METALLURGICA VENETA
ACCIAI SPECIALI

36NiCrMo16

Certified Company

Quality	36NiCrMo16
According to standard	**EN 10083-3: 2006**
Number	**1.6773**

Chemical composition

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

Deviations allowed for analysis product

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 hardenability 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	Ac3	Ms	Mf
700	760	240	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)					
		R	**Rp** 0.2	**A**%	**C**%	**Kv**	***HB***
from	to	N/mm²	N/mm² min.	min.	min.	J min.	*for information*
	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/mm²	1900	1820	1720	1610	1520	1420	1320	1200	1090	1000
Rp 0.2	N/mm²	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**

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

size mm		Testing at room temperature (longitudinal)			
		R	**Rp** 0.2	**A**%	**HB**
from	to	N/mm²	N/mm² 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 mm		Testing at room temperature (longitudinal)				size mm		
		R	**Rp** 0.2	**A**%	**HB**			
from	to	N/mm²	N/mm² min	min			max **HB**	max **HB**

No indications from reference standards

Forged quenched and tempered UNI EN 10250-3: 2001

size d / *t* mm		Testing at room temperature								
		R	**Rp** 0.2	**A**% L	**A**% T	**A**% Q	**Kv** L	**Kv** T	**Kv** Q	***HB***
from	to	N/mm² min	N/mm² 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* = *thickness*

EN 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.	$10^{-6} \bullet K^{-1}$
20	208	80	
100			11.5
200			12.3
300			12.8
400			13.3
500			13.7
600			14.0

Specific heat capacity J/(Kg•K)	**Density** Kg/dm³	**Thermal conductivity** W/(m•K)	**Specific electric resist.** Ohm•mm²/m	**Electrical conductivity** Siemens•m/mm²
460	7.84	33	0.30	3.33

; *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/mm²	N/mm²			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		