METALLURGICA VENETA
ACCIAI SPECIALI

41Cr4

Certified Company

Quality	41Cr4
According to standard	EN 10083-3: 2006
Number	1.7035

Chemical composition

C%	Si% max	Mn%	P% max	S% max	Cr%
0,38-0,45	0,40	0,60-0,90	0,025	0,035	0,90-1,20
± 0.02	+ 0.03	± 0.04	+ 0.005	+ 0.005	± 0.05

Deviations allowed for analysis product

For 41CrS4 n° 1.7039, S% 0.020-0.040 product deviations ± 0.005

Temperature °C

Hot-forming	Normalizing	Quenching	Tempering	Stress-relieving
1100-850	860 air	850 oil polymer or water	550-650 air	50° under the temperature of tempering

Soft annealing	Isothermal annealing	Spheroidizing	End quench hardenability test	Pre-heating welding		Stress-relieving after welding	
680 air (HB max 241)	820 furnace cooling to 650, then air (HB 190-220)	720-740 furnace cooling	850 water	300		550 furnace cooling	
				Ac1	**Ac3**	**Ms**	**Mf**
				750	790	310	100

Mechanical and physical properties

Hot-rolled mechanical properties in **quenched and tempered** condition EN 10083-3: 2006

size d / *t* mm		Testing at room temperature (longitudinal)					
		R	**Rp** 0.2	**A**%	**C**%	**Kv**	***HB***
from	to	N/mm²	N/mm² min.	min.	min.	J min.	*for information*
	16/*8*	1000-1200	800	11	30		*298-359*
16/*8*	40/20	900-1100	660	12	35	35	*271-331*
40/*20*	100/*60*	800-950	560	14	40	35	*240-286*

d = diameter *t* = *thickness*

Table of tempering values obtained at room temperature on rounds of Ø 10 mm after quenching at 850 °C in oil

HB		568	560	525	496	468	442	409	376	340	301	264	237
HRC		55.5	55	53	51	49	47	44	40.5	36.5	32	27	22
R	N/mm²	2130	2080	1950	1830	1700	1580	1420	1280	1120	1000	880	790
Rp 0.2	N/mm²	1580	1590	1580	1530	1470	1380	1260	1140	1020	890	780	680
A	%	6.8	7.5	7.6	7.9	8.8	9.8	11.0	12.6	14.5	17.2	20.0	22.8
C	%	28	35	38	41	44	46	48	52	56	60	64	67
Kv	J	16	24	24	15	15	26	30	38	46	90	124	132
Tempering at **°C**		**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**	**650**	**700**

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41CrS4 1.7039 EN 10277-5: 2008

Cold-drawn + quenching and tempering +C + QT [e]						Hot-rolled annealed + **peeled-reeled** +A +SH			
size mm		Testing at room temperature (longitudinal)							
		R	**Rp** 0.2	**A**%	***HB***	**R**	**Rp** 0.2	**A**%	**HB**
from	to	N/mm²	N/mm²	min	*for inform.*	N/mm²	N/mm² min	min	max
5 [b]	10								
10	16								
16	40	900-1100	660	12	*271-331*				241
40	63	800-950	560	14	*240-286*				241
63	100	800-950	560	14	*240-286*				241

[b] for thickness < 5 mm, mechanical properties should be agreed before order placement
[e] values valid also for +C+QT+SL

Hot-rolled, quenched and tempered, **cold-drawn** +QT +C [c] [e]						Hot-rolled annealed + **cold-drawn** +A +C			
size mm		Testing at room temperature (longitudinal)							
		R	**Rp** 0.2	**A**%	***HB***	**R**	**Rp** 0.2	**A**%	**HB**
from	to	N/mm²	N/mm² min	min	*for inform.*	N/mm² min	N/mm²	min	max
5 [b]	10	1000-1200	770	8	*298-359*				295
10	16	1000-1200	750	8	*298-359*				285
16	40	900-1100	670	9	*271-331*				280
40	63	800-1000	570	10	*240-298*				270
63	100	800-1000	570	11	*240-298*				270

[c] for flats and special sections, tensile strength (R) may differ by ± 10%
[b] for thickness < 5 mm, mechanical properties should be agreed before order placement
[e] values valid also for +QT+C+SL

Forged quenched and tempered EN 10250-3: 2001

size d / *t* mm		Testing at room temperature								
		R	**Rp** 0.2	**A**% L	**A**% T	**A**% Q	**Kv** L	**Kv** T	**Kv** Q	***HB***
from	to	N/mm² min	N/mm² min	min	min	min	J min	J min	J min	*min*
	100/*70*	800	560	14	14		35	35		*240*

L = longitudinal T = tangential Q = radial
d = diameter *t* = *thickness*

EN 10083-3: 2006 **Jominy test HRC** grain size 5 min.

mm distance from quenched extremity

	1.5	**3**	**5**	**7**	**9**	**11**	**13**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**H**
min	53	52	50	47	41	37	34	32	29	26	23	21				normal
max	61	61	60	59	58	56	54	52	46	42	40	38	37	36	35	

Temperature	**Mod. of elasticity** GPa		**Thermal expansion**
Testing at **°C**	**E** long.	**G** tang.	$10^{-6} \cdot K^{-1}$
20	210	80	
100	205	78	11.1
200	195	75	12.1
300	185	70	12.9
400	175	67	13.5
500			13.9
600	155	59	14.1

Specific heat capacity J/(Kg•K)	**Density** Kg/dm³	**Thermal conductivity** W/(m•K)	**Specific electric resist.** Ohm•mm²/m	**Electrical conductivity** Siemens•m/mm²
460	7.85	46	0.19	5.26

EUROPE EN	**ITALY** UNI	**CHINA** GB	**GERMANY** DIN	**FRANCE** AFNOR	**U.K.** B.S.	**RUSSIA** GOST	**USA** AISI/SAE
41Cr4	41Cr4	40Cr	41Cr4	42C4	530M40	41H	5140