



Technical Data Sheet	Grade	Code (SEL)	Cold work tool steel
	1.2436	X210CrW12	

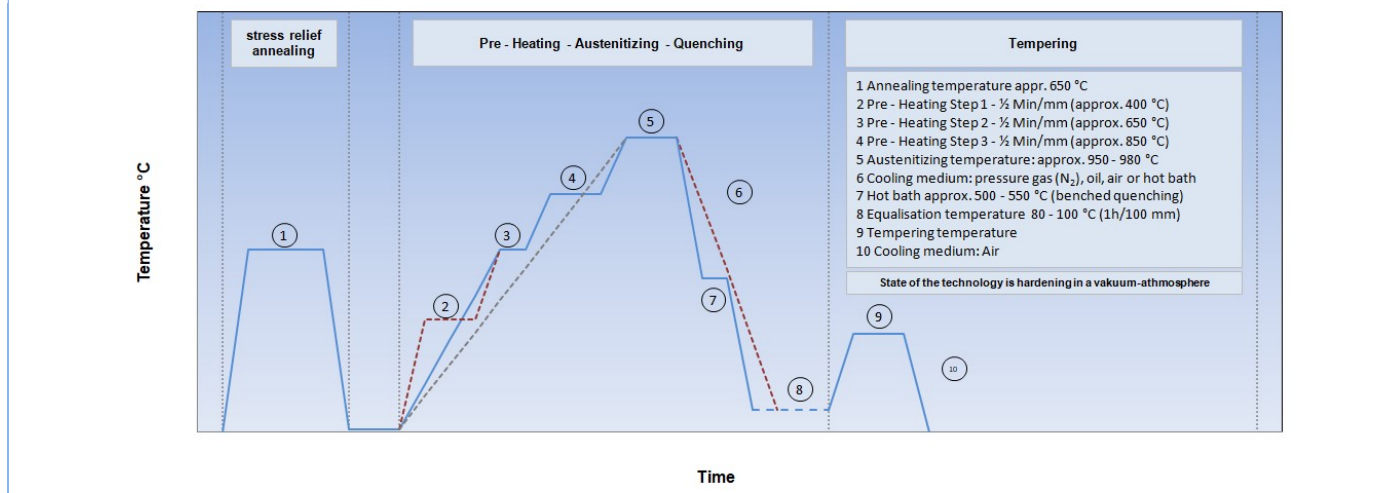
Standards	Steel properties
EN ISO 4957 X210CrW12	Ledeburitic 12 % chromium steel with very high wear resistance and cutting edge retention (high content of hard carbides) as well as improved hardenability in comparison to 1.2080. High hardenability and dimensional stable but with moderate toughness.
AFNOR Z210CW12-01	
BS -	
UNE F.5213	
UNI -	
AISI -	
GOST X12B	
Suitable for:	
Cutting tools, guillotine blades for cutting steel sheet up to about 3 mm thick and for cutting hardened steel strip, broaches, highly stressed woodworking tools where the toughness requirement is not too high, shaping and flanging tools, blades for producing chopped wire, thread rolling tools, deep drawing tools, press tools for the ceramic and pharmaceutical industry, drawing cones for wire drawing, extruding tools and guide strips, sand blasting tools	

C	Si	Mn	Cr	Mo	Ni	V	W	Co	Sonst.
2,10	0,30	0,40	12,00	-	-	-	0,70	-	-

Melting	EAF + VOD	Remarks Improved hardenability in comparison to 1.2080.
Density (g/cm³)	7,70	
Supply condition	soft annealed	
Hardness (HB)	max. 255	
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 ...)	-	10,9	11,9	12,3	-	12,6	12,9	13,0	13,2
Thermal conductivity (W / m * K)	annealed	16,7				20,5				24,2
	quenched + tempered	-				-				-

Thermal Cycle Diagram (Heat treatment)

