Quality	**100Cr6**	*Technical card*
According to standards	**EN ISO 683-17: 1999**	*Lucefin Group*
Number	**1.3505**	

Chemical composition

C%	**Si%**	**Mn%**	**P%** max	**S%** max	**Cr%**	**Mo%** max	**Al%** max	**Cu%** max
0,93-1,05	0,15-0,35	0,25-0,45	0,025	0,015	1,35-1,60	0,10	0,050	0,30
± 0.03	± 0.03	± 0.04	+ 0.005	+ 0.005	± 0.05	± 0.03	+ 0.010	+0.03

Product deviations are allowed

Temperature °C

Hot-forming	**Quenching** 1)	**Quenching** 2)	**Tempering** 1) 2)	**Stress relief annealing** 3)
1050-900	heating up to 650, pause, then 800-830 water	830-870 oil/ polymer salt bath 500-550 salt bath 180-200	150-300 air	600-650 furnace cooling

3) stress relief annealing is suggested to be carried out after machining and before final heat treatment

Isorhermal annealing +I	**Spheroidized annealing** +AC	**Recrystallization annealing**	**Pre-heating welding**	**Stress-relieving after welding**
800 rapid cooling to 720, pause, then air (HB max 210)	720-750 cooling 10 °C/h to 650, pause, then 40 °/h to 300, then air (HB max 220)	750-760 furnace cooling to 300, then air	not recommended	

AC1	**ACm**	**Ms**	**Mf**
755	850	300	85

Hardness in the globular annealed and cold-worked state (hot rolled +AC+C) can be HB 240

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

HV 30	832	800	772	746	674	633	577	528	471	434
HRC	65	64	63	62	59	57	54	51	47	44
R N/mm²			2400	2500	2420	2300	2100	1900	1650	1410
Tempering **°C**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	

Hardening depth from surface to core (**0**) on round tempered at 850 °C in oil. Hardness values expressed in *HRC*

mm	20	15	10	5	**0**	5	10	15	20
Ø 20			*65*	*64*	*64*	*64*	*65*		
Ø 30		*64*	*62*	*59*	*58*	*59*	*62*	*64*	
Ø 40	*62*	*57*	*52*	*50.5*	*50*	*50.5*	*52*	*57*	*62*

Evolution of the austenitic **grain size** as a function of the material heating temperature

Grain size	8 - 9	7- 8	7	6	4 - 5	4
Temperature °C	830	850	900	950	1000	1050

Thermal expansion	$10^{-6} \bullet K^{-1}$	►	11.4					14.7
Modulus of elasticity	longitudinal GPa	210						
Modulus of elasticity	tangential GPa	80						
Bulk Modulus	GPa	140						
Poisson number	*v*	0.30						
Test at **°C**		**20**	**100**	**200**	**300**	**400**	**500**	**700**

The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 700 °C .....

Data under fatigue with low cycle number. Values for quenched and tempered material

Cyclic yield strength, σ_y' MPa	Cyclic strength exponent, **n'**	Cyclic strength coefficient, **K'**, MPa	Fatigue strength coefficient, σ_f', MPa	Fatigue strength exponent, **b**
1324	0,15	3403	2642	- 0,09

Specific heat J/(Kg•K)	**Density** Kg/dm³	**Thermal conductivity** W/(m•K)	**Electrical resistivity** Ohm•mm²/m	**Electrical conductivity** Siemens•m/mm²
475	7.81	46.6	0.22	4.55

EUROPE EN	**ITALY** UNI	**CHINA** GB	**GERMANY** DIN	**FRANCE** AFNOR	**U.K.** B.S.	**RUSSIA** GOST	**USA** AISI/SAE
100Cr6	100Cr6	GCr15	1.3505	100C6		9Ch1	52100