

ideal-tek

SWISS TECHNOLOGY AT YOUR FINGERTIPS



Training Program - 01. Tweezer materials

Tweezer material selection guide*



		NON-MAGNETIC	HARDNESS	CORROSION RESIST.	CHEMICAL RESIST.	CLEANROOM	TEMPERATURE RESIST.	ESD SAFE	BIOCOMPATIBILITY
METAL									
	DX	Excel	Very	Good	Good	Good	Good	Very	Good
	CX	Good	Very	Very	Good	Good	Very	Very	Very
	SA	Very	Very	Very	Very	Very	Very	Very	Very
	S	Poor	Good	Very	Very	Very	Very	Very	Very
	C	Poor	Good	Poor	Poor	Very	Very	Very	Very
	NC	Good	Very	Very	Good	Good	Very	Very	Very
	TA	Good	Poor	Good	Very	Good	Very	Very	Good
	N	Good	Poor	Very	Poor	Very	Poor	Very	Very
	BR	Good	Poor	Very	Poor	Very	Poor	Very	Very
	PB	Good	Poor	Very	Poor	Very	Poor	Very	Very
COATING									
	SA+DC	Very	Good	Good	Good	Good	Good	Good	Good
	SA+NE	Very	Very	Very	Very	Good	Very	Good	Very
	SA+T	Very	Very	Very	Very	Very	Good	Poor	Very
	SA+GP	Very	Very	Good	Good	Good	Very	Very	Good
	SA+DR	Very	Poor	Very	Very	Good	Very	Good	Very
	SA+DN	Very	Poor	Very	Very	Poor	Poor	Good	Very
PLASTIC									
	CP	Very	Good	Good	Good	Good	Good	Good	Very
	CF	Very	Very	Very	Very	Good	Very	Very	Very
	SV	Very	Very	Good	Good	Good	Very	Very	Very
	DG	Very	Very	Very	Very	Good	Poor	Poor	Very
	LC	Good	Very	Good	Good	Good	Very	Very	Very
	LR	Good	Very	Good	Good	Good	Very	Poor	Very
CERAMIC									
	SA+MZ	Very	Good	Very	Good	Good	Good	Poor	Good
	SA+ZJ	Very	Good	Very	Good	Good	Good	Good	Good
	PSZ	Good	Good	Good	Good	Good	Good	Poor	Good

DEFINITION

- NON-MAGNETIC**
Those materials which do not acquire magnetic properties, either transient or permanent, when placed in a magnetic field or subjected to a magnetization process
- HARDNESS**
The resistance of a material to penetration
- CORROSION RESISTANCE**
The capability of material to withstand the deterioration and chemical breakdown during surface exposure in a specific environment
- CHEMICAL RESISTANCE**
The strength of a material to protect against chemical attack or solvent reaction
- CLEANROOM**
A controlled environment typically used in manufacturing
- TEMPERATURE RESISTANCE**
The resistance of material properties to decrease as temperature increases
- ESD SAFE**
A material that reduce static electricity to protect electrostatic-sensitive devices
- BIOCOMPATIBILITY**
The capability of a material to exist in harmony with tissue without causing deleterious changes

* Material selection chart is intended as a starting point to select material. Ideal-tek recommends always testing our specific product with your application

Metal tweezer materials



DX

MATERIAL DESCRIPTION

High-alloy Anti-Acid, Anti-Magnetic
Stainless Steel (AISI 904L)

MAIN FEATURES & APPLICATIONS

Non-magnetic - ◆ toughness - ◆ formability and weldability - ◆ resistance to severe corrosive conditions - ◆ resistance to acidic environments - ◆ resistance to stress corrosion cracking - ◆ cleanliness - maximum service temperature 450°C
TYPICAL APPLICATIONS
Chemical and pharmaceutical industries, cryogenic laboratories, process industries, etc.

CX

Superalloy Anti-Acid, Anti-Magnetic
(Superalloy Ni-Cr-Mo)

Fully non-magnetic - ◆ strength - ■ hardness - ◆ resistance to fatigue - ◆ shape retention - ■ corrosion resistance to most chemicals, salts and acids
TYPICAL APPLICATIONS
Non-magnetic tools for electronic and watch industry applications and for laboratory and medical applications in aggressive chemical environments

SA

Anti-Acid, Anti-Magnetic Stainless
Steel (AISI 316L)

Non-magnetic - ■ toughness - ■ corrosion resistance to most chemicals, salts and acids
TYPICAL APPLICATIONS
Tweezers for the electronic industry, watch-makers, jewelers and laboratory and medical applications in moderately aggressive chemical environments

S

Stainless Steel (AISI 420)

Magnetic - ◆ strength - ◆ hardness - ◆ resistance to corrosion
TYPICAL APPLICATIONS
Tweezers and cutting tools for the electronic industry, watch-makers, jewelers and laboratory and medical applications in mild aggressive chemical environments

