

TECHNICAL DATA SHEET

Stainless steel type SA

General notes:

- » **Low carbon austenitic steel** (Material number 1.4435, DIN X2CrNiMo18-14-3, AISI number 316L)
- » contains from 16.5 to 18.5 wt% chromium and has important quantities of nickel and molybdenum as additional alloying elements
- » non-magnetizable
- » good corrosion resistance to most chemicals, salts and acids
- » generally used where corrosion resistance and toughness are primary requirements
- » typical applications include tweezers for the electronic industry, watch-makers, jewelers and laboratory and medical applications in moderately aggressive chemical environments

Composition

Component	Wt. %	Component	Wt. %	Component	Wt. %
C	≤0.03	Si	≤1.0	Mn	≤2.0
P	≤0.045	S	≤0.03	Cr	17.0-19.0
Mo	2.5-3.0	Ni	12.5-15.0		

Mechanical properties

State	annealed
Density	8.0 g/cm³
Hardness HB30	≤ 215
Hardness Rockwell B	79
Tensile strength, ultimate	500-700 MPa
Tensile strength, yield	290
0.2% Yield stress	≥ 200 MPa
Elongation, break	40%
Modulus of elasticity	200 GPa

Thermal properties

Coef. of lin. therm expansion	16.0 E-6/°C	20°C-100°C
Coef. of lin. therm expansion	17.0 E-6/°C	20°C-300°C
Specific heat capacity	0.50 J/(g·K)	
Thermal conductivity	15 W/(m·K)	
Continuous use temperature	350°C	
Max service temperature, air	925°C	

Electrical properties

Resistivity	0.75 E-4 Ohm.cm
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Ceramic Replaceable Tip Tweezers (MZ)

General notes:

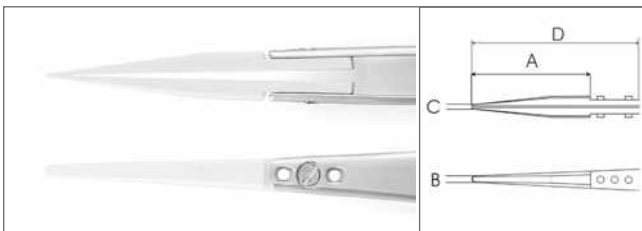
- » **Zirconia Toughened Alumina (ZTA)**
- » a superior combination of high strength (from zirconia) and high hardness (from alumina)
- » relatively low density
- » no open porosity
- » very hard surface, good abrasion and wear resistance
- » good flexural strength and fracture toughness
- » excellent thermal properties and high temperature stability
- » extreme corrosion resistance, nearly chemically inert
- » **electrically insulating**
- » typically applications includes soldering processes, handling of components during thermal and chemical processes. Generally used when very rigid tips are required

Thermal properties

Thermal conductivity	26 W/m·K	
Coef. of lin. therm expansion	8.0 E-6/°C	25°C-1.000°C
Continuous Use Temperature	1400°C	20.000 h
Shock resistance, ΔT	325°C	

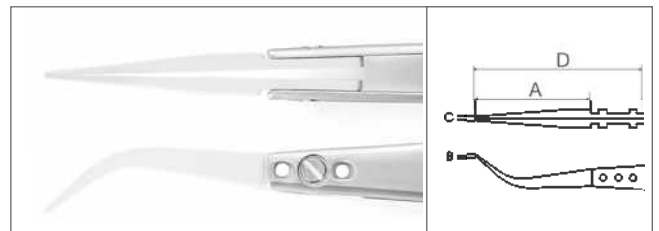
Electrical properties

Surface resistivity	>10¹² Ohm-cm
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2AMZ.SA

A 1.4" 35mm - B 0.08" 2.0mm - C 0.02" 0.5mm -
D 1.9" 50mm _ Replaceable tips set code: **A2AMZ**



