Quality	**32CrB4**	Quenching and Tempering Steel	*Technical card*
According to standard	**EN 10263-4: 2001**		***Lucefin Group***
Number	**1.7076**		*rev. 2018*

Chemical composition

C%	**Si%** max	**Mn%**	**P%** max	**S%** max	**Cr%**	**Cu%** max	**B%**	
0,30-0,34	0,30	0,60-0,90	0,025	0,025	0,90-1,20	0,25	0,0008-0,005	Product deviations are allowed
± 0.02	± 0.03	± 0.04	+ 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	850-880 air	860 oil, polymer, water	520-650 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**	
680-720 air (HB max 230)	840-880 furnace cooling to 690 then air (HB max 162)	700-720 air	860 water	250		540 furnace cooling	
				Ac_1	**Ac_3**	**Ms**	**Mf**
				745	810	380	180

Mechanical properties

State of supply accoeding EN 10263-4: 2001

size mm		Spheroidizing +AC or +AC+PE peeled		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	**Rm** max	**Z** min	**Rm** max	**Z** min	**Rm** max	**Z** min	**Rm** max	**Z** min
		N/mm²	%	N/mm²	%	N/mm²	%	N/mm²	%
2	5	-	-	550	64	590	62	-	-
5	40	550	62	530	64	570	62	670	57

Table of tempering values obtained at room temperature after quenching at 870 °C in water

HB	512	490	468	455	432	409	381	362	327	301	279	237
HRC	52	51	49	48	46	44	41	39	35	32	29	22
R N/mm²	1880	1820	1700	1640	1520	1430	1300	1220	1080	1010	930	790
Temp. at **°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

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**	**45**
min	49	48	47	46	46	45	-	-	-	-	-	-	-	-
max	56	56	55	55	55	54	53	53	51	49	45	42	40	38

LUCEFIN experience

Values obtained on rounds of Ø 33 mm after Quenching at 870 °C in water and Tempering at 560 °C

Longitudinal testing at room temperature

R	**Rp** 0.2	**A**	**Z**	**HB**
N/mm²	N/mm²	%	%	
1079	1016	16,4	66,7	321

impact strength **Kv**

°C	**+20**	**0**	**-20**	**-40**	**-60**	**-80**	**-101**
J media	135	124	101	66	46	35	25

Longitudinal testing at **+200 °C**

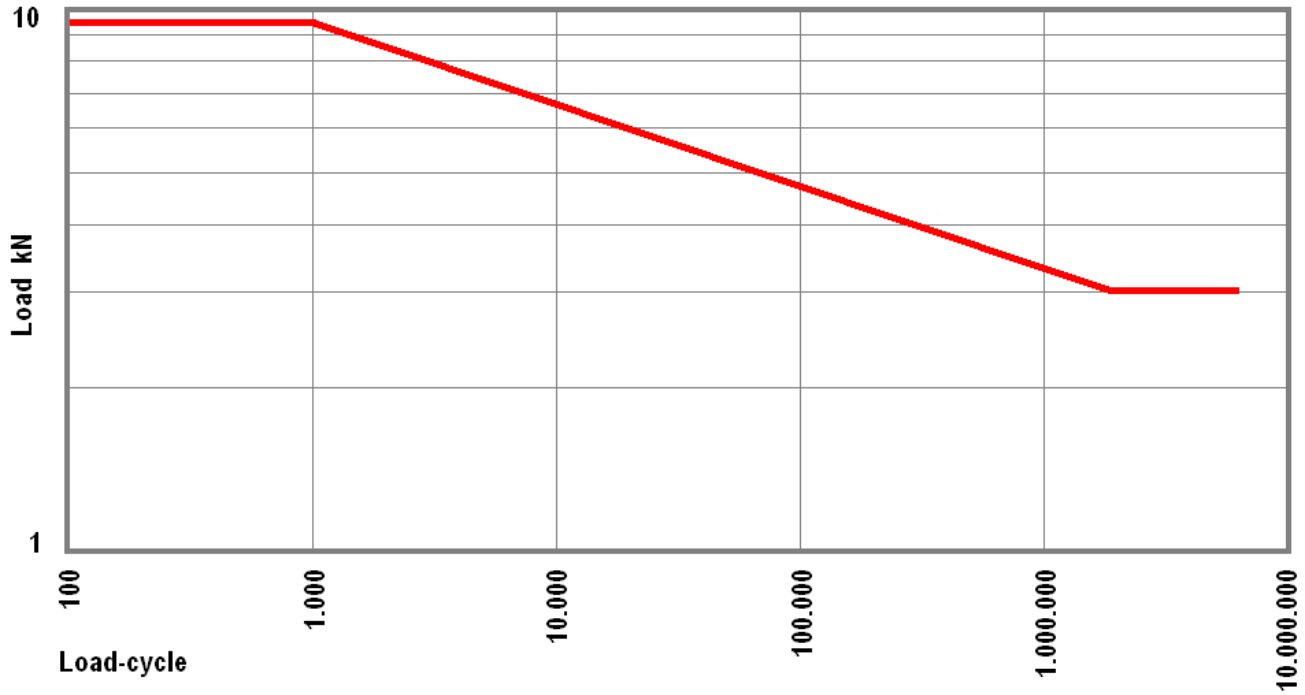
R	**Rp** 0.2	**A**	**Z**
N/mm²	N/mm²	%	%
1016	846	14	57,3

Longitudinal testing at **+300 °C**

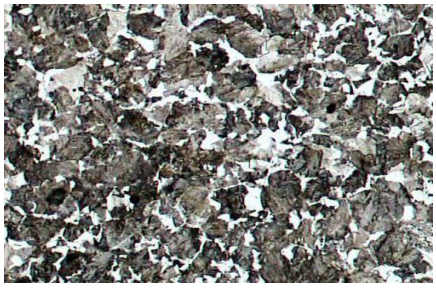
R	**Rp** 0.2	**A**	**Z**
N/mm²	N/mm²	%	%
1030	821	16,8	58,7

EUROPE EN	**ITALY** UNI	**CHINA** GB	**GERMANY** DIN	**FRANCE** AFNOR	**U.K.** B.S.	**RUSSIA** GOST	**USA** AISI/SAE
32CrB4							

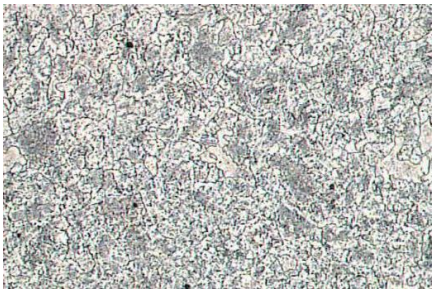
32CrB4 fatigue behaviour, cyclical stresses at room temperature



Micrography x200



+U sorbite-ferrite-pearlite



+AC spheroidized structure

+QT tempered martensite