

Quality	34CrAlNi7-10
According to standard	UNI EN 10085: 2003
Number	1.8550

Chemical composition

C%	Si% max	Mn%	P% max	S% max	Cr%	Mo%	Ni%	Al%	Deviations allowed for analysis product
0,30-0,37 ± 0.02	0,40 + 0.03	0,40-0,70 ± 0.04	0,025 +0.005	0,035 + 0.005	1,50-1,80 ± 0.05	0,15-0,25 ± 0.03	0,85-1,15 ± 0.05	0,80-1,20 ± 0.10	

Temperature °C

Hot-forming	Stress-relieving after machining	Quenching	Tempering	Nitrocarburizing	Final stress-relieving
1050-850	550-580 air	850-890 oil or polymer	570-660 air	570-580	50° under the temperature of tempering
Soft annealing	Isothermal annealing	Nitriding	End quench hardenableity test	Pre-heating welding	Stress-relieving after welding
650-700 air (HB max 248)		500-520 (HV 1000)	900 water	300 Ac1 730	550 furnace cooling Ac3 775 Ms 340 Mf 125

Mechanical and physical properties

Hot-rolled mechanical properties in **quenched and tempered** condition UNI EN 10085: 2003

size mm		Testing at room temperature (longitudinal)					Surface hardness in quenched and tempered and nitrided condition HV 1
from	to	R N/mm ²	Rp 0.2 N/mm ² min.	A% min.	Kv J min.	HB <i>for information</i>	
16	40	900-1100	680	10	30	271-331	950
40	100	850-1050	650	12	30	253-319	
100	160	800-1000	600	13	35	240-298	
160	250	800-1000	600	13	35	240-298	

Table of tempering values obtained at room temperature on rounds of Ø 10 mm after quenching at 880 °C in oil

		50	100	150	200	250	300	350	400	450	500	550	600	650	700
HB		534	534	525	518	504	489	468	448	432	404	376	327	294	271
HRC		53.5	53.5	53	52.5	51.5	50.5	49	47.5	46	43.5	40.5	35	31	28
R	N/mm ²	1970	1970	1950	1900	1850	1800	1710	1620	1520	1400	1280	1090	980	900
Rp 0.2	N/mm ²	1440	1450	1520	1570	1550	1500	1440	1390	1300	1210	1100	970	820	700
A	%	9.8	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.4	11.2	13.6	15.5	18.4	
C	%	38	40	43	43	42	40	39	40	43	45	50	57	63	
Kv	J	8	11	11	8	7	6	5	4	6	8	17	38	84	152
Tempering at °C		50	100	150	200	250	300	350	400	450	500	550	600	650	700

High-temperature testing

		20	100	200	300	400	500	600	
R	N/mm ²		840	780	760	790	700	580	350
Rp 0.2	N/mm ²		620	590	580	560	480	410	220
A	%		22	22	22	22	24	26	28
C	%		68	70	68	64	76	80	88
Kv	J		140	150	165	175	150	125	80
Test temperature °C		20	100	200	300	400	500	600	

34CrAINi7-10

Cold-drawn					Hot-rolled + peeled-reeled				
size mm		Testing at room temperature (longitudinal)			Testing at room temperature (longitudinal)				
from	to	R	Rp 0.2	A%	HB	R	Rp 0.2	A%	HB
		N/mm ²	N/mm ² min	min		N/mm ²	N/mm ² min	min	
No indications from reference standards									

Forged quenched and tempered DIN 17211: 1987. Use only as reference

size mm		Testing at room temperature (longitudinal)							HB
from	to	R	Rp 0.2	A% L	A% T	A% Q	Kv L	DVM L	HB
		N/mm ²	N/mm ² min	min	min	min	J min	J min	for information
100	100	850-1050	650	12			30	35	253-319
100	250	800-1000	600	13			35	40	240-298

L = longitudinal T = tangential Q = radial

Jominy test HRC 34CrAINi7 UNI 8552. Use only as reference

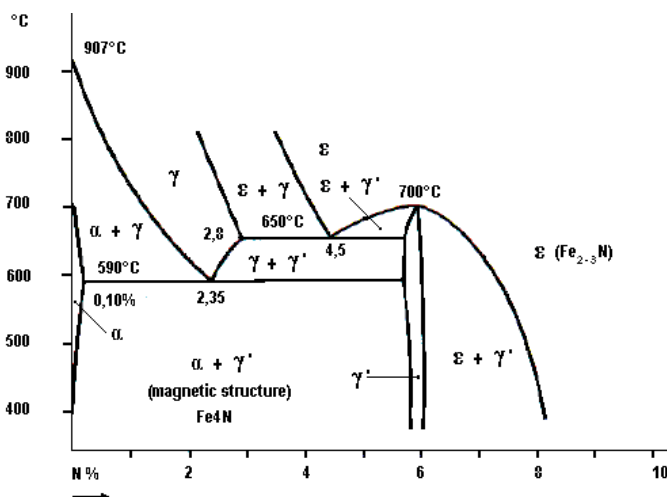
mm distance from quenched extremity

	1.5	3	5	7	9	11	13	15	20	25	30	35	40	45	50
min	48.5	48	47.5	46.5	45.5	44.5	43.5	43	39	37	34.5	33	32	31.5	31
max	59.5	59	58	57	56.5	56	55.5	55	54	52	50.5	48.5	47	46	45

Temperature Testing at °C	Mod. of elasticity GPa		Rp 0.2	R	A	Kv	Thermal expansion 10 ⁻⁶ · K ⁻¹
	E long.	G tang.	heat treatment on 15 mm dia. round				
20	210	80	680	800	20	150	9.1
100	205	79	600	780	20	155	11.1
200			590	780	20	165	12.1
300	185	71	580	780	20	175	12.9
400			500	700	22	155	13.5
500	165	63	400	590	25	125	13.9
600	155	59	220	360	30	100	

Specific heat capacity J/(Kg·K)	Density Kg/dm ³	Thermal conductivity W/(m·K)	Specific electric resist. Ohm·mm ² /m	Electrical conductivity Siemens·m/mm ²
460	7.85	35	0.31	3.22

EUROPE EN	ITALY UNI	CHINA GB	GERMANY DIN	FRANCE AFNOR	U.K. B.S.	RUSSIA GOST	USA AISI/SAE
34CrAINi7-10	34CrAINi7-10		34CrAINi7			34H2NMJu	K52440



As operating in continuous flow conditions, temperatures higher than 480 °C gaseous ammonia releases nitrogen hydrogen, that are absorbed and diffused in superficial steel layer. Nitrogen reacts with steel elements and create hard but very fragile nitrides. The lack of alloy elements in carbon steel cause the creation of iron nitrides only, thus giving steel significant fragility. To prevent this inconvenient, steels contain Cr, Mo (more similar to nitrogen than to iron). Maximum temperature suggested for nitrided steels is 590 °C, avoiding the eutectoid of 590 °C.

Fe₂₋₃N = nitrides behaving like a barrier to

Fe₂₋₃N = nitridi che fanno da barriera alla diffusione dell'azoto