



# Micromanipulator

**Probe Tips** are a common consumable necessary for the analytical probing of many products. Commonly used in the Failure Analysis, Product Development, & Research departments.

Most of our customers either buy them in bulk to save or **submit a blanket purchase order** that covers a one-year term, and; allows them to **order smaller quantities throughout the year while still getting the bulk discount.**

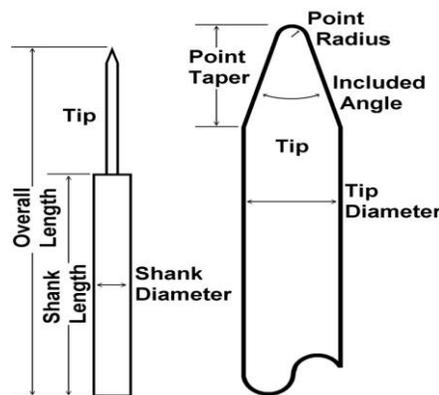
If you are unsure of how many of these tips you are buying I would suggest searching your records for **Probe Tips, Probe Needles, or Probe Pins** to see that consolidating these purchases would be a great savings to your organization.

Please contact me at [sales2@micromanipulator.com](mailto:sales2@micromanipulator.com)

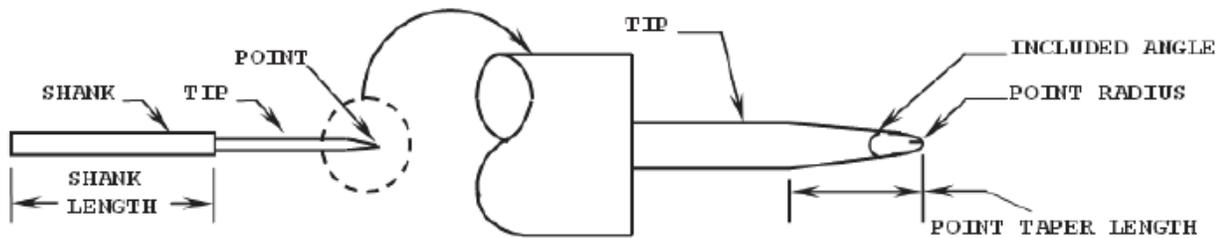
The Table below showcases our most popular probe tip styles in order of popularity.

Model	Per Box *	Box Qty 10+	Box Qty 25+	Box Qty 50+	Box Qty 100+
<a href="#">7B</a>	\$125.00	\$95.00	\$85.00	\$75.00	\$65.00
<a href="#">7A</a>	\$135.00	\$105.00	\$90.00	\$80.00	\$70.00
<a href="#">7S</a>	\$265.00	\$200.00	\$175.00	\$155.00	\$135.00
<a href="#">7X</a>	\$240.00	\$180.00	\$160.00	\$140.00	\$120.00
<a href="#">7H</a>	\$150.00	\$115.00	\$100.00	\$90.00	\$75.00

