Material data sheet
SWG 2379

Schmiedewerke Gröditz
GMH GRUPPE

material characteristics

material number / grade	SWG 2379						
DIN standard	X153CrMoV12						
comparable grade	AISI D2						
chemical composition - reference analysis [%]	C	Si	Mn	Cr	Mo	V	
	1.55	0.40	0.40	12.00	0.90	0.90	
production technology	EAF/LF/VD, forging, annealing						
service hardness / strength		HB	HRC	N/mm²			
		-	58 - 62	-			
delivery condition	annealed	≤ 255	-	-	variation upon request		
maximum dimension	diameter		thickness				
	≤ 800 mm		≤ 450 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				
	-		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		■	■	■			annealed
polishability	■						
weldability	■						CET = 2.28 % acc. DIN EN 1011-2
texturability	■						
nitridability		■	■	■	■	■	nitriding hardness 900 - 1250 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
	16.7	18.0	20.5	23.0
coefficient of thermal expansion between 20 °C and ... [10^{-6} · K^{-1}]	100 °C	200 °C	300 °C	500 °C
	10.5	11.0	11.2	12.0
elastic modulus [kN/mm^2]	20 °C	200 °C	300 °C	500 °C
	215	211	204	198

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application	technology	cold forming, mold making
	tools	stamping tools, press tools, mold inserts, guiding plates, cutting tools, wear plates
	process temperature	< 200 °C
	tool size	small-sized tools
	final products	steel sheets, reinforced plastics
	features	highest hardness, proper toughness, easily nitridable

SWG processing instructions	vacuum hardening

		T min [°C]	T max [°C]	medium / comment
heat treatment	annealing	800	850	furnace until 450 °C, then air
	hardening	1020	1040	warmbath, vacuum
	tempering	200	550	furnace, protective gas
	stress relieving	200	550	min. 30 °C below tempering temp.
	pre-heating before welding			not weldable
	nitriding	450	530	min. 30 °C below tempering temp.
	PVD-treating	450	530	

diagrams/ structure	CCT-diagram	yes
	tempering diagram	yes
	advice on heat treatment	vacuum hardening after pre-machining
	microstructure	martensit + primary carbides (ledeburit)

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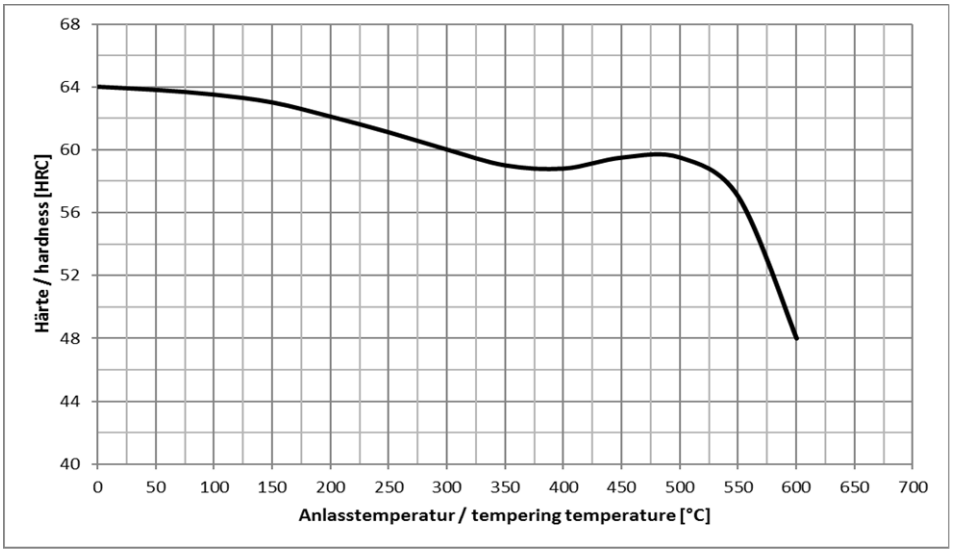
Tempering diagram: Average values on samples dia 25 mm x length 50 mm; hardened at 1020 °C in air



CCT-diagram