

## Steel grade

Material No.	PREMIUM 5120
AISI	5120
Search for alternatives in the ABRAMS STEEL GUIDE	<a href="http://www.abrams-steelguide.com/alternatives/5120">www.abrams-steelguide.com/alternatives/5120</a>

## Shapes



**Precision Ground Flat Stock Metric oversized [GFSM O/S]**  
L: 500 mm  
L: 1,000 mm



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



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

## Chemical composition AISI 5120 (reference value %)

C	Si	Mn	P	S	Cr
0.18 – 0.24	0.15 – 0.35	1.1 – 1.4	0 – 0.03	0 – 0.03	1.0 – 1.3

## Physical properties

Hardness (delivery condition)	max. 217 HB, annealed						
Tensile strength $R_m$ (as received condition)	approx. 104.4 KSI						
Working hardness	max. 60 HRC (surface hardness)						
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 - 1112°F	68 - 1292°F
	12.2	12.9	13.5	13.9	14.2	14.5	14.8
Thermal conductivity $W/(m \cdot K)$	68°F	662°F	1292°F				
	39.5	36.5	33.5				

## Technical properties

Cold work steel and plastic mold steel. High surface hardness with high core toughness. Excellent machinability, good cold hobbing and polishing properties. The even component strength is a result of the combination of hardened surface and high core toughness.

## Applications

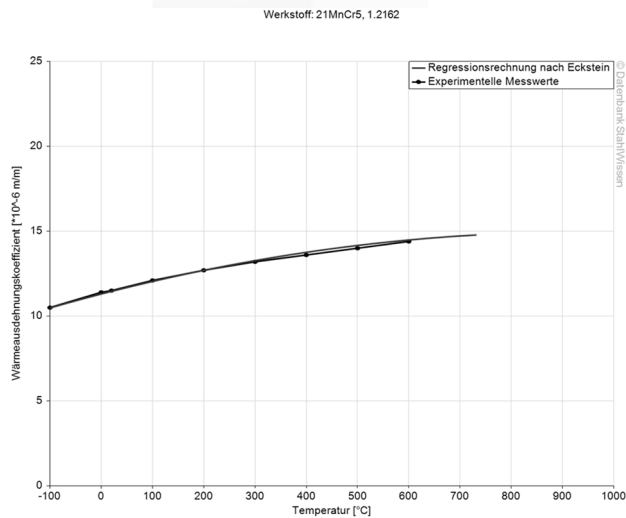
Mechanical engineering, jig construction, plant engineering, apparatus engineering, plastic processing, plastic molds, synthetic resin mold tools, base plates, bending bars, guide columns, gear parts, joint parts, shafts, gears, rods, bevel gears, crown wheels, piston pins, camshafts, bolts, pins, cardan joints.



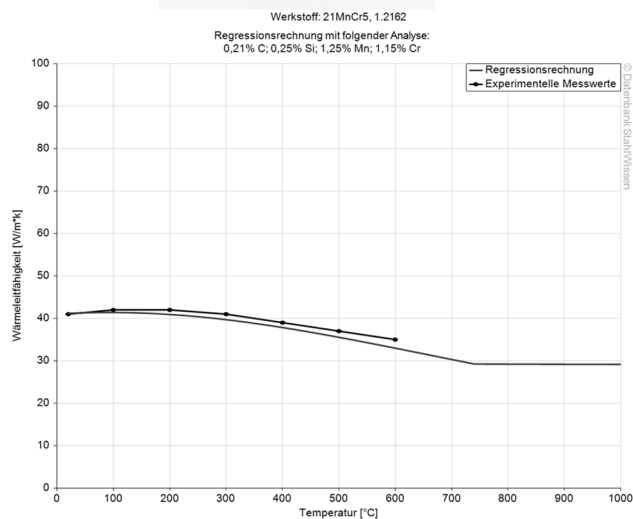
## Heat treatment

Soft annealing	Temperature		Cooling		Hardness	
	1238 - 1310°F		Furnace		max. 217 HB	
Stress relief annealing	Temperature		Cooling			
	1112 - 1202°F		Furnace			
Tempering	Case harden	Intermediate annealing	Hardening	Cooling	Surface hardness after quenching	
	1598 - 1652°F	1148 - 1202°F	1490 - 1544°F	Oil, hotbasin (356 - 428°F)	62 HRC	
	212°F	392°F	572°F	752°F	932°F	1112°F
	61 HRC	60 HRC	57 HRC	54 HRC	50 HRC	48 HRC

