

Designation	X4CrNi18-12	EN 1.4303	UNS (ASTM) S30500	AISI 305	LMSA D340
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Chemical composition

Fe	C	Cr	Ni	Si	Mn	P	S	N
Balance	≤ 0.06	17.0 - 19.0	11.0 - 13.0	≤ 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. The nickel content enables the austenitic structure, responsible for the corrosion resistance. The absence of a second phase, such as strain induced martensite or ferrite promotes the corrosion resistance. Austenitic stainless steel 1.4303, X5CrNi18-12, is very widely used because of its good cold deformability and its excellent deep drawing capability. Stainless steel grade 305, X4CrNi-18-12 has an excellent corrosion resistance similar to 304 grade in moderate oxidizing and reducing environments. Grade 305 does not have good corrosion resistance to seawater. The 305 grade, X4CrNi18-12 exhibits an excellent behaviour in deep drawing operations, due to high ductility and a very stable austenitic phase and, consequently, a low strain hardening rate. This steel is not magnetizable even at high strain hardening rates. The 305 stainless steel can be welded by various common standard welding processes. However, the weld is more susceptible to hot cracking compared to grades 304 and 304L.

Lamineries MATTHEY can produce the 1.4303, X5CrNi18-12, in various tempers ranging from dead soft to extra hard rolled

Typical uses

Thanks to its corrosion resistance, the 1.4303 is widely used in the chemical industry, cutlery, watches and clocks, medical devices, appliances etc. The 1.4303, X5CrNi18-12, as delivered by Lamineries MATTHEY is frequently used to manufacture parts such as spring components, 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
C650 ^{[1], [2]} soft	650 - 850	190 - 250
C500 ^{[1], [2]} skin pass	500 - 650	150 - 200
C680 ^[1] ¼ hard	680 - 1000	200 - 300
C950 ^[1] ½ hard	950 - 1150	250 - 390
C1100 ^[1] extra hard	1100 - 1300	310 - 420
C1250 ^[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 C650 temper.

Physical properties

Modulus of elasticity	kN/mm ²	200
Poisson ratio		0.29
Density	g/cm ³	7.90
Melting point	°C	1400 -1450°C
Linear dilatation coefficient	10 ⁻⁶ /°C	16.0 (20-100°C) / 16.5 (20-200°C) / 17.0 (20-300°C) 17.5 (20-400°C) / 18.0 (20-500°C)
Thermal conductivity at 20°C	W/m °K	15.0
Electrical resistivity	μΩcm	73
Electrical conductivity	MS/m	1.4
Specific heat at 20°C	J/(kg. K)	500
Magnetic properties		Non-magnetic

Tolerances (strip and foil)

Thickness	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	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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