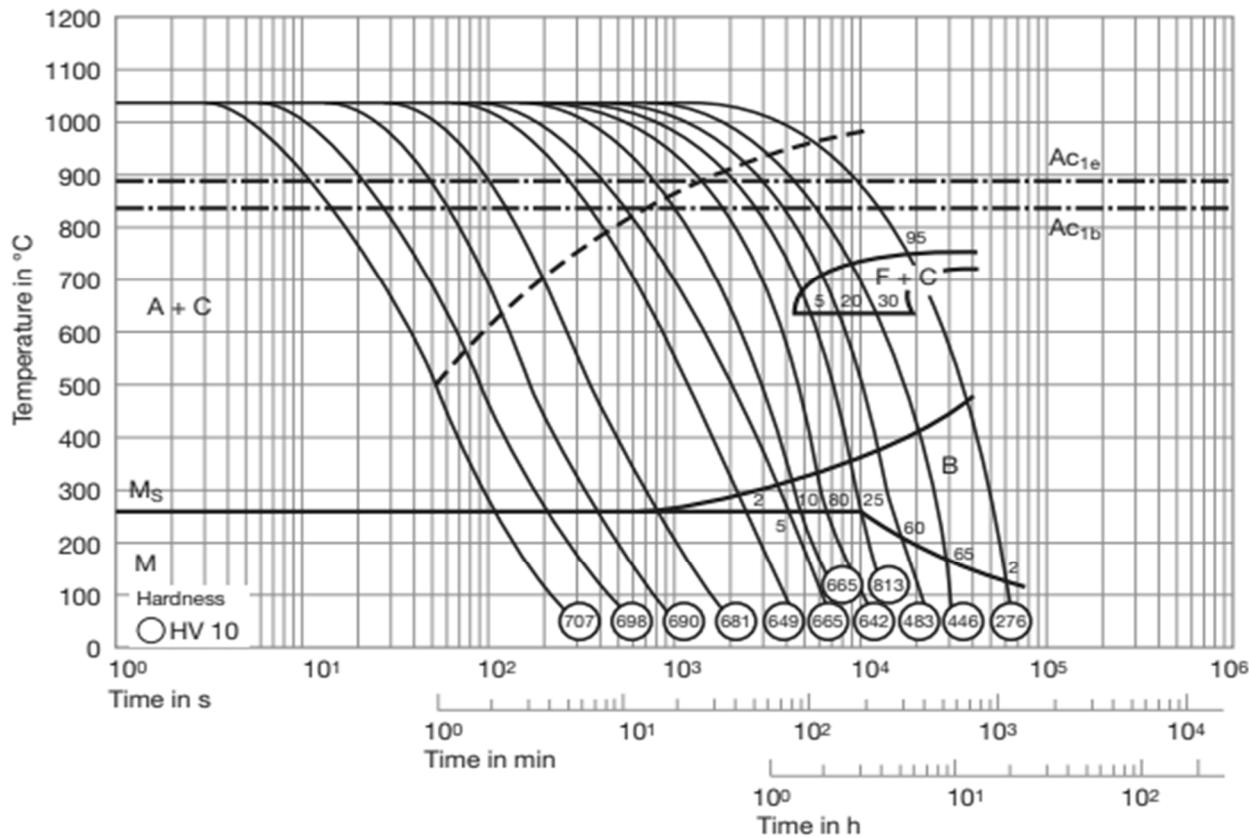
### Tempering diagram



### Hot wear resistance



**Time-temperature-transformation diagram**



**Condition of delivery**

Thermodur®2343 EFS and Thermodur®2343 Superclean are given an extra fine structure (EFS) thanks to the application of the most modern special technological processes from the melting of selected feed materials to heat treatment. Although these processes already provide a high isotropy of material properties, we recommend using the remelted grade Thermodur®2343 Superclean for highest requirements.

Thermodur®2343 EFS and Thermodur®2343 Superclean are usually supplied in normalized and annealed condition with a hardness of max. 229 BHN.

For further info on our product range of tool steel, stainless steel and Engineering steel please visit [www.swisssteelgroup.com](http://www.swisssteelgroup.com)

Discover our Green Steel portfolio on [www.swissgreensteel.com](http://www.swissgreensteel.com)

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We reserve the right to make changes and technical improvements without notice. Errors and omissions excepted.  
 The desired performance characteristics are only binding if they had been agreed upon exclusively at the time that the contract was made.