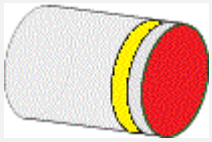
ENGINEERING STEELS + ALLOYS

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.

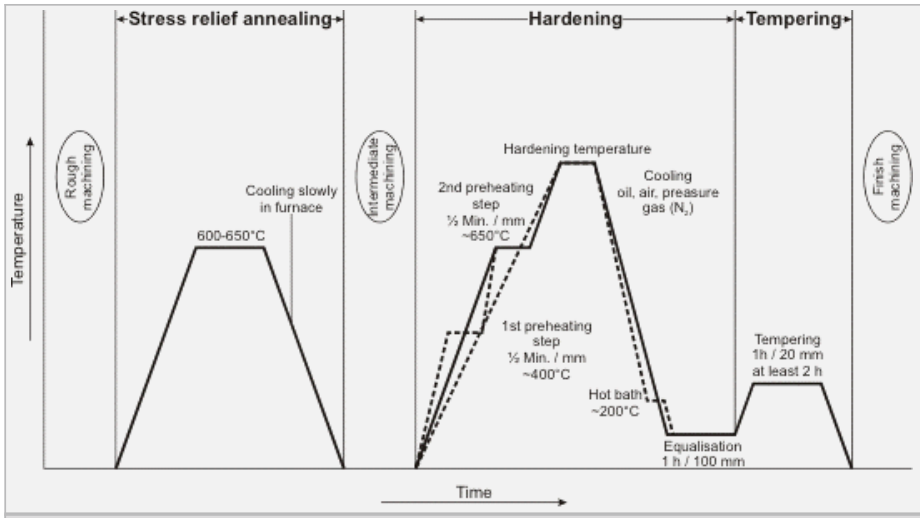
Colour Code	Stocked Sizes	
Red/Yellow 	Rounds Flats	20.5 mm - 180 mm Dia 50 mm x 12 mm - 100 mm x 30 mm
	Condition of Delivery	
	Hardened & tempered, 900 - 1050 N/mm^2	

Related Specifications	
Germany	DIN 1.2311
USA	AISI P20

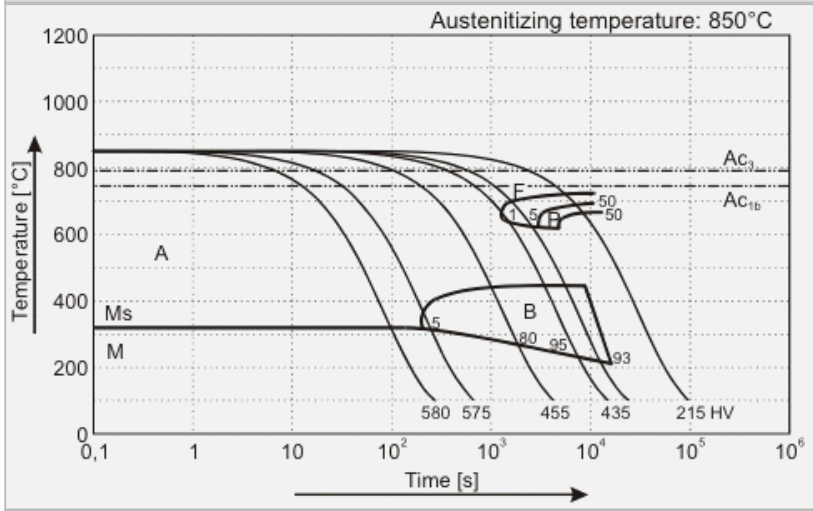
Chemical Composition	
	%
Carbon	0.40
Manganese	1.50
Chromium	1.90
Molybdenum	0.20

Physical Properties					
Thermal expansion coefficient	$\left[\frac{10^{-6}\,m}{m\,K}\right]$	20-100°C 12,1	20-200°C 12,7	20-300°C 13,2	20-400°C 13,6
Thermal conductivity	$\left[\frac{W}{m\,K}\right]$	20°C 39,6	350°C 39,2		

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