STUDER BIENNAFORM
NOTZ group advanced metal solutions

1.4310

Flat wire

		Material number	AISI	ASTM	EN/DIN	UNS
Description	**X10CrNi18-8**	1.4310	301	-	X10CrNi18-8	S30100

Chemical composition

Fe	C	Si	Mn	P	S	Cr	Ni	Mo	N
Rest	0.05-0.15	≤ 2.0	≤ 2.0	≤ 0.045	≤ 0.015	16.0-19.0	6.0-9.5	≤ 0.8	≤ 0.1

Chemical analysis according to the European standard EN in mass percentages. / *Other

Dimensions

The product can be supplied as flat wire in a thickness range of 0.05-2.50 mm and a width range of 0.20-10 mm, in various edge designs.

Delivery mode

- In coils
- On different spools

Physical properties

Young's modulus, E	20 ºC	200.00 [GPA]
Thermal expansion coefficient	20 ºC – 200 ºC	16.80 [10^{-6}/K]
Density	-	7.9 [g/cm^3]
Heat conductivity	20 ºC	15.0 [W/mK]
Specific resistance	20 ºC	0.73 [Ω mm^2/m]
Specific heat capacity	20 ºC	500 [J/kgK]

Technical main features

Properties and applications

This material is an austenitic chromium-nickel steel with relatively good corrosion resistance and good mechanical properties. The ratio of yield strength to tensile strength is over 80%. Therefore, this material can absorb greater forces without being plastically deformed, which is a typical characteristic of spring steels. Thus, this material is often used in the spring industry. A corresponding proportion of deformation-martensite, which forms during cold forming, makes the material magnetic.

This grade is used for the following industries:

- Automotive industry
- Medical engineering
- Spring manufacturing
- Electrical components
- Nutrition industry
- Chemical industry

Corrosion resistance
This grade has good corrosion resistance (PREN value of 16 - 23.4). The technical term PREN stands for "Pitting Resistance Equivalent Number" and indicates the resistance value that a material has against corrosion.
However, it should be noted that the carbon content leads to formation of chromium carbides, which precipitate at the grain boundaries and cause chromium depletion, making it susceptible to intracrystalline corrosion. For higher corrosion resistance, a polished surface is recommended.

Heat treatment
This grade is also suitable for forging, for which the material is heated in the temperature range 900 - 1200°C and then cooled in air. The material can be solution annealed between 1000 - 1100 °C, followed by cooling in air or with water. When using or processing, care must be taken to avoid the emergence of sigma phases. These are brittle phases with high hardness. The temperature range between 450 - 850°C is critical for this, so a short dwell time in this zone should be intended.
Hardening is not possible in the usual sense; the carbon content is decisive for this.

Weldability
If required, this grade can also be welded with or without filler metal. The interpass temperature is 200 °C. After welding, heat treatment is not necessary.

Strain hardening
The figure below shows a hardening curve for the material 1.4310. Due to the metastable austenite structure, there is a particularly high strain hardening with this grade during cold forming. The figure below shows a flow curve of the material 1.4310 that was rolled from 1 mm round material to a flat wire with a thickness of 0.2 mm. The raw material was annealed with a strength of about 770 MPa.

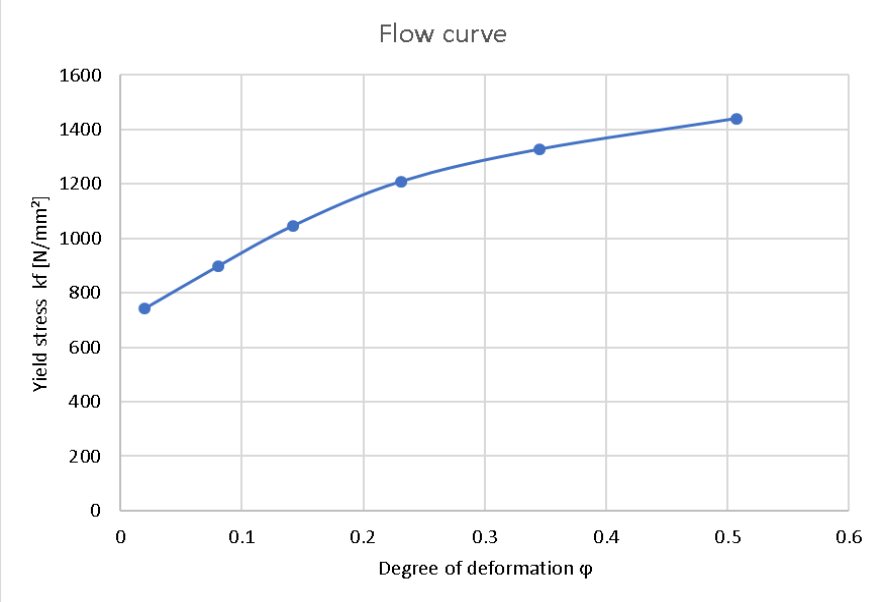

Figure: Hardening curve of the material 1.4310

Surface finish

Special surface qualities available upon request.

Processing

This grade is not appropriate for machining. The low thermal conductivity in combination with a strong strain hardening are reasons for this.

Note

All information provided in this data sheet is based on the best knowledge and the latest state of the art, but without guarantee. The use of materials should always be discussed with our sales specialists or our materials laboratory on a product- and application-specific basis.

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