



P-2000 SAMPLE PROGRAMS

QUARTZ 1.0 mm O.D. x 0.7 mm I.D.

PROGRAM#0: Micro-Electrode

Line 1 HEAT: 700 FIL: 4 VEL: 60 DEL: 145 PULL: 175

PROGRAM#2: Patch Pipette

Line 1 HEAT: 700 FIL: 4 VEL: 55 DEL: 130 PULL: 55

PROGRAM#4: Small Patch Pipette

Line 1 HEAT: 700 FIL: 4 VEL: 55 DEL: 130 PULL: 55

Line 1 HEAT: 700 FIL: 4 VEL: 50 DEL: 128 PULL: 60

OLD
Program #50

HEAT
725

QUARTZ 1.0 mm O.D. x 0.5 mm I.D.

PROGRAM#1: Patch Pipette

Line 1 HEAT: 700 FIL: 4 VEL: 55 DEL: 132 PULL: 55

Line 2 HEAT: 750 FIL: 4 VEL: 50 DEL: 127 PULL: 55

FIL
5

PROGRAM#6: Long Micropipette

Line 1 HEAT: 825 FIL: 5 VEL: 50 DEL: 145 PULL: 175

VEL
50

QUARTZ 1.5 mm O.D. x 0.75 mm I.D.

PROGRAM#9: Patch Pipette

Line 1 HEAT: 925 FIL: 4 VEL: 40 DEL: 130 PULL: 40

Line 2 HEAT: 875 FIL: 4 VEL: 60 DEL: 126 PULL: 60

VEL
128

BOROSILICATE 1.0 mm O.D. x 0.5 mm I.D.

PROGRAM#10: Micro-Electrode

Line 1 HEAT: 350 FIL: 4 VEL: 50 DEL: 225 PULL: 150

PROGRAM#11: Patch Pipette

Line 1 HEAT: 350 FIL: 4 VEL: 30 DEL: 200 PULL: 0

PULL

ALUMINOSILICATE 1.0 mm O.D. x 0.58 mm I.D.

