



Technical Data Sheet	Grade	Code (SEL)	Cold work tool steel
	1.2083 ESR	X40Cr14	

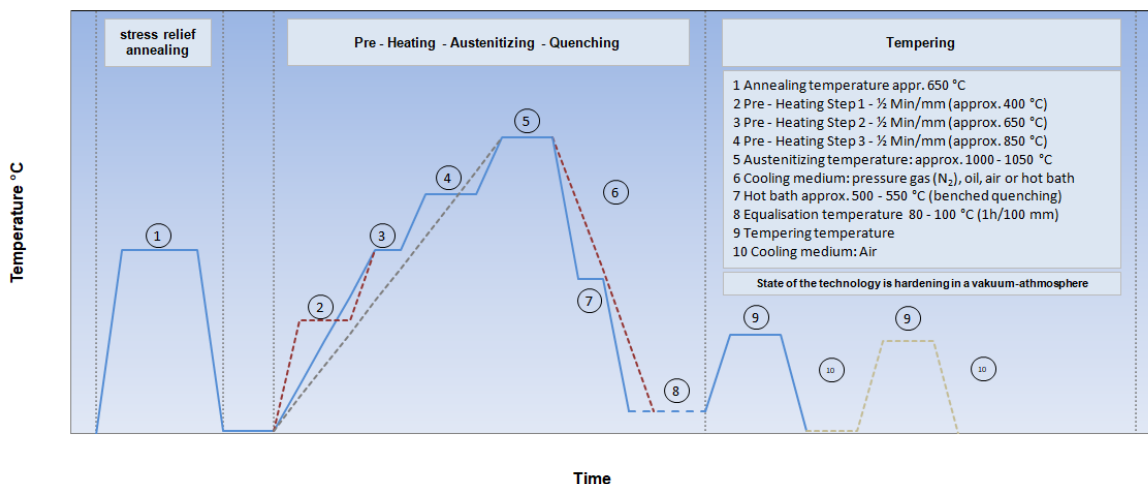
Standards	Steel properties
<b>EN ISO 4957</b> X40Cr14	Tool steel with high dissolved Cr – content in the matrix, through hardenable, high wear resistance, corrosion-resistant, good polishability.
<b>AFNOR</b> Z40C14	
<b>BS</b> -	
<b>UNE</b> F.5263	
<b>UNI</b> -	
<b>AISI</b> 420	
<b>GOST</b> 40X13	<b>Suitable for:</b>
	Moulds, tooling and inserts for processing plastics with corrosive reactions, moulds and pressure tools

C	Si	Mn	Cr	Mo	Ni	V	W	Co	Sonst.
0,40	< 1,00	< 1,00	13,50	-	-	-	-	-	-

<b>Melting</b> ESR	<b>Remarks</b> In the hardened condition 1.2083 ESR is corrosion-resistant.
<b>Density (g/cm³)</b> 7,80	
<b>Supply condition</b> soft annealed	
<b>Hardness (HB)</b> max. 241	
<b>Tensile strength (N/mm²)</b> -	
<b>Work hardness (HRC)</b> -	
<b>Structure</b> -	
<b>Cleanness (DIN 50602)</b> K1 < 15	

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 ...)	-	10,5	10,9	11,3	-	11,6	-	-	-
<b>Thermal conductivity (W / m * K)</b>	annealed	24,6				25,3				26,2
	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>	760 - 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>	1000 - 1050		After through-heating hold for 15-30 minutes
Pre – heating Step 1	appr. 400		
Pre – heating Step 2	appr. 650		
Pre – heating Step 3	appr. 850		
<b>Quenching</b>	500 - 550	hot bath	To reduce as possible thermal stress, size alteration and distorsion it is recommended to use the softest quenching medium. Oftentimes a hot bath hardening with the advantage of less thermal stress.
	appr. 80	Oil	
	appr. 80	Air	To avoid stress corrosion cracks the steel has to be carried out immediately after hardening and when the steel is at appr. 80 °C. Cooling down to RT has to be disabled.
	appr. 80	pressure gas	

Tempering Chart		Tempering – Hardness after tempering									
	Temperature °C	100	200	300	400	500	550	600	650	700	
	HRC	56	55	52	51	52	-	40	-	-	
<b>Remarks for tempering</b> 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.											