C

Carbon Steel (AISI 1060)

Magnetic - ◆ strength - ◆ hardness - ● resistance to corrosion
TYPICAL APPLICATIONS
Tweezers and cutting tools for the electronic industry, watch-makers, jewelers applications

NC

Superalloy Anti-Acid, Anti-Magnetic
(Superalloy Ni-Cr-Mo)

Fully non-magnetic - ◆ strength - ■ hardness - ◆ resistance to fatigue - ◆ shape retention - ■ corrosion resistance to most chemicals, salts and acids
TYPICAL APPLICATIONS
Non-magnetic tools for electronic and watch industry applications and for laboratory and medical applications in aggressive chemical environments

TA

Titanium (Nonferrous alloy, Grade 1)

Fully non-magnetic - ■ mechanical properties - ◆ ductility - ■ cold formability - ◆ corrosion resistance - ■ melting point (high temperature resistance)
TYPICAL APPLICATIONS
Handling of components in cleaning/chemical processes at high temperature, histology, biology, medicine, surgery. Used when high strength-to-weight ratio is required. Bio-compatible

N

Nickel (Nonferrous alloy CuNi18Zn20)

Non-magnetic - soft and elastic - ■ cold workability (forming) - ◆ corrosion resistance by fresh water and steam - ◆ resistance to saltwater corrosion - ◆ resistance to alkalis and organic acids - ● resistance to inorganic acids
TYPICAL APPLICATIONS
Handling of scratch-sensitive parts in electronic, micro-mechanical and jewellery applications

BR

Brass (Nonferrous alloy CuZn37)

Non-magnetic - ◆ cold workability (forming) - ◆ mechanical properties - ■ corrosion resistance - ◆ corrosion resistance by fresh water and steam
TYPICAL APPLICATIONS
Tweezers for handling scratch-sensitive mechanical parts, watch components, magnets

PB

Bronze (Nonferrous alloy CuSn8P)

Non-magnetic - ■ cold workability (forming) - ■ tensile properties - ■ corrosion resistance - ◆ corrosion resistance by fresh water and steam
TYPICAL APPLICATIONS
Tweezers for handling scratch-sensitive mechanical parts, watch components, magnets

Coating tweezer materials

More TECHNICAL information on our material TDS



COATING DESCRIPTION	MAIN FEATURES & APPLICATIONS
SA + DC High-tek Diamond coating	ESD-safe material - hardness - wear resistance - friction coefficient - adherence to the tweezers - humidity resistant - chemical stability and corrosion resistance - 100% biological compatibility TYPICAL APPLICATIONS DLC tweezers are ideally suited for applications in medical, biological and clean room environments, as well as perfect for handling hard / abrasive materials.
SA + NE Engineering ESD epoxy coating (polyester + epoxy resins + conductive additives)	ESD-safe material - general resistance - dispersion - impact-resistant surface - elasticity - functional permanent graffiti protection - cleanliness TYPICAL APPLICATIONS ESD tweezer coating for an enhanced operator comfort
SA + T Industrial Teflon coating (PTFE)	abrasion resistance - toughness - chemical corrosion resistance - cleanliness - heat resistance - cryogenic stability TYPICAL APPLICATIONS Teflon-coated tweezers are recommended when specimen material is fragile. It reduces the rate of heat during critical cryo work and reduces the corrosive action of acids and bases on tweezers tips. The PTFE coating also gives some protection of the metal when using with chemical compound.
SA + GP Gold plating coating	Pure 24-carat gold - chemical corrosion resistance - oxidation resistance - electrical conductor TYPICAL APPLICATIONS Tweezers for microelectronics, TEM staining, immunogold work, electro-chemistry and nanotechnology work
SA + DR Engineering ESD rubber grip (TPV Thermoplastic vulcanizate)	ESD-safe material - softness - flexibility - tear resistance - abrasion/wear resistance - hydrolytic resistance (hot water) - chemical resistance TYPICAL APPLICATIONS ESD-safe handles, floor and work surface mats. ESD ergonomic tweezer cushion grips for an enhanced operator comfort. Ideal for repetitive handling tasks in specimen preparation, electronics, instrumentation, laboratories and forensics. Especially useful for handling ESD sensitive components or small static items
SA + DN Engineering ESD foam grip (PVC foam)	ESD-safe material - softness - flexibility - tear resistance - abrasion/wear resistance - chemical resistance TYPICAL APPLICATIONS ESD-safe handles, floor and work surface mats. ESD ergonomic tweezer cushion grips for an enhanced operator comfort. Ideal for repetitive handling tasks in specimen preparation, electronics, instrumentation, laboratories and forensics. Especially useful for handling ESD sensitive components or small static items

Plastic tweezer materials



CP

High-performance plastic - Carbon PEEK (polyetheretherketone reinforced with carbon nano)

ESD safe material - ◆ hardness - ■ rigidity - ◆ flexural strength - ◆ wear resistance - ◆ dimension stability - ◆ resistance to chemicals and aggressive agents - ◆ resistance to thermal ageing - ◆ heat capability
TYPICAL APPLICATIONS
Handling of components in cleaning/chemical/assembly processes at high temperature (soldering).



