Quality	**60SiCr8**	**Spring Steel**	*Technical card*
According to standards	**UNI 3545: 1980**		***Lucefin Group***
Number	1.7108 ~		*rev. 2018*

Chemical composition

C%	**Si%**	**Mn%**	**P%** max	**S%** max	**Cr%**	
0,57-0,64	1,70-2,20	0,70-1,00	0,035	0,035	0,25-0,40	Product deviations are allowed
± 0.03	± 0.05	± 0.04	+ 0.005	+ 0.005	± 0.04	

Other elements not mentioned above should not be added to the steel, except for those necessary to casting

Temperature °C

Hot-forming	**Normalizing +N**	**Quenching +Q** on spring		**Tempering +T**	**Hot moulding** of springs
1050-850	870 air	830-860 oil or polymer		430-480 air	920-830
Soft annealing +A	**Isothermal annealing**	**Natural state +U**	**End quench hardenability test**	**Pre-heating welding**	**Stress-relieving after welding**
680 air (HB max 255)	820 furnace cooling to 720, then air (HB max 250)	- (HB max 321)	850 water	not allowed	

Ac1	**Ac3**	**Ms**	**Mf**
770	800	270	50

Mechanical properties

Hot-rolled properties obtained on test blanks of Ø 10 mm after quenching at 850 °C in oil, tempering at 480 °C in air UNI 3545: 1980. Use only as reference

Values for **springs** according to Stahlschlüssel 2007 standard

size mm	Testing at room temperature (longitudinal)								
	R	**Rp** 0.2	**A**%	***HB***	***HRC***	**R**	**Rp** 0.2	**A**%	**DVM**
	N/mm²	N/mm² min.	min.		*for inf.*	N/mm²	N/mm² min	min	J min
10	1450-1700	1250	5	*415-467*	*44.5 - 49*	1350-1600	1150	6	21

Table of tempering values obtained at room temperature on round of Ø 10 mm after quenching at 850 °C in oil

HB		468	461	442	409	353
HRC		49	48.5	47	44	38
R	N/mm²	1700	1660	1570	1420	1160
Rp 0.2	N/mm²	1390	1340	1240	1180	1000
A	%	4.5	5.0	6.0	7.0	9.0
Kv	J	10	10	10	12	12
Temper. at **°C**		**400**	**450**	**500**	**550**	**600**

UNI 3545: 1980 **Jominy test HRC** grain size 5 min.

mm distance from quenched end

	1.5	**3**	**5**	**7**	**9**	**11**	**13**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**
min	58	58	57	51	45	40	38	37	33	30	29	28	27	26	25
max	66	66	65	64	63	61	59	57	50	45	43	41	40	39	39

Maxi thickness and diameter recommended for the spring to obtain, after quenching, internal hardness of **52 HRC**	Flat products thickness mm	Round products Ø mm
	16	24

Thermal Expansion	$10^{-6} \cdot K^{-1}$	►	11.5	12.2	13.9	14.7	
Mod. of Elasticity long.	GPa	206					
Mod. of Elasticity tang.	GPa	79					
Specific Heat Capacity	J/(Kg•K)						
Thermal Conductivity	W/(m•K)	16					
Density	Kg/dm³	7.85					
Specific Electric Resistivity	Ohm•mm²/m	0.70					
Electrical Conductivity	Siemens•m/mm²	1.43					
°C		**20**	**100**	**250**	**500**	**1000**	

The symbol ► indicates temperature between 20 °C and 100 °C, 20 °C and 250 °C …

EUROPE EN	**ITALY** UNI	**CHINA** GB	**GERMANY** DIN	**FRANCE** AFNOR	**U.K.** B.S.	**RUSSIA** GOST	**USA** AISI/SAE
60SiCr8	60SiCr8	60Si2CrA	60SiCr7	61SC7		60S2HA	9261 - 9262