

<b>Designation</b>	<b>X6CrNiMoTi17-12-2</b>	EN 1.4571	UNS (ASTM) -	AISI 316Ti	LMSA D300
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## Chemical composition

Fe	C	Cr	Ni	Mo	Mn	Si	P	S	Ti
Balance	≤ 0.08	16.5 - 18.5	10.5 -13.5	2.0 - 2.5	≤ 2.0	≤ 1.0	≤ 0.045	≤ 0.015	≤ 0.70

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 the most well-known and common used stainless steel grades. In addition to the chromium content of around 17 %, austenitic stainless steel contain additions of molybdenum, titanium and niobium. The addition of nickel allows to obtain an austenitic structure that increases corrosion resistance.

Stainless steel 1.4571 grades was developed by users and German engineers, it is a version of the austenitic 316 chrome-nickel-molybdenum stainless steel but stabilized with titanium. Stabilization occurs by heat treatment at an intermediate temperature, at which titanium reacts with carbon to form titanium carbides. The presence of titanium carbides reduces the susceptibility of chromium carbides precipitation at grain boundaries, thus improving steel resistance to intergranular corrosion.

Stainless steel grade 316Ti can be exposed in service for a long period of time at temperatures up to 500 °C, without loss of corrosion resistance, as is the case with 304 and 316 stainless steels. Despite, 316Ti -1.4571 grade has similar physical and mechanical properties to 316 stainless steel grade. This steel is magnetizable due to the presence of small amounts of  $\delta$  (delta) ferrite and/or by the formation of ferromagnetic martensite during cold rolling. 316Ti stainless steel can be easily welded by all standard welding processes, except by oxyacetylene torch. Depending on the welding conditions, a small amount of magnetizable residual ferrite may be present along the welding line. A post-weld treatment is not necessary if the alloy is welded in the soft temper.

## Typical uses

Frequently used to manufacture pressure gauges, various watch components, membranes for the chemical industry.

## Typical manufacturing range

		Thickness (mm)	Width (mm)	Length (mm)
<b>Rolled products</b>	Strip in coils <sup>[1]</sup>	0.010 - 0.500	1.5 - 200.0	-
	Strip as sheets <sup>[1]</sup>	0.015 - 0.500	10.0 - 200.0	100 - 3000

<sup>[1]</sup> 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 <sub>p0.2</sub> (N/mm <sup>2</sup> )	R <sub>m</sub> (N/mm <sup>2</sup> )	A <sub>50mm</sub> (%)	Hardness HV
C650 <sup>[1]</sup>	soft	220 min.	650 - 850	30 min.	190 - 250
C540 <sup>[1], [2]</sup>	soft	220 min.	540 - 680	30 min.	150 - 200
C680 <sup>[1]</sup>	¼ hard	-	680 - 1000	-	200 - 300
C950 <sup>[1]</sup>	½ hard	-	950 - 1150	-	250 - 390
C1100 <sup>[1]</sup>	hard	-	1100 - 1300	-	310 - 420
C1250 <sup>[1]</sup>	extra hard	-	1250 - 1150	-	380 - 500

<sup>[1]</sup> These tempers do not exactly correspond to the EN 10151 and EN 10088 and are only indicative

<sup>[2]</sup> The temper C550 is only possible for thicknesses superior or equal to 0.1mm. For thicknesses < 0.1mm, the corresponding temper is C650.

## Physical properties

Modulus of elasticity	kN/mm <sup>2</sup>	200
Poisson ratio		0.33
Density	g/cm <sup>3</sup>	8.0
Melting point	°C	1410
Linear dilatation coefficient	10 <sup>-6</sup> / °C	16.5 (20-100°C) / 17.5 (20-300°C) / 18.5 (20-500°C) / 19.0 (20-600°C) / 19.5 (20-700°C)
Thermal conductivity at 20°C	W/m °K	15
Electrical resistivity at 20°C	μΩcm	75
Electrical conductivity at 20°C	MS/m	1.35
Specific heat at 20°C	J/(kg. K)	500
Magnetic properties		Non-magnetic in the soft temper (μ = 1.005 )

## Tolerances (strip and foil)

Thickness	Thickness (mm)		Lamineries MATTHEY			
	≥	<	LMSA Standard	LMSA Precision	LMSA Extreme	
<p>The table shown is an outline of our typical thickness tolerances available. They are tighter than industry standards.</p> <p>Our "LMSA Precision" and "LMSA Extreme" tolerances are available upon request.</p>	-	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		
<b>Width</b>	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.					
<b>Camber</b>	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	
<b>Surface</b>	Special surface qualities upon request					
<b>Flatness</b>	Special requirement on the longitudinal or transversal flatness upon request					

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