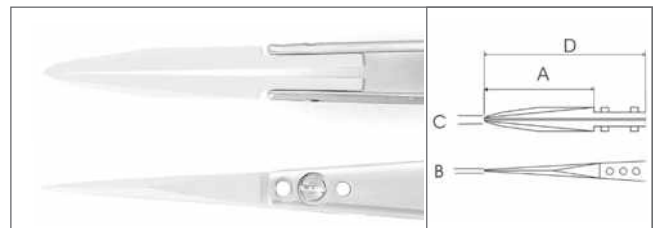
7MZ.SA

A 1.2" 30mm - B 0.03" 0.7mm - C 0.035" 0.9mm -
D 1.57" 40mm _ Replaceable tips set code: **A7MZ**



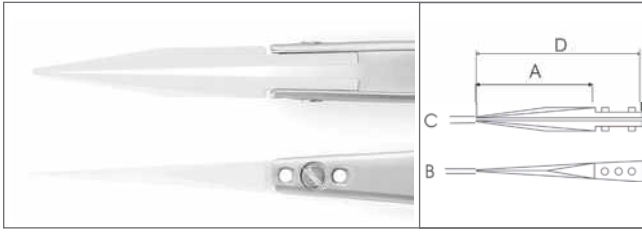
71MZ.SA

A 1.18" 30mm - B 0.03" 0.7mm - C 0.05" 1.2mm -
D 1.8" 45mm _ Replaceable tips set code: **A71MZ**



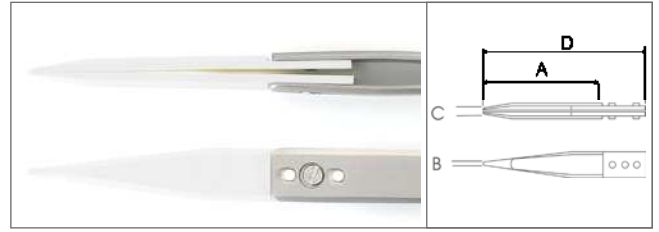
72MZ.SA

A 1.18" 30mm - B 0.01" 0.3mm - C 0.03" 0.7mm -
D 1.8" 45mm _ Replaceable tips set code: **A72MZ**



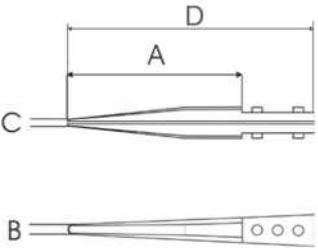
73MZ.SA

A 1.4" 35mm - B 0.01" 0.3mm - C 0.04" 1.0mm -
D 1.9" 50mm _ Replaceable tips set code: **A73MZ**



74MZ.SA

A 1.6" 40mm - B 0.04" 1.0mm - C 0.04" 1.0mm -
D 2.2" 55mm _ Replaceable tips set code: **A74MZ**

	A mm	B mm	C mm	D mm	
2AMZ.SA	35	2.0	0.5	50	
7MZ.SA	30	0.7	0.9	40	
71MZ.SA	30	0.7	1.2	45	
72MZ.SA	30	0.3	0.7	45	
73MZ.SA	35	0.3	1.0	50	
74MZ.SA	40	1.0	1.0	55	
PART #	DIMENSIONS				

TECHNICAL DATA SHEET

Advanced Ceramic type MZ

General notes:

- » **Zirconia Toughened Alumina (ZTA)**
- » a superior combination of high strength (from zirconia) and high hardness (from alumina)
- » relatively low density
- » no open porosity
- » very hard surface, good abrasion and wear resistance
- » good flexural strength and fracture toughness
- » excellent thermal properties and high temperature stability
- » extreme corrosion resistance, nearly chemically inert
- » electrically insulating
- » typically applications includes soldering processes, handling of components during thermal and chemical processes. Generally used when very rigid tips are required

Mechanical properties

Flexural modulus	380 GPa
Flexural strength	500 MPa
Tensile strength	450 MPa
Fracture toughness	7.2 Mpa·m^{1/2}
Knoop Hardness	1750 kg/mm²

Thermal properties

Thermal conductivity	26 W/m-K	
Coef. of lin. therm expansionl	8.0 E-6/°C	25-1000°C
Continuous Use Temperature	1400°C	20'000 h
Shock resistance, ΔT	325°C	

Electrical properties

Volume resistivity	>10¹² Ohm-cm
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Other properties

Density	4.30 g/ccm
Open porosity	0.0%
Water absorption	0.0%
Color	white

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