

Quality	102Cr6	Bearing Steel	<i>Technical card</i>
According to standards	UNI EN ISO 4957: 2002		Lucefin Group
Number	1.2067		rev. 2018

Chemical composition

C%	Si%	Mn%	P%	S%	Cr%	Product deviations are allowed
0,95-1,10	0,15-0,35	0,25-0,45	max 0,030	max 0,030	1,35-1,65	
± 0.03	± 0.03	± 0.04	+ 0.005	+ 0.005	± 0.05	

Temperature °C

Hot-forming	Quenching ¹⁾ +Q	Quenching ²⁾ +Q	Tempering ^{1) 2)} +T	Stress relief annealing +SR	*) annealing must be carried out after machining and before final heat treatment
1050-900	Heating up to 650, pause, then 820 water	850 oil/ polymer salt bath 500-550 salt bath 180-200	180-220 air	600-650 ^{x)} furnace cooling	
Soft annealing +A	Spheroidized annealing +AC	Recrystallization annealing +RA	Pre-heating welding	Stress-relieving after welding	
740-770 air	770-780 cooling 15-20 °C/h to 730, pause, 10 °C/h to 600, then cooling 40 °C/h to 300, then air	750 furnace cooling to 300, then air (HB max 220)		not recommended	
HB max 223 ^{a)}	(HB max 207)				
				Ac1 750	Ac3 785
				Ms 210	Mf -10 subcooling

^{a)} in the cold-drawn condition (+A+C), hardness can be 20 HB higher than in the annealed condition (+A)

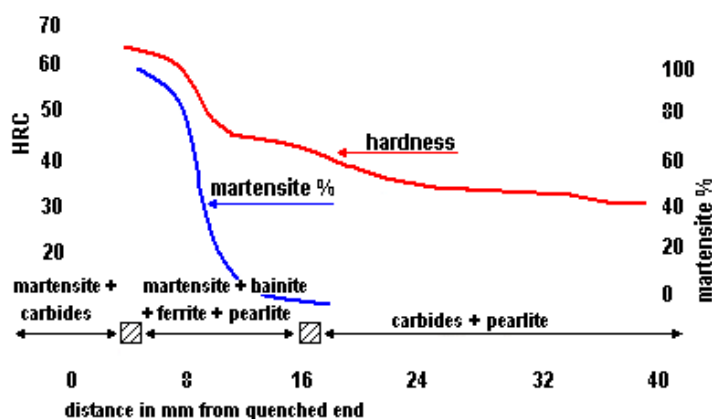
Mechanical properties

Table of tempering values obtained at room temperature on round of Ø 10 mm after quenching at 840 °C in oil

HB	739	722	706	688	654	595	543	496	442	409	371	336	301	243
HRC	65	64	63	62	60	57	54	51	47	44	40	36	32	23
R N/mm ²	-	-	2400	2500	2470	2300	2100	1900	1650	1410	1250	1110	1010	810
R _p 0.2 N/mm ²	-	-	1800	2080	2190	2090	1900	1700	1500	1300	1100	950	800	690
A %	-	-	-	-	-	-	-	-	5.0	7.0	9.0	12.0	16.0	18.0
Z %	-	-	-	-	-	-	-	-	22	30	34	44	50	54
K Mesnager J			5	7	8	9	11	14	18	24	30	44	57	70
Tempering at °C	50	100	150	200	250	300	350	400	450	500	550	600	650	700

HRC from surface to core for diameter Ø quenched at 850 °C in oil
Hardness variations show the mass effect

mm	0	5	10	15	20
Ø 10	65	64	-	-	-
Ø 30	64	62	59	58	-
Ø 40	62	57	52.5	50.5	50



Hardness/structure curves

Thermal Expansion	10 ⁻⁶ • K ⁻¹	▶	12.5	13.2	13.6	14.0	14.3
Modulus of Elasticity long.	GPa		212				
Modulus of Elasticity tang.	GPa		81				
Specific Heat Capacity	J/(Kg•K)		460				
Thermal Conductivity	W/(m•K)		33.0		32.0		31.4
Density	Kg/dm ³		7.85				
Specific Electric Resist.	Ohm•mm ² /m		0.30				
Electrical Conductivity	Siemens•m/mm ²		3.33				
°C			20	100	200	300	400 500 700

