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SWISS TECHNOLOGY AT YOUR FINGERTIPS

Training Program - 01. Tweezer materials

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Tweezer material selection guide*

Excellent Very good Good Poor

METAL

	NON-MAGNETIC	HARDNESS	CORROSION RESIST.	CHEMICAL RESIST.	CLEANROOM	TEMPERATURE RESIST.	ESD SAFE	BIOCOMPATIBILITY
DX	■	■	⬟	⬟	⬟	⬟	◆	⬟
CX	⬟	■	■	⬟	⬟	■	◆	■
SA	■	■	■	■	■	◆	◆	■
S	●	⬟	◆	◆	■	◆	◆	◆
C	●	⬟	●	●	■	◆	◆	◆
NC	⬟	■	■	⬟	⬟	■	◆	■
TA	⬟	●	⬟	■	⬟	■	◆	⬟
N	■	●	◆	●	◆	●	◆	◆
BR	■	●	◆	●	◆	●	◆	◆
PB	■	●	◆	●	◆	●	◆	◆

COATING

	NON-MAGNETIC	HARDNESS	CORROSION RESIST.	CHEMICAL RESIST.	CLEANROOM	TEMPERATURE RESIST.	ESD SAFE	BIOCOMPATIBILITY
SA+DC	■	⬟	⬟	⬟	⬟	⬟	⬟	⬟
SA+NE	■	■	■	■	⬟	■	⬟	◆
SA+T	■	◆	■	■	■	⬟	●	■
SA+GP	■	◆	⬟	⬟	⬟	■	◆	⬟
SA+DR	■	●	■	■	⬟	◆	⬟	◆
SA+DN	■	●	■	■	●	●	⬟	◆

PLASTIC

	NON-MAGNETIC	HARDNESS	CORROSION RESIST.	CHEMICAL RESIST.	CLEANROOM	TEMPERATURE RESIST.	ESD SAFE	BIOCOMPATIBILITY
CP	■	⬟	⬟	⬟	⬟	⬟	⬟	◆
CF	■	■	■	■	⬟	◆	◆	◆
SV	■	◆	⬟	⬟	⬟	◆	■	◆
DG	■	◆	■	■	⬟	●	●	◆
LC	⬟	■	⬟	⬟	⬟	■	■	◆
LR	⬟	■	⬟	⬟	⬟	■	●	◆

CERAMIC

	NON-MAGNETIC	HARDNESS	CORROSION RESIST.	CHEMICAL RESIST.	CLEANROOM	TEMPERATURE RESIST.	ESD SAFE	BIOCOMPATIBILITY
SA+MZ	■	⬟	■	⬟	⬟	⬟	●	⬟
SA+ZJ	■	⬟	■	⬟	⬟	⬟	⬟	⬟
PSZ	⬟	⬟	⬟	⬟	⬟	⬟	●	⬟

