

material characteristics	material number / grade	SWG XPM						
	short designation	25MnCrNiMoV6-6-4						
	comparable grade	P20HH						
	chemical composition - reference analysis [%]	C	Si	Mn	Cr	Mo	Ni	others
		0.27	0.30	1.55	1.35	0.50	1.00	alloyed
	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			
			359 - 400	38 - 42	1140 - 1270			
	delivery condition	Q+T	359 - 400	38 - 42	1140 - 1270			
	maximum dimension	diameter			thickness			
	-			≤ 1500 mm				
US-specification	EN 10228-3			SEP 1921				
	table 3 - type 1 - qual. class 3			group 3 - class D,d				
cleanliness	DIN 50602			ASTM E45 method A				
	K4 ≤ 20			A ≤ 1,5; B, C, D ≤ 2				

technological properties		0	1	2	3	4	5	comment	
	toughness		■	■	■				in relation to service hardness
	hot strength at working temp.		■	■	■				
	wear resistance		■	■	■				
	corrosion resistance	■							
	machinability		■	■	■				Q+T
	polishability		■	■	■				ISO/SPI: N1/A-1
	weldability		■	■	■	■			CET = 0.57 % acc. DIN EN 1011-2
	texturability		■	■	■	■			
	nitridability		■	■	■				nitriding hardness 550 - 700 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
		37.0	38.9	38.6	37.2
	coefficient of thermal expansion between 20 °C and ... [10 ⁻⁶ · K ⁻¹]	100 °C	200 °C	300 °C	500 °C
		11.8	12.5	13.1	14.8
	elastic modulus [kN/mm ²]	20 °C	200 °C	300 °C	500 °C
		212	207	192	175

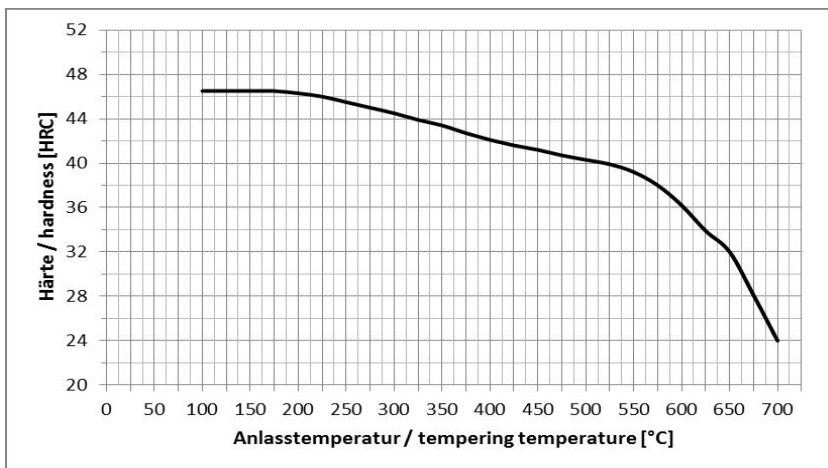
application	technology	mold making, injection molding, press-molding
	tools	large plastic molds, cavities, with high surface requirement
	process temperature	< 250 °C
	tool size	medium- and large-sized molds
	final products	TV housing, bumpers, interior car parts, car lights
	features	good texturing reliability

SWG processing instructions	welding, texturing, polishing, deep-hole drilling
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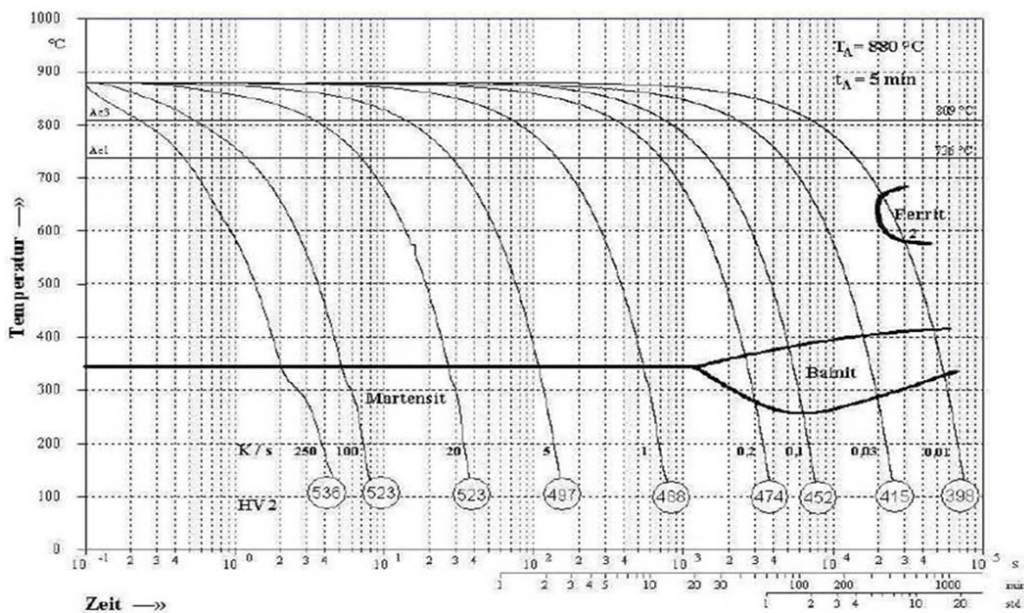
heat treatment		T min [°C]	T max [°C]	medium / comment
	annealing	710	740	air
	hardening	870	920	oil, polymer
	tempering	540	650	air
	stress relieving	500	530	max. 30 °C below tempering temp.
	pre-heating before welding	300	330	
	nitriding	450	530	max. 30 °C below tempering temp.
	PVD-treating	450	530	

diagrams / structure	TTT-diagram	yes
	tempering diagram	yes
	advice on heat treatment	pre-hardened
	microstructure	mainly bainitic

Tempering diagram: Average values on samples dia 25 mm x length 50 mm; hardened at 880 °C in oil



TTT-diagram (continuous)



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