LAMINERIES MATTHEY
NOTZ group advanced metal solutions

Stainless Steel

1.4301

		EN	UNS (ASTM)	AISI	LMSA
Designation	**X5CrNi18-10**	1.4301	S30400	304	**D110**

Chemical composition

Fe	C	Cr	Ni	Si	Mn	P	S	N
Balance	≤ 0.07	17.0 - 19.5	8.0 - 10.5	≤ 1.0	≤ 2.0	≤ 0.045	≤ 0.015	≤ 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

Austenitic stainless steels are amongst the most popular and most widely used of the stainless steel family. They have a chromium content of around 17 % and comprise nickel and possibly other additives such as molybdenum, titanium or niobium. It is the nickel content which enables the austenitic structure that supports corrosion resistance. In fact, the absence of a second phase, such as strain induced martensite or ferrite promotes the corrosion resistance. Austenitic stainless steel 1.4301, X5CrNi18-8, is very widely used because of its excellent intercristalline corrosion resistance, very good cold deformability, good deep drawing capability and its good aptitude for welding. The 1.4301, X5CrNi18-8, preserves its excellent corrosion resistance up to 300 °C but can also be used at very low temperatures for cryogenic applications. In the soft temper, alloy 1.4301, X5CrNi18-8, is practically non-magnetic. The work hardening effect during cold deformation is rather weak, for example, it does not reach the spring properties of stainless steel 1.4310, X10CrNi18-8.

Lamineries MATTHEY can produce the 1.4301, X5CrNi18-8, in various tempers ranging from dead soft to extra hard rolled

Typical uses

Thanks to its corrosion resistance, the 1.4301 is widely used in the chemical industry, cutlery, watches and clocks, medical devices, appliances etc. The 1.4301, X5CrNi18-10, as delivered by Lamineries MATTHEY is frequently used to manufacture parts such as spring components, pressure membranes, various watch components, deep drawn parts, connectors etc.

Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
Rolled products	Strip in coils [1]	0.010 - 0.500	1.5 - 200.0	-
	Strip as sheets [1]	0.015 - 0.500	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
C500 [1], [2]	soft	540 - 750	150 - 200
C700 [1], [2]	skin pass	650 - 850	190 - 250
C850 [1]	¼ hard	680 - 1000	200 - 300
C1000 [1]	½ hard	950 - 1150	250 - 390
C1150 [1]	extra hard	1100 - 1300	310 - 420
C1300 [1]	spring	1250 - 1550	380 - 500

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

[2] The temper C500 (soft) is only available for thicknesses higher or equal to 0.1 mm. For thicknesses < 0.1mm, soft corresponds to the C700 temper.

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Physical properties

Modulus of elasticity	kN/mm²	200 (180 at 300°C, 165 at 500°C)
Poisson ratio		0.29
Density	g/cm³	8.0
Melting point	°C	1375 - 1400
Linear dilatation coefficient	10^{-6}·/ ºC	16 (17 at 300°C, 18 at 500°)
Thermal conductivity at 20°C	W/m °K	15
Electrical resistivity	μΩcm	73
Electrical conductivity	MS/m	1.4
Specific heat at 20°C	J/(kg. K)	500
Magnetic properties		Can be slightly magnetic in soft temper. Its magnetism increases with work hardening (also with its hardness and its tensile strength).

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

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