

## Steel grade

Material No. / Werkstoff-Nr.	PREMIUM 1.2162
Description	21MnCr5
AISI/SAE	1.2162
Search for alternatives in the ABRAMS STEEL GUIDE®	<a href="http://www.steel-guide.eu/alternatives/1.2162">www.steel-guide.eu/alternatives/1.2162</a>

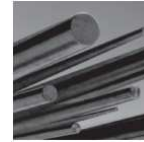
## Specifications



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



**€co-Präz\* [€co]**  
L: 500 mm



**Round steel [RS]**  
black  
L: 500 mm  
L: 1.000 mm

## Chemical composition AISI/SAE 1.2162 (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. 720 N/mm <sup>2</sup>						
Working hardness	max. 60 HRC (surface hardness)						
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
	12,2	12,9	13,5	13,9	14,2	14,5	14,8
Thermal conductivity $W/(m \cdot K)$	20°C	350°C	700°C				
	39,5	36,5	33,5				

## Technical properties

Cold work steel and plastic mould 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

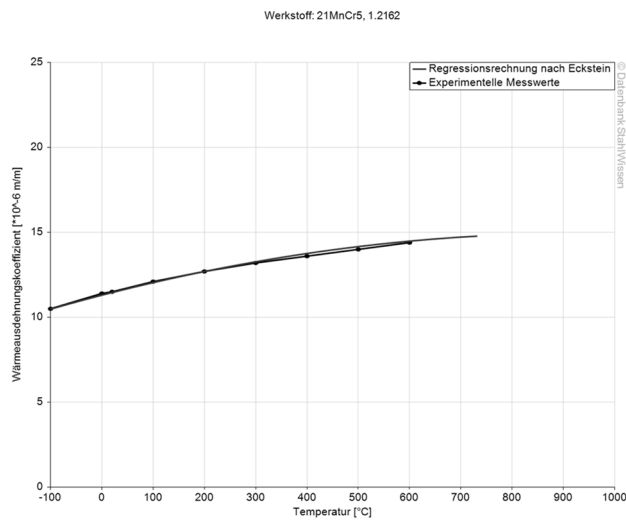
Mechanical engineering, jig construction, plant engineering, apparatus engineering, plastic processing, plastic moulds, synthetic resin mould tools, base plates, bending bars, guide columns, gear parts, joint parts, shafts, gears, rods, bevel gears, crown wheels, piston pins, camshafts, bolts, pins,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



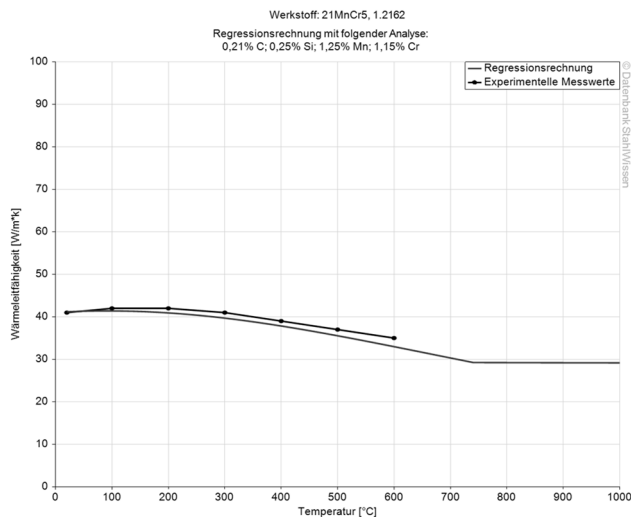
## Heat treatment

Soft annealing	Temperature		Cooling		Hardness	
		670 - 710°C		Furnace		max. 217 HB
Stress relief annealing	Temperature		Cooling			
		600 - 650°C		Furnace		
Tempering	Case harden	Intermediate annealing	Hardening	Cooling	Surface hardness after quenching	
	870 - 900°C	620 - 650°C	810 - 840°C	Oil, hot basin (180 - 220°C)	62 HRC	
	100°C	200°C	300°C	400°C	500°C	600°C
	61 HRC	60 HRC	57 HRC	54 HRC	50 HRC	48 HRC

