

Quality	36NiCrMo16	<i>Technical card</i>
According to standard	EN 10083-3: 2006	<i>Lucefin Group</i>
Number	1.6773	

Chemical composition

C%	Si% max	Mn%	P% max	S% max	Cr%	Mo%	Ni%	Product deviations are allowed
0,32-0,39 ± 0.02	0,40 + 0.03	0,50-0,80 ± 0.04	0,025 + 0.005	0,025 + 0.005	1,60-2,00 ± 0.05	0,25-0,45 ± 0.04	3,60-4,10 ± 0.07	

Temperature °C

Hot-forming	Normalizing	Quenching	Quenching	Tempering	Stress-relieving			
1100-900	850 air	880 air	830-860 oil, polymer, water or s.b. (500)	550-650 air	50° under the temperature of tempering			
Soft annealing	Isothermal annealing	Full annealing	End quench hardenableity test	Pre-heating welding	Stress-relieving after welding			
650 air (HB max 269)		790 furnace cooling (HB max 275)	825 water	250	550 furnace cooling			
				Ac1 700	Ac3 760	Ms 240	Mf 30	

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 ²	Rp 0.2 N/mm ²	A% min.	C% min.	Kv J min.		
	16/8	1250-1450	1050	9	40		370-415	
16/8	40/20	1250-1450	1050	9	40	30	370-415	
40/20	100/60	1100-1300	900	10	45	35	331-380	
100/60	160/100	1000-1200	800	11	50	45	298-359	
160/100	250/160	1000-1200	800	11	50	45	298-359	

d = diameter t = thickness

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

HB		518	496	468	448	432	409	385	357	327	301
HRC		52.5	51	49	47.5	46	44	41.5	38.5	35	32
R	N/mm ²	1900	1820	1720	1610	1520	1420	1320	1200	1090	1000
Rp 0.2	N/mm ²	1550	1500	1430	1360	1290	1200	1100	990	900	870
A	%	7.0	8.0	8.6	9.2	9.6	10.0	11.0	12.4	14.0	14.0
C	%	23	24	25	27	27	28	32	38	48	50
Kv	J	28	28	27	26	26	26	28	38	64	64
Tempering at °C		200	250	300	350	400	450	500	550	600	650

36NiCrMo16

Lucefin Group

Hot-rolled, quenched and tempered, **cold-drawn** +QT +C

size		Testing at room temperature (longitudinal)			
mm		R	Rp 0.2	A%	HB
from	to	N/mm ²	N/mm ² min	min	

No indications from reference standards

Cold-drawn quenched and tempered					Cold-drawn from hot-rolled annealed	Cold-drawn annealed or annealed + peeled-reeled
size		Testing at room temperature (longitudinal)			size	
mm		R	Rp 0.2	A%	HB	mm
from	to	N/mm ²	N/mm ² min	min		max HB

No indications from reference standards

Forged quenched and tempered UNI EN 10250-3: 2001

size d / t		Testing at room temperature								
mm		R	Rp 0.2	A% L	A% T	A% Q	Kv L	Kv T	Kv Q	HB
from	to	N/mm ² min	N/mm ² min	min	min	min	J min	J min	J min	min
	250/160	1000	800	11	8		45	22		298
250/160	500/330	1000	800	11	8		45	22		298
500/330	990/660	1000	800	11	8		45	22		298

L = longitudinal T = tangential Q = radial
d = diameter t = thicknessEN 10083-3: 2006 **Jominy test HRC** grain size 5 min.

distance in mm from quenched end

	1.5	3	5	7	9	11	13	15	20	25	30	35	40	45	50	H
min	50	49	48	48	48	48	47	47	47	47	47	47	47	47	47	normal
max	57	56	56	56	56	56	55	55	55	55	55	55	55	55	55	

Temperature	Mod. of elasticity GPa		Thermal expansion				
	Testing at °C	E long.	G tang.	10 ⁻⁶ •K ⁻¹			
20		208	80				
100				11.5			
200				12.3			
300				12.8			
400				13.3			
500				13.7			
600				14.0			

Specific heat capacity	Density	Thermal conductivity	Specific electric resist.	Electrical conductivity
J/(Kg•K)	Kg/dm ³	W/(m•K)	Ohm•mm ² /m	Siemens•m/mm ²
460	7.84	33	0.30	3.33

Lucefin experience; *Forged round* 300 mm quenched at 870 °C in water, tempered 590 °C air

Depth from Heat Treatment surface	Longitudinal Testing						
	R	Rp 0.2	A%	C%	Kv +20°C	Kv -20°C	HB
	N/mm ²	N/mm ²			J	J	
½ radius	1201	1110	12,8	55,0	90-98-90	62-58-60	371

Chemical composition %

C	Si	Mn	P	S	Cr	Mo	Ni
0.34	0.25	0.50	0.012	0.005	1.68	0.40	3.70

EUROPE EN	ITALY UNI	CHINA GB	GERMANY DIN	FRANCE AFNOR	U.K. B.S.	RUSSIA GOST	USA AISI/SAE
36NiCrMo16	34NiCrMo16		36NiCrMo16	35NCD16	835M30		