

## Steel grade

Material No. / Werkstoff-Nr.	PREMIUM 1.4112
Description	X90CrMoV18
BS	1.4112
AISI/SAE	440B; S44003
Search for alternatives in the ABRAMS STEEL GUIDE®	<a href="http://www.steel-guide.co.uk/alternatives/1.4112">www.steel-guide.co.uk/alternatives/1.4112</a>

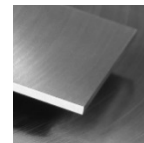
## Specifications



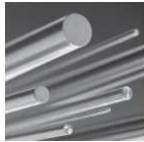
**Precision flat steel  
with machining allowance [PFS/BA]**  
L: 1,000 mm



**€co-Präz® [€co]**  
L: 300 mm  
L: 500 mm



**Hart-Präz® [Hart]**  
L: 250 mm  
L: 500 mm



**Precision round steel  
without machining allowance [PRS]**  
bright ground, ISO h9  
L: 1,000 mm



**Precision round steel [PRS/BA]**  
geschält / überdreht  
L: 500 mm  
L: 1,000 mm

## Chemical composition BS 1.4112 (reference value %)

C	Si	Mn	P	S	Cr	Mo	V
0.85 – 0.95	0 – 1.0	0 – 1.0	0 – 0.04	0 – 0.015	17.0 – 19.0	0.9 – 1.3	0.07 – 0.12

## Physical properties

Hardness (delivery condition)	max. 265 HB, annealed			
Tensile strength $R_m$ (as received condition)	approx. 925 N/mm <sup>2</sup>			
Working hardness	max. 53-58 HRC			
Thermal expansion coefficient $10^{-6}m/(m \cdot K)$	20 - 100°C	20 - 200°C	20 - 300°C	20 - 400°C
	10.3	10.8	11.2	11.6
Thermal conductivity $W/(m \cdot K)$	20°C	350°C		
	15.9	20.6		

## Technical properties

Corrosion resistant martensitic chrome-steel (approx. 18 % Cr) for cold work. Reaches an unusually high hardness and high wear resistance after heat treatment. High gloss polishable and conditionally acid resistant.

## Applications

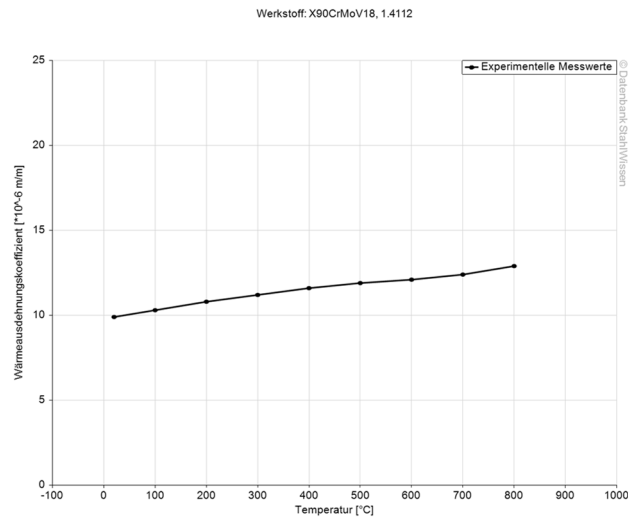
Cutting tools, knives, knife blades, cutlery, guide rails, wear parts, perforated discs, screw elements, pump shafts, scale pans, horizontal cutting, surgical instruments, plastic moulds, injection nozzles, roller bearings, ball bearings, mechanical engineering, food industry, building industry.



