

Material No.: Code:

**1.2312 40CrMnNiMo8-6-4**

DE - Brand:

**MCMS**

In the DIN EN ISO 4957 the grades 1.2311 (AISI P20), 1.2312 (AISI P20+S) and 1.2738 (AISI P20+Ni) covered by the above mentioned code were amalgamated. The grade 1.2312 contain additional quantities of S and no additional quantities of Ni.

**Chemical composition:**  
(Typical analysis in %)

C	Mn	Cr	Mo	S			
0,40	1,50	1,90	0,20	0,05			

**Steel properties:**

Plastic mould steel with additional sulphur, usually supplied in a quenched and tempered condition. Polishable, better machinability compared to 1.2311. Similar to AISI P20+S

**Applications:**

Plastic moulds, frames for plastic pressure dies, hydro-forming tools.

**Condition of delivery:**

Quenched and tempered, 950 - 1100 N/mm<sup>2</sup>

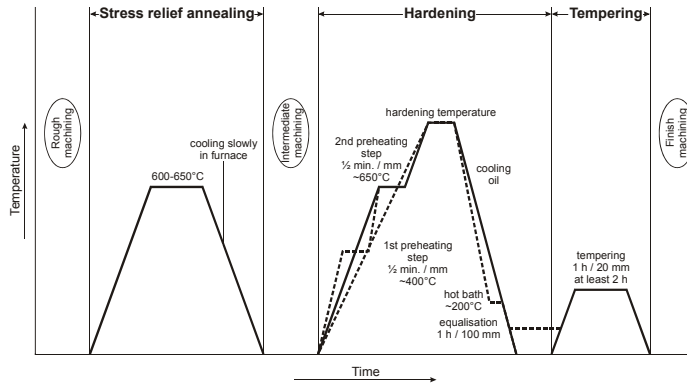
**Physical properties:**

Thermal expansion coefficient	$\left[ \frac{10^{-6} \cdot \text{m}}{\text{m} \cdot \text{K}} \right]$	20-100°C	20-200°C	20-300°C	20-400°C
		12,3	12,9	13,3	13,5
Thermal conductivity	$\left[ \frac{\text{W}}{\text{m} \cdot \text{K}} \right]$	20°C	350°C		
		39,6	39,3		

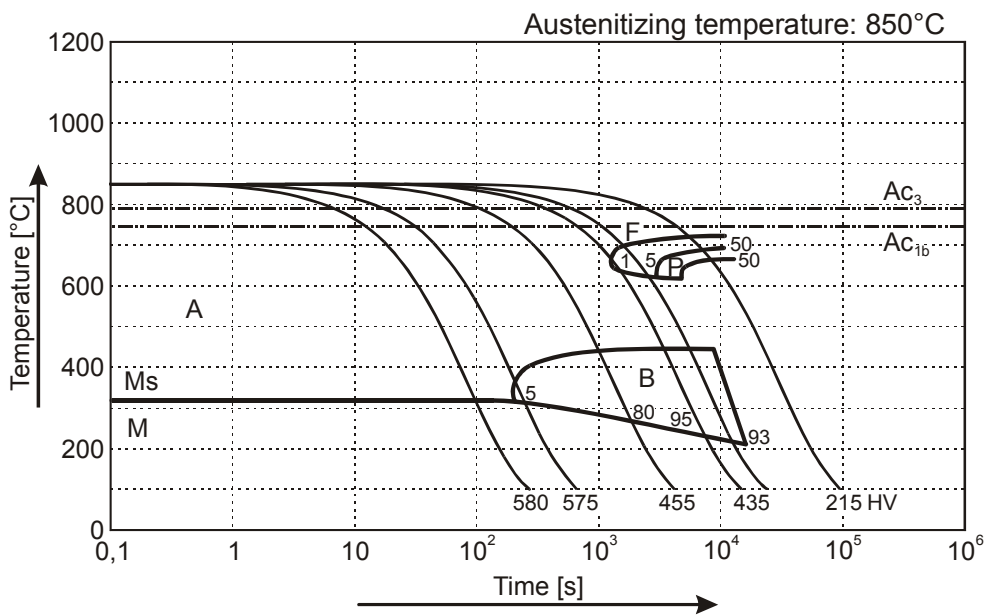
**Heat treatment:**

Soft annealing	<b>Temperature</b>	<b>Cooling</b>	<b>Hardness</b>
	710 - 740°C	furnace	max. 235 HB
Stress relief annealing The recommendation 500 - 550°C is valid for quenched and tempered condition. In the soft annealed condition stress relieving between 600 - 650°C is possible.	<b>Temperature</b>	<b>Cooling</b>	
	500 - 550°C	furnace	
Hardening	<b>Temperature</b>	<b>Cooling</b>	<b>Tempering</b>
	830 - 870°C	oil or hot bath 180 - 220°C	see tempering diagram

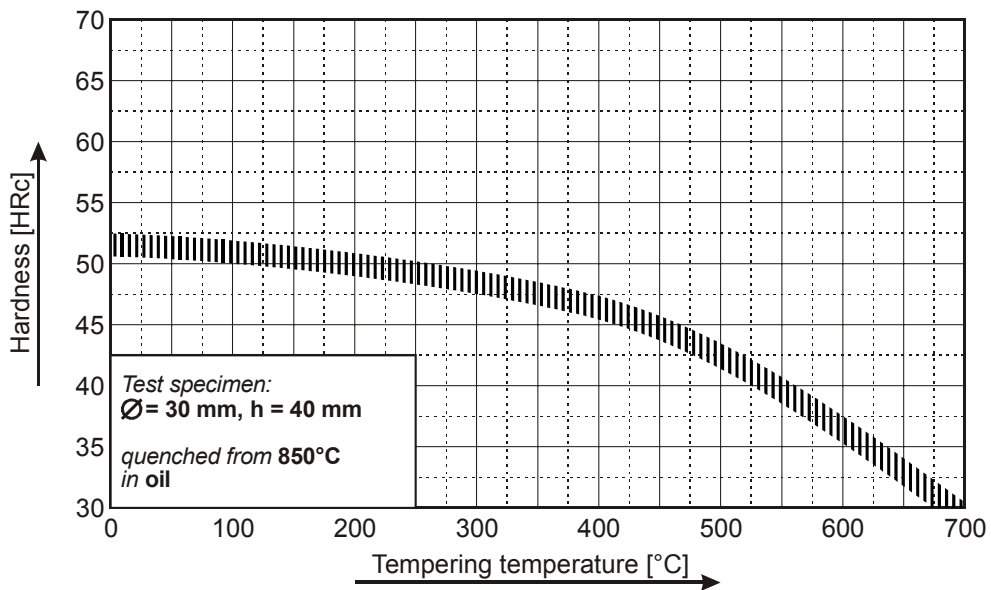
## (1.2312) Thermal Cycle Diagram



## Continuous Cooling Transformation Diagram (CCT)



## Tempering Diagram



Remarks: All technical information is for reference only.