

Quality	23MnB4	Quenching and Tempering Steel	<i>Technical card Lucefin Group rev. 2018</i>
According to standard	EN 10263-4: 2001		
Number	1.5535		

Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Cu%	B%	Product deviations are allowed
	max		max	max	max	max		
0,20-0,25	0,30	0,90-1,20	0,025	0,025	0,30	0,25	0,0008-0,005	
± 0.02	± 0.03	± 0.05	+ 0.005	+ 0.005	± 0.05	+ 0.03	± 0.0003	

Temperature °C

Hot-forming	Normalizing +N	Core hardenability +CH	Tempering +T	Stress-relieving +SR			
1150-850	880-900 air	880 oil, polymer, water	420-630 air	50 under the temperature of tempering			
Soft annealing +A	Isothermal annealing +I	Spheroidizing +AC	End quench hardenability test	Pre-heating welding		Stress-relieving after welding	
700 air	860-880 cooling to 700 then air	690-700 air (HB max 156)	880 water	150-180		slow cooling	
				Ac1	Ac3	Ms	Mf
				700	805	430	210

Mechanical properties

State of supply according EN 10263-4: 2001

size mm		Untreated +U or +PE peeled		Spheroidizing +AC or +AC+PE peeled		Untreated, cold-drawn +U+C		Untreated, cold-drawn and spheroidized +U+C+AC		Untreated, cold-drawn, spheroidized and skin pass +U+C+AC+LC		Spheroidized and cold-drawn +AC+C	
from	to	R max	Z min	R max	Z min	R max	Z min	R max	Z min	R max	Z min	R max	Z min
		N/mm ²	%	N/mm ²	%	N/mm ²	%	N/mm ²	%	N/mm ²	%	N/mm ²	%
2	5	-	-	-	-	-	-	510	66	550	64	-	-
5	10	600	60	520	64	700	55	500	66	540	64	620	59
10	25	600	60	520	64	690	55	500	66	540	64	610	59

Table of tempering values obtained at room temperature after quenching at 880 °C in water

HB	409	404	395	385	371	348	319	286	264	253	237
HRC	44	43.5	42.5	41.5	40	37.5	34	30	27	25	22
R N/mm ²	1430	1410	1360	1320	1250	1160	1050	950	880	850	790
Tempering at °C	100	150	200	250	300	350	400	450	500	550	600

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

EN 10263-4: 2001 Hardenability values (type H) **Jominy HRC**

distance from quenched end

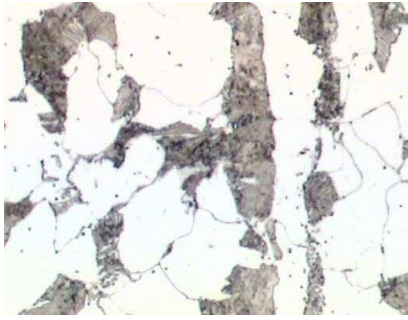
mm	1.5	3	5	7	9	11	13	15	20	25	30	35	40
min	43	41	40	32	23	-							
max	49	48	47	47	45	41							

Mechanical properties at +20 °C (longitudinal testing) **LUCEFIN** experience

Heat treatments	temperature °C	hot-rolled Ø mm	R N/mm ²	Rp 0.2 N/mm ²	A %	Z %
Natural +U		14	460	430	30	74
Quenching +Q	910 oil	14	1100	1050	13	56
Tempering +T	480 air	14	980	920	13	66

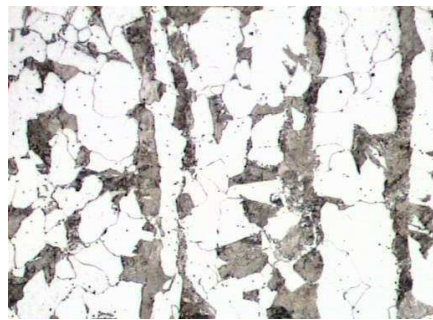
EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
23MnB4	23MnB4		23MnB4	23MnB4	23MnB4		

Micrography x100



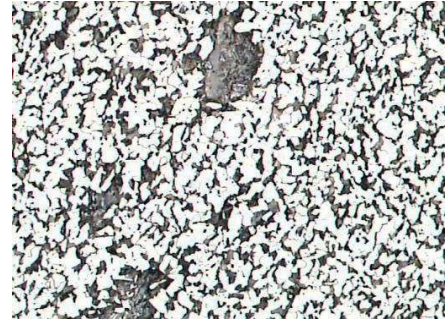
Structure: ferrite - pearlite

Micrography x500



Structure: ferrite - pearlite

Micrography x1000



Structure: ferrite - pearlite

CCT diagram

