

<b>Quality</b>	<b>18CrNiMo7-6</b>
According to standards	<b>EN 10084: 2008</b>
Number	<b>1.6587</b>

### Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Mo%	Ni%	
0,15-0,21	0,40	0,50-0,90	0,025	0,035	1,50-1,80	0,25-0,35	1,40-1,70	Product deviations are allowed
± 0.02	+ 0.03	± 0.04	+ 0.005	+ 0.005	± 0.05	± 0.03	± 0.05	

### Temperature °C

Hot-forming	Normalizing +N	Core hardening	Carburizing	Hardening carburiz. surface	Tempering +T	Annealing +FP
1150-900	860-925 air	830-870 oil or polymer	900-950 (HRC 60-63)	780-820 oil or polymer	150-200 air	900-1000 (HB 159-207)
Soft annealing +A	Isothermal annealing +I	Spheroidized annealed +AC	End quench hardenability test	Pre-heating welding	Stress-relieving after welding	
660-700 air (HB max 229)	850-900 furnace cooling to 610 then air (HB 140-210)	1000-1100 furnace cooling to 650 then air (HB max 180)	860 water	250-350 <b>Ac1</b>  745	welding must be carried out on the annealed state and before carburizing  <b>Ac3</b>  825	
					furnace cooling MS * core ** carburizing surface 400* 170**	

### Mechanical properties

Mechanical properties for **hot-formed** products according to Stalschlüssel 2010 standard, after hardening 850 °C oil + stress-relieving at 200°C

size mm		Testing at room temperature (longitudinal)					Lucefin experience					
from	to	R min	Rp 0.2	A%	Kcu	HB	quenching 850 °C water, tempering 200 °C air					
		N/mm <sup>2</sup>	N/mm <sup>2</sup> min.	min.	J min.	min	∅	R	Rp 0.2	A	Kv	+20 °C
							mm	N/mm <sup>2</sup>	N/mm <sup>2</sup>	%	J	
	16	1200				359	30	1160	1010	12.2	48-46-52	
16	40	1100				331						
40	100	900				271						

18CrNiMo7-6 1.6587 Stalschlüssel 2010. Material: casehardened, quenched and tempered

size mm	R	Rp 0.2	A%	C%	Kv	HB
from to	N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	min	J min	
11	1180-1420	835	7	30	44	354-406
12 30	1080-1320	785	8	35	44	327-384
31 63	980-1270	685	8	35		295-373

### EN 10084: 2008 Jominy test HRC

mm distance from quenched end															
mm	1.5	3	5	7	9	11	13	15	20	25	30	35	40	45	grades
<b>min</b>	40	40	39	38	37	36	35	34	32	31	30	29	29		H = normal
<b>max</b>	48	48	48	48	47	47	46	46	44	43	42	41	41		
<b>min</b>	43	43	42	41	40	40	39	38	36	35	34	33	33		HH restricted scatter bands
<b>max</b>	48	48	48	48	47	47	46	46	44	43	42	41	41		
<b>min</b>	40	40	39	38	37	36	35	34	32	31	30	29	29		HL restricted scatter bands
<b>max</b>	45	45	45	45	44	43	42	42	40	39	38	37	37		

<b>Thermal Expansion</b>	10 <sup>-6</sup> · K <sup>-1</sup> ▶	11.1	12.1	12.9	13.5	13.9
<b>Mod. of Elasticity long.</b>	GPa	210				
<b>Specific Heat Capacity</b>	J/(Kg·K)	460				
<b>Thermal Conductivity</b>	W/(m·K)	38				
<b>Density</b>	Kg/dm <sup>3</sup>	7.85				
<b>Specific Electric Resistivity</b>	Ohm·mm <sup>2</sup> /m	0.18				
<b>Electrical Conductivity</b>	Siemens·m/mm <sup>2</sup>	5.55				
<b>°C</b>		<b>20</b>	<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>
					<b>500</b>	

The symbol ▶ indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ...

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Table of tempering values obtained at room temperature on rounds Ø 11 mm after quenching at 850 °C in water

<b>HB</b>		400	393	384	363	319	258	213
<b>HRC</b>		43	42.5	41.5	39	34	26	
<b>R</b>	N/mm <sup>2</sup>	1390	1360	1320	1230	1050	860	700
<b>Rp 0.2</b>	N/mm <sup>2</sup>	1230	1210	1170	1080	940	791	560
<b>A</b>	%	12	12	12	13	15	18	20
<b>C</b>	%	52	53	54	55	58	65	68
<b>Kv</b>	J	44	60	50	40	80	140	160
Tempering at °C		<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>	<b>600</b>	<b>700</b>

EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
18CrNiMo7-6	18CrNiMo7-6		17CrNiMo6	18CND6	822M17 ~		4820 ~

Classification of steel grades according to minimum tensile strength as a function of diameter after hardening and tempering at 200 °C (EN 10084)

