

# GARBA 178Mo

**Stainless spring wire. Similar to EN 1.4310 with increased tensile strength.**

GARBA 178Mo is a general-purpose austenitic stainless steel that is used for springs and other components requiring good fatigue resistance and good resistance against atmospheric corrosion. Addition of molybdenum increases the tensile strength as compared to GARBA 188 and also increases the resistance against localised and general 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%
Mo	0.80%

## 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 - 0.40		2250 - 2590
0.41 - 0.50		2200 - 2530
0.51 - 0.65		2150 - 2470
0.66 - 0.80		2100 - 2420
0.81 - 1.00		2050 - 2360
1.01 - 1.25		2000 - 2300
1.26 - 1.50		1950 - 2240
1.51 - 1.75		1900 - 2190
1.76 - 2.00		1850 - 2130

Diameter (mm)	Tolerance (mm)	Tensile strength (N/mm <sup>2</sup> )
2.01 - 2.50		1750 - 2010
2.51 - 3.00		1700 - 1960
3.01 - 3.50		1650 - 1900
3.51 - 4.25		1600 - 1840
4.26 - 5.00		1550 - 1780
5.01 - 6.00		1500 - 1730
6.01 - 7.00		1450 - 1670
7.01		1400 - 1610

## 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
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W/(m*°C)	15.0	16.0	18.0	20.0
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### 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.

## Steel grades and product standards

Nearest equivalent product standards	EN ISO 6931-1	ASTM A313	BS 2056 302 S26
Nearest equivalent steel grades	EN/DIN 1.4310	AISI/SAE 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. 420 °C for 0.5 - 4 hours.