PROGRAM#20: Micro-Electrode

Line 1 HEAT: 400 FIL: 4 VEL: 50 DEL: 225 PULL: 150

PROGRAM#21: Patch Pipette

Line 1 HEAT: 400 FIL: 4 VEL: 30 DEL: 200 PULL: 0

Sutter Instrument Company

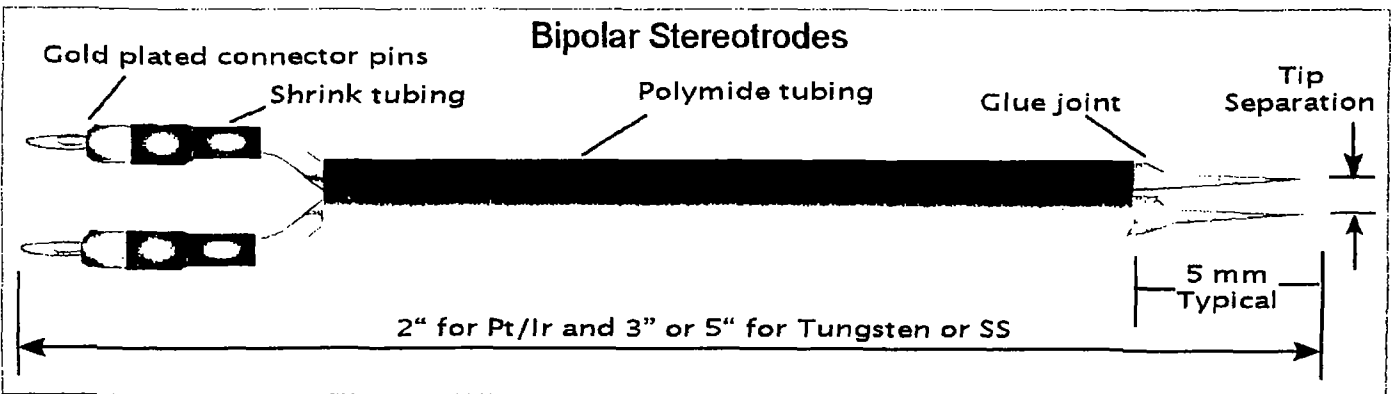
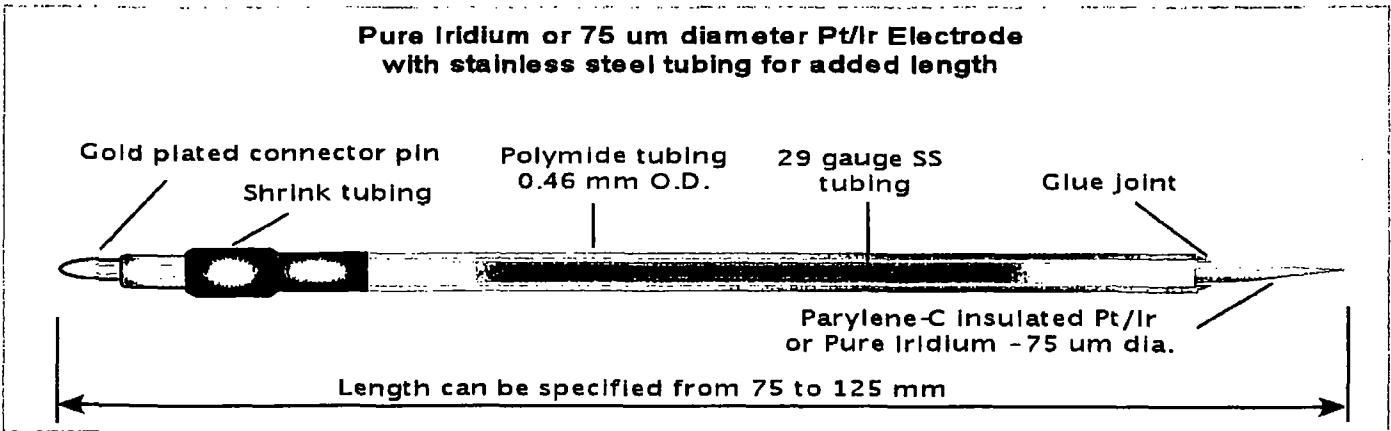
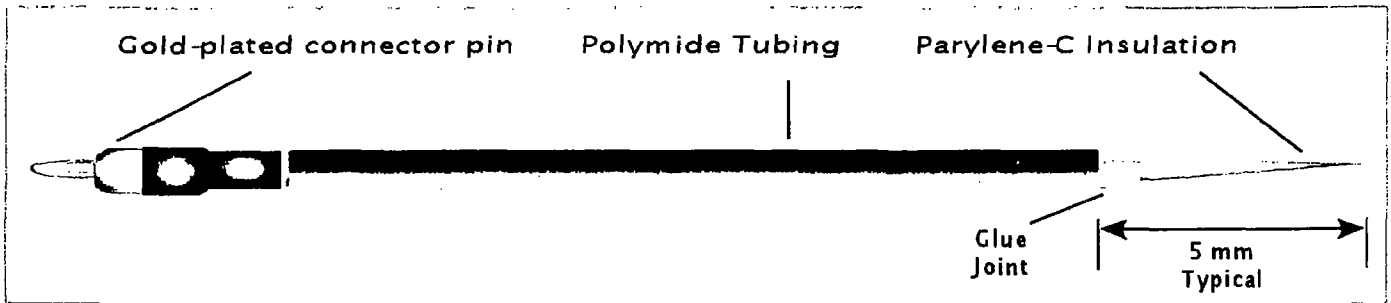
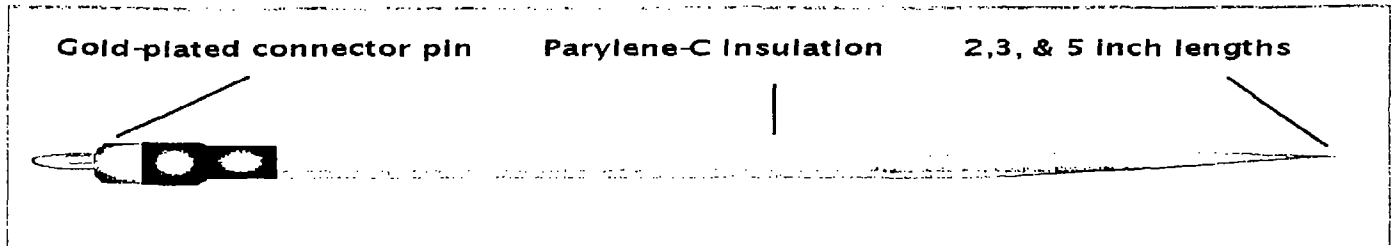
51 DIGITAL DRIVE, NOVATO CA 94949

