

Quality	18NiCrMo5Bi	Case-hardening	<i>Technical card</i>
According to standards	UNI 7846: 1978	Steel	Trafilix Industries
Number			<i>rev. 2025</i>

Chemical composition

C%	Si%	Mn%	P% max	S% max	Cr%	Mo%	Ni%	Bi%	
0,15-0,21 ± 0.02	0,15-0,40 ± 0.03	0,60-0,90 ± 0.04	0,035 + 0.005	0,035 + 0.005	0,70-1,00 ± 0.05	0,15-0,25 ± 0.03	1,20-1,50 ± 0.05	0,03-0,2 0.005	Product deviations are allowed

Temperature °C

Hot-forming	Normalizing +N	Natural state	Core hardening	Carburizing	Hardening carburizing surface	Stress-reliev. +SR	
1100-900	880 air (HB 250 ~)	(HB 260 ~)	840-870 oil-polymer salt bath	880-930	800-830 oil-polymer salt bath	150-180	
Soft annealing +A	Isothermal annealing +I	Aannealing +FP	End quench Hardenability	Pre-heating welding		Stress-relieving after welding	
700 cooling 15 °C/h until 600, then air (HB max 240)	850 furnace cooling to 650, then air (HB 150-220)	950-1000 quick cooling (HB 149-201)	850 water	welding must be carried out on the annealed state and before carburizing			
				150-350		600 furnace cooling	
				Ac1	Ac3	Mf	Ms * core ** carburizing surface
				730	815	140	360* 180**

Mechanical properties

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

size mm	Testing at room temperature (longitudinal)					
test blanks	R	Rp 0.2	A%	Kcu	HB	
	N/mm ²	N/mm ² min.	min.	J min.		
11	1230-1520	980	8	30	363-432	
30	980-1270	735	9	32.5	295-373	for information only
63	830-1130	635	10	35	249-339	for information only

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

HB	415	415	415	409	404	395	381	362	344	327	301	271	237	218
HRC	44.5	44.5	44.5	44	43.5	42.5	41	39	37	35	32	28	22	-
R N/mm ²	1460	1460	1450	1430	1400	1360	1300	1230	1150	1080	1000	900	790	710
Rp 0.2 N/mm ²	1070	1120	1170	1210	1210	1190	1150	1100	1040	960	860	790	700	610
A %	13.5	13.6	13.5	13.2	13.0	12.8	12.8	12.9	13.8	15.0	17.0	19.5	22.0	24.0
Z %	57.0	58.0	59.0	60.0	60.0	60.0	60.0	60.0	61.0	63.0	65.0	68.0	72.0	74.0
Kv J	64	64	62	62	64	46	46	46	75	94	125	148	166	180
HRC carburizing	64	63.5	62	60	59	56	-	-	-	-	-	-	-	-
Tempering at °C	50	100	150	200	250	300	350	400	450	500	550	600	650	700

18NiCrMo5

Trafilix Industries

Cold-drawn +C (815M17) BS 970-3: 1991. Use only as reference

size mm		Testing at room temperature (longitudinal)				
		R	Rp 0.2	A%	Kv	HB
from	to	N/mm ² min	N/mm ² min	min	J min	min
	19	1080	-	8	22	327

Mechanical properties tested after quenching, carburized layer, quenching at 830 °C oil, tempering 200 °C air

Forged UNI 8550: 1984. Use only as reference

size mm		Testing at room temperature (longitudinal)				
		R	Rp 0.2	A%	Kcu	HB
from	to	N/mm ²	N/mm ² min	min (L)	J min (L)	for inform.
	11	1225-1520	980	8	30	361-432
11	25	1030-1325	785	9	32.5	311-384
25	40	930-1230	735	9	32.5	278-363
40	100	785-1080	590	10	35	234-327

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

L = longitudinal

UNI 7846:1978 **Jominy test HRC** grain size 5 min.

mm distance from quenched end		1.5	3	5	7	9	11	13	15	20	25	30	35	40	45	50
min	39	38	36	34	31	29	27	25.5	23	21	20.5	20	-	-	-	-
max	49	48.5	48	46.5	45	43.5	41	40	37	35.5	34.5	33.5	33	32.5	32	32

Thermal Expansion	10 ⁻⁶ • K ⁻¹	
Mod. of Elasticity long.	GPa	240
Mod. of Elasticity tang.	GPa	96
Specific Heat Capacity	J/(Kg•K)	460
Thermal Conductivity	W/(m•K)	41
Density	Kg/dm ³	7.85
Specific Electric Resist.	Ohm•mm ² /m	0.16
Electrical Conductivity	Siemens•m/mm ²	6.25
°C	20	

EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
17NiCrMo6-4	18NiCrMo5	-	-	18NCD6	815M17	19HNM	4317