\*Each box contains 10 probe tips



Probe Tip Reference	Style	Model Number	Tip Diameter*	Point Radius in Microns*	Point Taper Length*	Included Angle (degrees)*	Overall Length*	Shank Diameter*	Material	Attributes
	Fine-tip	7A	.005"	0.35	.020"	14	1.4"	.020"	Shank: Nickel	Bendable shank cat-whisker
		7A-M	.005"	0.35	.020"	14	1.4"	.020"	Tip: Tungsten	
	Heavy Duty Needle	7B	.020"	0.5	.060"	19	1.4"	.020"	Tungsten	Bendable shank and tip Larger targets General purpose  * may be Gold plated, add "G" to part number
		7B-1	.020"	1.0	.070"	16	1.4"	.020"		
		7B-2	.020"	2.0	.090"	13	1.4"	.020"		
		7B-5*	.020"	5.0	.090"	13	1.4"	.020"		
		7B-10*	.020"	10.0	.075"	15	1.4"	.020"		
		7B-25*	.020"	25.0	.080"	14	1.4"	.020"		
		7B-50*	.020"	50.0	.080"	11	1.4"	.020"		
7B-100*		.020"	100.0	.080"	9	1.4"	.020"			
7B-200*	.020"	200.0	.080"	3	1.4"	.020"				
Small Targets with 'C' bend	7C	.005"	0.35	.025"	14	1.3"	.020"	Dumet (CU.FE)	Bendable shank cat-whisker	
Tungsten Carbide	7D	.020"	5.0	.075"	15	1.4"	.020"	Tungsten Carbide	For cutting	
	7D-3/4	.020"	5.0	.075"	15	0.75"	.020"			
Small Targets High Temperature	7F	.001"	0.5	.0027"	21	1.50"	.020"	Shank: Nickel Tip: Tungsten	Bendable shank and tip cat-whisker super flexible	
	7F-10	.001"	10.0	.001"	45	1.50"	.020"			
	7F-C10 with 'C' bend	7F-C10	.003"	10.0	.004"	37	1.50"			.020"
Heavy Duty Needle	7G	.020"	0.5	.060"	19	0.5"	.020"	Tungsten	Same as Model 7B but shorter shank length  * may be Gold plated, add "G" to part number	
	7G-1	.020"	1.0	.070"	16	0.5"	.020"			
	7G-2	.020"	2.0	.090"	13	0.5"	.020"			
	7G-5*	.020"	5.0	.090"	13	0.5"	.020"			
	7G-10*	.020"	10.0	.075"	15	0.5"	.020"			
	7G-25*	.020"	25.0	.080"	14	0.5"	.020"			
	7G-50*	.020"	50.0	.080"	11	0.5"	.020"			
	7G-100*	.020"	100.0	.080"	9	0.5"	.020"			
7G-200*	.020"	200.0	.080"	3	0.5"	.020"				
Low Contact Resistance	7H	.020"	1.0	.135"	8	1.4"	.020"	Beryllium Copper	Low contact resistance	
Very Small Targets	7X	7X-SHORT	.003"	0.1	.013"	13	1.4"	.020"	Shank: Nickel Tip: Tungsten	Bendable shank cat-whisker sharpest probe
		7X-M	.003"	0.1	.013"	13	1.4"	.020"		
	7X-M	.003"	0.1	.013"	13	1.4"	.020"	Bendable		
High Compliance	7S	.005"	0.35	.020"	14	1-5/8"	.020"	Tungsten	Very flexible	



## SERIES - 7 - DISPOSABLE PROBE TIPS

### Model 7A

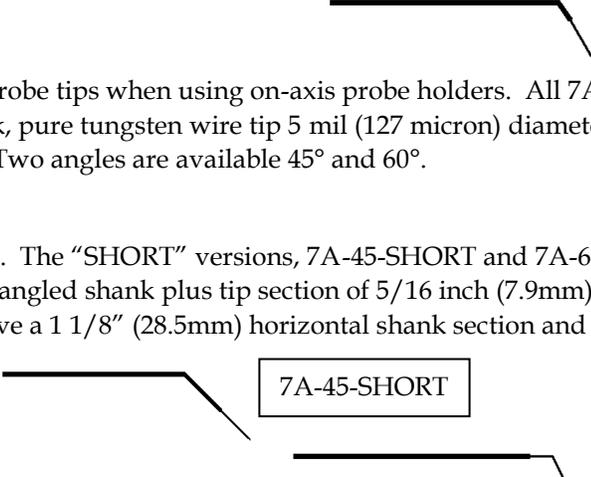
The 7A has a 20 mil (0.5mm) diameter nickel shank, 1.25" (32mm) long. The tip is 5 mil (127 micron) diameter pure tungsten wire about 130 mil (3.3mm) long. The standard point radius is 0.35 micron. The point taper length is 20 mils (0.5mm). The included angle is 14°. Special radii from 0.1 to 50 micron are available upon request. The total length of the shank and tip is 1.4 inch (35.5mm) long.