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METAL MICROELECTRODES and STEREOTRODES

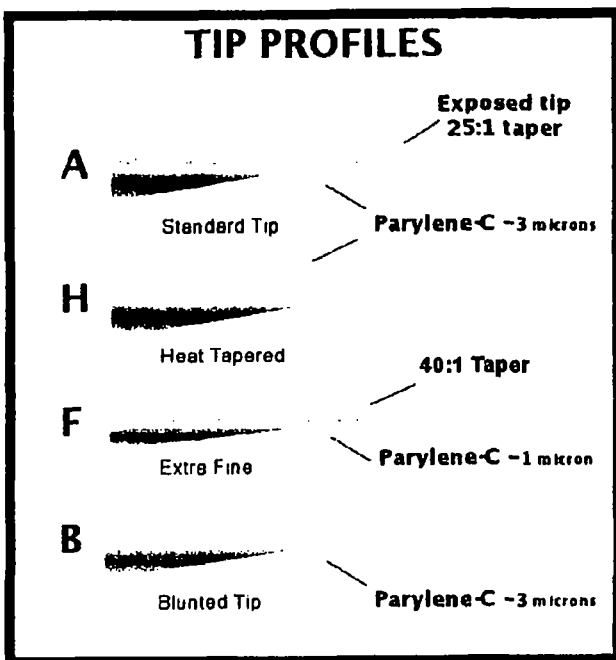
Micro Probe offers a variety of microelectrodes made with Platinum/Iridium, Tungsten, Stainless Steel (Elgiloy), and pure Iridium. Our probes are sharpened electrochemically, insulated with Parylene-C, individually exposed under a microscope, and inspected to have reproducible tip profiles and tip exposures. Parylene-C is a bio-compatible polymer which is deposited one molecule at a time in a vacuum chamber. It provides a pin hole free uniform insulation right down to the recording or stimulating tip.

We understand the importance in providing an electrode which is perfect. The primary starting point for any successful experiment begins at the electrode tip. We realize that there are almost as many ideal electrode designs as there are unique experimental protocols and therefore, we have provided a large number of micro-electrode configurations. Please visit our web site: www.microprobes.com to view all of our electrode selections



Please visit our web site, www.microprobes.com for a complete listing of all our electrode selections.

