



钢铁之家

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# 全球钢号百科!

Global Steel Grade Encyclopedia



涵盖的行业或国家与地区类别



国际材料与试验协会

GJB

国家军用标准



动力机械工程师协会

EU

前欧洲标准化

AISI

美国钢铁学会



德国工业标准

AMS

航空航天材料规范



国际标准

JASO

日本汽车标准组织

EN

欧洲标准

JB

中国机械行业标准

UNS

统一编号系统

UNI

意大利标准



美国机械工程师协会

SS

瑞典标准



国家标准



日本工业标准

AISI	316 L	DIN	1.4404 - X 2 CrNiMo 17 12 2				AFNOR	Z 2 CND 17 12	
<b>General characteristics</b>									
Austenitic stainless steel with an excellent corrosion resistance. Its general characteristics are comparable to that of the grade 316 L (1.4435), but it differs from the latter in a slightly lower Nickel and Molybdenum content. In case of complex machining operations, such as the drilling of long but narrow holes, modified steel types (e.g. 316L PM) with the addition of chip breaking additives may be preferred. This steel complies with the standard EN 1811 and can be used for products in direct and prolonged contact with skin.							<b>Machinability</b>	-	
							<b>Quench hardening</b>	no	
							<b>Polishing</b>	+	
							<b>Magnetic</b>	no	
							<b>Age hardening</b>	no	
							<b>Welding</b>		
							MIG,TIG,WIG	yes	
							Arc	yes	
							Resistance	yes	
Autogenous	yes								
Laser	yes								
<b>Chemical composition according to DIN (%)</b>									
<b>C</b>	<b>Si</b>	<b>Mn</b>	<b>P</b>	<b>S</b>	<b>Cr</b>	<b>Mo</b>	<b>Ni</b>	<b>others</b>	
< 0.03	< 1	< 2	< 0.045	< 0.015*	16.5-18.5	2 - 2.5	10 - 13	N < 0.11	
*S < 0.03% for bars, wires, profiles and corresponding semi-products									
<b>Physical properties</b>									
<b>Density</b> $\rho$ [kg·m <sup>-3</sup> ]		<b>Electrical resistivity</b> $\rho$ [ $\mu\Omega\cdot m$ ]			<b>Specific heat</b> $C_p$ [J·kg <sup>-1</sup> ·K <sup>-1</sup> ]		<b>Thermal conductivity</b> $\lambda$ [W·m <sup>-1</sup> ·K <sup>-1</sup> ]		
7'980		0.75			500		15		
<b>Coefficient of thermal expansion</b> $\alpha$ [10 <sup>-6</sup> ·°C <sup>-1</sup> ] between 20°C and							<b>Elastic modulus</b> 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		
<b>Mechanical properties</b>									
<b>State</b>	<b>Yield strength</b> Rp <sub>0.2</sub> [MPa]				<b>Tensile strength</b> Rm [MPa]	<b>Elongation</b> A <sub>5</sub> [%]	<b>Vickers Hardness</b> [HV]		
	20°C	100°C	200°C	300°C					
<b>Annealed</b>	190	166	137	118	490-690	≥45	150 - 200		
<b>Full hard</b>	1300				1400	5	430		
<b>Thermal treatments</b>									
<b>Type</b>	<b>Temperature</b> [°C]	<b>Time</b> [minutes]	<b>Protective atmosphere</b>			<b>Cooling</b>			
<b>Annealing</b>	1020 -1080	15 - 60	H <sub>2</sub> + N <sub>2</sub> or cracked NH <sub>3</sub>			Rapid			
<b>Surface treatments</b>									
<b>Type</b>	<b>Solution</b>				<b>Remarks</b>				
<b>Pickling</b>	6 - 25 % HNO <sub>3</sub> + 0.5 - 8 % HF				Only suitable in annealed condition, hot				
<b>Passivation</b>	20 - 50% HNO <sub>3</sub>				Hot				
<b>Fabrication characteristics</b>									
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 pure steel 1.4404 is relatively difficult to machine, but there exist special executions with improved machinability, such as the steel Px or PM.									
<b>Welding, brazing and soldering</b>									
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.									
<b>Available products</b>									
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.