



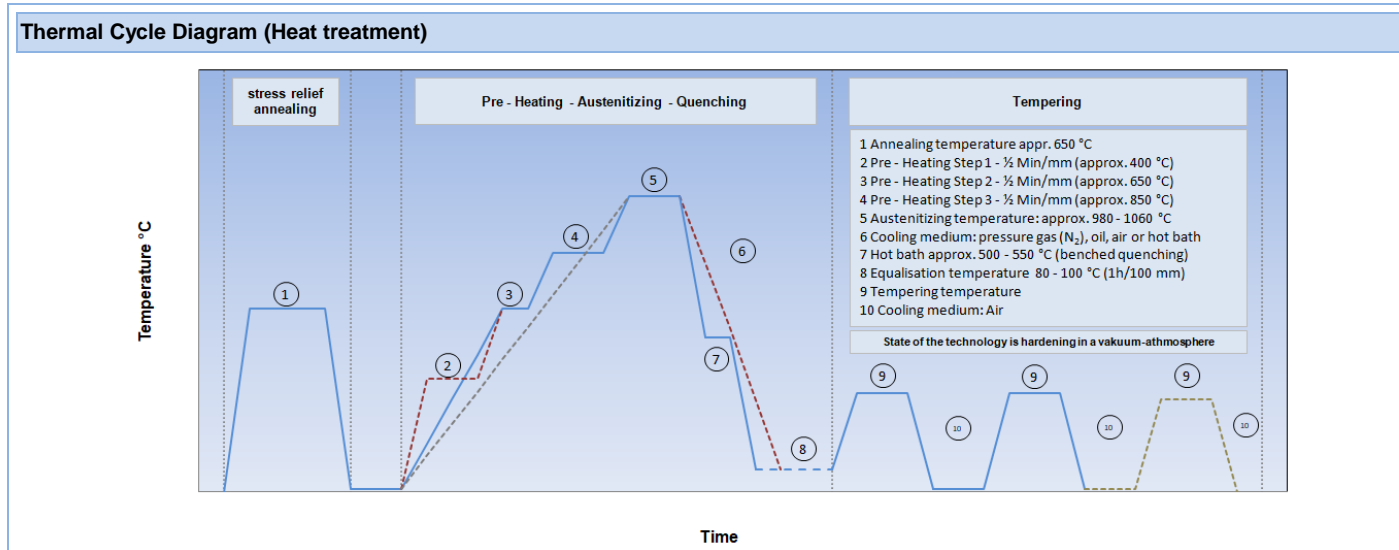
Technical Data Sheet	Grade	Code (SEL)	Hot work tool steel
	1.2343 ESR	X37CrMoV5-1	

Standards	Steel properties
EN ISO 4957 X37CrMoV5-1	Chromium-Molybdenum-Vanadium-alloyed hot working tool steel with high hot tensile strength and toughness. Good thermal conductivity and insusceptibility to hot cracking. Can be water-cooled to a limited extent. Excellent polishability.
AFNOR Z35CDV5	
BS BH 11	
UNE F.520.G (F.5317)	
UNI X37CrMoV51KU	
AISI H 11	
GOST 4X5MΦC	
Suitable for:	
Dies and die inserts, tools for forging machines, pressure casting dies for light metals, highly stressed tools for extrusion of lightmetals such as liners, dies, punches. Hot extrusion tools, forging dies, casting- and pressure tools, ejector pins, hot shear knives, tool holders and shrink fit chucks.	

C	Si	Mn	Cr	Mo	Ni	V	W	Co	Sonst.
0,37	1,00	0,40	5,20	1,30	-	0,40	-	-	-

Melting	EAF + VOD	Remarks 1.2343 has in comparison a higher toughness than 1.2344. Enhanced cleanliness, homogeneity and toughness in comparison to conventional melted 1.2343. Preheating before use: 250 - 300 °C – is recommended.
Density (g/cm³)	7,80	
Supply condition	EFS - annealed	
Hardness (HB)	max. 229	
Tensile strength (N/mm²)	-	
Work hardness (HRC)	-	
Structure	SEP 1614	
Cleanliness (DIN 50602)	K1 < 15	

Physical properties		20 °C	100 °C	200 °C	300 °C	350 °C	400 °C	500 °C	600 °C	700 °C
Thermal expansion coefficient	10 ⁻⁶ * K (20 °C bis ...)	-	11,8	12,4	12,6	-	12,7	12,8	12,9	12,9
Thermal conductivity (W / m * K)	annealed	29,8				30				33,4
	quenched + tempered	26,8				27,3				30,3



Hinweis: Die in diesem Datenblatt enthaltenen Angaben dienen der Beschreibung, eine Haftung ist ausgeschlossen.



Heat treatment	Temperature (°C)	Cooling	Remarks heat treatment
Soft annealing	750 - 840	Furnace	Controlled slow cooling in furnace
Stress-relief annealing	ca. 650	Furnace	Slow cooling in furnace. After extensive machining process or complex shapes
Hardening	980 - 1060		After through-heating hold for 15-30 minutes.
Pre – heating Step 1	appr. 400		To avoid grain coarsening a austenitizing temperature of 980 - 990 °C is recommended.
Pre – heating Step 2	appr. 650		
Pre – heating Step 3	appr. 850		
Quenching	500 - 550	hot bath	In case of oil or polymer hardening interrupt at appr. 250 °C; or vacuum hardening
	appr. 80	Oil	
	appr. 80	Air	
	appr. 80	pressure gas	

Tempering Chart

Tempering – Hardness after tempering

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

Remarks for tempering

Slow heating to tempering temperature immediately after hardening. Time in furnace 1 hour for each 20 mm of workpiece thickness but at least 2 hours. Tempering must be repeated at least twice at a temperature 30 °C lower than the previous.

A third tempering cycle for the purpose of a best possible ductility and stress relieving may be advantageous.

Continuous Cooling Transformation Chart

Heat resistance chart

Hinweis: Die in diesem Datenblatt enthaltenen Angaben dienen der Beschreibung, eine Haftung ist ausgeschlossen.

Wilhelm Oberste-Beulmann GmbH & Co. KG

An der Hasenjagd 2, D-42897 Remscheid | Tel.: +49 (0) 2191 93 60-0, Fax: +49 (0) 2191 34 99 80 | info@oberste-beulmann.de | www.oberste-beulmann.de

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