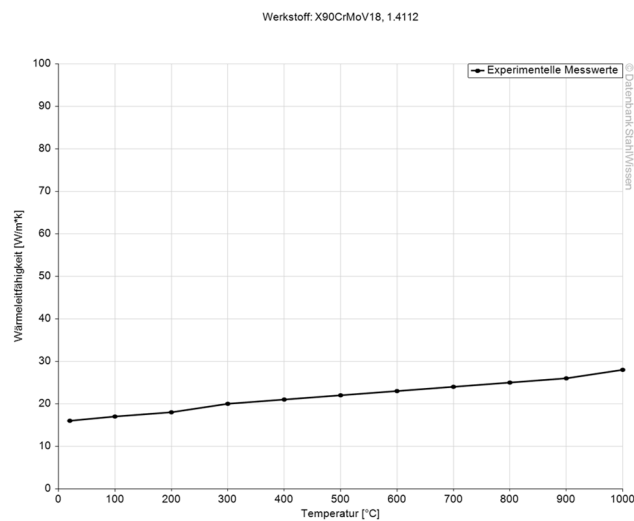
## Heat treatment

	Temperature	Cooling	Hardness
Soft annealing	780 - 840°C	Furnace	max. 265 HB
Stress relief annealing	600 - 650°C	Furnace	
Hardening	1000 - 1050°C	Quenching in	
		Air, oil, hot basin (500 - 550°C), compressed gas (N <sub>2</sub> )	
Tempering	100°C	300°C	600°C
	59 HRC	57 HRC	40 HRC

## Thermal expansion coefficient diagram

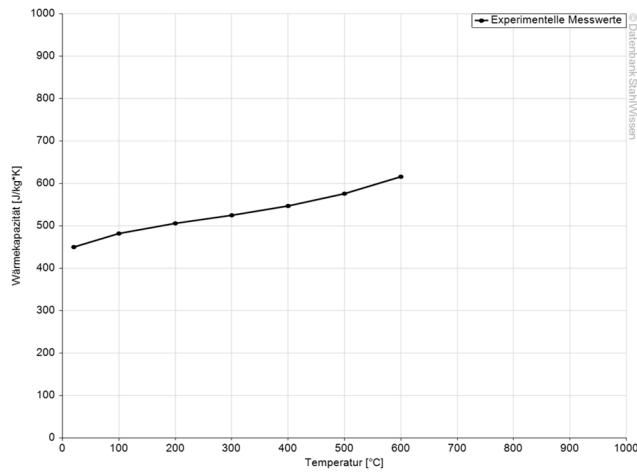


## Thermal conductivity diagram



## Thermal capacity diagram

Werkstoff: X90CrMoV18, 1.4112



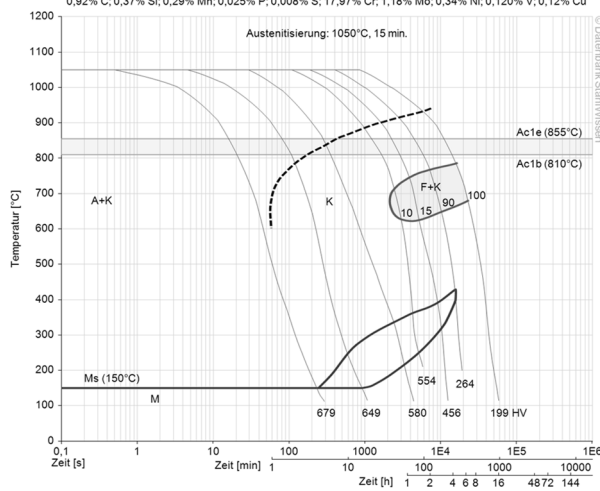
## Continuous ZTU-diagram

Werkstoff: X90CrMoV18, 1.4112

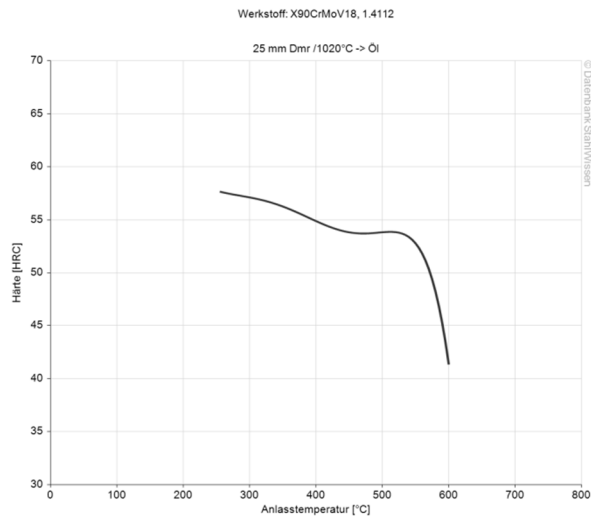
Schmelzanalyse:

0,92% C; 0,37% Si; 0,29% Mn; 0,025% P; 0,008% S; 17,97% Cr; 1,18% Mo; 0,34% Ni; 0,120% V; 0,12% Cu

Austenitisierung: 1050°C, 15 min.



## 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

