



Training Program - 01. Tweezer materials

Tweezer material selection guide*



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

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

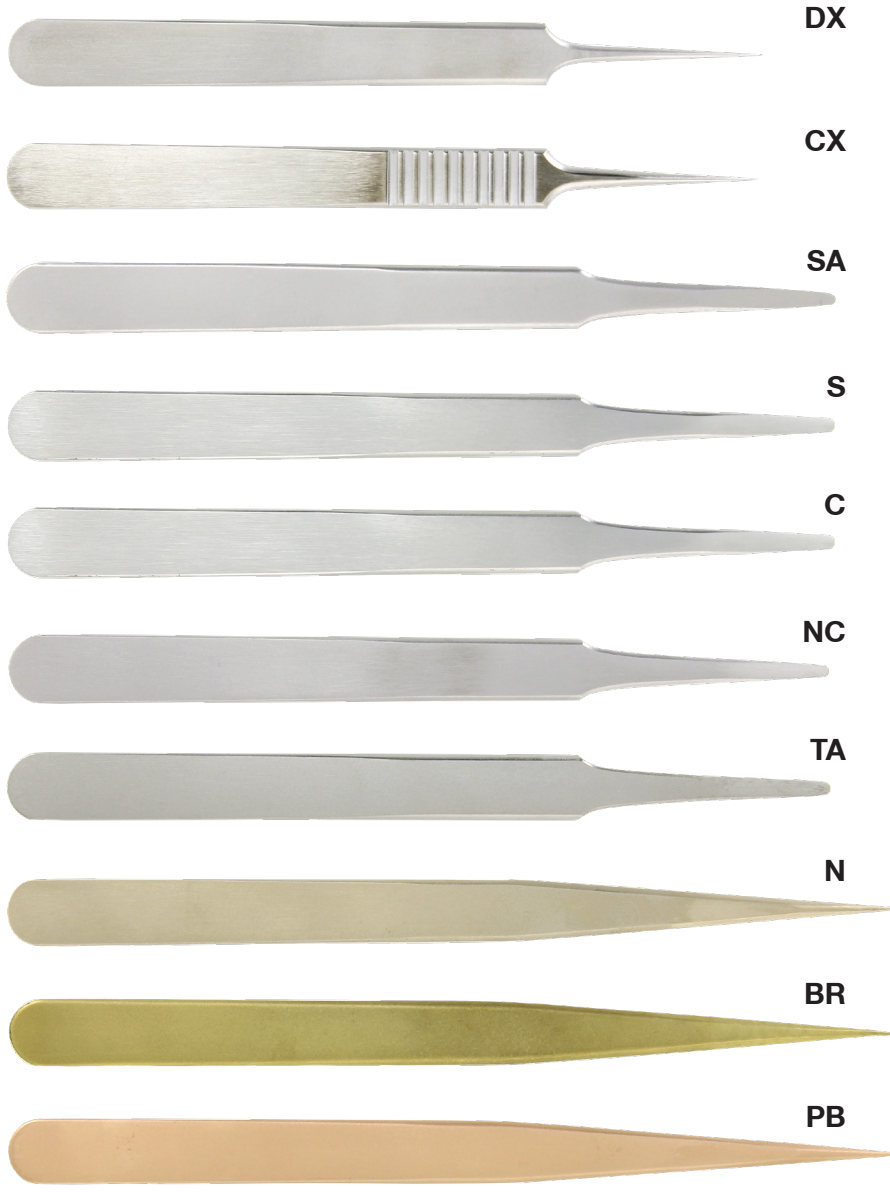
TEMPERATURE RESISTANCE
The resistance of material properties to decrease as temperature increases

ESD SAFE
A material that reduces 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
CX
SA
S
C
NC
TA
N
BR
PB

MATERIAL DESCRIPTION	MAIN FEATURES & APPLICATIONS
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.
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
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
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
Carbon Steel (AISI 1060)	Magnetic - strength - hardness - resistance to corrosion TYPICAL APPLICATIONS Tweezers and cutting tools for the electronic industry, watch-makers, jewelers applications
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
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
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
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
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
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 PTFE coating	abrasion resistance - toughness - chemical corrosion resistance - cleanliness - heat resistance - cryogenic stability TYPICAL APPLICATIONS PTFE-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

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



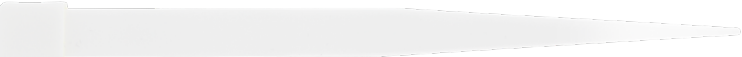
Engineering plastic - Larton (PPS/GF30 polyphenylene sulphide reinforced with 30 wt% glass fibre)

■ 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 style="text-align: right;">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 style="text-align: right;">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 style="text-align: right;">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>