TIP PROFILES

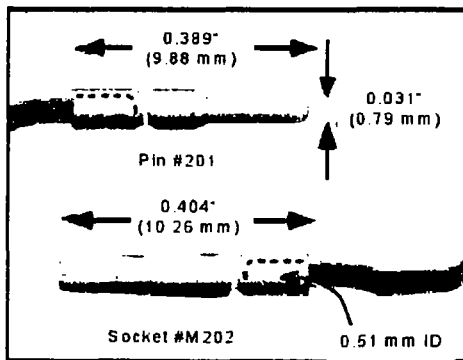


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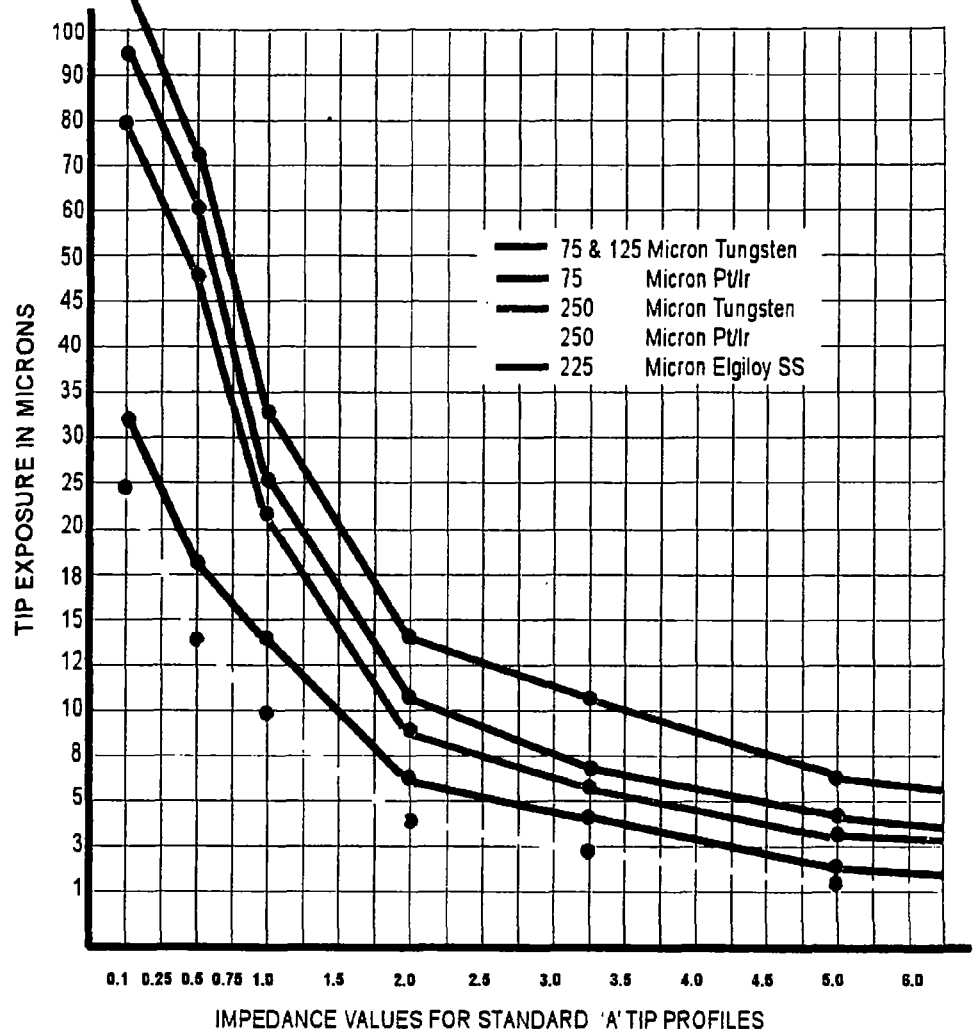
The tip profile is another subtle specification which will determine the ultimate success of your recording or stimulation paradigm. It is however, a microprobe parameter for which there is some debate. Many first time users may want to experiment with different tip profiles in order to see which one works best for their experimental protocol. The 'A' tip profile is the most general use model that works well for most applications.

The 'H' heat tapered model should be used by those investigators who must penetrate through membranes such as the dura. The "F" tip profile provides the finest tip profile and is excellent when one is trying to record from very small tightly packed cell structures or from nerve fibers. Many investigators have found that the "B" tip profile yields better signal to noise ratios and it

ELECTRODE TIP EXPOSURES FOR DIFFERENT IMPEDANCE VALUES



Most all electrodes come with the male, M201 connector. Each box also comes with a single female connector. These connectors may also be purchased in quantities of 100 each.



