LAMINERIES MATTHEY
NOTZ group advanced metal solutions

Stainless Steel
1.4310

Designation	X10CrNi18-8	EN	UNS (ASTM)	AISI	LMSA
		1.4310	S30100	301	D100

Chemical composition

Fe	C	Cr	Ni	Si	Mn	P	S	Mo	N
Bal.	0.05 - 0.15	16.0 - 19.0	6.0 - 9.5	≤ 2.0	≤ 2.0	≤ 0.045	≤ 0.015	≤ 0.80	≤ 0.11

Values (Weight %). In order to achieve maximum homogeneity and consistent quality, the actual manufacturing tolerances are tighter and more precisely than the composition indicated.

Main technical properties and features

The tensile strengths of austenitic stainless steels are average but can be increased considerably, for certain types, by cold rolling. The 1.4310, X10CrNi18-8, is the most widely used stainless steel for the production of springs. It reaches very high mechanical strength through cold working. Its austenitic structure is rather unstable and its corrosion resistance is lower than, for example, that of the 1.4435, 316L, or of the 1.4301, X5CrNiMo 18-10. An increase of the mechanical strength of the 1.4310, X10CrNi18-8, by more than 250 N/mm^2 can be achieved by tempering at 280 to 420 °C after having been highly cold worked. This tempering is interesting in that it also increases the fatigue strength limit.

Lamineries MATTHEY proposes a special version of the 1.4310: the 1.4310.4. Its chemical composition has been adapted in order to increase the reaction to work hardening (Ni content between 6.4 and 6.6 %). 1.4310.4 is also specially cast in order to avoid unwanted inclusions: The 1.4310.4 is especially suitable for demanding spring applications such as the manufacturing of snap domes.

Typical uses

Stainless steel 1.4310 is often used for the manufacturing of springs and other products requiring a good fatigue resistance such as connector components, electric switch blades, watch components, certain types of knives etc.

Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
Rolled products	Strip in coils [1]	0.010 - 0.800	1.5 - 200.0	-
	Strip as sheets [1]	0.015 - 0.800	10.0 - 200.0	100 - 3000

[1] Not all our production possibilities are presented here. Other dimensions or product forms available upon request. Some combinations of thicknesses and widths are not possible.

Mechanical properties of strips

Temper		R_m (N/mm^2)	Hardness HV
C700 [1]	soft	690 - 900	170 - 250
C1300 [1]	½ hard	1300 - 1550	390 - 480
C1500 [1]	hard	1500 - 1800	410 - 520
C1700 [1]	extra hard	1700 min.	450 min.

[1] These tempers do not correspond exactly to the EN 10151 standard and are only indicative.

Stainless Steel

1.4310

Physical properties

Modulus of elasticity	kN/mm²	195 [1]
Poisson ratio		0.29
Density	g/cm³	7.90
Melting point	°C	1400 - 1450
Linear dilatation coefficient	10^{-6}·/ °C	16.8
Thermal conductivity at 20°C	W/m °K	14.7
Electrical resistivity	µΩcm	70
Electrical conductivity	MS/m	1.4
Specific heat at 20°C	J/(kg. K)	460
Magnetic properties		Amagnetic in soft temper (µ = 1.0002 - 1.004) [2]

[1] The Modulus of elasticity of 1.4310 varies slightly with the amount of cold working and depends, therefore, on the temper as well as the direction of measurement, longitudinal or transverse to the rolling direction. In the longitudinal direction, the Young's Modulus decreases from approx. 205 kN/mm² in the annealed temper to 185 kN/mm² for a cold working of about 40% (R_m approx. 1400-1600N/mm²) and then increases gradually with further cold working. In all cases, the tempering process will increase the Young's Modulus and decrease its tendency to change as a function of cold work.

[2] The magnetic permeability increases very quickly with the cold working and the mechanical resistance.

Tolerances (strip and foil)

Thickness

The table shown is an outline of our typical thickness tolerances available. They are tighter than industry standards.

Our "LMSA Precision" and "LMSA Extreme" tolerances are available upon request.

Thickness (mm)		Lamineries MATTHEY		
≥	<	LMSA Standard	LMSA Precision	LMSA Extreme
-	0.025	-	-	± 0.001
0.025	0.050	± 0.003	± 0.002	± 0.0015
0.050	0.065	± 0.004	± 0.003	± 0.002
0.065	0.100	± 0.006	± 0.004	± 0.003
0.100	0.125	± 0.008	± 0.006	± 0.003
0.125	0.150	± 0.008	± 0.006	± 0.004
0.150	0.250	± 0.010	± 0.008	± 0.004
0.250	0.300	± 0.012	± 0.008	± 0.005
0.300	0.400	± 0.012	± 0.009	± 0.005
0.400	0.500	± 0.015	± 0.010	± 0.006
0.500	0.600	± 0.020	± 0.012	± 0.007
0.600	0.800	± 0.020	± 0.014	± 0.007
0.800	1.000	± 0.025	± 0.015	± 0.009
1.000	1.200	± 0.025	± 0.018	± 0.012
1.200	1.250	± 0.030	± 0.020	± 0.012
1.250	1.500	± 0.035	± 0.025	± 0.014

Width

Our width tolerances "Standard" is +0.2, -0.0 (or ± 0.1 mm upon request). They are available for slit widths < 125 mm and thicknesses < 1.00 mm. Special tolerances upon request.

Camber

Our tolerance "LMSA Standard" respects the EN Standard 1654 (Length of measurement 1000 mm).
Other tolerances upon request.

Width (mm)		Camber max. (mm/m)			
		LMSA standard		LMSA extreme	
>	≤	≤ 0.5 mm	> 0.5 mm	≤ 0.5 mm	> 0.5 mm
3	6	12	-	6	-
6	10	8	10	4	5
10	20	4	6	2	3
20	250	2	3	1	1.5

Surface: Special surface qualities upon request

Flatness: Special requirement on the longitudinal or transversal flatness upon request

Rue Montagu 38
CH 2520 La Neuveville
P. +41 (0)32 752 32 32

www.matthey.ch
sales@matthey.ch