

## Steel grade

Material No. / Werkstoff-Nr.	PREMIUM 1.2738
Description	40CrMnNiMo8-6-4
AISI/SAE	P20+Ni
Search for alternatives in the ABRAMS STEEL GUIDE <sup>®</sup>	<a href="http://www.steel-guide.eu/alternatives/P20Ni">www.steel-guide.eu/alternatives/P20Ni</a>

## Specifications



€co-Präz\* [€co]  
L: 500 mm



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

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

C	Si	Mn	P	S	Cr	Mo	Ni
0,35 - 0,45	0,2 - 0,4	1,3 - 1,6	0 - 0,03	0 - 0,03	1,8 - 2,1	0,15 - 0,25	0,9 - 1,2

## 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 $10^{-6}m/(m \cdot K)$	20 - 100°C	20 - 200°C	20 - 300°C	20 - 400°C	20 - 500°C	20 - 600°C	20 - 700°C
	11,1	12,9	13,4	13,8	14,2	14,6	14,9
Thermal conductivity $W/(m \cdot K)$	20°C	350°C	700°C				
	34,5	33,5	32,0				

## Technical properties

Steel grade with focus on plastic mould making; nickel additives for a better through-hardenability (constant strength), also for thicknesses > 400 mm. Low sulphur steel and therefore polishable and grainable.

## Applications

Plastic moulds, moulding frames, die casting moulds, dies, forging tools, metal extrusion tools, tube presses, hydroforming tools.

## Heat treatment

	Temperature	Cooling	Hardness				
Soft annealing	710 - 740°C	Furnace	max. 325 HB				
Stress relief annealing	Temperature	Cooling					
	550 - 600°C	Furnace					
Hardening	Temperature	Quenching in	Hardness after quenching				
	840 - 870°C	Polymer, oil	51 HRC				
Tempering	100°C	200°C	300°C	400°C	500°C	600°C	700°C
	51 HRC	50 HRC	48 HRC	46 HRC	42 HRC	39 HRC	28 HRC

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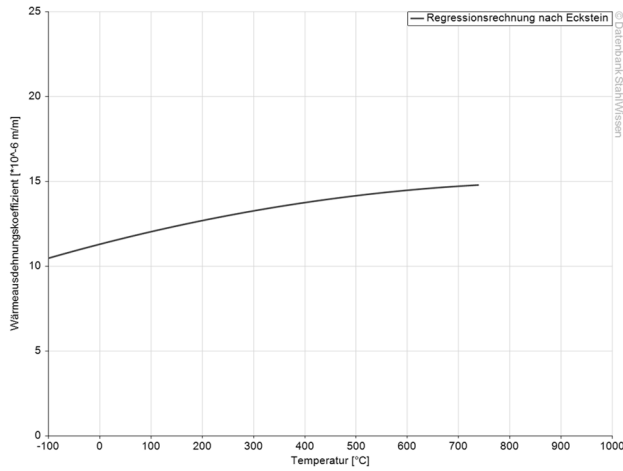
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## Thermal expansion coefficient diagram