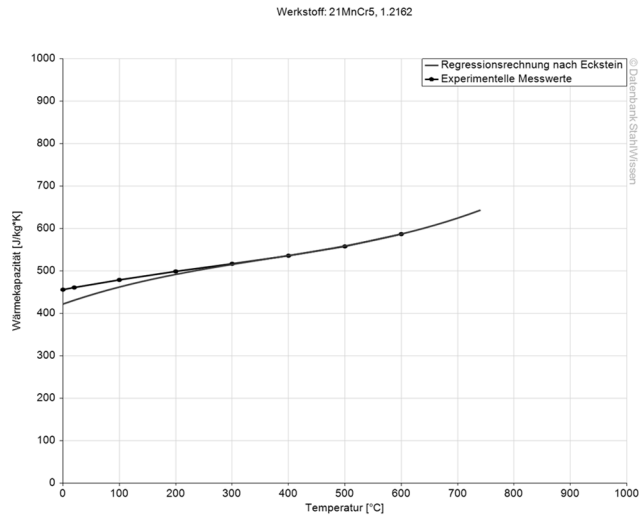
## Thermal expansion coefficient diagram



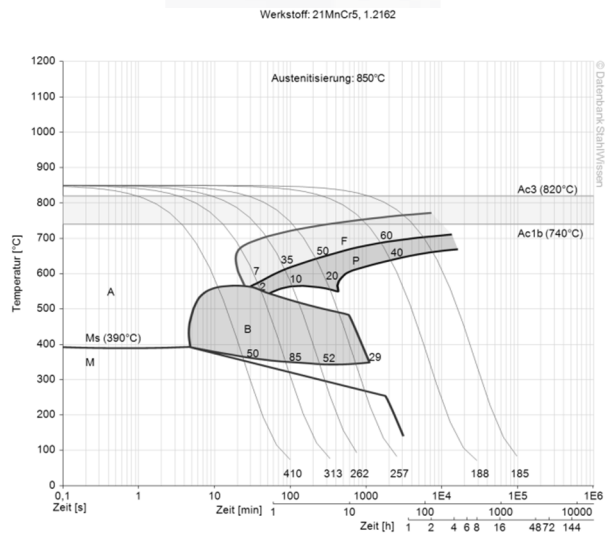
## Thermal conductivity diagram



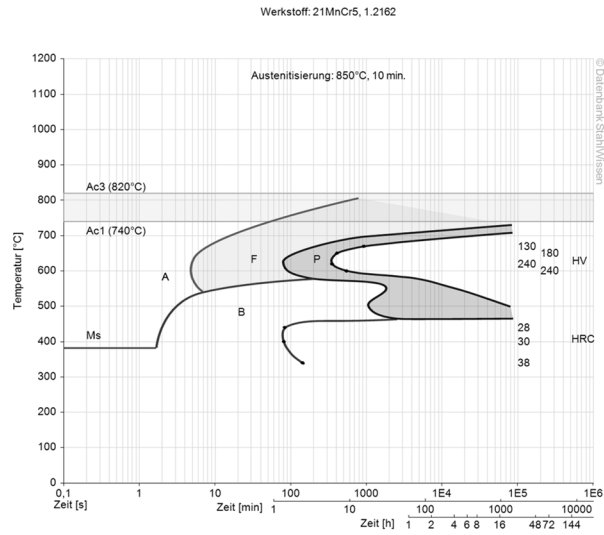
## Thermal capacity diagram



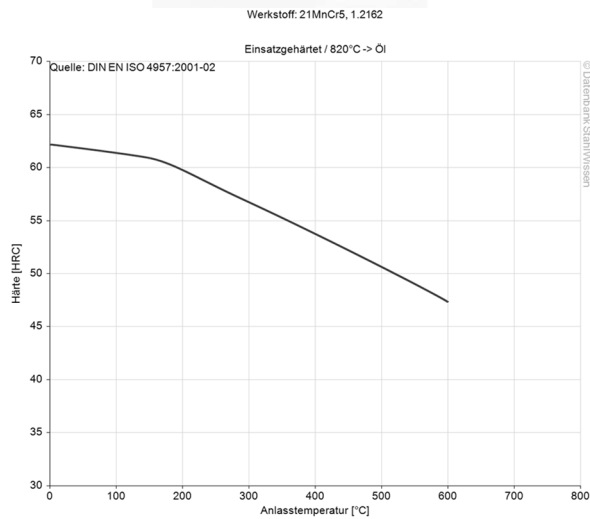
## Continuous ZTU-diagram



## 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

