Material data sheet
SWG 2738ECO

Schmiedewerke Gröditz
GMH GRUPPE

material characteristics							
material number / grade	SWG 2738ECO						
short designation	40CrMnNiMo7						
comparable grade	~AISI P20+Ni						
chemical composition - reference analysis [%]	C	Si	Mn	Cr	Mo	others	
	0.40	0.25	1.50	2.00	0.20	Ni	
production technology	EAF/LF/VD, forging, Q+T						
service hardness / strength converted acc. to DIN EN ISO 18265 table B2		HB	HRC	N/mm²			
		280 - 325	28.3 - 34.2	890 - 1030			
delivery condition	Q+T	280 - 325	28.3 - 34.2	890 - 1030	variation upon request		
maximum dimension	diameter			thickness			
	≤ 900 mm			≤ 600 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: N2/A-2; for high-polishing XPM
weldability		■	■	■			CET = 0.65 % acc. DIN EN 1011-2
texturability		■	■				for high texturing reliability: XPM
nitridability		■	■	■			nitriding hardness 700 - 850 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	
	34.8	35.7	36.0	32.1	
coefficient of thermal expansion between 20 °C and ... [10^{-6} · K^{-1}]	100 °C	200 °C	300 °C	500 °C	
	11.1	12.9	13.4	14.2	
elastic modulus [kN/mm^2]	20 °C	200 °C	300 °C	500 °C	
	212	207	192	175	

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application	technology	mold making, injection molding
	tools	plastic molds, mid size mold frames, die-holder
	process temperature	< 250 °C
	tool size	medium-sized molds
	final products	standard plastic parts
	features	quenched and tempered, for high surface requirements: XPM and XPM ESR

SWG processing instructions	welding, texturing

		T min [°C]	T max [°C]	medium / comment
heat treatment	annealing	710	740	air
	hardening	850	880	oil, polymer
	tempering	560	640	air
	stress relieving	500	550	max. 30 °C below tempering temp.
	pre-heating before welding	320	350	
	nitriding	400	550	max. 30 °C below tempering temp.
	PVD-treating	400	550	

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

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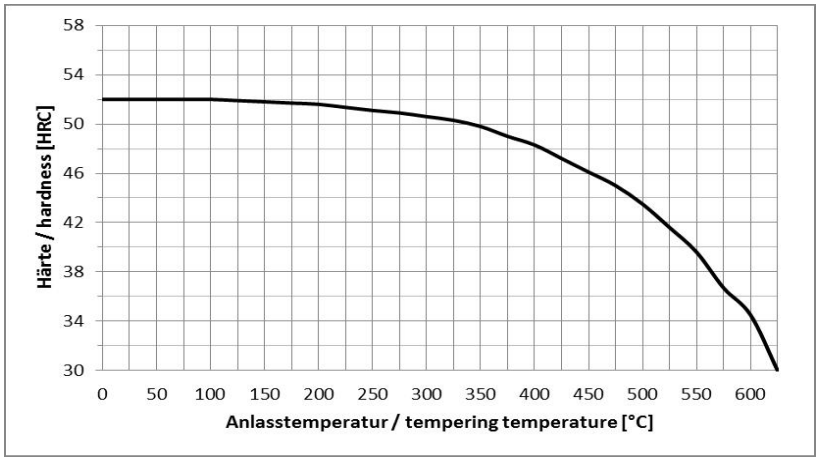
Tempering diagram: Average values on samples dia 25 mm x length 50 mm; hardened at 880 °C in oil



TTT-diagram (continuous)