

Material for EM-Tec Gatan 3View stub and cryo grid box tweezers

The material used for manufacturing the EM-Tec Gatan 3View stub and cryo grid box tweezers is a selected grade of low carbon AISI 316L stainless steel.

It is used for the following high precision tweezers:

[#50-001521 EM-Tec 521.AM Gatan 3View stub handling tweezers](#)

[#50-001553 EM-Tec 553.AM cryo grid box handling tweezers](#)

General remarks:

- AISI 316L is a low carbon austenitic stainless steel (DIN 1.4435, X2CrNiMo 18-14-3)
- Contains 17 – 19 wt% Chromium and contains significant amounts of Nickel and Molybdenum as additional alloy components
- Non-magnetisable
- Can not be hardened by heat treatment
- Can be work hardened, annealing is recommended for stress relieving
- Good corrosion resistance to most chemicals, salts and acids
- Generally used where corrosion resistance and toughness are primary requirements
- Typical applications include tweezers for microscopy, electronic industry, fine mechanics, laboratory and medical in moderately aggressive chemical requirements

Composition of AISI 316L

Element	Wt. %
C	≤0.03
Cr	17.0 – 19.0
Ni	12.5 – 15.0
Mo	2.5 – 3.0
Mn	≤2.0
Si	≤1.0
P	≤0.045
S	≤0.03
Fe	Balance

Properties of AISI 316L

Mechanical Properties	
State	Annealed
Density	8.0 g/cm ³
Hardness Brinell	149
Hardness Rockwell B	80
Hardness Vickers	155
Tensile strength, ultimate	515 MPa
Tensile strength, yield	205 MPa
Yield stress, 0.2%	≤200 Mpa
Elongation until break	60%
Modulus of Elasticity	200 GPa
Poisson's ratio	0.3
Thermal Properties	
Coefficient of linear thermal expansion	16 x 10 ⁻⁶ /°C (20-100°C)
Coefficient of linear thermal expansion	17 x 10 ⁻⁶ /°C (20-300°C)
Specific heat capacity	0.50 J/(g.K)
Thermal conductivity	15W/(m.K)
Continuous use (service) temperature	350°C
Maximum service temperature (short)	925°C
Electrical Properties	
Resistivity	0.75 x 10 ⁻⁴ Ohm.cm

TSB 50-001521 Material for EM-Tec 3View stub and cryo grid box tweezers 2022-05-04 Revision 2