

S1 TOOL STEEL (60WCRV7)

S1 toolsteel is a cold work steel with very good toughness, is dimensionally stable, and impact resistant, with high hardening capacity. Applications: Cold shear knives, paper and wood cutting knives, cutting tools for plates up to 10 mm, ejector pins, air hammers.

Colour Code	Stocked Sizes		
	Rounds	20 mm - 150 mm Dia	
	Condition of Delivery		
	Soft annealed to max. 229 HB		

Related Specifications

Germany	DIN 1.2550
USA	AISI S1

Chemical Composition

	%
Carbon	0.60
Tungsten	2.00
Chromium	1.00
Vanadium	0.15

Physical Properties

Thermal expansion coefficient	$\left[\frac{10^{-6} \text{ m}}{\text{m K}} \right]$	20-100°C	20-200°C	20-300°C	20-400°C
		10,9	11,5	12,0	12,4
Thermal conductivity	$\left[\frac{\text{W}}{\text{m K}} \right]$	20°C	350°C		
		31,9	29,6		

Heat Treatment

Soft Annealing

Temperature	740 - 760°C
Cooling	furnace
Hardness	max 229 HB

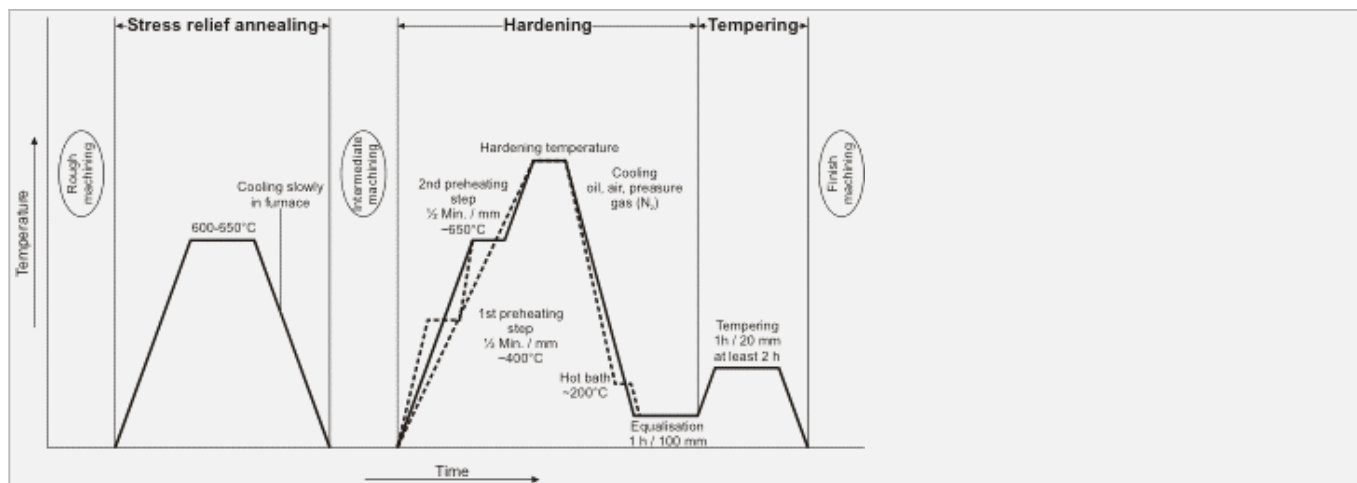
Stress Relief Annealing

Temperature	600 - 650°C
Cooling	furnace

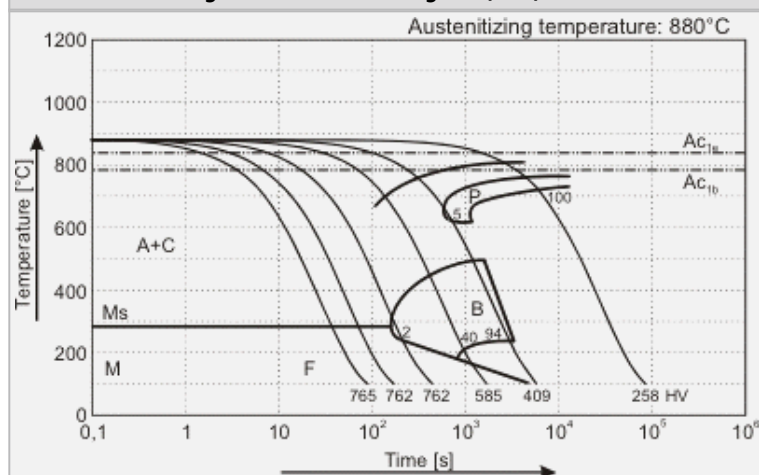
Hardening

Temperature	860 - 900°C
Cooling	oil or hot bath 180 - 220°C
Hardness	see tempering diagram

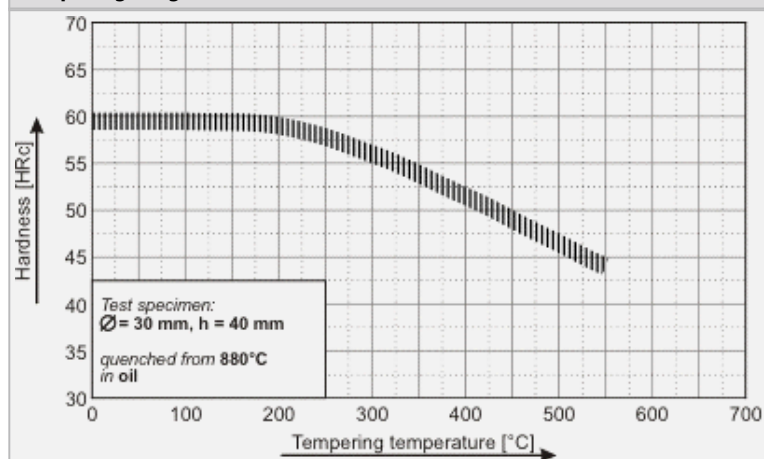
Thermal Cycle Diagram



Continuous Cooling Transformation Diagram (CCT)



Tempering Diagram



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