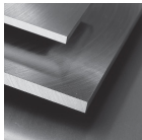


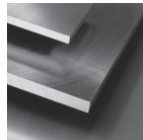
## Steel grade

Material No.	PREMIUM P20
AISI	P20

## Shapes



**Smart Flat Stock [Smart]  
Standardized Precision Blanks**  
L: 12"  
L: 24"



**Smart Flat Stock Metric [SmartM]  
Standardized Precision Blanks Metric**  
L: 300 mm  
L: 600 mm

## Chemical composition AISI P20 (reference value %)

C	Si	Mn	P	S	Cr	Mo
0.35 - 0.45	0.2 - 0.4	1.3 - 1.6	0 - 0.035	0 - 0.035	1.8 - 2.1	0.15 - 0.25

## Physical properties

Hardness (delivery condition)	max. 225 BHN					
Tensile strength $R_m$ (as received condition)	approx. 108.8 KSI					
Working hardness	max. 50 HRC					
Thermal expansion coefficient $10^{-6}m/(m \cdot K)$	68 - 212°F	68 - 392°F	68 - 572°F	68 - 752°F	68 - 932°F	68 - 1292°F
	11.1	12.9	13.4	13.8	14.6	14.9
Thermal conductivity $W/(m \cdot K)$	68°F	662°F	1292°F			
	34.5	33.5	32.0			

## Technical properties

Cold work steel and plastic mold steel (here annealed version). Good polishability and easily etched. High through-hardenability and uniform component strength.

## Applications

Mechanical engineering, jigs, base plates, assembling parts, molding frames, plastic molds, plastic processing, injection molds, die casting molds, hydroforming tools, recipient sleeves, intermediate sleeves, folding bars, tool holders, extrusion presses, tube presses, die holders, die insert.

## Heat treatment

	Temperature	Cooling	Hardness				
Soft annealing	1310 - 1364°F	Furnace	max. 225 BHN				
Stress relief annealing	Temperature	Cooling					
	1022 - 1112°F	Furnace					
Hardening	Temperature	Quenching in	Hardness after quenching				
	1544 - 1598°F	Oil, hotbasin (356 - 428°F)	51 HRC				
Tempering	212°F	392°F	572°F	752°F	932°F	1112°F	1292°F
	51 HRC	50 HRC	48 HRC	46 HRC	42 HRC	36 HRC	28 HRC

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ABRAMS PREMIUM STEEL

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ABRAMS STEEL GUIDE

ABRAMS ART PROJECTS

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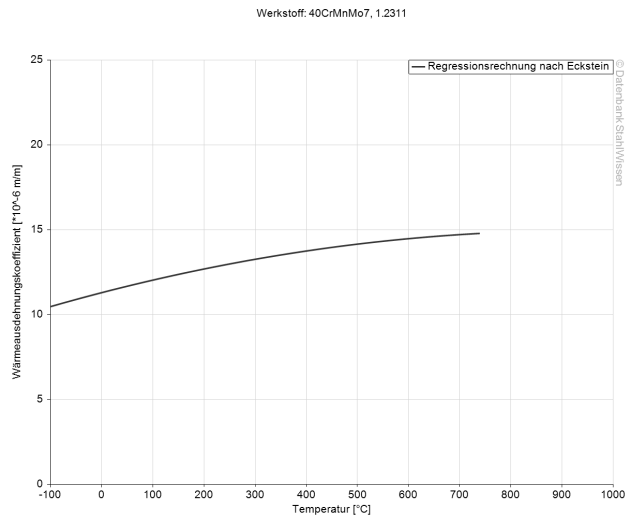
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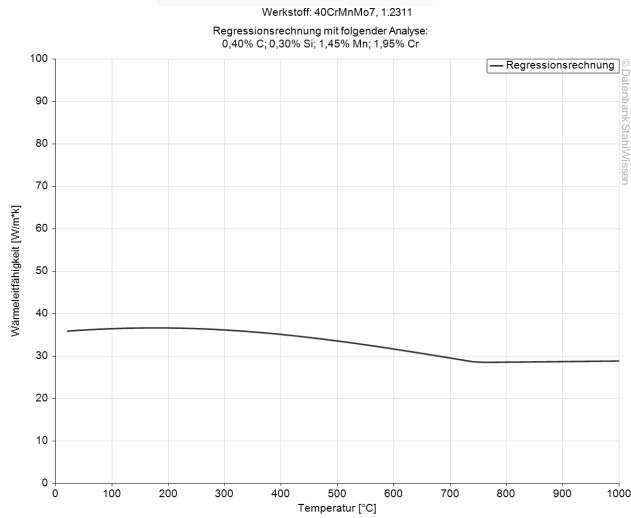
us.abrams-industries.com  
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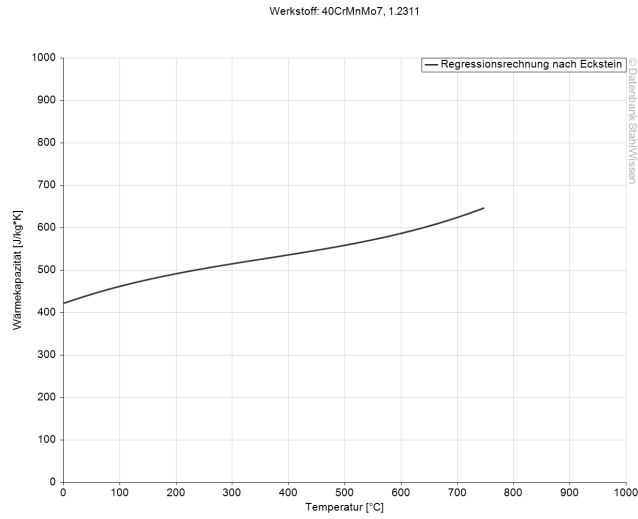
## Thermal expansion coefficient diagram