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

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Metal tweezer materials

More TECHNICAL information on our material TDS

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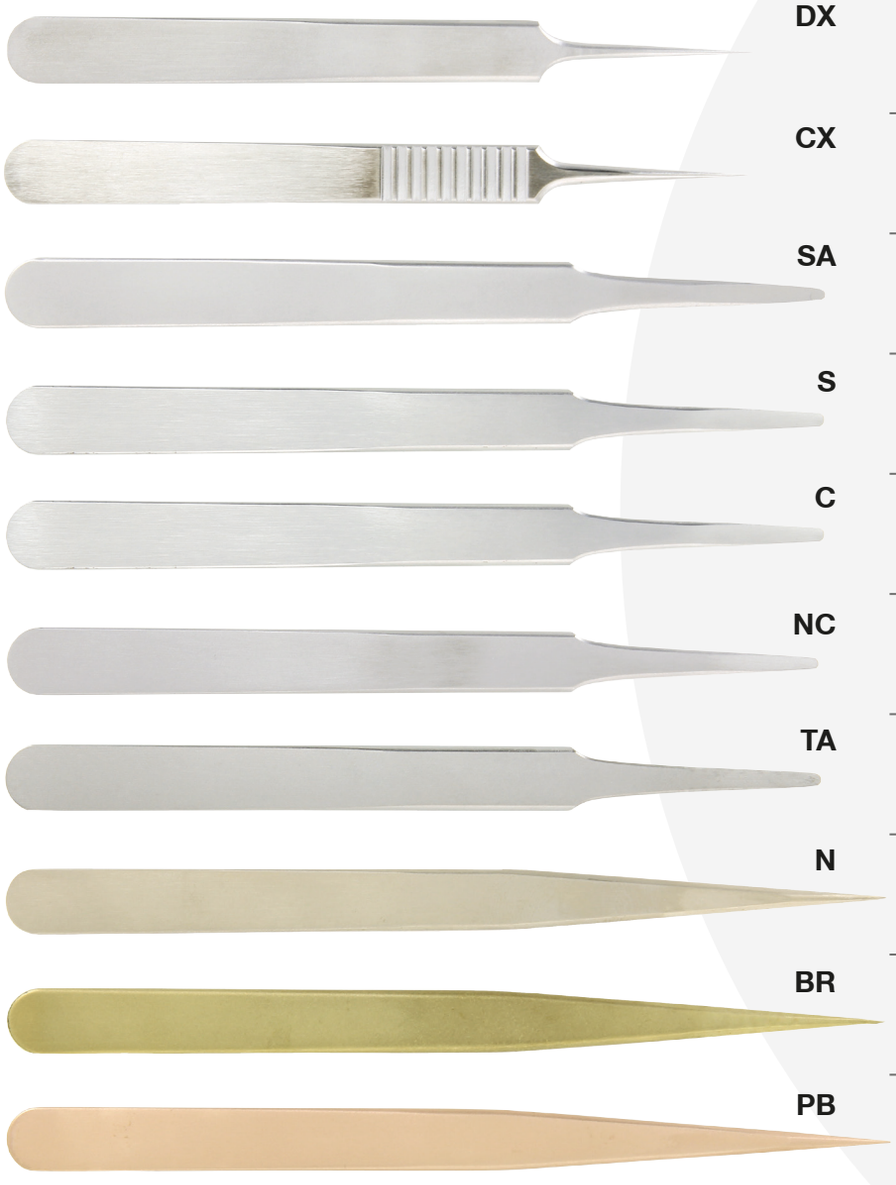

	MATERIAL DESCRIPTION	MAIN FEATURES & APPLICATIONS
DX	High-alloy Anti-Acid, Anti-Magnetic Stainless Steel (AISI 904L)	Non-magnetic - toughness - formability and weldability - resistance to severe corrosive conditions - resistance to acidic environments - resistance to stress corrosion cracking - cleanliness - 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 - strenght - 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 - strenght - 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 alkalies 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

