

MATERIAL	AISI 304	FAMILY	Austenitic stainless steel	SHEET #	AISI304.FIE
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EQUIVALENCY				
DIN	AFNOR	UNS	SS	ISO
1.4301 (X5CrNi18-10)	Z6 CN 18-09	S30400	2332 / 2333	4301-304-00-1

USE				
This material is commonly used for the manufacture of the following product elements:				
<input checked="" type="checkbox"/> Cannula (tube)	<input checked="" type="checkbox"/> Stylet (wire)	<input type="checkbox"/> Hub	<input type="checkbox"/> Handle	
<input type="checkbox"/> Adaptor	<input type="checkbox"/> Stopcock			

GENERAL CHARACTERISTICS		
Straightness	Circularity	Concentricity <i>(only tube)</i>
2 mm difference for 1'000 mm length	- Tube : Circularity \cong ID tolerance - Wire: Circularity \cong OD tolerance	$\leq 10\%$ tube thickness
Outer surface finish	Inner surface finish <i>(only tube)</i>	-
N5 ($R_{a \max} = 0.4$)	N7 ($R_{a \max} = 1.6$)	-

MANUFACTURING			
Turing, drilling, milling	Grinding	Laser cutting	Electro erosion machining
Not suggested	Good	Good	Good
Sharpening	Polishing	Laser marking	-
Good	Good	Excellent	-

ASSEMBLING			
Bonding	Press fit	Soldering	Laser welding / Plasma
Good	Not suggested	Good	Good

CHEMICAL COMPOSITION [%]									
C	Si	Mn	P	S	Cr	Ni	N	-	-
≤ 0.07	≤ 1.0	≤ 2.0	≤ 0.045	≤ 0.03	17.0-19.0	8.0-11.0	≤ 0.1	-	-

The reference to the chemical composition is the one from the standard ASTM F899.

The chemical composition from other equivalent standards may be slightly different from that provided in this information sheet.

MECHANICAL PROPRIETIES	
Material state	Tensile strength R_m [MPa]
Hard – Cannula	800 – 1'500
Annealed – Cannula	400 – 700
Hard – Stylet	1'400 – 2'400

PHYSICAL PROPRIETIES		
Density ρ [kg/m ³]	Electrical resistivity ρ [$\mu\Omega \times m$]	Thermal conductivity λ [W/(m \times K)] at 20°C
7'900	0.73	15.0
Modulus of elasticity E [GPa] at 20°C	Coefficient of linear thermal expansion α [$10^{-6} / ^\circ C$] between 20°C and 100°C	Specific heat capacity C_p [J/(kg \times K)] at 20°C
200	16.0	500

Corrosion resistance
Good corrosion resistance

BIOCOMPATIBILITY (ISO 10993-1)
The austenitic stainless steel AISI 304 is a metallic material compatible with standards of materials for medical devices. It is referenced in the American standard of surgical instruments ASTM F899 and therefore can be considered clinically established and a recognized material (state-of-the-art) for medical devices.
The customer is responsible to verify the compatibility of the material selected from its intended use.

STANDARDS	
ISO 15510	Stainless steels -Chemical composition
ISO 9626	Stainless steel needle tubing for the manufacture of medical devices
ISO 7153-1	Surgical instruments - Metallic materials - Part 1: Stainless steel
ASTM F899	Standard Specification for Wrought Stainless Steels for Surgical Instruments
ISO 16061	Instrumentation for use in association with non-active surgical implants - General requirements

All this information are for reference only. They have no legal or contractual commitment Unimed SA.

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