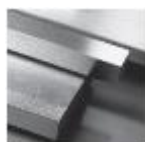


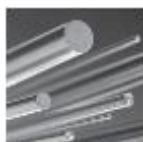
## Steel grade

Material No. / Werkstoff-Nr.	PREMIUM 1.2312
Description	40CrMnMoS8-6
AISI/SAE	P20+S
Search for alternatives in the ABRAMS STEEL GUIDE®	<a href="http://www.steel-guide.eu/alternatives/P20S">www.steel-guide.eu/alternatives/P20S</a>

## Specifications



**Precision flat steel with machining allowance [PFS/BA]**  
L: 500 mm  
L: 1.000 mm



**Precision round steel with machining allowance [PRS/BA]**  
peeled / rough-turned  
L: 500 mm  
L: 1.000 mm

## Chemical composition AISI/SAE P20+S (reference value %)

C	Si	Mn	P	S	Cr	Mo
0,35 - 0,45	0,3 - 0,5	1,4 - 1,6	0 - 0,03	0,05 - 0,1	1,8 - 2,0	0,15 - 0,25

## Physical properties

Hardness (delivery condition)	max. 325 HB, tempered					
Tensile strength $R_m$ (as received condition)	approx. 1.100 N/mm <sup>2</sup>					
Working hardness	max. 50 HRC					
Thermal expansion coefficient $10^{-6} \text{ m}/(\text{m} \cdot \text{K})$	20 - 100°C	20 - 200°C	20 - 300°C			
	Annealed	12,5	13,4	13,9		
	Tempered	12,3	13,0	13,7		
Thermal conductivity $W/(\text{m} \cdot \text{K})$	100°C	150°C	200°C	250°C	300°C	
	Annealed	40,2	40,9	40,3	40,0	39,0
	Tempered	39,8	40,4	40,4	39,9	39,0

## Technical properties

Pre-hardened cold work steel and plastic mould steel. Good machinability, although less polishable and more difficult to etch, due to added sulphur. High through-hardening ability and uniform component strength

## Applications

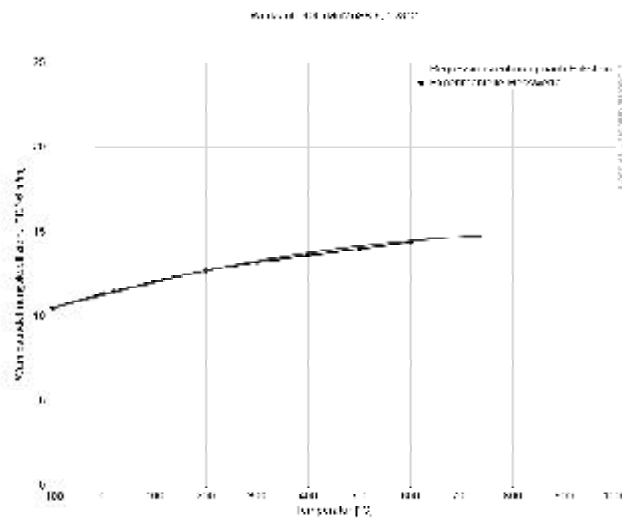
Machine construction, jigs, base plates, assembling parts, moulding frames, plastic moulds, plastic processing, die casting moulds, hydroforming tools, recipient sleeves, folding bars, tool holders..



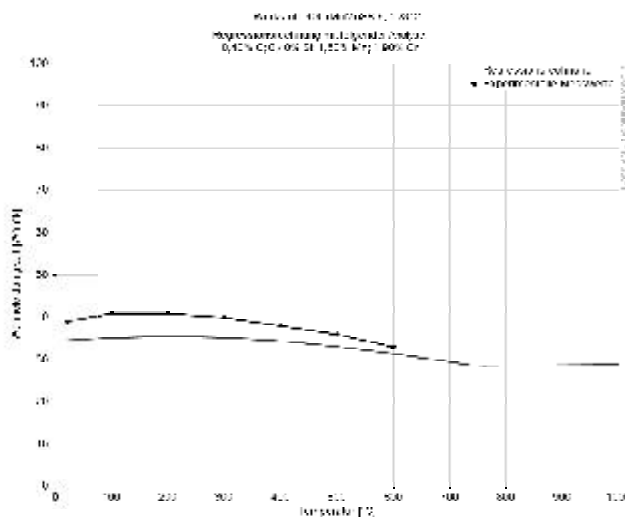
## Heat treatment

	Temperature	Cooling	Hardness				
Soft annealing	710 - 740°C	Furnace	max. 325 HB				
Stress relief annealing	580 - 620°C	Furnace					
	Temperature	Quenching in	Hardness after quenching				
Hardening	840 - 870°C	Oil, hot basin (180 - 220°C)	51 HRC				
	100°C	200°C	300°C	400°C	500°C	600°C	700°C
Tempering	51 HRC	50 HRC	48 HRC	46 HRC	42 HRC	36 HRC	28 HRC

## Thermal expansion coefficient diagram



## Thermal conductivity diagram



### ABRAMS PREMIUM STEEL

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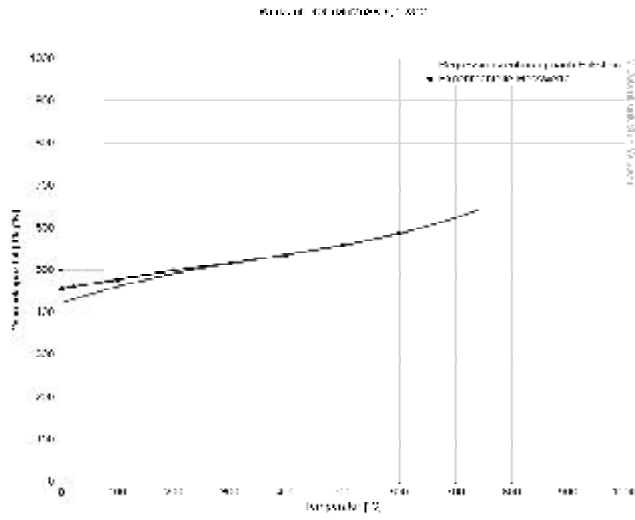
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**Thermal capacity diagram**



**Continuous ZTU-diagram**