The butt weld attaching the tip to the shank is brittle and can not be bent without breaking off the tip. If it is necessary to bend this probe it should be done on the shank away from the weld as shown to the right. If an application requires the tip wire to be bent the model 7A-M is recommended.

### **7A Pre-bent 45° and 60°**

The 7A pre-bent probe tips allow for quick change of probe tips when using on-axis probe holders. All 7A pre-bent probe tips have a 20 mil (0.5mm) diameter nickel shank, pure tungsten wire tip 5 mil (127 micron) diameter and 130 mil (3.3mm) long, plus a point radius of 0.35 micron. Two angles are available 45° and 60°.

These are available in "SHORT" and "LONG" versions. The "SHORT" versions, 7A-45-SHORT and 7A-60-SHORT, have a 5/8" (15.8mm) horizontal shank section and an angled shank plus tip section of 5/16 inch (7.9mm). The "LONG" versions, 7A-45-LONG and 7A-60-LONG, have a 1 1/8" (28.5mm) horizontal shank section and an angled shank plus tip section of 5/16 inch (7.9mm).



7A-45-SHORT

### **Model 7A-M**

To take full advantage of the low profile probing capabilities of the on-axis probe the probe point must be bent at the tip. The tip wire of the standard 7A when bent may fracture at the weld and break. This is not a problem however with the models 7A-M (and 7X-M) because the spot weld is not brittle and flexure will not break it. The tip wire may be bent at any point along its length without risk of breakage. These probes may be bent on either the shank or the tip to produce points with profiles as small as 1/16 inch (1.5mm).

This probe tip has a 20 mil shank (0.5mm), 1.25 inch (32mm) long, with a 5 mil (127 micron) diameter tip wire, about 150 mil (3.8mm) long. The total length of the shank and tip is 1.4 inch (35.5mm) long. The point taper length is 20 mils (0.5mm). The included angle is 14°. The standard point radius is 0.5 micron. Radii from 0.1 to 50 micron are available upon special order.

## Model 7B

This probe is made from a single piece of tungsten wire, 20 mil (0.5mm) diameter, with an overall length of 1.4 inch (35.5mm). The shank is continuous with the point, there is no separate tip wire. The point taper length is 60 mils (1.5mm). The included angle is 19°. The 7B has a point radius of 0.5 micron. Even though special point radii can be made to customer specifications, there is a series of stock 7B probes with a full range of radii. See chart below. There is also a series of gold plated radius probes. The 7B can transmit 3 amps at low wattage; large point radius probe tips are recommended for high voltage or high current applications (all at low wattage).

Because this probe is made from pure tungsten, which is relatively hard and stiff, it is not easy to cut or bend. If a shorter probe is needed refer to the 7G probe tip.

Tungsten	Gold Plated	Shank Diameter		Point Radius $\mu\text{m}$	Point Taper Length		Included Angle $^{\circ}$
		mil	mm		mil	mm	
<a href="#">7B</a>		20	0.5	0.5	60	1.5	19
<a href="#">7B-1</a>		20	0.5	1	70	1.8	16
<a href="#">7B-2</a>		20	0.5	2	90	2.3	13
<a href="#">7B-5</a>	<a href="#">7B-5G</a>	20	0.5	5	90	2.3	13
<a href="#">7B-10</a>	<a href="#">7B-10G</a>	20	0.5	10	75	1.9	15
<a href="#">7B-25</a>	<a href="#">7B-25G</a>	20	0.5	25	80	2.0	14
<a href="#">7B-50</a>	<a href="#">7B-50G</a>	20	0.5	50	80	2.0	11
<a href="#">7B-100</a>	<a href="#">7B-100G</a>	20	0.5	100	80	2.0	9
<a href="#">7B-200</a>	<a href="#">7B-200G</a>	20	0.5	200	80	2.0	3

## **7B Pre-bent 45° and 60°**

The 7B pre-bent probe tips allow for quick change of probe tips when using on-axis probe holders. All 7B pre-bent probe tips have a 20 mil (0.5mm) diameter tungsten shank, a 20 mil (0.5 mm) tip diameter and a point radius of 0.5 micron. Two angles are available 45° and 60°.

