

Material data sheet

SWG CPM40 VICTORY ESR



material characteristics	material number / grade	SWG CPM40 VICTORY ESR							
	short designation	15CrNiMoAlCu16-12-11							
	comparable grade	-							
	chemical composition - reference analysis [%]	C	Si	Mn	Cr	Mo	Ni	others	
		0.15	0.30	0.50	4.00	1.10	3.00	alloyed	
	production technology	EF/LF/VD/ESR, forging, Q+T							
	service hardness / strength converted acc. to DIN EN ISO 18265 table B2	HB		HRC		N/mm ²		variation upon request	
		359 - 400		38 - 42		1140 - 1270			
	delivery condition	Q+T		359 - 400		38 - 42			1140 - 1270
	maximum dimension	diameter							
-			≤ 400 mm						
US-specification	EN 10228-3			SEP 1921					
	table 3 - type 1 - qual. class 4			group 3 - class E,e					
cleanliness	DIN 50602			ASTM E45 method A					
	K1 ≤ 10			A ≤ 0,5; B, C ≤ 1,0; D ≤ 1,5					

technological properties		0	1	2	3	4	5	comment	
	toughness		■						in relation to service hardness 38-42 HRC
	hot strength at working temp.		■	■	■				
	wear resistance		■	■	■	■			
	corrosion resistance	■							
	machinability		■	■					
	polishability		■	■	■	■			ISO/SPI: N1/A-1
	weldability		■	■					CET = 0.83 % acc. DIN EN 1011-2
	texturability		■	■	■	■			
	nitridability		■	■	■	■	■		nitriding hardness 900 - 1250 HV1
chrome-platability		■	■	■	■			high cleanliness	

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
		28.0	28.4	29.0	29.5
	coefficient of thermal expansion between 20 °C and ... [10 ⁻⁶ · K ⁻¹]	100 °C	200 °C	300 °C	500 °C
		11.2	11.6	12.2	12.6
elastic modulus [kN/mm ²]	20 °C	200 °C	300 °C	500 °C	
	212	199	192	175	

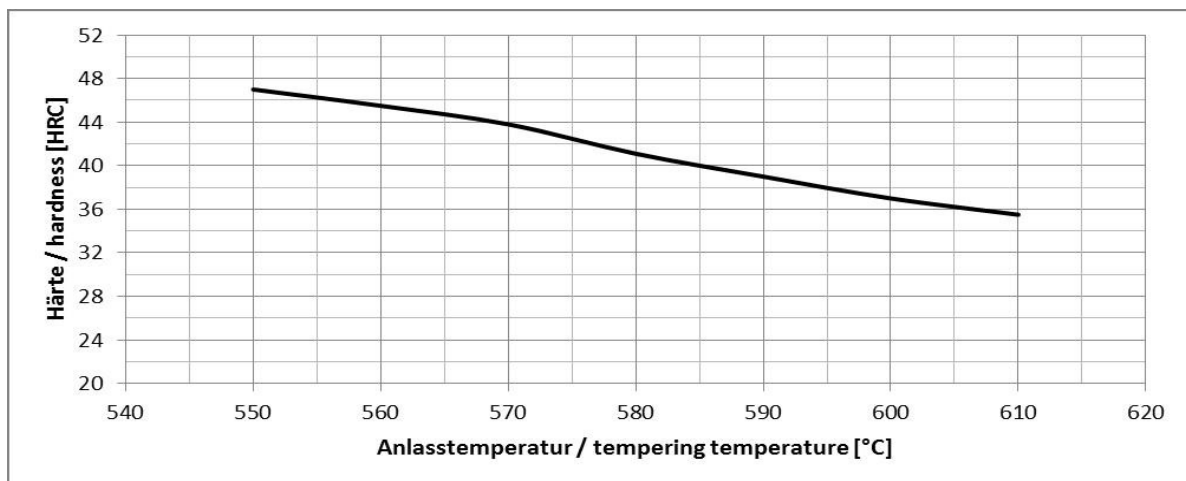
application	technology	mold making, injection molding, rapid heat cycle molding
	tools	plastic molds for "weldless molding"
	process temperature	< 300 °C
	tool size	small-, medium- and large-sized molds
	final products	plastic parts, textured, high gloss
	features	precipitation hardened, high cleanliness

SWG processing instructions	welding, texturing, polishing
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heat treatment		T min [°C]	T max [°C]	medium / comment
	annealing	650	680	air
	hardening	1000	1020	oil
	tempering	540	580	air
	stress relieving	500	530	min. 30 °C below tempering temp.
	pre-heating before welding	250	350	
	nitriding	450	530	min. 30 °C below tempering temp.
	PVD-treating	450	530	

diagrams/ structure	CCT-diagram	no
	tempering diagram	yes
	advice on heat treatment	pre-hardened
	microstructure	soft-martensite + precipitations

Tempering diagram: Average values on samples dia 25 mm x length 50 mm



PLEASE NOTE: The information contained in this data sheet is unbinding. It merely serves the first orientation of the user. Therefore, we do not assume any liability for the correctness, completeness or up-to-dateness of such data. In case of an order, the properties of the product are exclusively subject to the provisions of the respective contract.

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