

Quality	102Cr6
According to standards	UNI EN ISO 4957: 2002
Number	1.2067

Chemical composition						
C%	Si%	Mn%	P%	S%	Cr%	Deviations allowed for analysis product
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	

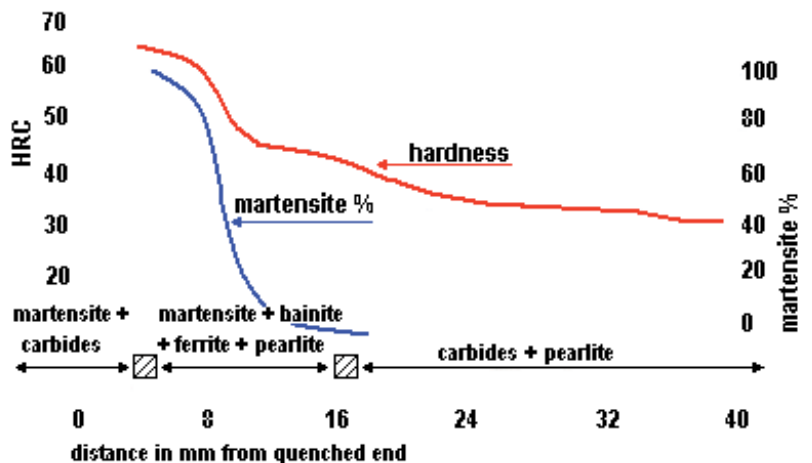
Temperature °C					
Hot-forming	Quenching ¹⁾	Quenching ²⁾	Tempering ^{1) 2)}	Stress relief annealing ^{x)}	
1050-900	Heating up to 650, pause, then 820 water	850 oil/ polymer salt bath 500-550 salt bath 180-200	180-220 air	600-650 furnace cooling	
				x) annealing must be carried out after machining and before final heat treatment	
Soft annealing	Spheroidizing +AC	Recrystallization annealing	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		not recommended	
HB max 223 ^{a)}	(HB max 207)	(HB max 220)		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 and physical 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 _{p0.2}	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
C	%								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

102Cr6

Heat treatment	Temperature (+ ... °C) - min. values									Data under fatigue
	20	200	300	350	400	450	500	600		
+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 and tempered, quenching at 830-870 °C in oil and tempering at 150-180 °C

Time – temperature – transformation diagram for isothermal cooling
Extract from Gerdau catalogue