These are available in "SHORT" and "LONG" versions. The "SHORT" versions, 7B-45-SHORT and 7B-60-SHORT, have a 5/8" (15.8mm) horizontal shank section and an angled section of 5/16 inch (7.9mm). The "LONG" versions, 7B-45-LONG and 7B-60-LONG, have a 1 1/8" (28.5mm) horizontal shank section and an angled section of 5/16 inch (7.9mm).

## Model 7C

The 7C probe is made from a diode header wire. The shank diameter is 20 mil (0.5mm). The shank length is 1.3 inch (33mm). The "C" bend tip is pure tungsten wire 5 mil (127 $\mu\text{m}$ ) diameter and about 1/16 inch (1.6mm) long. The point radius is 0.35 micron. Because of the relatively large diameter the tip wire and its short length, this probe has very little compliance and should not be used for applications that require the tip to flex and bend. The shank of the 7C probe tip is made of dumet metal (copper clad iron) and has a small glass bead near the tip. The glass bead serves no probing purpose.

## Model 7D - Cutting Probe Tip

The 7D is a single piece probe made from tungsten carbide wire 20 mil (0.5mm) in diameter and about 1.4 inch (35.5mm) long. The point is ground, not etched as in other pure tungsten probes, and therefore has a larger point radius and tolerance. The point radius is  $5 \pm 2$  micron. The point taper length is 75 mils (1.9mm) and the included angle is  $15^\circ$ . No other point radii are available.

A shorter version of the 7D is available as the model 7D-3/4. The 7D-3/4 has a length of 3/4 inch (19mm).

## Model 7F

The model 7F has a 20 mil (0.5mm) nickel shank 1.25 inch (31.7mm) long with a 1 mil (25 $\mu$ m) diameter tip wire about 0.25 inch (6.3mm) long. The standard point radius is 0.5 micron. Radii from 0.1 to 10 micron are available upon special order. The point taper length is 2.7 mils (69 $\mu$ m) and included angle is  $21^\circ$ . This is a compliant probe tip used for thermal chuck probing. To use this probe for hot chuck probing the point must be near vertical, within  $10^\circ$  or  $20^\circ$ , and the tip wire must be under enough force to bow it slightly. When bowed the tip acts like a leaf spring and will keep the point on its contact as it moves in three dimensions. Pre-bent models are available.

### 7F Pre-bent $45^\circ$ and $60^\circ$

The 7F pre-bent probe tips allow for quick change of probe tips when using on-axis probe holders. All 7F pre-bent probe tips have a 20 mil (0.5mm) diameter nickel shank, pure tungsten wire tip 1 mil (25 micron) diameter and 25 mil (6.3mm) long, plus a point radius of 0.5 micron. Two angles are available  $45^\circ$  and  $60^\circ$ .

These are available in "SHORT" and "LONG" versions. The "SHORT" versions, 7F-45-SHORT and 7F-60-SHORT, have a 5/8" (15.8mm) horizontal shank section and an angled shank plus tip section of 5/16 inch (7.9mm). The "LONG" versions, 7F-45-LONG and 7F-60-LONG, have a 1 1/8" (28.5mm) horizontal shank section and an angled shank plus tip section of 5/16 inch (7.9mm).

## Model 7G

This model is a short 7B. This probe is made from a single piece of tungsten wire, 20 mil (0.5mm) diameter, with an overall length of 0.5 inch (12.7mm). The shank is continuous with the point, there is no separate tip wire. The point taper length is 60 mils (1.5mm). The included angle is  $19^\circ$ . The 7G has a point radius of 0.5 micron. Even though special point radii can be made to customer specifications, there is a series of stock 7G probes with a full range of radii. See chart below. There is also a series of gold plated radius probes.

