

<b>Quality</b>	<b>34CrNiMo6</b>	<i>Technical card</i> <i>Lucefin Group</i>
According to standards	<b>EN 10083-3: 2006</b>	
Number	<b>1.6582</b>	

### Chemical composition

C%	Si% max	Mn%	P% max	S% max	Cr%	Mo%	Ni%	Product deviations are allowed
0,30-0,38 ± 0.02	0,40 + 0.03	0,50-0,80 ± 0.04	0,025 + 0.005	0,035 + 0.005	1,30-1,70 ± 0.05	0,15-0,30 ± 0.03	1,30-1,70 ± 0.05	

### Temperature °C

Hot-forming	Normalizing +N	Quenching +Q	Quenching +Q	Tempering +T	Stress-relieving +SR			
1100-900	860-870 air	870 oil or polymer	860 water	600-650 air	50° under the temperature of tempering			
Soft annealing +A	Isothermal annealing +I	Full annealing	End quench hardenability test	Pre-heating welding		Stress-relieving after welding		
650-680 air (HB max 248)	850-900 cooling furnace to 500, then air	830-900 cooling furnace to 300	850 water	300		600 furnace cooling		
				Ac1	Ac3	Ms	Mf	
				715	770	320	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)						HB <i>for information</i>
from	to	R N/mm <sup>2</sup>	Rp 0.2 N/mm <sup>2</sup> min.	A% min.	C% min.	Kv J min.		
	16/8	1200-1400	1000	9	40		359-404	
16/8	40/20	1100-1300	900	10	45	45	331-380	
40/20	100/60	1000-1200	800	11	50	45	298-359	
100/60	160/100	900-1100	700	12	55	45	271-331	
160/100	250/160	800-950	600	13	55	45	240-286	

d = diameter t = thickness

**Table of tempering** values obtained at room temperature on rounds of Ø 60 mm after quenching at 850 °C in oil

HB	525	500	468	450	371	344	319	271	240	
HRC	53	51.5	49	46.5	40	37	34	28	22	
R	N/mm <sup>2</sup>	1950	1850	1700	1500	1260	1150	1050	900	800
Rp 0.2	N/mm <sup>2</sup>	1450	1480	1450	1350	1180	980	950	700	680
A	%	10	10	10	12	13	13.4	18	20	22
C	%	48	50	52	58	62	62	68	68	70
Kv	J	18	18	18	18	45	70	90	110	120
Tempering at °C		<b>100</b>	<b>200</b>	<b>300</b>	<b>400</b>	<b>500</b>	<b>550</b>	<b>600</b>	<b>650</b>	<b>700</b>

**LUCEFIN** experience: *forged round* 520 mm quenched at 870 °C in water, tempered at 630 °C air

Depth from heat treated surface	Longitudinal Testing							HB
	R N/mm <sup>2</sup>	Rp 0.2 N/mm <sup>2</sup>	A %	C %	Kv +20 °C J	Kv -40 °C J		
25 mm	930	828	18,6	64,0			110-118-118	279
1/3 radius	900	750	15,4	60,0			48-44-45	271
1/2 diameter	860	730	12,6	46,0	70-74-70	25-28-25		264

**FATT** (fracture appearance transition temperature)

°C	<b>-70</b>	<b>-60</b>	<b>-40</b>	<b>-20</b>	<b>0</b>	<b>+20</b>	<b>+50</b>	<b>+80</b>	<b>+18</b>
% fibrosity	3	6	11	15	24	53	100	100	<b>FATT 50</b>
Kv average J	22	24	27	42	51	70	142	150	<b>68</b>

### Chemical composition %

														ppm		
C	Si	Mn	P	S	Cr	Mo	Ni	V	Cu	Sn	As	Sb	Al	H2	O2	N2
0.36	0.23	0.64	0.006	0.003	1.62	0.28	1.60	0.05	0.16	0.006	0.007	0.004	0.018	1.30	34	70

**34CrNiMo6** 1.6582 EN 10277-5: 2008

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Hot-rolled, quenched and tempered, <b>cold-drawn</b> +QT +C						Cold-drawn obtained from hot-rolled annealed +A +C
size mm		Testing at room temperature (longitudinal)				
from	to	R	Rp 0.2	A%	HB	HB
		N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	for inform.	max
5 <sup>b)</sup>	10	1000-1200	770	8	298-359	308
10	16	1000-1200	750	8	298-359	298
16	40	1000-1200	720	9	298-359	293
40	63	1000-1200	650	10	298-359	288
63	100	1000-1200	650	10	298-359	288

<sup>b)</sup> for thickness < 5 mm, mechanical properties should be agreed before order placement<sup>e)</sup> values are valid also for +QT+C+SL

Cold-drawn quenched and tempered +C +QT <sup>c) e)</sup>						Rolled + turned +SH or annealed + <b>peeled-reeled</b> +A +SH
size mm		Testing at room temperature (longitudinal)				
from	to	R	Rp 0.2	A%	HB	max HB
		N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	for inform.	
5 <sup>b)</sup>	10					
10	16					
16	40	1100-1300	900	10	331-380	248
40	63	1000-1200	800	11	298-359	248
63	100	1000-1200	800	11	298-359	248

<sup>c)</sup> for flats and special sections, tensile strength (R) may differ by ± 10%<sup>b)</sup> for thickness < 5 mm, mechanical properties should be agreed before order placement<sup>e)</sup> values are valid also for +C+QT+SL**Forged** quenched and tempered EN 10250-3: 2001

size d / t mm		Testing at room temperature									
from	to	R	Rp 0.2	A% L	A% T	A% Q	Kv L	Kv T	Kv Q	HB	
		N/mm <sup>2</sup>	N/mm <sup>2</sup> min	min	min	min	J min	J min	J min	min	
	250/160	800	600	13	9		45	22		240	
250/160	500/330	750	540	14	10		45	22		225	
500/330	990/660	700	490	15	11		40	20		213	

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	50	50	50	50	49	48	48	48	48	47	47	47	46	45	44	normal
max	58	58	58	58	57	57	57	57	57	57	57	57	57	57	57	

Temperature Testing at °C	Mod. of elasticity GPa		Thermal expansion			
	E long.	G tang.	10 <sup>-6</sup> · K <sup>-1</sup>			
20	220	88				
100	205	78	11.1			
200	195	75	12.1			
300	185	70	12.9			
400	175	67	13.5			
500			13.9			
600			14.1			

Specific heat capacity J/(Kg·K)	Density Kg/dm <sup>3</sup>	Thermal conductivity W/(m·K)	Specific electric resist. Ohm·mm <sup>2</sup> /m	Electrical conductivity Siemens·m/mm <sup>2</sup>
460	7.85	38	0.19	5.26

Minimum service temperature	Maximum service temperature
from -40°C to max -70°C	from +600 °C to max +650 °C

Corrosion resistance	Cold-working
Poor corrosion resistance; it is suggested to use protective coating	Easily cold-workable in its annealed condition; it has good ductility

EUROPE EN	ITALY UNI	CHINA GB	GERMANY DIN	FRANCE AFNOR	U.K. B.S.	RUSSIA GOST	USA AISI/SAE
34CrNiMo6	35NiCrMo6		34CrNiMo6	35NCD6	817M40	38Ch2N2MA	4340