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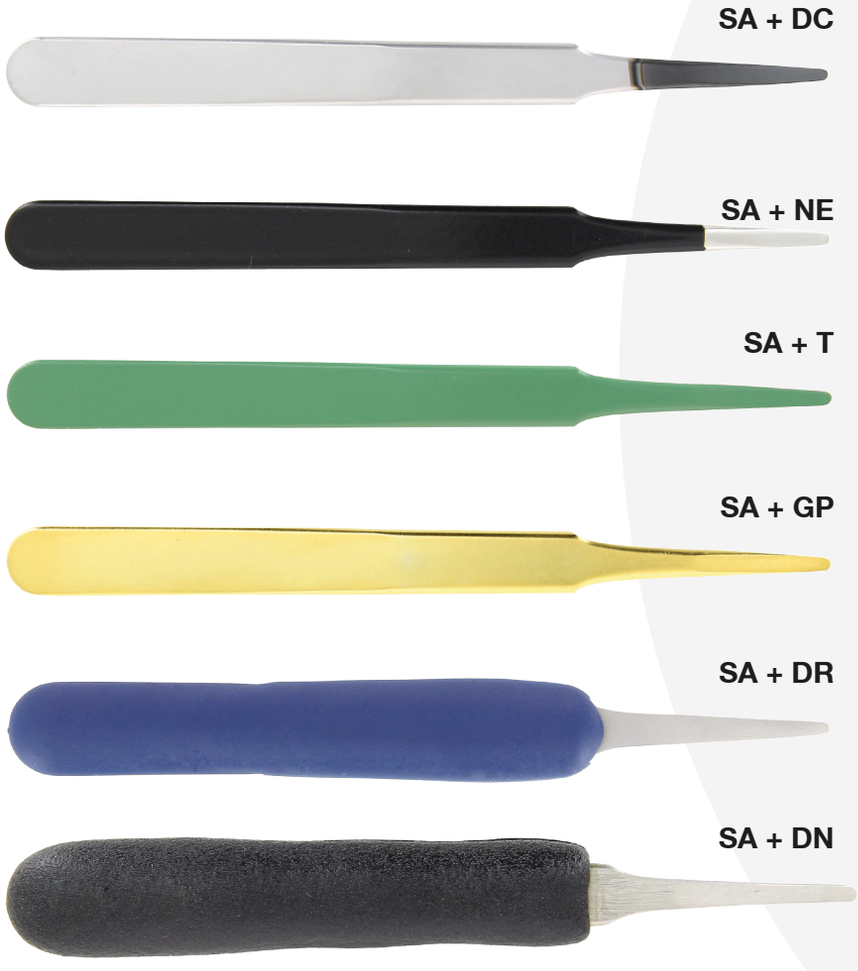

COATING DESCRIPTION	MAIN FEATURES & APPLICATIONS
High-tek Diamond coating	ESD-safe material - hardness - wear resistance - friction coefficient - adherence to the tweezers - humidity resistant - chemical stability and corrosion resistance - 100% biological compatibility ***TYPICAL APPLICATIONS*** DLC tweezers are ideally suited for applications in medical, biological and clean room environments, as well as perfect for handling hard / abrasive materials.
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
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.
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
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
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

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Plastic tweezer materials

More TECHNICAL information on our material TDS

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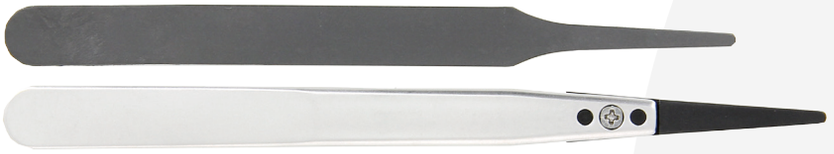
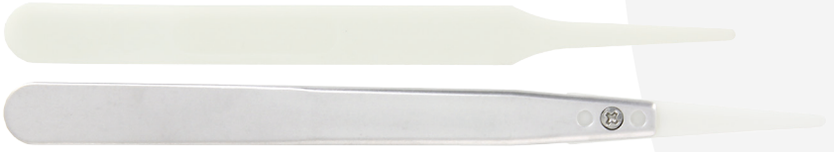
	MATERIAL DESCRIPTION	MAIN FEATURES & APPLICATIONS
 **CP**	High-performance plastic - Carbon PEEK (polyetheretherketone reinforced with carbon nano)	ESD safe material - ⬟ hardness - ■ rigidity - ⬟ flexural strength - ⬟ wear resistance - ◆ dimension stability - ⬟ resistance to chemicals and aggressive 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 strenght - ■ 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 strenght - ◆ 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

SA + MZ

SA + ZJ

PSZ

More TECHNICAL information on our material TDS

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MATERIAL DESCRIPTION	MAIN FEATURES & APPLICATIONS
Advanced white ceramic (Zirconia Toughened Alumina)	⬟ 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
ESD advanced black ceramic (Zirconia Toughened Alumina)	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
Advanced Ceramic (Partially stabilized zirconia)	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