Data sheet : Stainless Spring Steel Wire (1.4310)

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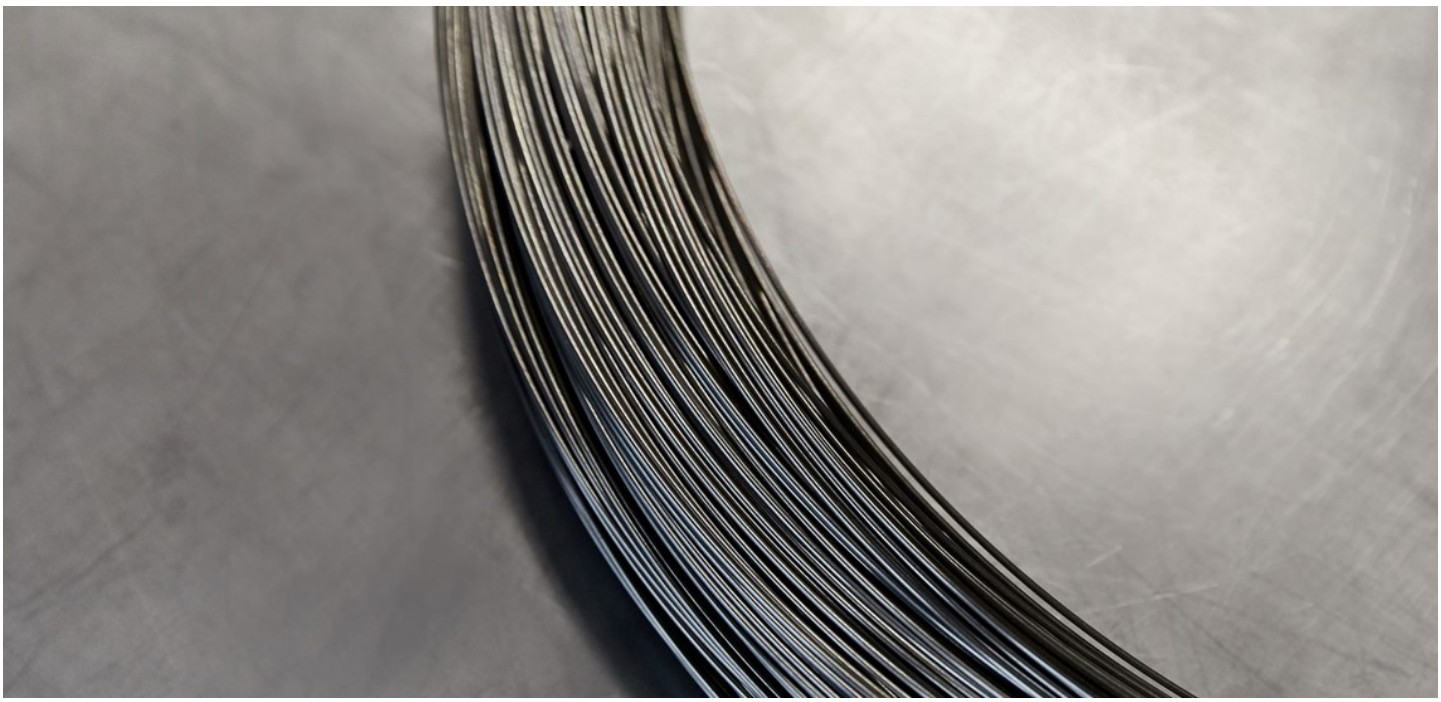

You can order the stainless spring steel wire as coils, spools or straightened bars. The standard lengths of the straightened rods are one, two or three meters.
The straightened bars can be cut in length according to your wishes.
Beside steel grade 1.4310 we are able to deliver 1.4401 (AISI 316) and 1.4404 (AISI 316L)!

Material	Material Number	DIN Material Code	US Material Code (AISI/SAE)
X10CrNi18-8	1.4310	X 12 CrNi 17-7	~ 302

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Material Standard	DIN EN 10270-3
Dimension standard	DIN EN 10270-3 DIN EN 10218-2 DIN EN 10278
Products	Wire (coils) Straightened rods Wire (spools)
Dimensions	coils/spools: 0,30 mm to 15,00 mm diameter bars: 0,30 mm to 15,00 mm diameter
Tensile strength (Rm)	1250 to 2200 N/mm², depending on the diameter of the wire
Surface	matt shining finish or polished, partial ground and polished
Information	The maximum possible temperature of usage is up to 250°C (dependent upon load).
Heat Treatment	• after the forming process of the spring the tensile strength can be increased by heat treatment (a plus of approx. 150 N/mm²) • the heat treatment also smoothes out the tensions of the forming process • the EN-Standard recommendation reaches from annealing at 250°C for 4 hours to 425°C for 30 minutes; cooling down by air

