

# GARBA 188

## Stainless spring wire

GARBA 188 is a general-purpose austenitic stainless steel, which is used for springs and other components requiring good fatigue resistance. The formability is excellent and the corrosion resistance is good against atmospheric corrosion.

## Chemical composition

Element	Weight %
C	0.05% - 0.15%
Si	2.00%
Mn	2.00%
P max.	0.045%
S max.	0.015%
Cr	16.00% - 19.00%
Ni	6.00% - 9.50%

## Mechanical properties

### For round wire

Diameter (mm)	Tolerance (mm)	Tensile strength (N/mm <sup>2</sup> )
0.30 - 0.65	±0.008	
0.66 - 1.01	±0.010	
1.02 - 2.26	±0.015	
2.27 - 4.01	±0.020	
4.02 - 6.26	±0.025	
6.27 - 8.00	±0.030	
0.30 - 0.30		2150 - 2470
0.31 - 0.40		2100 - 2420
0.41 - 0.50		2050 - 2360
0.51 - 0.65		2000 - 2300
0.66 - 0.80		1950 - 2240
0.81 - 1.00		1900 - 2190
1.01 - 1.25		1850 - 2130
1.26 - 1.50		1800 - 2070
1.51 - 1.75		1750 - 2010

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*Data last verified: 2023-04-13*

Diameter (mm)	Tolerance (mm)	Tensile strength (N/mm <sup>2</sup> )
1.76 - 2.00		1700 - 1960
2.01 - 2.50		1650 - 1900
2.51 - 3.00		1600 - 1840
3.01 - 3.50		1550 - 1780
3.51 - 4.25		1500 - 1730
4.26 - 5.00		1450 - 1670
5.01 - 6.00		1400 - 1610
6.01 - 7.00		1350 - 1550
7.01		1300 - 1500

## Surface conditions

### Surface condition

#### Surface performance

AC-surface 0.30–8.00 mm Ø. The AC-coating can be removed before heat treatment by using a 10–20% nitric acid pickle at room temperature.

## Physical properties

### Heat conductivity

Temperature °C	20	100	200	400
W/(m*°C)	15.0	15.5	17.5	20.0

### Resistivity

Temperature °C	20	100	200	300
nΩm	700	750	800	950

### Linear expansion

Pro °C	30-100	30-200	30-400
x10 <sup>-6</sup>	17.0	17.5	18.5

### Specific heat capacity

Temperature °C	20	100	200	400
J/(kg °C)	440	480	520	560

## Technical specification

Property	Value	
E modulus of elasticity	Abt. 180 kN/mm <sup>2</sup> in drawn condition.	Abt. 185 kN/mm <sup>2</sup> after heat treatment.
G modulus of shear	Abt. 70 kN/mm <sup>2</sup> in drawn condition.	Abt. 73 kN/mm <sup>2</sup> after heat treatment.
Density	7.90 kg/dm <sup>3</sup>	

## Steel grades and product standards

Nearest equivalent product standards	EN ISO 6931-1	ASTM A313	AMS 5688	BS 2056 302 S26	JIS G4314
Nearest equivalent steel grades	EN/DIN 1.4310	AISI/SAE 302	JIS SUS 302		

## Recommendations

### Heat treatment

As soon as possible after coiling, the springs should be stress relieved. Recommended temperature for compression springs or tension springs without initial tension is approx. 350°C for 0.5 - 3 hours.