

P20 TOOL STEEL (40CRMNNIMO8-6-4)

P20 is a plastic mould steel that is usually supplied in a hardened and tempered condition. Exhibiting good machinability with better polishability, compared to 1.2312 (AISI P20+S).

Applications: Plastic moulds, frames for plastic pressure dies, hydroforming tools.

Colour Code	Stocked Sizes	
Red/Yellow 	Rounds	20.5 mm - 180 mm Dia
	Flats	50 mm x 12 mm - 100 mm x 30 mm
Condition of Delivery		
Hardened & tempered, 900 - 1050 N/mm ²		

Related Specifications

Germany	DIN 1.2311
USA	AISI P20

Chemical Composition

	%
Carbon	0.40
Manganese	1.50
Chromium	1.90
Molybdenum	0.20

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>12,1</td> <td>12,7</td> <td>13,2</td> <td>13,6</td> </tr> </table>	20-100°C	20-200°C	20-300°C	20-400°C	12,1	12,7	13,2	13,6
20-100°C	20-200°C	20-300°C	20-400°C						
12,1	12,7	13,2	13,6						
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>39,6</td> <td>39,2</td> </tr> </table>	20°C	350°C	39,6	39,2				
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Heat Treatment

Soft Annealing

Temperature	710 - 740°C
Cooling	furnace
Hardness	max 235 HB

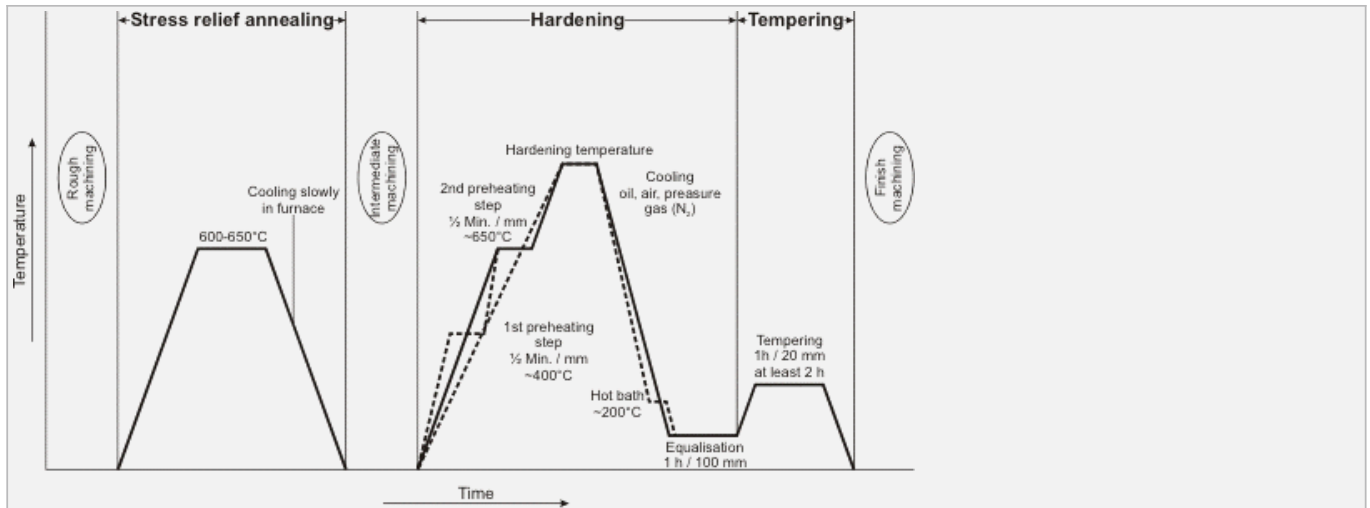
Stress Relief Annealing

Temperature	500 - 550°C
Cooling	furnace

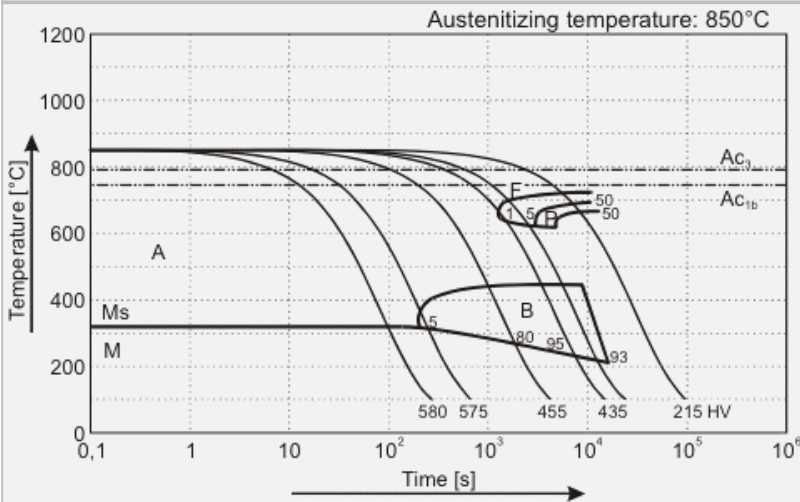
Hardening

Temperature	830 - 870°C
Cooling	oil or hot bath 180 - 220°C
Hardness	see tempering diagram

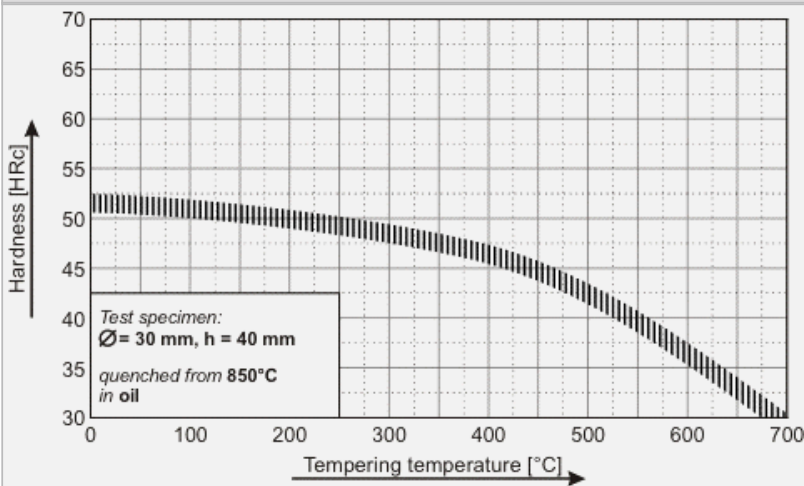
Thermal Cycle Diagram



Continuous Cooling Transformation Diagram (CCT)



Tempering Diagram



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