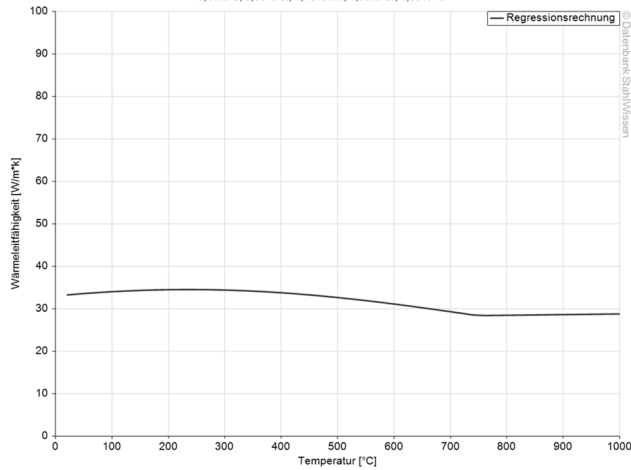
Werkstoff: 40CrMnNiMo8-6-4, 1.2738



## Thermal conductivity diagram

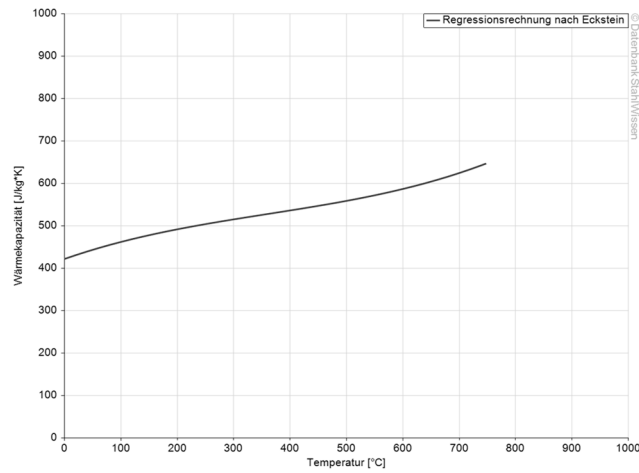
Werkstoff: 40CrMnNiMo8-6-4, 1.2738

Regressionsrechnung mit folgender Analyse:  
0,40% C; 0,30% Si; 1,45% Mn; 1,95% Cr; 1,05% Ni



## Thermal capacity diagram

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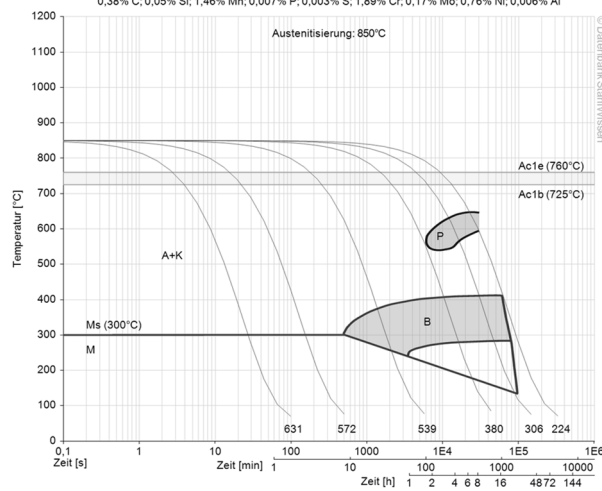
## Continuous ZTU-diagram

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Schmelzanalyse:

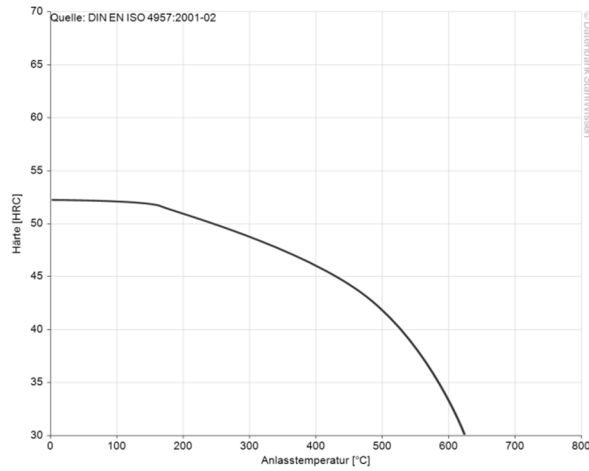
0,38% C; 0,05% Si; 1,46% Mn; 0,007% P; 0,003% S; 1,89% Cr; 0,17% Mo; 0,76% Ni; 0,006% Al

Austenitisierung: 850°C



## Tempering diagram

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The data shown here is to be used only as an indication of the statistics, thus we accept no liability.  
Diagrams are taken from Datenbank StahlWissen Dr. Sommer Werkstofftechnik  
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