Material Data sheet Issue: July 2023

Cold-rolled, stainless spring steel W.-Nr. 1.4529
Cold-rolled stainless strip steel W.-Nr. 1.4529 annealed

1. Application examples

Due to a molybdenum addition of 6.0 to 6.5% and an increased nickel content of over 24%, this material is extremely corrosion-resistant and suitable for many applications in the food industry as well as environmental and partly in medical technology. The material 1.4529 is seawater resistant, even at elevated temperatures in heat exchangers and at elevated salt concentrations such as in desalination plants. Since this material is almost non-magnetizable even in the hard-rolled state, it can be used for components that are exposed to strong magnetic fields.

Further application examples:
- Components in phosphoric acid production
- Components for the bleaching stage in the pulp industry
- Pressure vessels in the temperature range from -196 to 400° Celsius
- Tanks for storing and transporting aggressive chemical substances
- Building authority approval for components and fasteners in the indoor area of swimming pools (approved by the German Institute for Structural Engineering, September 1998)

The material 1.4529 is not listed in DIN EN 10 151 as a spring material.

2. Material codes

German Norm:	1.4529, X1CrNiMoCuN 25-20-7
AISI:	Alloy 926
ASTM:	N08926
English Norm:	
Franz. Norm:	
Japanese Norm:	Alloy 926

3. Alloy Composition *

C: max. 0,02%
Si: max. 0,50%
Mn: max. 1,00%
P: max. 0,03%
S: max. 0,01%
Cr: 19,0-21,0%
Ni: 24,0-26,0%
Mo: 6,0-7,0%
N: 0,15-0,25%
Cu: 0,50-1,50%

* the exact composition of each batch can be documented by a test certificate 2.2 or 3.1 according to DIN 10 204

4.1 Delivery condition Temper rolled

Condition:	cold rolled (austenitic with low content of martensite), not hardenable
Surface:	2H, roughness Ra maximal 0,3 µm (depending on the roughness of the working roll)
Ultimate tensile strength:	1250 - 1600 N/mm²
Yield strength Rp0,2:	> 1200 N/mm²

4.2 Delivery condition annealed

Condition:	austenitic
Surface:	2R, roughness Ra maximal 0,3 µm (depending on the roughness of the working roll)
Ultimate tensile strength:	650-900 N/mm²
Yield strength Rp0,2:	> 300 N/mm²

Further mechanical data: see chapter 7 and 8.

5. Sizes

thicknesses:	0,05-0,50 mm
raw material width:	ca. 400mm
edges:	cut
Lengths:	individual lengths from 5 to 10 000 mm or as Coil

The following maximum widths are available from stock:

thickness	***Tensile range 500-900 N/mm² annealed***	***Tensile range 1100-1500 N/mm² temper rolled***	***Annotation***
0,05		ca. 400mm	
0,075		ca. 400mm	
0,10		ca. 400mm	
0,15	ca. 400mm	ca. 400mm	
0,20	ca. 400mm	ca. 400mm	
0,30	ca. 400mm	ca. 400mm	
0,40	ca. 400mm	ca. 400mm	
0,50	ca. 400mm	ca. 400mm	

6. Tolerances

thickness tolerace:	DIN EN 9445 Table 1
width tolerance:	DIN EN 9445
straightness:	normal
flatness:	wave height max. 1,0 mm

7. Further mechanical data

Yield str. Rp0,2 :	depending on the tensile strength
Elongation A 80:	depending on the tensile strength

For the temper rolled condition only:
If good tumbling is done, the reversed bending stress (Mean stress = 0) is at approx. 35% of the tensile strength (bending direction is at a 90° angle to the rolling direction).

As the fatigue strength depends on different factors like the corrosive conditions and the edge treatment, no definitive endurance limit values can be guaranteed.

At high forces or bending not in the right angle to the rolling direction hardened steels like the alloy 1.4031Mo are strictly recommended.

The operation temperature should not exceed 120-250°C (compare to DIN 17224 – stainless strip steel for springs). Please note that Young's modulus values drop as temperature increases.

8. Physical properties

Density:	8,10 g/cm³
Heat capacity:	450 J/(kg °C) bei 20°C
Thermal conductivity:	12-18 W/(m °C) depending on the temperature
Heat capacity:	15,8 x 10 -6 (between 20 - 100 °C) 16,1 x 10 -6 (between 20 - 200 °C) 16,5 x 10 -6 (between 20 - 300 °C)
Electric resistance:	1,00 Ohm x mm²/m
Modus of elasticity:	195 000 MPa bei 20 °C
Relative permeability:	in the annealed condition generally less than 1,02 (at 200H) in the temper rolled condition also nearly not magnetizable

9. Blanking
This alloy can be blanked easily. In the annealed condition this alloy can be used for deep drawing parts due to a content of more than 24% Nickel.

10. Laser cutting
This alloy can be laser cut without problems.

11. Photo etching
This alloy is very easy to etch.

12.1 Bending (temper rolled condition)
As the high hardness of 1.4529 is obtained by temper rolling, the rolling direction has a big influence on the bending.
Bending at right angle (90°) to the rolling direction:

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	F1250-1600 N/mm²
Up to 0,25 mm	1,0 x t
0,25-0,50 mm	1,0 x t
0,50-0,75 mm	2,0 x t
0,75-1,00 mm	2,5 x t

t = strip thickness

Bending parallel to the rolling direction:

	F1250-1600 N/mm²
Up to 0,25 mm	2,5 x t
0,25-0,50 mm	3,0 x t
0,50-0,75 mm	4,0 x t
0,75-1,00 mm	5,0 x t

t = strip thickness

12.2 Bending in the annealed condition
The alloy 1.4529 can be bent and deep drawn easily in the annealed condition due to the very high nickel content.

13. Flat grinding
The alloy 1.4404 has in the annealed condition and also in the temper rolled condition an austenitic structure and is not magnetic.
Therefore, it can not be hold by magnetic clamping devices of flat grinding machines.

14. Welding
The alloy 1.4529 can be welded easily like all austenitic steels. In the temper rolled condition a change in the structure at the weldseam occurs which lowers the strength. Due to the very low content of Carbon of maximal 0.02% a corrosion at the weldseam should not occur.

15. Corrosion resistance
Alloy 1.4529 is not mentioned in the Nirosta table for the chemical resistance of stainless steels (see www.nirosta.de/Publikationen). Due to a high molybdenum content of over 6% and an increased nitrogen content of more than 0.15%, the alloy 1.4529 has a significantly better corrosion resistance than alloy 1.4539 (in a separate group in the Nirosta publication, with a PRE value of 37) and many other stainless steels.

With a PRE value of 45, the alloy 1.4529 is comparable to alloy 1.4565S (the best possible alloy in the Nirosta publication). Please check there or by testing whether the alloy 1.4529 is sufficiently resistant for your application.
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If the alloy 1.4529 is not sufficient, nickel alloys such as alloy alloy 59 (alloy number 2.4605) or alloy alloy 2120 (alloy number 2.4700) have to be used.

Important Annotation
The specifications which are given in this technical information sheet about the condition and application of the alloys are only for reference and are no confirmation about certain performances and characteristics.
The information correspond to our own experiences and experiences of our suppliers.
We can not guarantee for the results during processing and utilisation.