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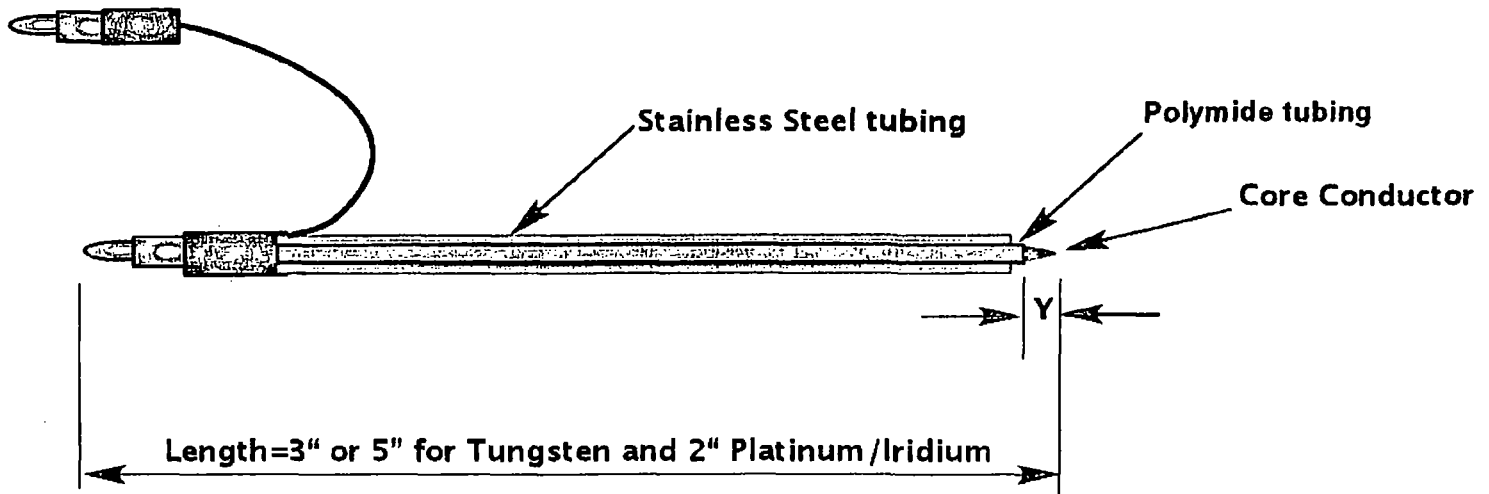
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 Galthersburg, MD 20877
 Phone:(301) 330-9788 * Fax:(301) 330-9667
 www.microprobes.com

TIP EXPOSURES FOR HEAT TAPERED "H" TIP PROFILES HAVE APPROXIMATELY 15 TO 20 PERCENT MORE EXPOSURE
 TIP EXPOSURES FOR BLUNTED "B" TIP PROFILES HAVE APPROXIMATELY 15 TO 20 PERCENT LESS EXPOSURE
 TIP EXPOSURES FOR THE "F" EXTRA FINE TIP PROFILES HAVE APPROXIMATELY 10 TO 15 PERCENT MORE EXPOSURE

