



Technical Data Sheet	Grade	Code (SEL)	High speed steel
	1.3343	HS6-5-2C	

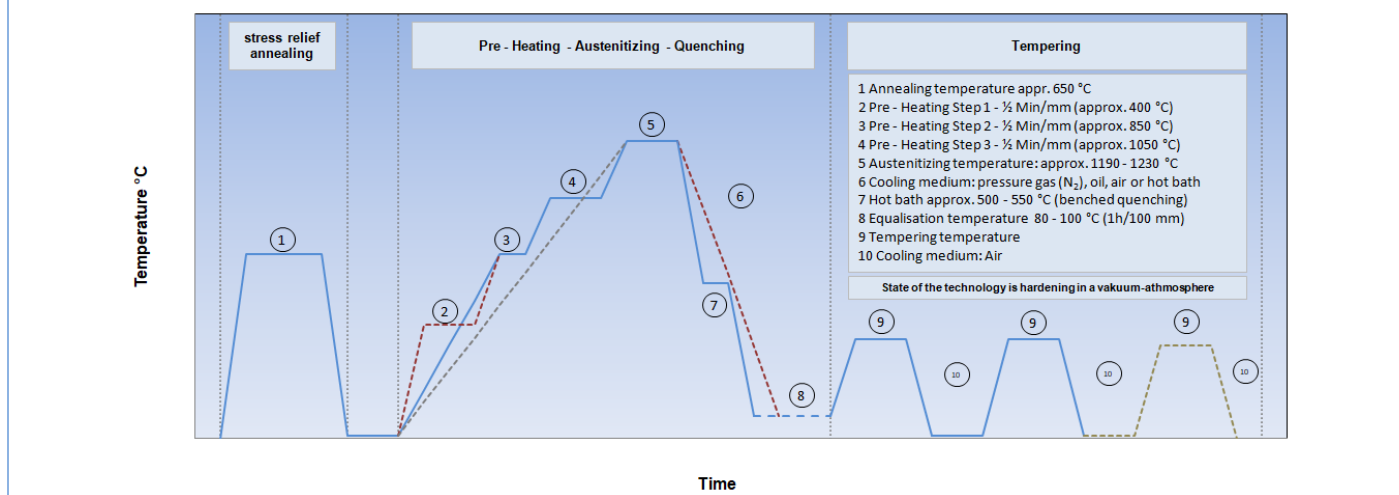
Standards	Steel properties
EN ISO 4957 HS6-5-2C	W-Co-alloyed standard high-speed steel with high toughness, compression strength, wear resistance and red hardness. Good dimensional stable with a good cutting edge retention.
AFNOR Z85WDCV06-05-04-02	
BS BM 2	
UNE F.550.A (F.5604)	
UNI HS 6-5-2	
AISI M 2	
GOST P6 M5	Suitable for:
	For all metal-cutting tools for roughing or finishing such as twist drills, diverse milling cutters, thread dies, broaches, reamers, countersinks, thread chasers, circular saw segments, shaping tools and woodworking tools. Also highly suitable for cold-forming tools such as cold extrusion rams and dies, as well as cutting and precision cutting tools, plastic moulds with elevated wear resistance and screws, cutting and fine cutting tools, hobbing tools.

C	Si	Mn	Cr	Mo	Ni	V	W	Co	Sonst.
0,90	< 0,45	< 0,40	4,10	5,00	-	1,90	6,40	-	-

Melting	EAF + VOD	Remarks Hardness in the annealed plus cold drawn condition (+A+C) may be 50 HB higher than in the annealed condition (+A).
Density (g/cm³)	8,20	
Supply condition	soft annealed	
Hardness (HB)	max. 269	
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 ...)	-	11,5	11,7	12,2	-	12,4	12,7	13,0	12,9
Thermal conductivity (W / m * K)	annealed	19,0								
	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	770 - 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	1190 - 1230		After through-heating hold for 15-30 minutes
Pre – heating Step 1	appr. 400		Upper temperature range for parts of simple shape and highest requirements concerning wear resistance, lower temperature for parts of complex shape and high ductility requirements. For coldworking tools also lower temperatures are of importance for higher toughness.
Pre – heating Step 2	appr. 850		
Pre – heating Step 3	appr. 1050		
Quenching	500 - 550	hot bath	In case of oil hardening interrupt at appr. 400 °C.
	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	64	63	62	62	65	66	60	53	-	
Remarks for tempering											
Slow heating to tempering temperature immediately after hardening in the range of 530 und 580 °C acc. to hardness requirements. Time in furnace 1 hour for each 20 mm of workpiece thickness but at least 2 hours.											
Tempering must be repeated two times. 1st and 2nd tempering to desired working hardness. 3rd tempering for stress relieving (appr.40 °C below the highest tempering temperature)											