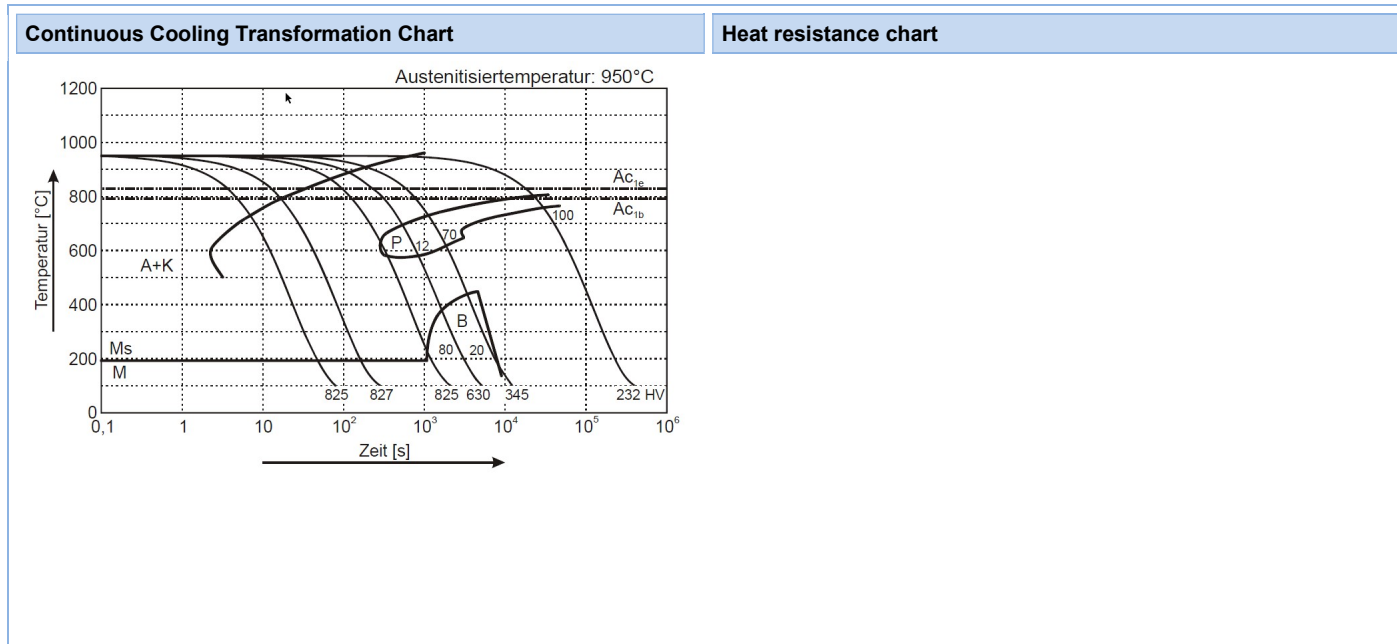


Hinweis: Die in diesem Datenblatt enthaltenen Angaben dienen der Beschreibung, eine Haftung ist ausgeschlossen.



Heat treatment	Temperature (°C)	Cooling	Remarks heat treatment
Soft annealing	800 - 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	950 - 980		After through-heating hold for 15-30 minutes
Pre – heating Step 1	appr. 400		Austenitizing temperature appr. 1020 °C for secondary hardening.
Pre – heating Step 2	appr. 650		For complex and sharp-edged tools air or hot bath hardening should be preferred
Pre – heating Step 3	appr. 850		
Quenching	500 - 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	
	appr. 80	Air	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	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	63	62	60	58	56	48	-	-	-	
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. For following coating or nitriding we recommend elevated hardening temperature (appr. 1020 °C) with subs											

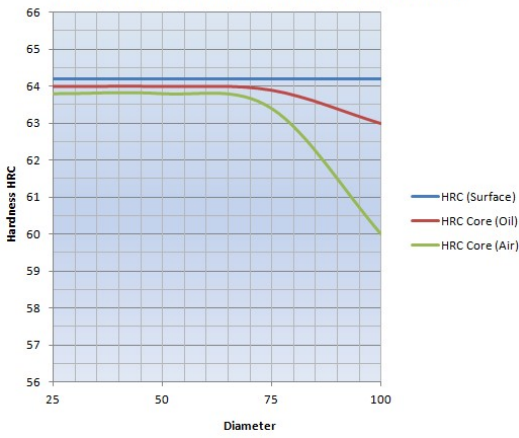




Potential Hardness Increase

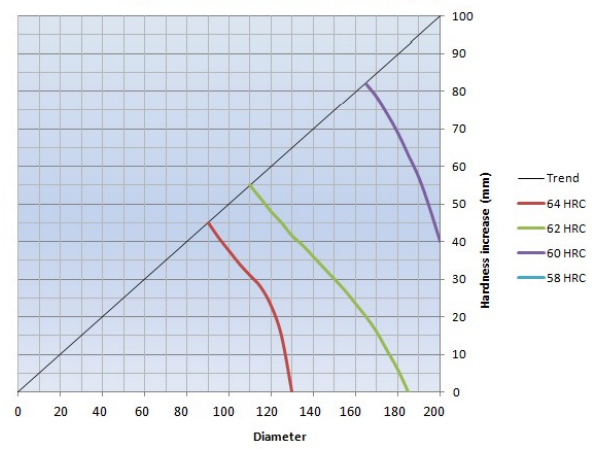
Several diameter

Potential Hardness Increase 1.2436 (several diameter)



Cooling medium

Potential Hardness Increase 1.2436 (Air)



Potential Hardness Increase 1.2436 (Oil)

