

## Raajratna Austenitic Stainless Steel Spring Wire (302/1.4310)

### DESCRIPTION

Raajratna manufactures high quality stainless steel spring wire from 0.10 – 16.00 mm in bright as well as in stearate coated surface finish.

Stainless steel spring wires can be supplied in ½ hard, ¾ hard & full hard conditions as well. We are using drawing lubricants from CONDAT and also of Japanese origin.

### APPLICATIONS

Stainless steel spring wires are used for producing various types of springs like Aerosol spring, Compression spring, Extension spring, and Torsion spring as well as for wire form, Straight Pin etc.

### STANDARDS

The stainless steel wires are manufactured as per **ASTM A 313, EN 10270-3, JIS G4314, BS 2056 & DIN 17224** and other equivalent international standards.

### SURFACE FINISH

Size (mm)	Finish
0.10 – 0.80	Bright
0.20 – 16.00	Coated
0.15 – 2.00	Ni Coated

### CHEMICAL ANALYSIS

Element	EN 10270-3 (Requirement)	Typical values
%C	0.05 – 0.15	0.090
%Mn	2.00 Max	1.150
%Si	2.00 Max	0.400
%P	0.045 Max	0.025
%S	0.015 Max	0.002
%Cr	16.00 - 19.00	17.500
%Ni	6.00 – 9.50	8.100
%Mo	0.80 Max	0.100
%N	0.11 Max	0.050

### PHYSICAL PROPERTIES

Density (20°C)	7.9 g/cm <sup>3</sup>
Thermal conductivity (20°C)	14.6 W/m.K.
Specific heat (20°C)	500 J/Kg.K
Electrical resistivity (20°C)	0.73 Ωmm <sup>2</sup> /m
Permeability (μ <sub>max</sub> )	10 Approx.
<b>Shear modulus</b>	
As drawn: 71 GPa approx	Tempered: 73 GPa approx
<b>Modulus of elasticity</b>	
As drawn: 185 GPa approx	Tempered: 193 GPa approx
<b>Thermal expansion coefficient</b>	
20° – 200°C	16.5
20° – 400°C	17.5
20° – 600°C	18.5

- Data shown are typical, and should not be construed as max & min values for specification. Data on any particular piece of material may vary from those shown herein.

## MECHANICAL PROPERTIES

Mechanical properties of supplied wire (As drawn condition) as per **EN 10270-3: 2001** are mentioned below.

Tensile strength as per EN 10270-3			
Sizes (mm)		Tensile strength (MPa)	
From	To	Nominal TS (min.)	High TS (min.)
	0.20	2200	2350
0.20	0.30	2150	2300
0.30	0.40	2100	2250
0.40	0.50	2050	2200
0.50	0.65	2000	2150
0.65	0.80	1950	2100
0.80	1.00	1900	2050
1.00	1.25	1850	2000
1.25	1.50	1800	1950
1.50	1.75	1750	1900
1.75	2.00	1700	1850
2.00	2.50	1650	1750
2.50	3.00	1600	1700
3.00	3.50	1550	1650
3.50	4.25	1500	1600
4.25	5.00	1450	1550
5.00	6.00	1400	1500
6.00	7.00	1350	1450
7.00	8.50	1300	1400
8.50	10.00	1250	1350

- Maximum tensile strength = min value + 15% of min value.
- After straightening, TS may be reduced by up to 10%.
- 1 MPa = 1 N/mm<sup>2</sup>.
- When better formability required or in case of thicker sizes, Tensile strength values may be agreed upon.

## HEAT TREATMENT

Tensile strength values of drawn wire may be increased by about 150 – 250 MPa by tempering at 350°C / 3 – 20 Minutes. Tempering effect will be more if greater holding time is used. In case of very short holding periods temperature may be raised up to 420°C.

This tempering treatment also affects the Yield strength/Tensile strength ratio. In as drawn condition this ratio is about 0.80 & after tempering treatment, the same would be around 0.85.