

AISI	304	DIN	1.4301 - X 5 CrNi 18 10				AFNOR	Z 6 CN 18 09	
General characteristics									
<p>Austenitic stainless steel of intermediate corrosion resistance.</p> <p>The high tolerance in carbon presents a risk for the precipitation of chromium carbides in the grain boundaries during heat treatment. These carbides reduce the resistance to intergranular corrosion. In applications presenting the risk of intergranular corrosion, the low carbon grade 304 L is preferably used.</p> <p>In case of complex machining operation, due to the limited machinability of the steel 304, consider to use a free machining grade (PX, 316 LS) or a modified 316 L grade (PM) when a high corrosion resistance is required.</p> <p>For applications in chlorine environments or sea water, a molybdenum containing steel of type 316L is to be preferred.</p> <p>For direct and prolonged contact with skin, the 316L type is preferred.</p>							Machinability	-	
							Quench hardening	no	
							Polishing	-	
							Magnetic	no	
							Age hardening	no	
							Welding		
							MIG, TIG, WIG	yes	
							Arc	yes	
							Resistance	yes	
Autogenous	-								
Laser	yes								
Chemical composition									
C	Si	Mn	P	S	Cr	Mo	Ni	Others	
< 0.07	< 1.00	< 2.00	< 0.045	< 0.015*	17.0-19.5	-	8.0 - 10.5	N < 0.11	
*S < 0.03% for bars, wires, profiles and corresponding semi-products									
Physical properties									
Density ρ [kg·m ⁻³]		Electrical resistivity ρ [$\mu\Omega\cdot m$]			Specific heat C_p [J·kg ⁻¹ ·K ⁻¹]		Thermal conductivity λ [W·m ⁻¹ ·K ⁻¹]		
7'900		0.73			500		15		
Coefficient of thermal expansion α [10 ⁻⁶ ·°C ⁻¹] between 20°C and							Elastic modulus E [GPa]		
100 °C	200 °C	300 °C	400 °C	500 °C	600 °C	700 °C	200 at 20°C		
16.0	17	17	18	18	18.5	18.5			
Mechanical properties									
State	Yield strength Rp _{0.2} [MPa]				Tensile strength Rm [MPa]	Elongation A ₅ [%]	Vickers Hardness [HV]		
	20°C	100°C	200°C	300°C					
Annealed	200	157	127	110	500-700	45	160 - 200		
Full hard	965				1275	4	390		
Thermal treatments									
Type	Temperature [°C]	Time [minutes]	Protective atmosphere			Cooling			
Annealing	1020 -1080	15 - 60	H ₂ + N ₂ or cracked NH ₃			Quench (water, oil)			
Surface treatments									
Type	Solution					Remarks			
Pickling	6 - 25 % HNO ₃ + 0.5 - 8 % HF					Only suitable in annealed condition, hot			
Passivation	20 - 50% HNO ₃					Hot			
Fabrication characteristics									
<p>This steel can easily be cold rolled, drawn and stamped. Suitable tooling is required because of its high work hardening rate. This alloy becomes slightly magnetic with increased cold working. This stainless steel should not be maintained for a long time between 500°C and 900°C, because of possible precipitation of chromium carbides at grain boundaries. A consecutive annealing for carbide dissolution is necessary, followed by rapid cooling to prevent a new precipitation. Quenching is recommended independently of the size of the pieces. This steel is relatively difficult to machine, modified steels such as PX, 316LS or PM with the addition of chip breaking additives may be preferred.</p>									
Welding, brazing and soldering									
<p>This steel can easily be welded by any conventional joining technique, except the oxyacetylene torch.</p> <p>and quenching are recommended after welding to prevent the risk of intergranular corrosion.</p> <p>The grade 304 L is preferably used for welded constructions as this low carbon grade will not be sensitized.</p>								Annealing	
Available products									
Sheets, ribbons, wires, profiles, tubes, dimensions and tolerances on request.									

The indications are basically founded on our actual know-how. This technical data sheet is without commitment and not contracted.