Because this probe is made from pure tungsten, which is relatively hard and stiff, it is not easy to cut or bend. If a longer probe is needed please refer to the 7B probe tip.

Tungsten	<a href="#">Gold Plated</a>	Shank Diameter		Point Radius $\mu$ m	Point Taper Length		Included Angle $^\circ$
		mil	mm		mil	mm	
7G		20	0.5	0.5	60	1.5	19
<a href="#">7G-1</a>		20	0.5	1	70	1.8	16
<a href="#">7G-2</a>		20	0.5	2	90	2.3	13
<a href="#">7G-5</a>	<a href="#">7G-5G</a>	20	0.5	5	90	2.3	13
<a href="#">7G-10</a>	<a href="#">7G-10G</a>	20	0.5	10	75	1.9	15
<a href="#">7G-25</a>	<a href="#">7G-25G</a>	20	0.5	25	80	2.0	14
<a href="#">7G-50</a>	<a href="#">7G-50G</a>	20	0.5	50	80	2.0	11
<a href="#">7G-100</a>	<a href="#">7G-100G</a>	20	0.5	100	80	2.0	9
<a href="#">7G-200</a>	<a href="#">7G-200G</a>	20	0.5	200	80	2.0	3

## Model 7H

The 7H is a single piece probe made from beryllium copper wire 20 mil (0.5mm) in diameter, with an overall length of about 1.5 inch (38.1mm). The point radius is 1micron. No other radii are available. The point taper length is 135 mils (3.4mm) and the included angle is 8°. The material is relatively soft and therefore may be cut or bent as needed. The 7H is designed for low contact resistance probing.



## Model 7S

The Model 7S probe tip is designed to produce a high compliance probe tip that provides a tip that 1) is extremely resistant to contact damage (fish-hooking), and 2) remain in contact with a device which moves due to thermal expansion/contraction. The selection of wire diameter, tip bend, tip taper and tip point radius all contribute to maintaining contact with a moving structure. The “spring” design provides a relatively constant force which maintains a uniform electrical contact. The 7S has a 20 mil (0.5mm) diameter nickel shank, 1.25” (32m) long. The tip is 5 mil (127 micron) diameter pure tungsten wire which extends beyond the shank by 3/8 to 1/2 inch (9.5 to 12.7mm). The standard point radius is 0.35 micron. The point taper length is 20 mils (0.5mm). The included angle is 14°. The total length of the shank and tip is 1 5/8 to 1 3/4 inch (41.3 to 44.4mm) long.



The butt weld attaching the tip to the shank is brittle and can not be bent without breaking off the tip. If it is necessary to bend this probe it should be done on the shank away from the weld as shown to the right.



## Model 7X

The 7X has a 20 mil (0.5mm) diameter nickel shank, 1 3/8 inch (34.9mm) long. The tip wire is pure tungsten, 3 mil (76µm) diameter, about 130 mil (3.3mm) long. The point taper length is 13 mils (0.33mm) and the included angle is 13°. The standard point radius is 0.1 micron. Larger radii up to 30 micron are available upon special order.

The 7X probe tip is etched to produce a very sharp thin point. The shape of the point is thin enough for probing very fine lines on a small pitch. Because of this thin shape the 7X is somewhat fragile, and relatively easy to bend.

As with the 7A, the butt weld joining the tip and shank is brittle on the 7X and can not be bent without breaking off the tip. This probe should be used straight, or when a bend is needed, should be bent on the shank away from the weld as shown at the right. If the tip wire is needed in a bent configuration the model 7X-M is recommended.



## **High Conductance Probe Tips (HCT)**

High conductance probe tips are specially manufactured to increase tip conductance and therefore reduce probe scrub needed by a factor of 5 or more. Models 7A, 7B, 7F, 7G, 7S, 7X and alternate radius tip probes may be ordered with a high conductance tip. To order use the standard tip model number then add the “ -HCT” suffix.

