Material for EM-Tec ESD safe epoxy coated precision electronic tweezers

The material used for manufacturing the EM-Tec ESD safe epoxy coated precision electronic tweezers is a selected grade of low carbon AISI 316L anti-magnetic stainless steel coated with a polyester type epoxy. Please note that the continuous use (=service) temperature is determined by the ESD safe black epoxy coating and is 120°C.

ESD safe black epoxy coating NE

General remarks:

- This conductive polyester epoxy coating consists of polyester and epoxy resins with an electrically conductive additives and pigment which is light and heat resistant
- Excellent general resistance to abrasion and wear
- Not compatible with organic solvents
- Continuous use (service) temperature 120°C
- Easy to clean
- Excellent dispersion
- Impact resistant surface
- Good elasticity
- Enhanced operator comfort

Properties of ESD safe black epoxy coating

Thermal Properties	
Continuous use (service) temperature	120°C
Electrical Properties	
Resistivity @ 100V	10^{-5} - 10^{-6} Ohm
Chemical Properties	
Good resistance to	Diluted acids, salts and alkalis
Not compatible to	Organic solvents
Powder specifications	
Particle size	<100 µm
Solids	Ca. 99%

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Anti-magnetic stainless steel AISI 316L

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 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 HB30	≤215
Hardness Rockwell B	79
Hardness Vickers	155
Tensile strength, ultimate	515 MPa
Tensile strength, yield	290 MPa
Yield stress, 0.2%	≥200 Mpa
Elongation until break	40%
Modulus of Elasticity	200 GPa
Poisson's ratio	0.3

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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

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