

material characteristics	material number / grade	SWG 2085					
	DIN standard	X33CrS16					
	comparable grade	AISI 420+S					
	chemical composition - reference analysis [%]	C	Si	Mn	S	Cr	Ni
		0.33	< 1.00	< 1.00	0.08	16.00	< 1.00
	production technology	EAF/LF/VD, forging, Q+T					
	service hardness / strength <small>converted acc. to DIN EN ISO 18265 table B2</small>		HB	HRC	N/mm ²		
			280 - 325	28.3 - 34.2	890 - 1032		
	delivery condition	Q+T	280 - 325	28.3 - 34.2	890 - 1032		
	maximum dimension	diameter			thickness		
	≤ 800 mm			≤ 600 mm			
US-specification	EN 10228-3			SEP 1921			
	table 3 - type 1 - qual. class 2			group 3 - class C,c			
cleanliness	DIN 50602			ASTM E45 method A			
	K4 ≤ 40 (oxides only)			B, C, D ≤ 2			

variation upon request

technological properties		0	1	2	3	4	5	comment	
	toughness		■						in relation to service hardness
	hot strength at working temp.		■	■	■				
	wear resistance		■	■					
	corrosion resistance		■	■	■				polished surface for best corrosion resistance
	machinability		■	■	■	■			
	polishability	■							sulphur alloyed
	weldability		■						CET = 1.25 % acc. DIN EN 1011-2
	texturability	■							
	nitridability		■	■	■	■	■		nitriding hardness 900 - 1200 HV1
	chrome-platability	■							

rating properties: 0 = not suitable; 1 = low; 2 = middle; 3 = good; 4 = very good; 5 = perfectly suitable

physical properties	thermal conductivity [W · m ⁻¹ · K ⁻¹]	20 °C	200 °C	300 °C	500 °C
		11.2	16.8	21.0	23.6
	coefficient of thermal expansion between 20 °C and ... [10 ⁻⁶ · K ⁻¹]	100 °C	200 °C	300 °C	500 °C
		11.0	11.1	11.2	12.0
elastic modulus [kN/mm ²]	20 °C	200 °C	300 °C	500 °C	
	218	206	198	180	

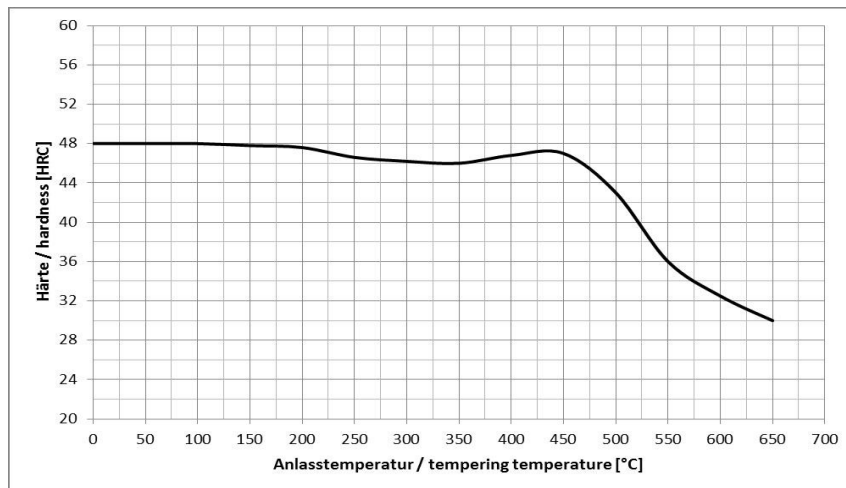
application	technology	mold making, injection molding, corrosion resistance
	tools	plastic molds: moldbase, cores, mold frames
	process temperature	< 300 °C
	tool size	small- and medium-sized molds
	final products	plastic injection parts
	features	pre-hardened, easy machining, corrosion-resistant

SWG processing instructions	welding
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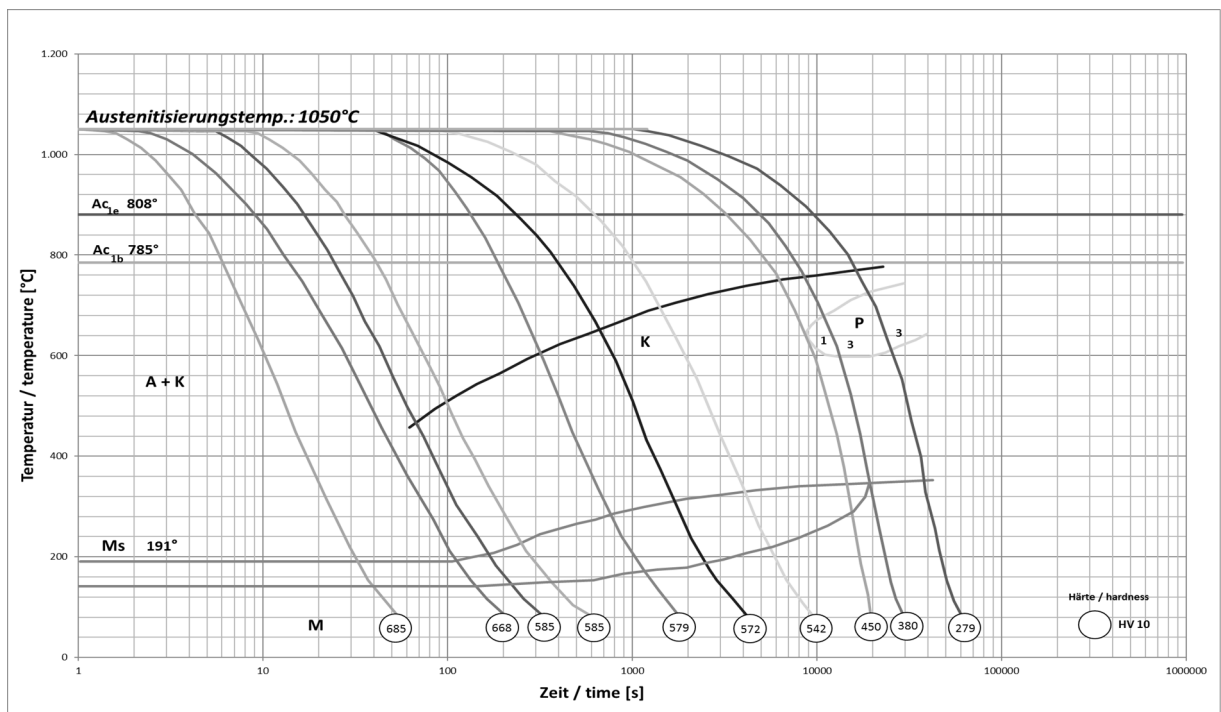
heat treatment		T min [°C]	T max [°C]	medium / comment
	annealing	720	750	air
	hardening	1020	1040	oil
	tempering	550	600	air
	stress relieving	500	530	min. 30 °C below tempering temp.
	pre-heating before welding	320	350	
	nitriding	400	530	min. 30 °C below tempering temp.
	PVD-treating	400	530	

diagrams/ structure	CCT-diagram	yes
	tempering diagram	yes
	advice on heat treatment	pre-hardened
	microstructure	martensitic + manganese sulfides

Tempering diagram: Average values on samples dia 25 mm x length 50 mm; hardened at 1010 °C in oil



CCT-diagram



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