



Technical Data Sheet	Grade	Code (SEL)	Hot work tool steel
	1.2329 mod.	46CrSiMoV7	

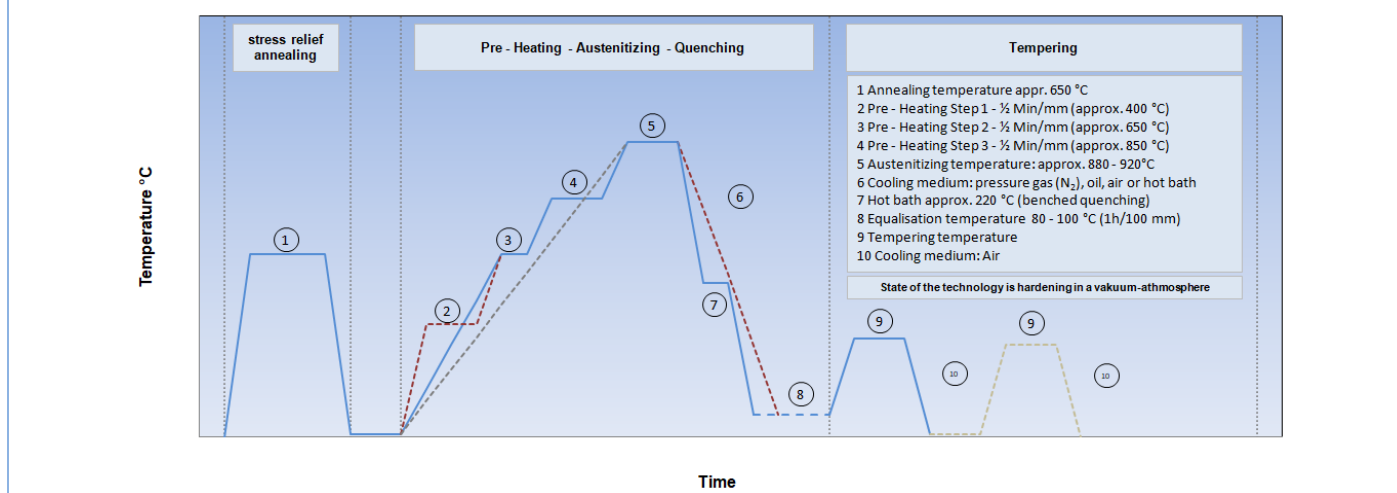
Standards	Steel properties
<b>EN ISO 4957</b> - <b>AFNOR</b> - <b>BS</b> - <b>UNE</b> - <b>UNI</b> - <b>AISI</b> - <b>GOST</b> -	Excellent tempering resistance, high-temperature strength, full quenching and tempering properties, outstanding weldability, nitridable, PVD and CVD coatable, good machinability.
	<b>Suitable for:</b> Hot-work tool steel for forging dies, pressure disks for extrusion, mould press dies.

C	Si	Mn	Cr	Mo	Ni	V	W	Co	Sonst.
0,49	0,70	0,85	1,80	0,35	0,60	0,20	-	-	Cu < 0,30

<b>Melting</b>	EAF + VOD	<b>Remarks</b> -
<b>Density (g/cm³)</b>	7,85	
<b>Supply condition</b>	soft annealed	
<b>Hardness (HB)</b>	max. 230	
<b>Tensile strength (N/mm²)</b>	-	
<b>Work hardness (HRC)</b>	-	
<b>Structure</b>	-	
<b>Cleanness (DIN 50602)</b>	-	

Physical properties		20 °C	100 °C	200 °C	300 °C	350 °C	400 °C	500 °C	600 °C	700 °C
<b>Thermal expansion coefficient</b>	10 <sup>-6</sup> * K (20 °C bis ...)	-	-	-	-	-	-	-	-	-
<b>Thermal conductivity (W / m * K)</b>	annealed	-	-	-	-	-	-	-	-	-
	quenched + tempered	-	-	-	-	-	-	-	-	-

**Thermal Cycle Diagram (Heat treatment)**



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



Heat treatment	Temperature (°C)	Cooling	Remarks heat treatment
<b>Soft annealing</b>	780 - 800	Furnace	Controlled slow cooling in furnace
<b>Stress-relief annealing</b>	ca. 650	Furnace	Slow cooling in furnace. After extensive machining process or complex shapes
<b>Hardening</b>	880 - 920		After through-heating hold for 15-30 minutes
Pre – heating Step 1	appr. 400		
Pre – heating Step 2	appr. 650		
Pre – heating Step 3	-		
<b>Quenching</b>	200 - 250	hot bath	-
	appr. 80	Oil	
	appr. 80	Air	
	-	-	

Tempering Chart		Tempering – Hardness after tempering									
		Temperature °C	100	200	300	400	500	550	600	650	700
		HRC	-	54	52	50	48	-	44	-	-
		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.									

Continuous Cooling Transformation Chart	Heat resistance chart