



Technical Data Sheet	Grade	Code (SEL)	Cold work tool steel
	1.2360 mod.	X48CrMoV8-1-1	

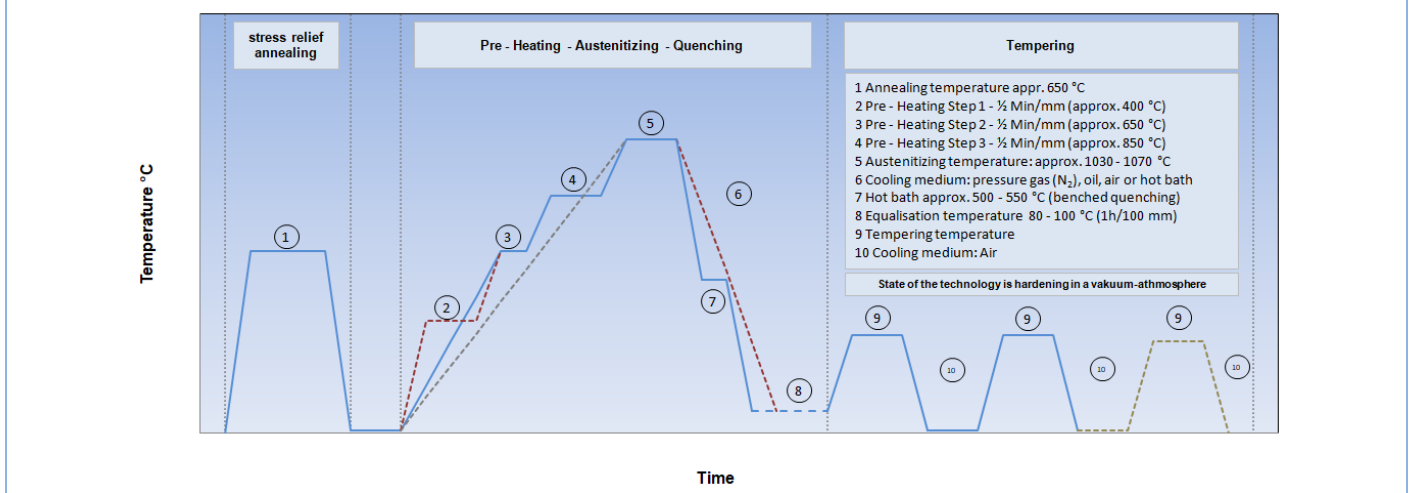
Standards	Steel properties
EN ISO 4957 - AFNOR - BS - UNE - UNI - AISI - GOST -	<p>1.2360 mod. is a 8 % chromium cold working tool steel that derives its high wear resistance from a balanced combination of the alloying elements. The reduced V-content (appr. 0.5 %) combined a sufficiently high hardenability with high toughness (even at comparatively low operating temperatures below RT).</p> <p>Suitable for:</p> <p>Chipper knives, blade holders, cutting-, blanking- and punching tools, veneer slicing blades, blade inserts, billet-shear blades, shear blades for sheets (thickness 15 mm) and reinforcements.</p>

C	Si	Mn	Cr	Mo	Ni	V	W	Co	Sonst.
0,52	0,95	0,45	8,20	1,30	0,25	0,50	-	-	-

Melting	EAF + VOD	Remarks Sheets: spheroidized annealed in protection atmosphere
Density (g/cm³)	7,75	
Supply condition	spheroidized annealed	
Hardness (HB)	max. 240	
Tensile strength (N/mm²)	-	
Work hardness (HRC)	-	
Structure	-	
Cleanness (DIN 50602)	-	

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 ...)	-	-	11,6	-	-	11,3	-	-	-
Thermal conductivity (W / m * K)	annealed	26,1								
	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
Soft annealing	830 - 860	Furnace	Controlled slow cooling in furnace
Stress-relief annealing	ca. 650	Furnace	Slow cooling in furnace. After extensive machining process or complex shapes
Hardening	1030 - 1070		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		
Quenching	appr. 550	hot bath	To reduce as possible thermal stress, size alteration and distorsion it is recommended to use the softest quenching medium.
	appr. 80	Oil	Oftentimes a hot bath hardening with the advantage of less thermal stress. To avoid stress corrosion cracks the steel has to be carried out immediately after hardening and when the steel is at appr. 80 °C.
	appr. 80	Air	
	appr. 80	pressure gas	Cooling down to RT has to be disabled.

Tempering Chart		Tempering – Hardness after tempering									
	Temperature °C	100	200	300	400	500	550	600	650	700	
	HRC	61	60	58	58	60	57	53	-	-	
Remarks for tempering											
-											

Continuous Cooling Transformation Chart	Heat resistance chart