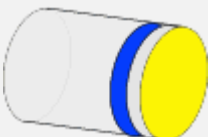


## S1 TOOL STEEL (60WCRV7)

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	
Yellow/Blue	Rounds	20 mm - 150 mm Dia
	<b>Condition of Delivery</b>	
	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	$\left[ \frac{10^{-6} \text{ m}}{\text{m K}} \right]$ <table border="1"> <tr> <td>20-100°C</td> <td>20-200°C</td> <td>20-300°C</td> <td>20-400°C</td> </tr> <tr> <td>10,9</td> <td>11,5</td> <td>12,0</td> <td>12,4</td> </tr> </table>	20-100°C	20-200°C	20-300°C	20-400°C	10,9	11,5	12,0	12,4
20-100°C	20-200°C	20-300°C	20-400°C						
10,9	11,5	12,0	12,4						
Thermal conductivity	$\left[ \frac{\text{W}}{\text{m K}} \right]$ <table border="1"> <tr> <td>20°C</td> <td>350°C</td> </tr> <tr> <td>31,9</td> <td>29,6</td> </tr> </table>	20°C	350°C	31,9	29,6				
20°C	350°C								
31,9	29,6								

### Heat Treatment

#### Soft Annealing

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

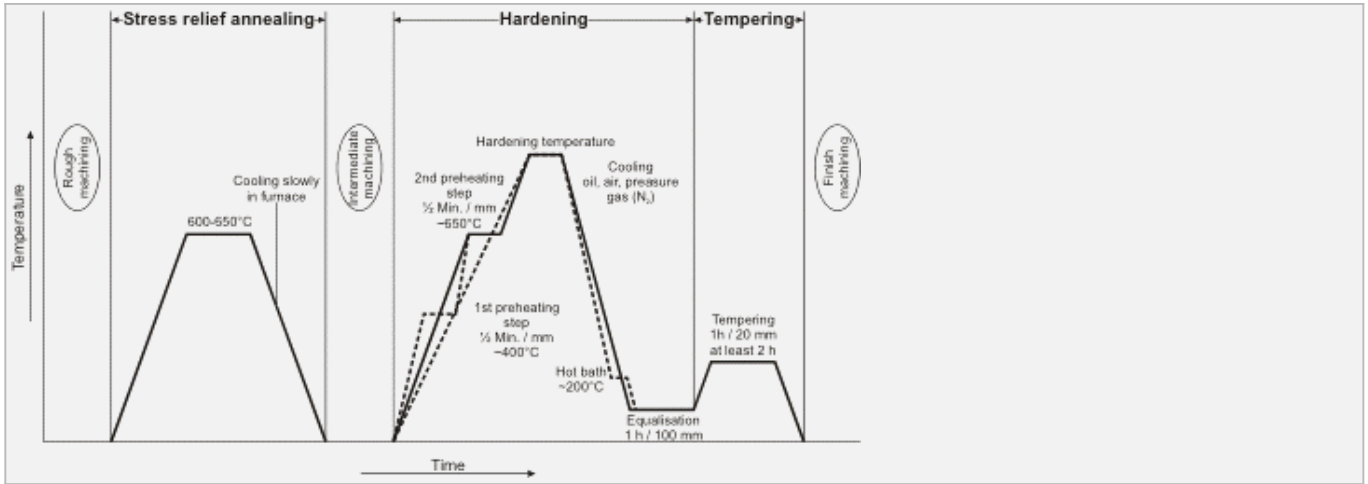
#### Stress Relief Annealing

Temperature	600 - 650°C
Cooling	furnace

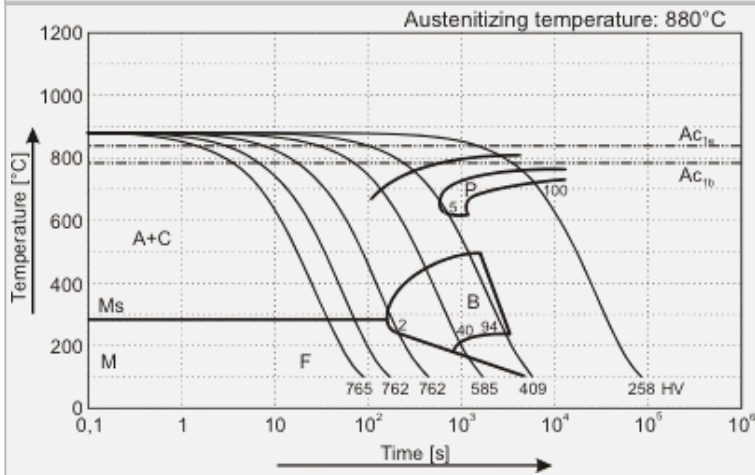
#### Hardening

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

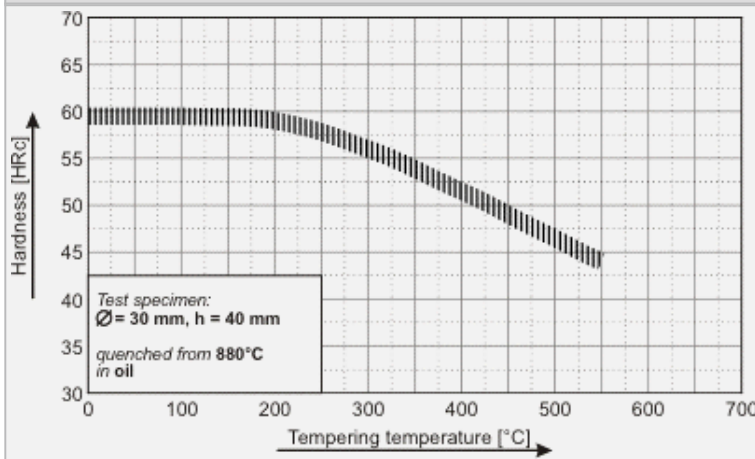
### Thermal Cycle Diagram



**Continuous Cooling Transformation Diagram (CCT)**



**Tempering Diagram**



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