

<b>Quality</b>	<b>40CrMoV4-6</b>
According to standard	<b>EN 10269: 2001</b>
Number	<b>1.7711</b>

<b>Chemical composition</b>									
C%	Si%	Mn%	P%	S%	Cr%	Mo%	V%	Al tot	Deviations allowed for analysis product
	max		max	max				max	
0,36-0,44	0,40	0,45-0,85	0,030	0,030	0,90-1,20	0,50-0,65	0,25-0,35	0,015	
± 0.02	± 0.03	± 0.04	+ 0.005	+ 0.005	± 0.05	± 0.03	± 0.03	± 0.01	

<b>Temperature °C</b>									
Hot-forming	Normalizing	Quenching	Tempering	Stress-relieving		Natural state +U			
1100-950	880-900 air	900-930 oil or polymer	650-720 air	50 under the temp. of tempering		(HB max 350)			
Soft annealing	Isothermal annealing	Annealing	Quenching and stress-relieving	Pre-heating welding		Stress-relieving after welding			
680-730 air (HB max 241)	880 furnace cooling to 730, then air	830 slow furnace cooling (HB 220)	930 oil 200 air (HRC ~ 54)	300 <b>Ac1</b> <b>Ac3</b> 760       870		560 furnace cooling <b>Ms</b> <b>Mf</b> 340       120			

<b>Mechanical properties</b>									
Hot-rolled +QT EN 10269: 2001									
size mm		Kv and traction test at room temperature in longitudinal							
from	to	R	Rp 0.2	A%	C%	Kv +20 °C	Kv -40 °C	Kv -100 °C	HB
		N/mm <sup>2</sup>	N/mm <sup>2</sup> min.	min.	min.	J min.	J min.	J min.	
	100	850-1000	700	14	45	30			253-298
100	160	850-1000	640	14	45	25			253-298

+QT = quenched and tempered

Min. prof strength 0.2 % at high temperatures		Rp 0.2 N/mm <sup>2</sup> - EN 10269: 2001											
diam.	≤	687	670	647	631	608	593	577	554	523	470	400	293
100	160	631	612	591	577	556	542	528	507	479	429	366	268
	°C	<b>50</b>	<b>100</b>	<b>150</b>	<b>200</b>	<b>250</b>	<b>300</b>	<b>350</b>	<b>400</b>	<b>450</b>	<b>500</b>	<b>550</b>	<b>600</b>

Table of tempering values obtained at room temperature on rounds of Ø 40 mm after quenching at 925 °C in oil												
HB		525	520	510	485	460	438	430	409	390	360	271
HRC		53	52.5	52	50.5	48.5	46.5	46	44	42	39	28
R	N/mm <sup>2</sup>	1950	1920	1860	1780	1660	1550	1500	1430	1360	1200	900
Rp 0.2	N/mm <sup>2</sup>	1600	1600	1580	1580	1550	1480	1360	1300	1260	1050	800
A	%	8	8	8	8	8	8.5	9	10	11	13	16
Kv	J	30	30	30	30	30	32	35	40	80	100	150
Tempering at	°C	<b>200</b>	<b>250</b>	<b>300</b>	<b>350</b>	<b>400</b>	<b>450</b>	<b>500</b>	<b>550</b>	<b>600</b>	<b>650</b>	<b>700</b>

Temp.	Mod. of elasticity GPa		Thermal expansion 10 <sup>-6</sup> •K <sup>-1</sup>	Plastic deformations and creep rupture resistance				
	E long.	G tang.		σ <sub>1</sub> (1%) N/mm <sup>2</sup>		σ <sub>R</sub> N/mm <sup>2</sup>		
Test to °C			°C	10.000 h	100.000 h	10.000 h	100.000 h	200.000 h
20	211	81	450			513	462	446
100	204	78	460			483	422	400
200	196	75	470			451	374	347
300	186	71	480			413	319	286

Calore specifico J/(Kg•K)	Densità Kg/dm <sup>3</sup>	Conducibilità Termica W/(m•K)			Resistività Elettrica Ohm•mm <sup>2</sup> /m	Conducibilità Siemens•m/mm <sup>2</sup>
		20°C	250°C	500°C		
460	7.85	33.0	--	--	--	--

EUROPA EN	ITALIA UNI	SPAGNA UNE	GERMANIA DIN	FRANCIA AFNOR	UK B.S.	SVEZIA SS	USA AISI/SAE
40CrMoV4-6	40CrMoV4-6	40CrMoV4-6	40CrMoV4-6	40CrMoV4-6	670-860	40CrMoV4-6	A193B16