

Abbreviation	EN Norm	ASTM / AISI	AFNOR	DIN Abbreviation	ISO	Other
X10CrNi18-8	1.4310	301 / 302	Z12CN17-07	1.4310		

## 1.4310 Wire

Chemical analysis by European Norm EN 10088-1 in mass percent

C	Si	Mn	P	S	N	Cr	Mo
0.05-0.15	≤ 2.00	≤ 2.00	0.045	≤ 0.015	≤ 0.11	16.0-19.0	≤ 0.80
Ni	Fe						
6.0-9.5	Remainder						

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**Diameter** 0.02 – 4.00 mm

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### Application

1.4310 is categorized as nonrusting austenitic steel. It is one of the most commonly used chrome-nickel alloys. Due to its alloy structure, 1.4310 produces deformation-martensite, which allows it to reach a high tensile strength and also causes the material to be magnetic. Since 1.4310 is quite malleable, it is used mainly in the production of springs, where a certain level of corrosive resistance is required. The level of malleability heavily depends on the ultimate tensile strength.

### Resistance to Corrosion

The corrosive resistance of 1.4310 is in the lower range, similar to that of 1.4301. Additional factors that can lower the resistance to corrosion are high ultimate tensile strengths and rough surfaces.

1.4310 should not be welded since it becomes susceptible to intergranular corrosion between 400°C and 900°C. The intergranular corrosion occurs mainly at grain boundaries where carbon bonds with the chrome. Accordingly, this type of corrosion is also referred to as "grain decay".

### Thermal Treatment

1.4310 is solution- or soft annealed at Temperatures between 1050°C and 1100°C in an inert gas. Rapid cooling must follow immediately to avoid over sensitizing the material and so prevent intergranular corrosion.

The manufactured parts can then be tempered at 250°C (or to a maximum of 400°C), with or without an inert gas. This thermal treatment causes a rise in elasticity, which in turn, reduces the material fatigue.

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### Surface Finish

Drawn	Chemically purged	0.020 – 3.499 mm
Surface Ground	Chemically purged	3.500 – 4.000 mm

## Delivery mode

As a ring  
On assorted spools  
Straightened  
Axles

## Diameter tolerances

Diameter (mm)	Tolerance (%)	Tolerance ( $\mu$ )
0.020 – 0.249		$\pm 1.0$
0.250 – 0.399		$\pm 1.5$
0.400 – 1.500		$\pm 2.0$
1.500 – 4.000		$\pm 2.5$

## Mechanical Properties

Condition at delivery (mm)	Ultimate Tensile Strength in cold-twisted delivery condition (N/mm <sup>2</sup> )
0.005 – 0.019	2000 - 2500
0.020 – 0.199	600 - 2500
0.200 – 0.499	600 - 2500
0.500 – 0.999	600 - 2500
1.000 – 1.999	600 - 2500
2.000 – 4.000	600 - 2300

## Physical Properties

Density		7.90 g/cm <sup>3</sup>
Coefficient of Thermal Expansion	20 °C – 200 °C	16.80 10 <sup>-6</sup> /K
Specific Heat Capacity	20 °C	460.00 J/kgK
Thermal Conductivity	20 °C	14.70 W/mK
Specific Electric Resistance	20 °C	0.70 $\Omega$ mm <sup>2</sup> /m
Young's Modulus	20 °C	195.00 GPa

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