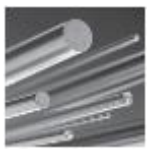
Steel grade

Material No. / Werkstoff-Nr.	PREMIUM 1.2080
Description	X210Cr12
AISI/SAE	D3; T30403
Search for alternatives in the ABRAMS STEEL GUIDE®	**www.steel-guide.eu/alternatives/D3**

Specifications

Precision flat steel
without machining allowance, DIN 59350 [PFS]
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 D3 (reference value %)

C	Si	Mn	P	S	Cr
1,9 - 2,2	0,1 - 0,6	0,2 - 0,6	0 - 0,03	0 - 0,03	11,0 - 13,0

Physical properties

Hardness (delivery condition)	max. 250 HB, annealed						
Tensile strength R_m (as received condition)	approx. 850 N/mm^2						
Working hardness	max. 62 HRC						
Thermal expansion coefficient 10^{-6}m/(m • K)	20 - 100°C	20 - 200°C	20 - 300°C	20 - 400°C	20 - 500°C	20 - 600°C	20 - 700°C
	10,8	11,7	12,2	12,6	12,8	13,1	13,3
Thermal conductivity W/(m • K)	20°C	350°C	700°C				
	16,7	20,5	24,2				

Technical properties

Cold work steel with excellent wear resistance, due to its high chromium carbide content, and excellent cutting power (for laminations up to a thickness of 4 mm). Full hardenability, dimensional stability but medium toughness. The classic among the ledeburite 12 % chromium steels.

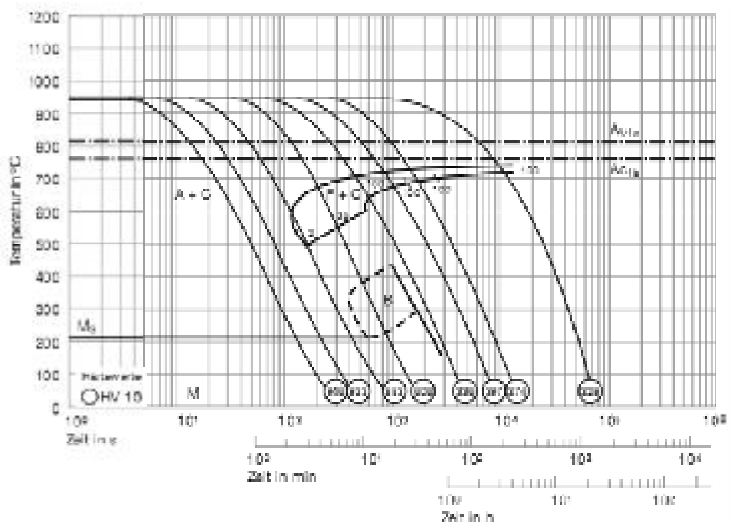
Applications

Blanking tools, stamping tools, embossing tools, scraping tools, trimming tools, woodworking tools, drawing tools, press tools, stone moulds, sintered tools, machine knives, hammer cores, ring rollers, thread rolling dies, plastic moulds.

Heat treatment

Soft annealing	**Temperature**		**Cooling**		**Hardness**	
	800 - 840°C		Furnace		max. 250 HB	
Stress relief annealing	**Temperature**		**Cooling**			
	approx. 650 - 700°C		Furnace			
Hardening	**Temperature**		**Quenching in**		**Hardness after quenching**	
	930 - 960°C		Oil		64 HRC	
	950 - 980°C		Air (up to 30 mm thickness)		64 HRC	
Tempering	100°C	200°C	300°C	400°C	500°C	600°C
	63 HRC	62 HRC	59 HRC	57 HRC	54 HRC	46 HRC

Continuous ZTU-diagram



Tempering diagram