CF

Engineering plastic - Carbon fiber (PA66/CF30 polyamide 66 reinforced with 30 wt% carbon fibre)

ESD safe material - ■ rigidity - ■ tensile strength - ■ flexural strength - ■ fatigue resistance - ■ creep resistance - ■ wear and abrasion resistance - ■ chemical resistance - ◆ heat capability
TYPICAL APPLICATIONS
Handling of sensitive components and devices in electronics assembly and lab applications. Clean room compatible.



SV

High performance plastic - PVDF (polyvinylidene fluoride carbon fibre reinforced)

ESD safe material - ◆ mechanical strength - ◆ toughness - ■ abrasion resistant - ◆ high purity - ◆ chemical resistance - ■ resistant to UV and nuclear radiation (sterilisation) - ◆ heat capability
TYPICAL APPLICATIONS
Handling of very scratch - and contamination - sensitive components, cleaning and etching processes. Clean room and medical device approved material.



DG

Engineering plastic - Delrin (POM/GF30 acetal resin reinforced with 30 wt% glass fibre)

◆ tensile strength - ◆ flexural strength - ◆ fatigue resistance - ◆ creep resistance - ◆ wear resistance - ◆ abrasion resistance - ■ hydrolytic resistance (hot water) - ■ chemical resistance - insulating
TYPICAL APPLICATIONS
Handling of very scratch sensitive components (ceramic and glass devices, wafers, capillary)



LC

Engineering plastic - Conductive Larton (PPS/GF30 polyphenylene sulphide reinforced with 30 wt% glass fibre)

ESD-safe material - ■ hardness - ■ rigidity - ◆ flexural strength - ◆ creep resistance - ◆ dimension stability - ● fume optical density and toxicity - ◆ chemical resistance - ◆ resistance to thermal ageing - ◆ heat capability - UL94V-0 self-extinguishing
TYPICAL APPLICATIONS
Soldering and cleaning/chemical processes at high temperature. Used in clean room environment.



LR

Engineering plastic - Larton (PPS/GF30 polyphenylene sulphide reinforced with 30 wt% glass fibre)

■ hardness - ■ rigidity - ◆ flexural strength - ◆ creep resistance - ◆ dimension stability - ● fume optical density and toxicity - ◆ chemical resistance - ◆ resistance to thermal ageing - ◆ heat capability - UL94V-0 self-extinguishing - insulating
TYPICAL APPLICATIONS
Soldering processes, handling of components in cleaning/chemical processes.

Ceramic tweezer materials

More TECHNICAL information on our material TDS



MATERIAL DESCRIPTION	MAIN FEATURES & APPLICATIONS
<p>SA + MZ</p> <p>Advanced white ceramic (Zirconia Toughened Alumina)</p>	<p> ◆ strength - ◆ hardness - no open porosity - ◆ hard surface - ◆ abrasion resistance - ◆ wear resistance - ◆ flexural strength - ◆ fracture toughness - ■ corrosion resistance - ◆ thermal properties - ◆ temperature stability - electrically insulating TYPICAL APPLICATIONS Soldering processes, handling of components during thermal and chemical processes. Generally used when very rigid tips are required </p>
<p>SA + ZJ</p> <p>ESD advanced black ceramic (Zirconia Toughened Alumina)</p>	<p> ESD-safe material - ◆ strength - ◆ hardness - no open porosity - ◆ hard surface - ◆ abrasion resistance - ◆ wear resistance - ◆ flexural strength - ◆ fracture toughness - ■ corrosion resistance - ◆ thermal properties - ◆ temperature stability TYPICAL APPLICATIONS Handling of EOS/ESD sensitive components, handling of components during thermal, chemical and soldering processes. Generally used when very rigid tips are required </p>
<p>PSZ</p> <p>Advanced Ceramic (Partially stabilized zirconia)</p>	<p> Fully non-magnetic - ◆ hardness - ◆ fracture toughness - ◆ surface finish - no open porosity - ◆ abrasion resistance - ◆ wear resistance - ◆ flexural strength - ◆ corrosion resistance - ◆ thermal properties - ◆ temperature stability - ◆ electrical insulation TYPICAL APPLICATIONS Tweezers for demanding requirements for high grade application in clean rooms, chemistry, semiconductor and electronics manufacturing, analytical chemistry, biotechnology and nanotechnology </p>