Quality	**C55E**	*Technical card*
According to standard	**EN 10083-2: 2006**	*Lucefin Group*
Number	**1.1203**	

Chemical composition

C%	**Si%** max	**Mn%**	**P%** max	**S%** max	**Cr%** max	**Mo%** max	**Ni%** max	
0,52-0,60	0,40	0,60-0,90	0,030	0,035	0,40	0,10	0,40	Product deviations are allowed
± 0.03	+0.03	± 0.04	+ 0.005	+ 0.005				

Cr+Mo+Ni max 0.63%
For C55R n° 1.1209, S% 0.020-0.040 product deviations ± 0.005
For C55 n° 1.0535, P% - S% max 0.045

Temperature °C

Hot-forming	**Normalizing**	**Quenching**	**Quenching**	**Tempering**	**Stress-relieving**
1050-850	825-885 air	830 water	850 oil or polymer	550-650 air	50° under the temperature of tempering

Soft annealing	**Isothermal annealing**	**Natural state**	**End quench hardenability test**	**Pre-heating welding**		**Stress-relieving after welding**	
680-700 air (HB max 229)	790 furnace cooling to 660, then air	(HB max 255)	830 water	250		600 furnace cooling	
				Ac1	**Ac3**	**Ms**	**Mf**
				730	765	300	80

Mechanical and physical properties

Hot-rolled mechanical properties in **normalized** condition EN 10083-2: 2006

size d / *t* mm		Testing at room temperature (longitudinal)					
		R	**Re** [a]	**A%**	**C%**	**Kv**	***HB***
from	to	N/mm² min	N/mm² min.	min.	min.	J min.	*min*
	16/*16*	680	370	11			*208*
16/*16*	100/*100*	640	330	12			*198*
100/*100*	250/*250*	620	300	12			*190*

d = diameter *t* = *thickness*

Hot-rolled mechanical properties in **quenched and tempered** condition EN 10083-2: 2006

size d / *t* mm		Testing at room temperature (longitudinal)					
		R	**Re** [a]	**A%**	**C%**	**Kv**	***HB***
from	to	N/mm²	N/mm² min	min.	min.	J min	*for information*
	16/*8*	800-950	550	12	30		*240-286*
16/*8*	40/*20*	750-900	490	14	35		*225-271*
40/*20*	100/*60*	700-850	420	15	40		*213-253*

[a] Re upper yield strength or, if no yield phenomenon occurs, $Rp_{0.2}$ has to be considered
d = diameter *t* = *thickness*

Table of tempering values obtained at room temperature on rounds of Ø 60 mm after quenching at 830 °C in oil

HB		286	268	253	240	226	223	162
HRC		28	25	23	22.5	20		
R	N/mm²	950	890	850	800	760	720	560
Rp 0.2	N/mm²	650	590	530	480	430	400	380
A	%	9	11	13	16	18	19	24
C	%	28	38	42	45	50	50	
Tempering at **°C**		**400**	**450**	**500**	**550**	**600**	**650**	**690** (annealing)

C55 1.0535 EN 10277-**2**: 2008

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Cold-drawn +C [c]						Hot-rolled + **peeled-reeled** +SH [c]			
size		Testing at room temperature (longitudinal)				Testing at room temperature (longitudinal)			
mm		**R** [a]	**Rp** 0.2 [a]	**A**%	***HB***	**R**	**Rp** 0.2	**A**%	**HB**
from	to	N/mm²	N/mm² min	min	*for inform.*	N/mm²	N/mm² min	min	
5 [b]	10	770-1100	590	5	*231-331*				
10	16	730-1080	520	6	*224-327*				
16	40	690-1050	440	7	*210-319*	610-910			181-269
40	63	650-1030	390	8	*200-311*	610-910			181-269
63	100					610-910			181-269

[a] for flats and special sections, yield point can be – 10% and tensile strenght can be ± 10%
[b] for thickness < 5 mm, mechanical properties should be agreed before order placement
[c] values valid also for +C+SL and +SH+SL

C55E 1.1203 **Forged** normalized EN 10250-2: 2001

size		Testing at room temperature (longitudinal)							
mm		**R**	**Re** [c]	**A**% L	**A**% T	**A**% Q	**Kv** L	**Kv** T	***HB***
from	to	N/mm² min	N/mm² min	min	min	min	J min	J min	*min*
	100	640	330	12					*198*
100	250	620	300	12	9				*190*
250	500	600	260	12	9				*178*
500	1000	590	250	11	8				*176*

d = diameter *t* = *thickness*

C55E 1.1203 **Forged** quenched and tempered EN 10250-2: 2001

size d / *t*		Testing at room temperature (longitudinal)							
mm		**R**	**Re** [c]	**A**% L	**A**% T	**C**% L	**Kv** L	**Kv** T	***HB***
from	to	N/mm² min	N/mm² min	min	min	J min	J min	J min	*min*
	100/*70*	700	420	15					*213*
100/*70*	250/*160*	630	360	17	11				*192*
250/*160*	500/*330*	610	330	16	10				*183*

L = longitudinal T = tangential Q = radial
[c] Re upper yield strength or, if no yield phenomenon occurs, Rp 0.2 has to be considered
d = diameter *t* = *thickness*

EN 10083-2: 2006 **Jominy test HRC** grain size 5 min.

mm distance from quenched extremity

	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**13**	**15**	**20**	**25**	**30**	**H**
min	58	55	47	37	33	32	31	30	29	28	27	26	25	24	22	20	normal
max	65	64	63	62	60	57	52	45	37	36	35	34	33	32	30	29	

Temperature	**Mod. of elasticity** GPa		**Thermal expansion**	**Density**
Testing at **°C**	**E** long.	**G** tang.	$10^{-6} \cdot K^{-1}$	Kg/dm³
20	205	79		7.85

EUROPE EN	**ITALY** UNI	**CHINA** GB	**GERMANY** DIN	**FRANCE** AFNOR	**U.K.** B.S.	**RUSSIA** GOST	**USA** AISI/SAE
C55E	C55	55	Ck55	XC55 H1	870M55		1055