

AISI	316 L	DIN	1.4435 - PM				AFNOR	Z 3 CND 18 14 03	
General characteristics									
Austenitic stainless steel grade 316 L 1.4435, with improved machinability, achieved by the optimisation of the composition and microstructure as well as by the absence of hard inclusions. This steel exhibits a good polishing aptitude. This steel contains a controlled sulfur concentration of 0.015 - 0.03% that improves machinability as compared to the standard grade 316 L 1.4435. This steel complies with the standard EN 1811 and can be used for products in direct and prolonged contact with skin.							Machinability	+	
							Quench hardening	no	
							Polishing	+	
							Magnetic	no	
							Age hardening	no	
							Welding		
							MIG, TIG, WIG	yes	
							Arc	yes	
							Resistance	no	
Autogenous	no								
Laser	yes								
Chemical composition (%)									
C	Si	Mn	P	S	Cr	Mo	Ni	Others	
< 0.030	< 1.0	< 2.0	< 0.045	0.015 - 0.03	17 - 19	2.5 - 3	12.5 - 15	N < 0.11	
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]		
7'980		0.75			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		
16.5	17.5	17.5	18.5	18.5	19	19.5	172 at 400°C		
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				500 - 700	≥45	160 - 200		
Full hard	1300				1400	5	430		
Thermal treatments									
Type	Temperature [°C]	Time [minutes]	Protective atmosphere			Cooling			
Annealing	1020 - 1080	15 - 60	H ₂ + N ₂ or cracked NH ₃			Rapid			
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									
This steel can easily be cold rolled, drawn and stamped. However, suitable tooling is required because of its high work hardening rate. This alloy may become slightly magnetic with increasing 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 only required for big cross sections. The machining aptitude of this steel is intermediate between a standard steel 316L (1.4435) and the resulfured grades such as PX or 316 LS.									
Welding, brazing and soldering									
This steel can easily be welded by any conventional joining technique, except the oxyacetylene torch. Depending on the welding conditions, some residual ferrite may form along the welding line. There is no need for any post-weld heat treatment. Welding electrodes: 1.4430, 1.4576.									
Available products									
Wires, profiles, 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.