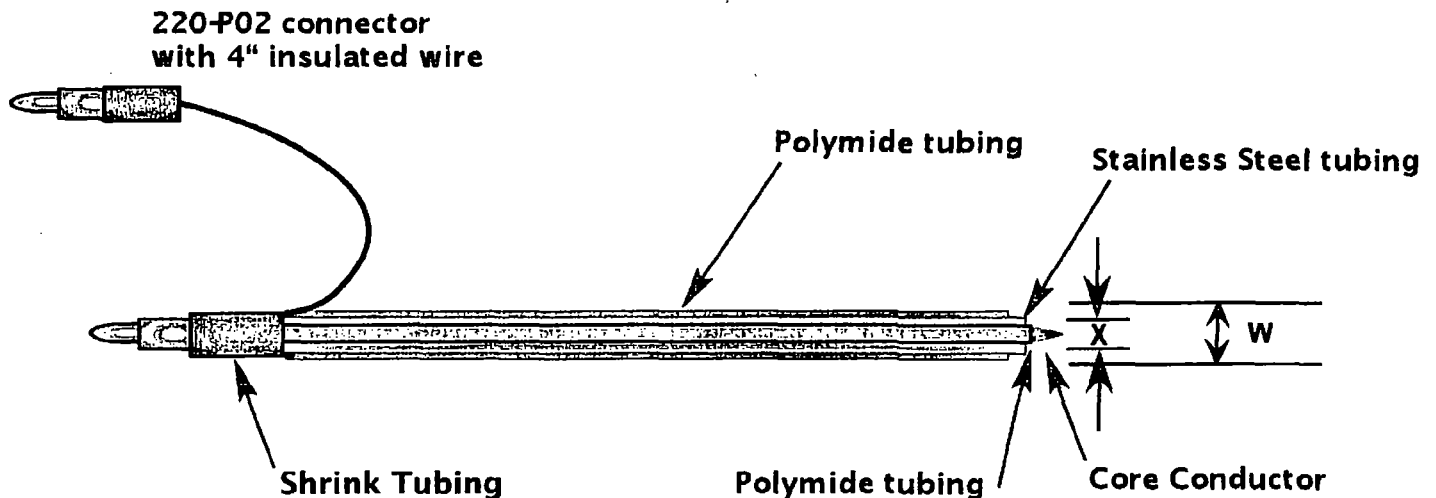
CONCENTRIC BIPOLAR ELECTRODES

Concentric bipolar electrodes are excellent for shielded macro recording as well as evoked potentials. They are especially well suited for bipolar stimulation paradigms.

CONCENTRIC ELECTRODE WITH EXPOSED METAL SHIELD



CONCENTRIC ELECTRODE WITH SS SHIELD INSULATED WITH POLYIMIDE



(Edges shown sharp for demonstration purposes only)

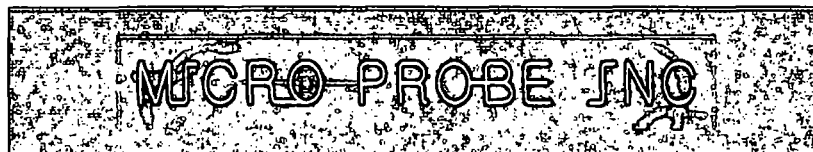
Concentric Bipolar Electrodes can be ordered with 3 or 5 inch long tungsten or 2 inch platinum/iridium core conductors. The electrode is etched to a sharp point. The outer stainless steel conductor can be specified exposed or insulated with Polymide tubing. 'W' is the overall outside diameter, 'X' is the outer diameter of the inner Polymide sleeve, and 'Y' is the length of the exposed core conductor.

(See table for different configurations and metal types)

