

Quality	C30E	Quenching and Tempering Steel	<i>Technical card</i>
According to standards	ISO 683-1: 2018		Lucefin Group
Number	1.1178		<i>rev. 2018</i>

Chemical composition

C%	Si%	Mn%	P% max	S% max	Cr% max	Mo% max	Ni% max	Cu% max	Product deviations are allowed
0,27-0,34 ± 0.02	0,10-0,40 ± 0.03	0,50-0,80 ± 0.04	0,025 + 0.005	0,035 + 0.005	0,40 +0.05	0,10 +0.03	0,40 +0.05	0,30	

Cr+Mo+Ni max 0.63%
For C30R n° 1.1179, S% 0.020-0.040 product deviations ± 0.005

Temperature °C

Hot-forming	Normalizing +N	Quenching +Q	Quenching +Q	Tempering +T	Stress-relieving +SR
1150-850	870-910 air	850 water	890 oil or polymer	550-660 air	50° under the temperature of tempering
Soft annealing +A	Isothermal annealing +I	Natural state +U	Hardening on specimen Ø 25	Pre-heating welding	Stress-relieving after welding
700 air (HB max 190)	880 furnace cooling to 650, then air (HB 140-180)	- (HB max 210)	860 water (HRC ~ 50)	100 Ac1 Ac3 730 810	slow cooling Ms Mf 400 180

Mechanical properties

C30E – C30R Hot-rolled mechanical properties in **normalized** condition ISO 683-1: 2018

size d / t		Testing at room temperature (longitudinal)					
mm		R	Re _H ^{a)}	A%	Z%	Kv ₂	HB for information
from	to	N/mm ² min	N/mm ² min.	min.	min.	J min.	min
	16/16	510	280	20	-	-	154
16/16	100/100	480	250	21	-	-	146
100/100	250/250	460	230	21	-	-	139

^{a)} Re_H upper yield strength or, if no yield phenomenon occurs, Rp_{0.2} has to be considered
d = diameter t = thickness

C30E – C30R Hot-rolled mechanical properties in **quenched and tempered** condition ISO 683-1: 2018

size d / t		Testing at room temperature (longitudinal)					
mm		R	Re _H ^{a)}	A%	Z%	Kv ₂	HB
from	to	N/mm ²	N/mm ² min	min.	min.	J min	for information
	16/8	600-750	400	18	-	30	178-225
16/8	40/20	550-700	350	20	-	30	159-213
40/20	63/35	500-650	300	21	-	30	152-200

^{a)} Re_H 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 10 mm after quenching at 860 °C in water

HB	454	441	409	343	263	225
HRC	48	47	44	37	27	20
R N/mm²	1640	1580	1430	1140	880	750
Tempering at °C	100	200	300	400	500	600

C30E 1.1178 – C30R 1.1179 EN 10277: 2018
Lucefin Group

Cold-drawn +C ^{c)}						Hot-rolled and Peeled +SH ^{d)}			
size mm		Testing at room temperature (longitudinal)				Testing at room temperature (longitudinal)			
from	to	R	Rp 0.2	A%	HBW	R	Rp 0.2	A%	HBW
		N/mm ² min	N/mm ² min	min	for inform.	N/mm ² min	N/mm ² min	min	min
5 ^{b)}	10	610-910	455	6	183-274	-	-	-	-
10	16	570-870	420	7	169-260	-	-	-	-
16	40	550-850	345	8	159-253	480-680	-	-	145-200
40	63	520-820	300	9	155-246	480-680	-	-	145-200
63	100	480-780	250	9	146-232	480-680	-	-	145-200

^{b)} For thickness < 5 mm, mechanical properties should be agreed before order placement
^{c)} Values valid also for +C+G
^{d)} Values valid also for +SH+G

Hot-rolled quenched and tempered and Peeled +QT+SH						Quenched and tempered and Cold-drawn +QT+C			
size mm		Testing at room temperature (longitudinal) ^{a)}				Testing at room temperature (longitudinal)			
from	to	R	Rp 0.2	A%	Kv₂ +20 °C	R	Rp 0.2	A%	Kv₂ +20 °C
		N/mm ²	N/mm ² min	min	min	N/mm ²	N/mm ² min	min	J min
5	10	-	-	-	-	-	-	-	-
10	16	-	-	-	-	-	-	-	-
16	40	550-750	350	20	40	-	-	-	-
40	63	500-650	300	20	40	-	-	-	-
63	100	500-650	300	20	40	-	-	-	-

^{a)} Values valid also for +C+QT

C30 1.0528 Forged normalized UNI EN 10250-2: 2001

size mm		Testing at room temperature (longitudinal)				
from	to	R	Re ^{a)}	A%	Kv	HB
		N/mm ² min	N/mm ² min	min (L)	J min (L)	min
	100	480	250	21	-	146
100	250	460	230	21	-	139

^{a)} Re upper yield strength or, if no yield phenomenon occurs, Rp_{0.2} has to be considered

Jominy test HRC

mm distance from quenched end	1	2	3	4	5	6	7	8	9	10	11	13	15	20
min	No indications from reference standards													
max														

Thermal Expansion	10 ⁻⁶ .K ⁻¹	►	11.1	12.1	12.9	13.5	13.9	14.1
Mod. of Elasticity l.	GPa	210						
Mod. of Elasticity t.	GPa	80						
Specific Heat Capac.	J/(Kg.K)	486	519	599				
Thermal conductiv.	W/(m.K)	51.0						
Density	Kg/dm ³	7.85						
Electric Resistivity	Ohm.mm ² /m	0.166						
Elec. Conductivity	Siemens.m/mm ²	6.02						
°C		20	100	200	300	400	500	600

The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 200 °C ...

EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
C30E	C30	30	Ck30	XC32	080M30	30	1030