

Material for Micro-Tec AFM / SPM disc gripper tweezers

The material used for manufacturing the Micro-Tec AFM / SPM disc gripper tweezers is a selected grade of non-magnetic AISI 304.

It is used for the following products:

#50-040012 Micro-Tec AFM / SPM disc gripper tweezers for Ø12mm AFM / SPM discs

#50-040015 Micro-Tec AFM / SPM disc gripper tweezers for Ø15mm AFM / SPM discs

General remarks:

- AISI 304 is an austenitic stainless steel (DIN 1.4301, X5CrNi 18-10) and is the most common type of stainless steel
- Contains 18 – 20 wt% Chromium and contains significant amounts of Nickel as additional alloy component
- Normally non-magnetic, but becomes slightly magnetic when cold worked
- Can not be hardened by heat treatment
- Can be work hardened, annealing is recommended for stress relieving
- Good corrosion resistance to most solvents, salts and moderate acids
- Generally used where corrosion resistance is a requirement
- Typical applications include tweezers for microscopy, electronic industry, fine mechanics and laboratory

General composition of AISI 304

Element	Wt. %
C	≤0.08
Cr	18.0 – 20.0
Ni	8.0 – 10.5
Mn	≤2.0
Si	≤1.0
P	≤0.045
S	≤0.03
Fe	Balance

Properties of AISI 304

Mechanical Properties	
State	Annealed
Density	8.0 g/cm ³
Hardness Brinell	123
Hardness Rockwell B	70
Hardness Vickers	129
Tensile strength, ultimate	505 MPa
Tensile strength, yield	215 MPa
Yield stress, 0.2%	≤200 Mpa
Elongation until break	70%
Modulus of Elasticity	195 GPa
Poisson's ratio	0.29
Thermal Properties	
Coefficient of thermal linear expansion	17.3 x 10 ⁻⁶ /°C (20-100°C)
Coefficient of linear thermal expansion	17.8 x 10 ⁻⁶ /°C (20-300°C)
Specific heat capacity	0.50 J/(g.K)
Thermal conductivity	16.2W/(m.K)
Continuous use (service) temperature	325°C
Maximum service temperature (short)	870°C
Electrical Properties	
Resistivity	0.72 x 10 ⁻⁴ Ohm.cm

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