CHEMICAL ANALYSIS (IN %) ACCORDING TO DIN EN 10270-3, TABLE 1

Material Code	C	Si	Mn	P	S	Cr	Ni	N
1.4310	0,05 - 0,15	≤ 2,00	≤ 2,00	≤ 0,045	≤ 0,015	16,00 - 19,00	6,00 - 19,00	≤ 0,11

ADDITIONAL INFORMTION

MECHANICAL PROPERTIES

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E-MODULUS IN GPA (GIGAPASCAL) AT ROOM TEMPERATURE (GUIDE VALUE) ACCORDING EN 10270-3 TABLE A.1 (EXCERPT FOR MATERIAL 1.4310)

Intermediate values can be averaged. With rising temperatures the levels of E modulus and shear modulus decline. The specifications for the shear modulus apply to measurement with a torsion pendulum at wires with max. 2,8 mm diameter. The E-modulus is calculated from the shear modulus with the poissons constant of 0,30. 1 Pascal = 1 N/m²

Condition of the wire	Delivery condition	+ heat treatment
Rm approx. 1800 Mpa	180	195
Rm approx. 1300 Mpa	174	189

SHEAR MODULUS IN GPA (GIGAPASCAL) AT ROOM TEMPERATURE (GUIDE VALUE) ACCORDING EN 10270-3 TABLE A.1 (EXCERPT FOR MATERIAL 1.4310)

Intermediate values can be averaged. With rising temperatures the levels of E modulus and shear modulus decline. The specifications for the shear modulus apply to measurement with a torsion pendulum at wires with max. 2,8 mm diameter. The E-modulus is calculated from the shear modulus with the poissons constant of 0,30. 1 Pascal = 1 N/m²

Condition of the wire	Delivery condition	+ heat treatment
Rm approx. 1800 Mpa	70	73
Rm approx. 1300 Mpa	68	71

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TENSILE STRENGTH ACCORDING EN 10270-3, TABLE 2 (EXCERPT FOR MATERIAL 1.4310)

Notes:
After straightening the wire the tensile strength can be about 10 % lower.
highest tensile strength = minimum tensile strength + 15% of the minimum
The tensile strength can be increased by heat treatment

Diameter (mm)	NS (normal tensile strength), min.	HS (higher tensile strength), min.
d ≤ 0,20	2200	2350
0,20 < d ≤ 0,30	2150	2300
0,30 < d ≤ 0,40	2100	2250
0,40 < d ≤ 0,50	2050	2200
0,50 < d ≤ 0,65	2000	2150
0,65 < d ≤ 0,80	1950	2100
0,80 < d ≤ 1,00	1900	2050
1,00 < d ≤ 1,25	1850	2000
1,25 < d ≤ 1,50	1800	1950
1,50 < d ≤ 1,75	1750	1900
1,75 < d ≤ 2,00	1700	1850
2,00 < d ≤ 2,50	1650	1750
2,50 < d ≤ 3,00	1600	1700
3,00 < d ≤ 3,50	1550	1650
3,50 < d ≤ 4,25	1500	1600
4,25 < d ≤ 5,00	1450	1550
5,00 < d ≤ 6,00	1400	1500
6,00 < d ≤ 7,00	1350	1450
7,00 < d ≤ 8,50	1300	1400
8,50 < d ≤ 10,00	1250	1350

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TOLERANCES

DIAMETER TOLERANCE ACCORDING EN 10270-3, TABLE 5

All dimensions in mm.

Diameter (d)	Coils/spools	Straightened bars, lower tolerance	Straightened bars, upper tolerance
d < 0,21	± 0,005	-0.005	0.009
0,21 ≤ d < 0,26	± 0,005	-0.005	0.009
0,26 ≤ d < 0,41	± 0,008	-0.008	0.018
0,41 ≤ d < 0,65	± 0,008	-0.008	0.018
0,65 ≤ d < 0,81	± 0,010	-0.01	0.025
0,81 ≤ d < 1,01	± 0,010	-0.01	0.025
1,01 ≤ d < 1,61	± 0,015	-0.015	0.04
1,61 ≤ d < 2,26	± 0,015	-0.015	0.05
2,26 ≤ d < 3,20	± 0,020	-0.02	0.07
3,20 ≤ d < 4,01	± 0,020	-0.02	0.08
4,01 ≤ d < 4,51	± 0,025	-0.025	0.1
4,51 ≤ d < 6,01	± 0,025	-0.025	0.12
6,01 ≤ d < 6,26	± 0,025	-0.025	0.12
6,26 ≤ d < 7,01	± 0,030	-0.03	0.135
7,01 ≤ d < 9,01	± 0,030	-0.03	0.16
9,01 ≤ d < 10,00	± 0,035	-0.035	0.185

TOLERANCE OF LENGTH ACCORDING EN 10270-3, TABLE 6

All dimensions in mm.

Length (L)	Class 1	Class 2	Class 3
L ≤ 300	+ 1,00 mm	+ 1 %	0.02
300 < L ≤ 1000	+ 2,00 mm	+ 1 %	0.02
1000 < L	0.002	+ 1 %	0.02

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