## Thermal expansion coefficient diagram

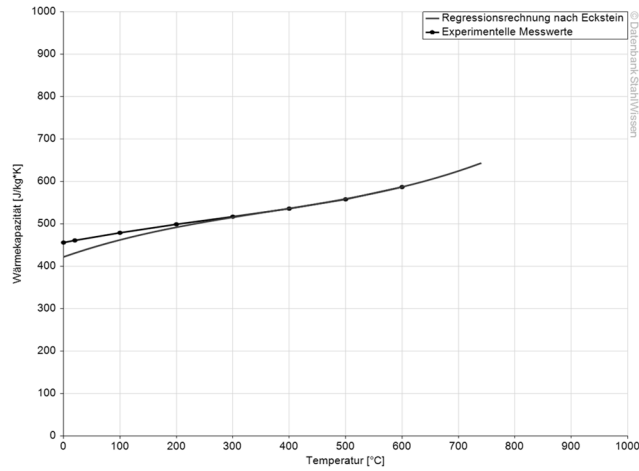


## Thermal conductivity diagram



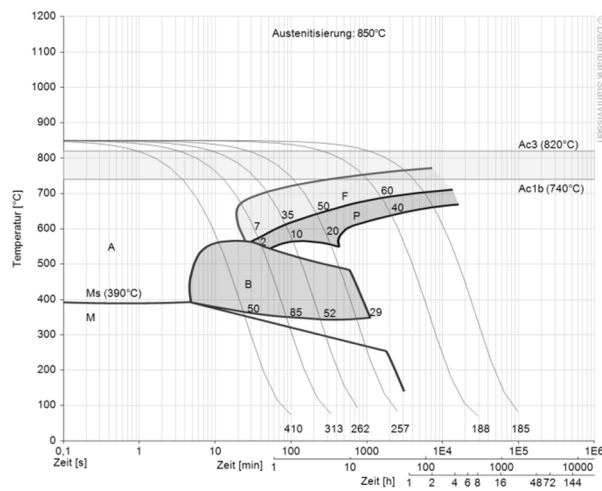
## Thermal capacity diagram

Werkstoff: 21MnCr5, 1.2162

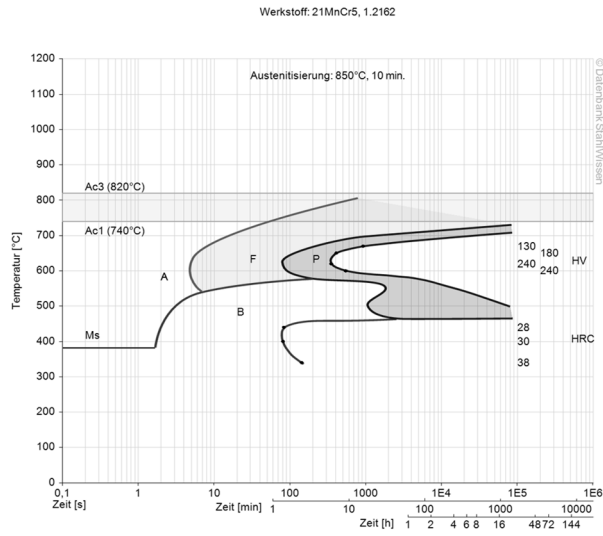


## Continuous ZTU-diagram

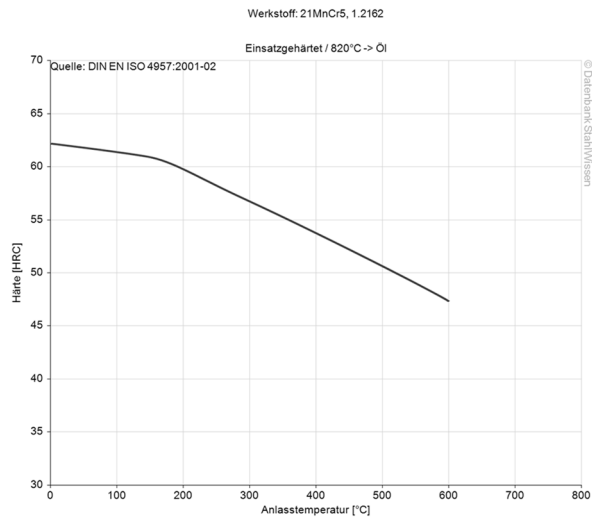
Werkstoff: 21MnCr5, 1.2162



## 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

