

Quality	16NiCr4
According to standard	EN 10084: 2008
Number	1.5714

Chemical composition

C%	Si% max	Mn%	P% max	S% max	Ni%	Cr%	Deviations allowed for analysis product
0,13-0,19 ± 0.02	0,40 + 0.03	0,70-1,00 ± 0.04	0,025 + 0.005	0,035 + 0.005	0,80-1,10 ± 0.05	0,60-1,00 ± 0.05	

On request, this steel grade may be supplied with addition of lead (Pb) 0.15-0.35%

16NiCrS4 n° 1.5715 sulphur (S) 0.020-0.040%

It can be also supplied calcium (Ca) treated

Copper (Cu) max 0.40%

Temperature °C

Hot-forming	Normalizing	Core hardening	Carbonitriding	Carburizing	Hardening carburizing surf.	Tempering
1150-900	870 air	840 -880 oil-polymer salt bath	750-930 gas	870-950	810-840 oil-polymer salt bath	150 200
Soft annealing	Isothermal annealing	Spheroidizing	End quench hardenability test	Pre-heating welding	Stress-relieving after welding	
700 air (HB max 217)	860 furnace cooling to 650, then air (HB 166-217)	(HB 156-207)	870 water	250 Ac1 735	welding must be carried out on the annealed state and before carburizing Ac3 825	
					550 furnace cooling Ms * core ** carburizing surface 380* 180**	

Mechanical and physical properties

Hot-rolled values obtained on test blanks after core hardening + stress-relieving UNI 7846: 1978. Use only as reference

size mm test blanks	Testing at room temperature (longitudinal)					
	R	Rp 0.2	A%	C%	Kcu	HB
11	N/mm ² 1080-1470	N/mm ² min. 835	min. 9	min. 10	J min. 30	327-417
30	830-1130	590			32.5	249-339 for information only

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

HB	400	395	395	395	390	381	371	353	336	301	271	240	224	210
HRC	43	42.5	42.5	42.5	42	41	40	38	36	32	28	22.5		
R N/mm ²	1380	1370	1370	1360	1340	1310	1250	1180	1100	1010	900	800	730	690
Rp 0.2 N/mm ²	1020	1070	1100	1200	1200	1100	1070	1020	940	850	770	690	620	520
A %	13.0	13.0	13.2	13.2	13.4	13.6	13.8	14.2	15.5	17.0	19.2	22.0	24.0	25.0
C %	55	58	59	60	62	63	63	63	64	65	67	70	73	74
Kv J	66	66	66	64	64	46	45	46	75	110	135	170	196	
HRC carburized layer	64	63	62	60	59	57								
Tempering at °C	50	100	150	200	250	300	350	400	450	500	550	600	650	700

16NiCrS4 1.5715 EN 10277-4: 2008

size mm		Soft annealing +A +SH Peeled-reeled, ground +SL	Soft annealing +A +C Cold-drawn	Heat treatment for pearlite / ferrite +FP +SH Peeled-reeled, ground	Heat treatment for pearlite / ferrite +FP +C Cold-drawn
from	to	HB max	HB max	HB	HB
5 ^{a)}	10		270		
10	16		260		
16	40	217	255	156-207	156-245
40	63	217	255	156-207	156-240
63	100	217	255	156-207	156-240

a) for thickness < 5 mm, mechanical properties should be agreed before order placement

Forged UNI 8550: 1984. Use only as reference

size mm		Testing at room temperature								
from	to	R	R_{p0.2}	A% L	A% T	A% Q	Kcu L	Kcu T	Kv L	HB
		N/mm ²	N/mm ² min	min	min	min	J min	J min	J min	for inform.
	11	1080-1470	835	9			30			327-417
11	25	880-1195	640	10			32.5			263-356
25	40	785-1080	590	10			32.5			234-327
40	60	735-980	540	11			32.5			224-295

Mechanical properties obtained on test blanks after core hardening + stress-relieving

L = longitudinal T = tangential Q = radial

EN 10084: 2008 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	39	36	33	29	27	25	23	22	20							normal
max	47	46	44	42	40	38	36	34	32	30	29	28	28			

Temperature Testing at °C	Mod. of elasticity GPa		Thermal expansion 10 ⁻⁶ · K ⁻¹
	E long.	G tang.	
20	210	80	
100			11.1
200			12.1
300			12.9
400			13.5
500			14.1
600			

Specific heat capacity J/(Kg·K)	Density Kg/dm ³	Thermal conductivity W/(m·K)	Specific electric resist. Ohm·mm ² /m	Electrical conductivity Siemens·m/mm ²
460	7.85	38	0.18	5.56

EUROPE EN	ITALY UNI	CHINA GB	GERMANY DIN	FRANCE AFNOR	U.K. B.S.	RUSSIA GOST	USA AISI/SAE
16NiCr4	16CrNi4		15CrNi6	16NC4	637M17	16HGN	3215 appr.