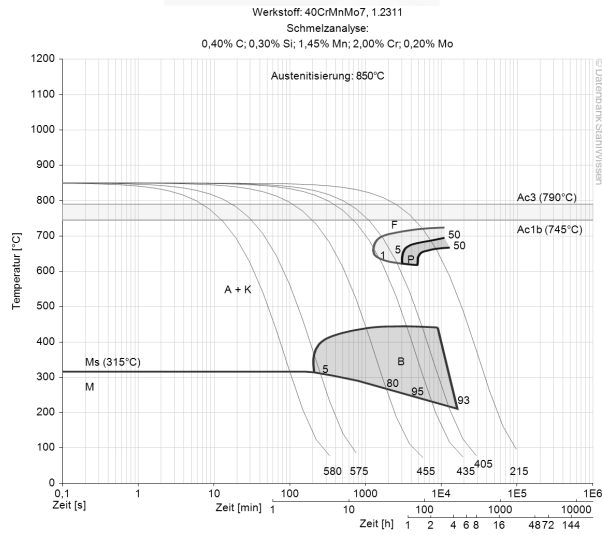
## Thermal conductivity diagram



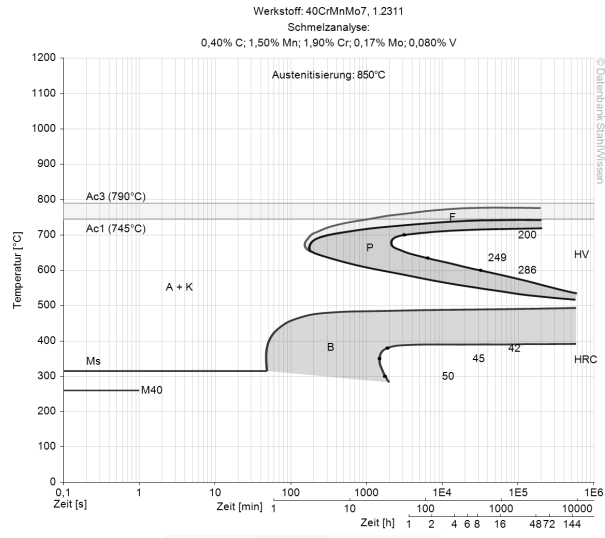
## Thermal capacity diagram



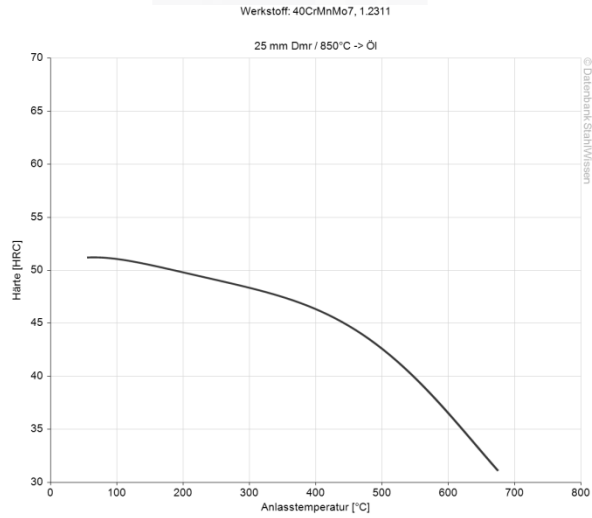
## Continuous ZTU-diagram



## Isothermal ZTU-diagram



## Tempering diagram



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  
 Issued: 2012

