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/mm²)
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

Diameter (mm)	Tolerance (mm)	Tensile strength (N/mm²)
1.51 - 1.75		1750 - 2010
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
$x10^{-6}$	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/mm2 in drawn condition.	Abt. 185 kN/mm2 after heat treatment.
G modulus of shear	Abt. 70 kN/mm2 in drawn condition.	Abt. 73 kN/mm2 after heat treatment.
Density	7.90 kg/dm3	

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. 350ºC for 0.5 - 3 hours.