

Steel grade

Material No.	PREMIUM S1
AISI	S1
Search for alternatives in the ABRAMS STEEL GUIDE	www.abrams-steelguide.com/alternatives/S1

Shapes



**Smart Flat Stock [Smart]
Standardized Precision Blanks**
L: 12"
L: 24"



**Smart Flat Stock Metric [SmartM]
Standardized Precision Blanks Metric**
L: 300 mm
L: 600 mm

Chemical composition AISI S1 (reference value %)

C	Si	Mn	P	S	Cr	V	W
0.55 - 0.65	0.7 - 1.0	0.15 - 0.45	0 - 0.03	0 - 0.03	0.9 - 1.2	0.1 - 0.2	1.7 - 2.2

Physical properties

Hardness (delivery condition)	max. 229 HB, annealed						
Tensile strength R_m (as received condition)	approx. 111.6 KSI						
Working hardness	max. 60 HRC						
Thermal expansion coefficient $10^{-6}m/(m \cdot K)$	68 - 212°F	68 - 392°F	68 - 572°F	68 - 752°F	68 - 932°F	68 - 1112°F	68 - 1292°F
	11.8	12.7	13.1	13.5	14.0	14.3	14.5
Thermal conductivity $W/(m \cdot K)$	68°F	662°F	1292°F				
	34.2	32.6	30.9				

Technical properties

Steel grade with focus on cold work, with full hardenability, excellent toughness, dimensional stability and impact strength.

Applications

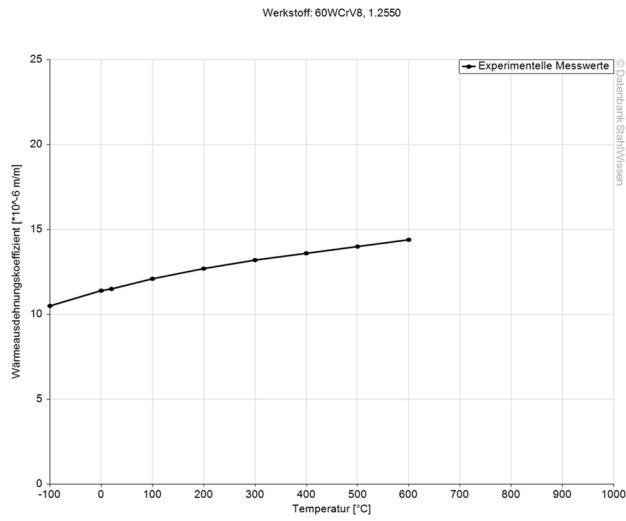
Blanking tools, dies, punches, forming dies, embossing tools, coining tools, tableting punches, plug-in tools, trimming tools, cold shear knives, riveting pins, hand chisels, pneumatic chisels, centre punches, ejectors, woodworking tools.

Heat treatment

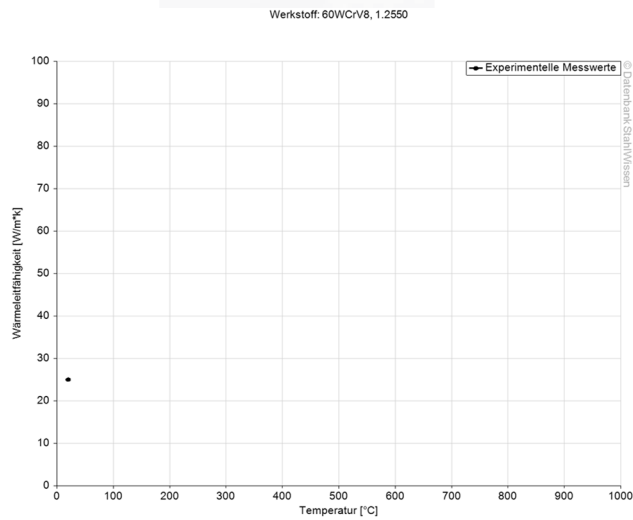
	Temperature	Cooling	Hardness			
Soft annealing	1310 - 1382°F	Furnace	max. 229 HB			
	Temperature	Cooling				
Stress relief annealing	approx. 1202°F	Furnace				
	Temperature	Quenching in	Hardness after quenching			
Hardening	1598 - 1652°F	Oil, hotbasin (356 - 428°F)	60 HRC			
Tempering	212°F	392°F	572°F	752°F	932°F	1112°F
	60 HRC	58 HRC	56 HRC	52 HRC	48 HRC	43 HRC