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

102Cr6

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Heat treatment	Temperature (+ ... °C) - min. values			Data under fatigue
	20	200	300	
+QT	1339	-	-	Cyclic yield strength, σ_y' N/mm ² low cycle number
+QT	0.15	-	-	Cyclic strength exponent, n' low cycle number
+QT	3328	-	-	Cyclic strength coefficient, K' N/mm ² low cycle number
+QT	2620	-	-	Fatigue strength coefficient, σ_f' N/mm ² low cycle number
+QT	-0.09	-	-	Fatigue strength exponent, b low cycle number
+QT	0.15	-	-	Fatigue ductility coefficient, g_f' low cycle number
+QT	-0.56	-	-	Fatigue ductility exponent, c low cycle number

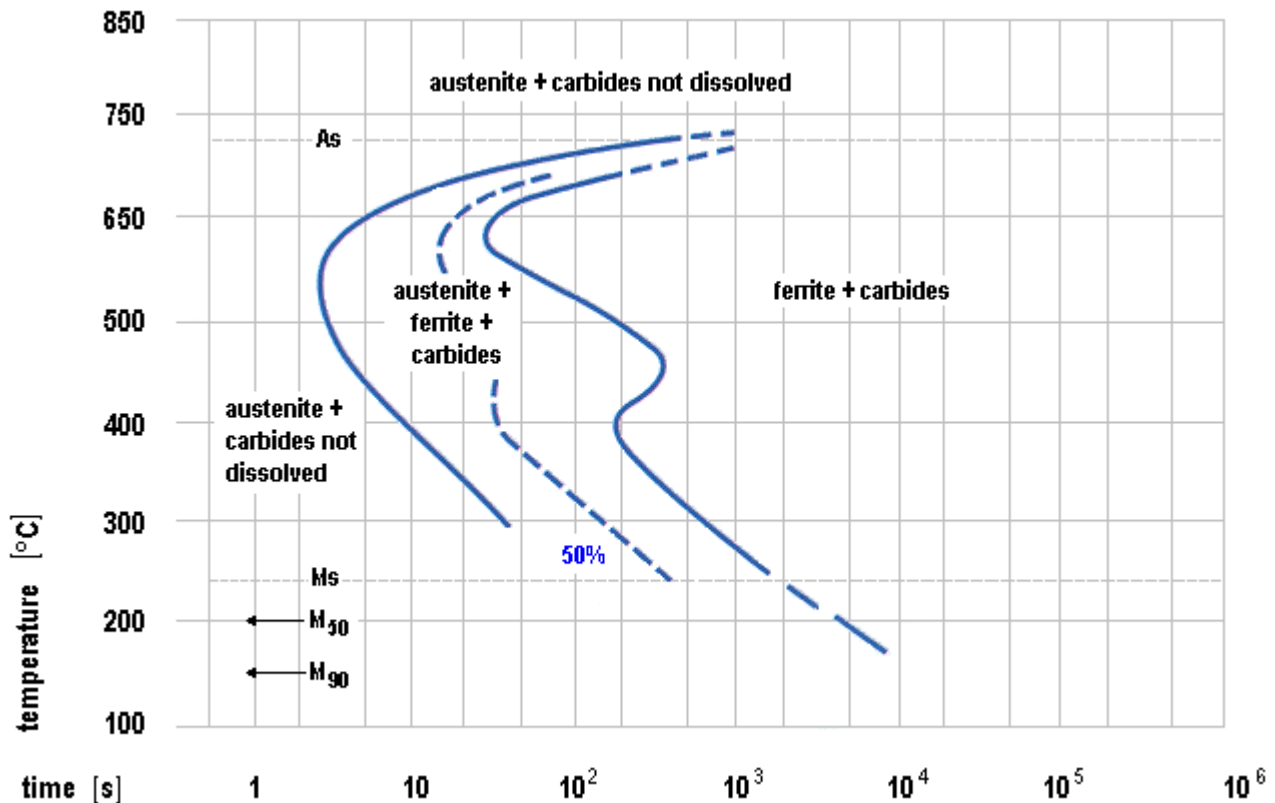
+QT quenched an tempered, quenching at 830-870 °C in oil and tempering at 150-180 °C

Room-temperature hardness after exposure (ASM Vol. 1)

Exposure time h.	HRC hardness before exposure	HRC after exposure at °C ...			
		205	260	315	370
1000	61	58	56	53	47

Time – temperature – transformation diagram for isothermal cooling

Extract from Gerdau catalogue



EUROPE	ITALY	CHINA	GERMANY	FRANCE	U.K.	RUSSIA	USA
EN	UNI	GB	DIN	AFNOR	B.S.	GOST	AISI/SAE
102Cr6	100Cr6	Cr2	100Cr6	100Cr6		9Ch	52100