

Quality	27MnCrB5-2	Quenching and Tempering Steel	<i>Technical card Lucefin Group rev. 2018</i>
According to standard	ISO 683-2: 2018		
Number	1.7182		

Chemical composition

C%	Si% max	Mn%	P% max	S% max	Cr%	Cu% max	B%	Product deviations are allowed
0,24-0,30 ± 0.02	0,40 ± 0.03	1,10-1,40 ± 0.06	0,025 + 0.005	0,035 ± 0.005	0,30-0,60 ± 0.05	0,40 + 0.05	0,0008-0,005 ± 0.0003	

Temperature °C

Hot-forming	Normalizing +N	Quenching +Q	Quenching +Q	Tempering +T	Stress-relieving +SR		
1150-900	870-900 air	880 water (HRC ~ 51)	920 oil, polymer (HRC ~ 48)	180-200 air or 450-660 air	50° under the temp. of tempering		
Soft annealing +A	Spheroidizing +AC	Hot rolled +U	End quench hardenable tes	Pre-heating welding		Stress-relieving after welding	
690-710 air (HB max 220)	680-720 furnace cooling to 420 after air (HB max 160)	- (HB max 250)	900 water	120-150		slow cooling	
				Ac1	Ac3	Ms	Mf
				705	800	440	220

Mechanical properties

Hot-rolled mechanical properties in **quenched and tempered** condition EN 10083-3: 2006

Ø / t		Testing at room temperature (longitudinal)							Kv ₂	HBW
from	to	R	Re	A%	Z%			J min.		
16 / 8	40 / 20	1000-1250	800	14	55			-	298-370	
16 / 8	60 / 40	900-1150	750	14	55			60	271-347	
40 / 20	60 / 40	800-1000	700	15	55			65	240-298	

Ø = diameter t = thickness

Table of tempering values obtained at room temperature on rounds of Ø 11 mm after quenching at 880 °C in water

HB		468	455	442	432	409	390	371	344	327	294	264	243
HRC		49	48	47	46	44	42	40	37	35	31	27	23
R	N/mm ²	-	-	-	1540	1440	1350	1260	1150	1080	980	890	800
Rp 0.2	N/mm ²	-	-	-	1230	1170	1080	1000	920	840	780	700	620
A	%	-	-	-	10	10	11	12	13	14	14	15	16
Z	%	-	-	-	35	35	38	40	42	45	48	50	52
Kv 20°C	J	-	-	-	36	28	30	40	50	60	70	80	84
Tempering °C		100	150	200	250	300	350	400	450	500	550	600	650

Avoid long permanences at temperatures from 200 to 400 °C because they can cause embrittlement

ISO 683-2: 2018 **Jominy test HRC**

mm distance from quenched end													
mm	1.5	3	5	7	9	11	13	15	20	25	30	35	H
min	47	46	45	44	43	41	39	36	30	24	20	-	
max	55	55	55	54	54	53	52	51	47	44	40	37	

Typical values of round quenched to 880 °C in water

Ø	Tempering °C	R	Rp 0.2	A%	Z%	Kv +20 °C	HRC
mm		N/mm ²	N/mm ² min.	min.	min.	J min.	
16	200	1450-1700	1200	8	40	30	44-49
60	200	1000-1300	850	10	45	30	32-41
16	500	1000-1250	800	14	55	70	32-40
60	500	800-1000	700	14	55	70	22-32

EUROPE	ITALY	CHINA	GERMANY	FRANCE	UK	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
27MnCrB5-2	27MnCrB5-2		27MnCrB5-2	27MnCrB5-2	27MnCrB5-2		