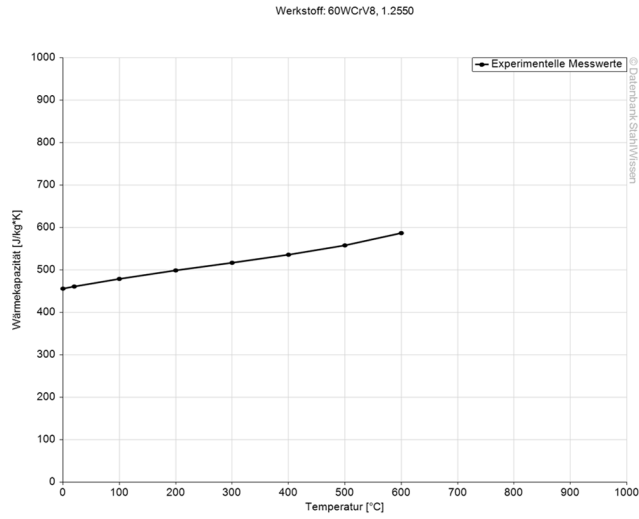
Thermal expansion coefficient diagram



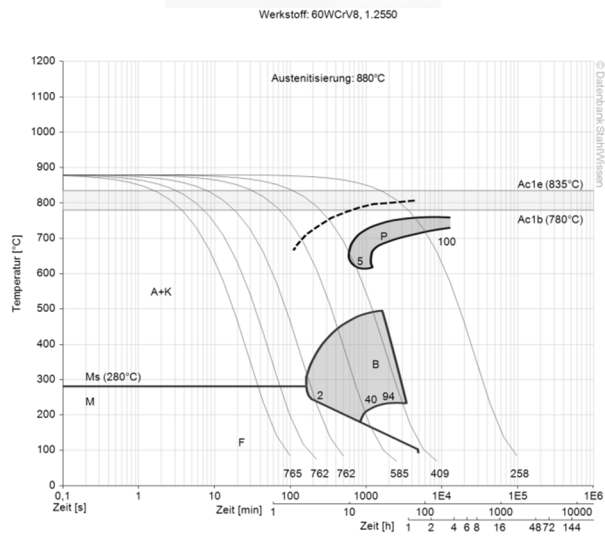
Thermal conductivity diagram



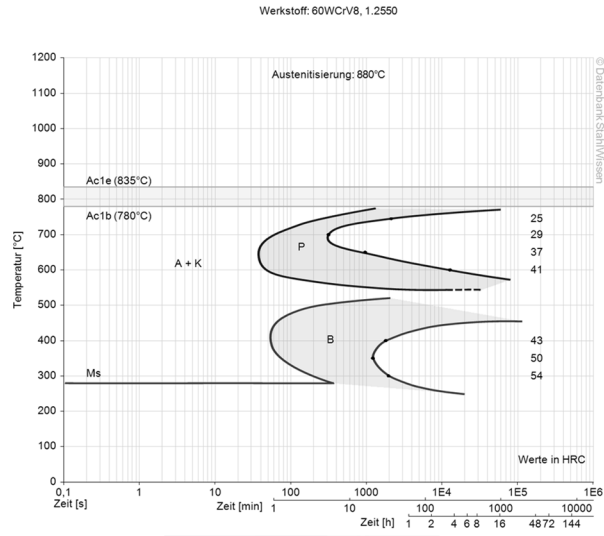
Thermal capacity diagram



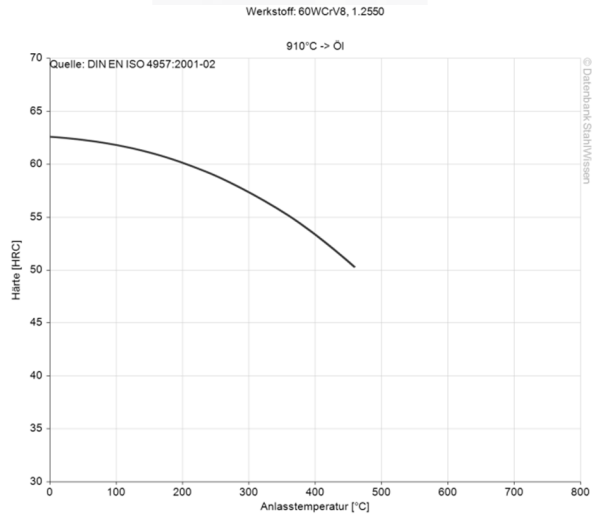
Continuous ZTU-diagram



Isothermal ZTU-diagram



Tempering diagram



The data shown here is to be used only as an indication of the statistics, thus we accept no liability.
 Diagrams are taken from Datenbank StahlWissen Dr. Sommer Werkstofftechnik
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