

<b>Quality</b>	<b>36Si7</b>	<b>Spring Steel</b>	<i>Technical card Lucefin Group rev. 2018</i>
According to standards	<b>EN 10089: 2002</b>		
Number	<b>1.5023</b>		

### Composizione chimica

C%	Si%	Mn%	P%	S%	Product deviations are allowed.
			max	max	
0,35-0,42	1,50-1,80	0,50-0,80	0,025	0,025	Product deviations are allowed.
± 0.02	± 0.05	± 0.04	+ 0.005	+ 0.005	

Other elements non mentioned above should not be added to the steel, except for those necessary to casting  
Cu + 10Sn ≤ 0,60

### Temperature °C

Hot-forming	Normalizing +N	Quenching +Q on spring	Tempering +T	Hot moulding of springs			
1050-850	850-880 air	880 oil or polymer	400-480 air	820-900			
Soft annealing +A	Spheroidized annealing +AC	Stato naturale +U	End quench hardenability test	Pre-heating welding	Stress-relieving after welding		
640-680 air (HB max 217)	- (HB max 200)	-	850 water	not allowed			
				<b>Ac1</b>	<b>Ac3</b>	<b>Ms</b>	<b>Mf</b>
				764	841	341	125

### Mechanical properties

Hot-rolled mechanical properties after quenching at 880 °C in water and tempering at 450 °C in air EN 10089: 2002

size mm	Testing at room temperature (longitudinal)					
	R	Rp 0.2	A%	Z%	KU	HRC
flats max 5	N/mm <sup>2</sup>	N/mm <sup>2</sup> min.	min.	min	J min	for information
round max 7	1300-1600	1150	8	35	18	41-47

Table of tempering values obtained at room temperature on round of Ø 10 mm after quenching at 860 °C in oil

	HB	HRC	R	Rp 0.2	A	Tempering at °C	100	150	200	250	300	350	400	450	500	550	600	650	700
HB	-	-	-	-	-	-	-	-	-	-	-	-	409	400	390	371	336	-	-
HRC	-	-	-	-	-	-	-	-	-	-	-	-	44	43	42	40	36	-	-
R	N/mm <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	1430	1400	1380	1250	1100	-	-
Rp 0.2	N/mm <sup>2</sup>	-	-	-	-	-	-	-	-	-	-	-	1110	1100	1090	1010	900	-	-
A	%	-	-	-	-	-	-	-	-	-	-	-	8	8	8,5	9	11	-	-

38Si7 1.5023 EN 10089: 2002 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	H
min	54	48	38	31	27	24	21	19	-	-	-	-	-	-	-	-
max	61	58	51	44	40	37	34	32	29	27	26	25	25	25	24	-

Max thickness and diameter recommended for the spring to obtain, after quenching, internal hardness of 48 HRC

Flat products  
thickness mm

Round products  
Ø mm

5

7

<b>Thermal Expansion</b>	10 <sup>-6</sup> . K <sup>-1</sup>	►	
<b>Mod. of Elasticity long.</b>	GPa	210	
<b>Mod. of Elasticity tang.</b>	GPa	80	
<b>Specific Heat Capacity</b>	J/(Kg.K)	480	
<b>Thermal Conductivity</b>	W/(m.K)	40	
<b>Density</b>	Kg/dm <sup>3</sup>	7.80	
<b>Specific Electric Resistivity</b>	Ohm.mm <sup>2</sup> /m	0.25	
<b>Electrical Conductivity</b>	Siemens.m/mm <sup>2</sup>		
<b>°C</b>		20	100

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

EUROPE	ITALY	SPAIN	GERMANY	FRANCE	UK	SWEDEN	USA
EN	UNI	UNE	DIN	AFNOR	B.S.	SS	AISI/SAE
38Si7	38Si7	38Si7		40Si7	38Si7	38Si7	