



Technical Data Sheet	Grade	Code (SEL)	High speed steel
	1.3243	HS6-5-2-5	

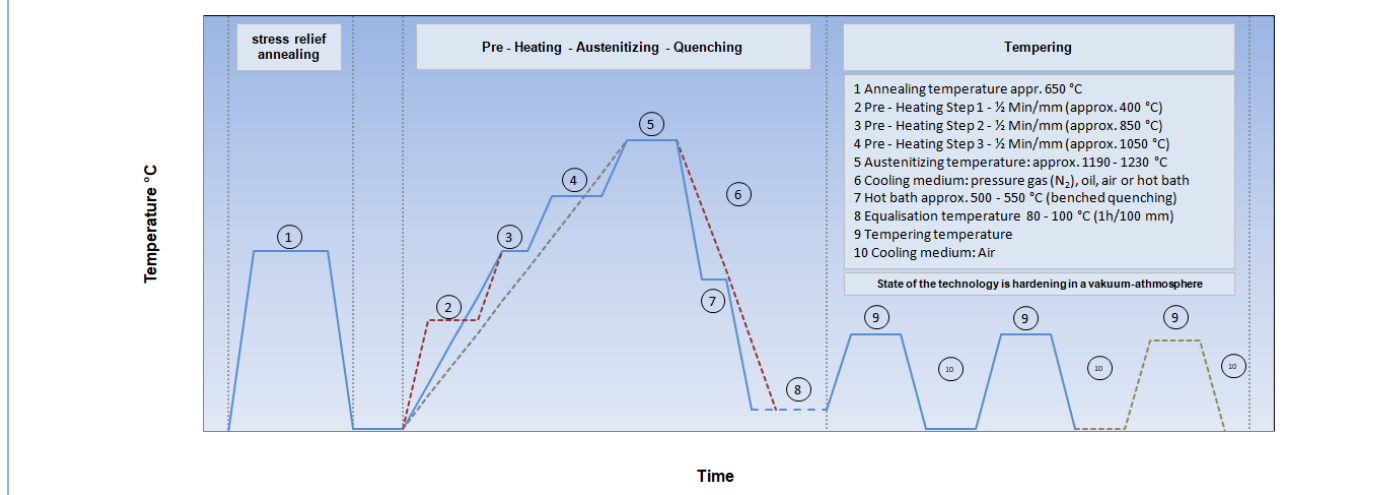
Standards	Steel properties
<b>EN ISO 4957</b> HS6-5-2-5	Co-alloyed, tough high-performance high-speed steel with high red hardness and tempering resistance. Dimensionally stable. Suitable for conditions involving thermal stresses and discontinuous cutting.
<b>AFNOR</b> Z85WDKCV06-05-05-04-02	
<b>BS</b> BM 35	
<b>UNE</b> F.550.C (F.5613)	
<b>UNI</b> HS 6-5-2-5	
<b>AISI</b> M 35	
<b>GOST</b> P6 M5 K5 S6	
	<b>Suitable for:</b>
	Heavy-duty milling cutters of all kinds, highly stressed twist drills and taps, profile knives, machining of high-strength materials, broaches.

C	Si	Mn	Cr	Mo	Ni	V	W	Co	Sonst.
0,92	< 0,45	< 0,40	4,10	5,00	-	1,90	6,40	4,80	-

<b>Melting</b>	EAF + VOD	<b>Remarks</b> Hardness in the annealed plus cold drawn condition (+A+C) may be 50 HB higher than in the annealed condition (+A).
<b>Density (g/cm³)</b>	8,20	
<b>Supply condition</b>	soft annealed	
<b>Hardness (HB)</b>	max. 269	
<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 ...)	-	11,5	11,7	12,2	-	12,4	12,7	13,0	12,9
<b>Thermal conductivity (W / m * K)</b>	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
<b>Soft annealing</b>	800 - 860	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>	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		
<b>Quenching</b>	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
<b>HRC</b>	64	63	59	61	64	66	62	56	-

**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)

### Time Temperature Transformation Chart

### Heat resistance chart