METALLURGICA VENETA
ACCIAI SPECIALI

1.2379

Certified Company

Quality	X153CrMoV12	Supply conditions:
According to standards	UNI EN ISO 4957: 2002	Annealed
Number	**1.2379**	

Chemical composition

C%	Si%	Mn%	P% max	S% max	Cr%	Mo%	V%
1,45-1,60	0,10-0,60	0,20-0,60	0,030	0,030	11,0-13,0	0,70-1,00	0,70-1,00
± 0.04	± 0.03	± 0.04	+ 0.005	+ 0.005	± 0.15	± 0.05	± 0.04

Product deviations are allowed

Temperature °C

Hot-forming	Stress-relieving After machining and before quenching	Pre-heating	Quenching [1]	Tempering [1]	Soft annealing
1050-900	650-700 furnace cooling to 320, then air	400, pause, then 800, pause, then ▲ [1] or [2]	▲ 1000-1040 oil, polymer or air	180-250 calm air minimum 2 cycles	800-840 calm air (HB max 255)

Quenching [2]	Tempering [2]	Tempering [2]	Isothermal annealing	Pre-heating welding	Stress-relieving after welding
▲ 1060-1090 oil or polymer	520 calm air	180-250 calm air	870 furnace cooling to 760, pause, furnace cooling to 720, air (HB max 250)	250-300	650 furnace cooling

Ac1	Ac3	Ms	Mf
800	840	200	-10 [b]

[b] subcooling
the symbol ▲ indicates the temperature rise to ……..°C ▲

Mechanicaland physical properties

Table of tempering after quenching at 1020 °C in oil

HB	722	714	706	688	670	654	624	624	644	644	605	482	336
HRC	64	63.5	63	62	61	60	58.5	58.5	59.5	59.5	57.5	50	36
N/mm²							2375	2375			2285	1760	1110
Tempering at **°C**	**50**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**	**700**

Modulus of elasticity	long. GPa				215	211	204	198	191	182
Modulus of elasticity	tang. GPa				82	81	78	76	73	70
Thermal expansion	$10^{-6} \cdot K^{-1}$	8.6	9.9		10.1	10.7	11.3	11.8	12.2	12.5
Specific heat capacity	J/(Kg•K)				439					
Thermal conductivity	W/(m•K)				31.9	31.5	30.9	29.7	28.6	27.6
Specific electric resist.	Ohm•mm²/m				0.453	0.515	0.596	0.695	0.798	0.908
Density	Kg/dm³				7.68					
Testing at	**°C**	**-100**	**0**		**20**	**100**	**200**	**300**	**400**	**500**

Cold-work tool steels

- chromium-molybdenum-vanadium steel grade
- long working life
- good toughness
- limited deformations during treatment
- extremely suitable for engraving and surface hardening, nitriding and/or P.V.D. (Physical Vapour Deposition)
- applications: *thin blades up to a thickness of 6 mm, clipping tools, shearing machine, croppers, lower dies, broaches*