Concentric Metal Electrodes

Excellent for ERP Recording and Stimulation

Item	Electrode length	Dimensions			Tip dia. microns	Tip Profile	Outer Polymide	price pkg of 5
		W	X	Y				
Tungsten (0.003" X 3") Concentric Electrodes								
WE3CEA3	76 mm	0.400 mm	0.126 mm	<0.2 mm	2-3 um	Standard	yes	\$ 220.00
WE3CEA3SS	76 mm	0.325 mm	0.126 mm	<0.2 mm	2-3 um	Standard	no	\$ 200.00
Tungsten (0.005" X 3") Concentric Electrodes								
WE3CEA5	76 mm	0.450 mm	0.195 mm	<0.3 mm	2-3 um	Standard	yes	\$ 220.00
WE3CEA5SS	76 mm	0.350 mm	0.195 mm	<0.3 mm	2-3 um	Standard	no	\$ 200.00
Tungsten (0.005" X 5") Concentric Electrodes								
WE5CEA5	127 mm	0.450 mm	0.195 mm	<0.3 mm	2-3 um	Standard	yes	\$ 280.00
WE5CEA5SS	127 mm	0.350 mm	0.195 mm	<0.3 mm	2-3 um	Standard	no	\$ 240.00
Platinum/Iridium (0.003" X 2") Concentric Electrodes								
PI2CEA3	65 mm	0.400 mm	0.126 mm	<0.2 mm	2-3 um	Standard	yes	\$ 300.00
PI2CEA3SS	65 mm	0.325 mm	0.126 mm	<0.2 mm	2-3 um	Standard	no	\$ 280.00
Platinum/Iridium (0.010" X 2") Concentric Electrodes								
PI2CEA10	65 mm	0.760 mm	0.360 mm	<0.4 mm	3-4 um	Standard	yes	\$ 300.00
PI2CEA10SS	65 mm	0.525 mm	0.360 mm	<0.4 mm	3-4 um	Standard	no	\$ 280.00



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Micro Wire Arrays for Chronic Implantation

Flexible design options

Although we stock several Omnetics connectors models you may specify your own connector model

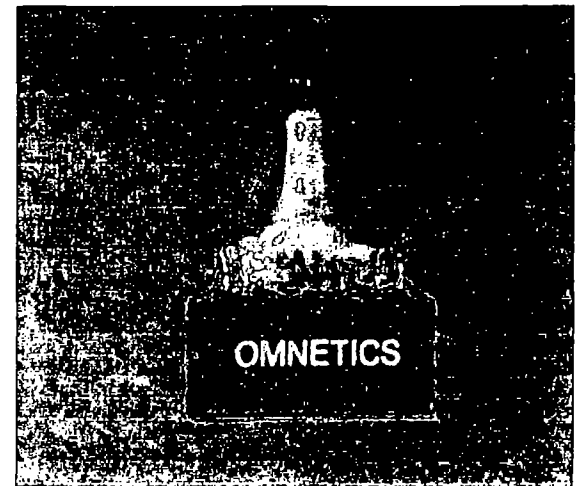
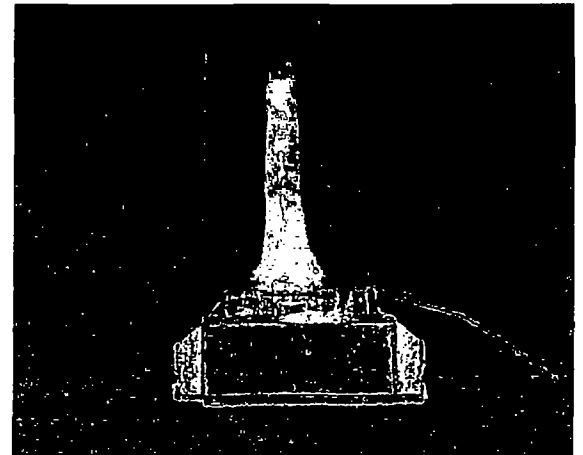
Select either stainless steel or platinum/iridium wires

Can be specified with or without ground and reference wires

Designed in cooperation with Dr. Laura People's Laboratory at the University of Pennsylvania, these arrays have been developed to provide the optimum in flexibility to the investigator. We can assemble your arrays using one of several different metals as well as insulating materials. Several of our users have requested that we stack two connectors to increase the number of wires using the Omnetics connectors shown to the right. At this time we can provide as many as 36 electrode wires in one array including a ground wire. These arrays have been fabricated using either stainless steel, silver, or platinum/iridium ground wires

Please review some of our standard micro wire array designs and keep in mind that you may specify most of the parameters associated with their fabrication. Download the "Design Sheet For Micro Wire Arrays" from our web site to specify your optimum design parameters.

Call or email us to
obtain a quotation for
your specific application



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Specifying and Pricing of Micro Wire Arrays

Micro Probe can fabricate arrays having many different configurations utilizing one of the many Omnetics connectors as well as other connector types. We list here a sampling of our standard designs and how to specify the many variables associated with these arrays. Please use the "Design Sheet for Micro Wire Arrays" to assist you in designing your Micro Wire Array.

Metal type SS or PI	Number of Electrodes N	Number of conn. #	length of carbo wax Y.Y in mm	Elect. Dist. beyond carbo XX in mm	Electrode separation Es=.25/.5 mm	Separation btw. rows Rs=.25/.5 mm	Reference Electrode 1=yes/0=no	Ground wire 0=no or SS Ag for silver	Epoxy depth/mm marker-0=none or dist. from tip
ex. SS	8	1	5	2	0.25	0	0	SS	0
ex. PI	16	2	10	2	0.25	0.5	1	Ag	5

- (1) Electrode diameters are 0.002" (50 microns); the stainless steel wire is insulated with Teflon and the Pt/Ir with H-ML.
- (2) The ground electrode can be specified as 0.005" SS or 0.008" Silver - Ag.
- (3) The reference electrode is of the same metal type and deminsions as the electrodes but with a 2mm exposure.
- (4) The inner row spacing is 0.50 mm unless otherwise specified.
- (5) Single connector models may specify multiple rows.

EX. 1: SS-8-1-5.0-2.0-.25-0-0-SS-0 is a single connector stainless steel Micro Wire Array with 8 electrode wires, the SS wires have a total length of 7 mm beyond the epoxy mold with 2 mm beyond the carbo wax, the distance between the micro wires are spaced 0.25 mm apart, no reference wire, and the array has a 2 cm long SS ground wire.

EX. 2: PI-16-2-10.0-2.0-.25-.5-1-Ag-5.0 is a 2 connector platinum/iridium Micro Wire Array with 16 electrode wires, the PI wires have a total length of 12 mm beyond the epoxy mold with 2 mm beyond the carbo wax, the distance between the electrode wires is 0.25 mm and the distance between the rows is 0.5 mm, a reference wire is included as well as a 2 cm long silver wire, there is an epoxy ball that extends 5.0 mm up from the tips as a depth marker.

PRICING - Price is based on the number of connectors (Omnetics #s A11365-001 or A12623-001), the number of wires, the metal type specified, stainless steel or platinum/iridium, and whether a reference and or ground wire is specified. For Omnetics connector types with 0.025" centers or other connector types contact *MPI* for a quotation.

Metal type	Price for # of connectors	+ n # of Electrodes*	+ Ground wire if specied	= Total cost
SS-Stainless steel	1 conn.=\$45 ^ 2 conn.=\$93	+ n x \$7.50	+ \$4.50	= \$
PI-Platinum/Iridium	1 conn.=\$45 ^ 2 conn.=\$93	+ n x \$9.50	+ \$4.50	= \$

* n includes reference electrode if specified

Pricing examples from above:

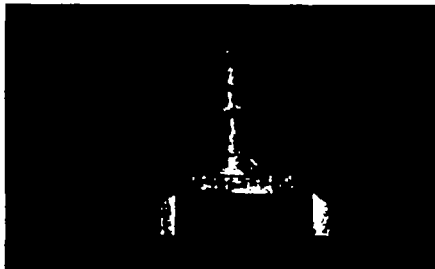
SS-8-1-5.0-2.0-.25-0-0-SS-0 = 45.00 + (8 x 7.50 = 60.00) + 4.50 = \$109.50

PI-16-2-10.0-2.0-.25-.50-1-Ag-5 = \$93.00 + (17 x 9.50 = 161.50) + 4.50 = \$254.50

SS-16-2-10-2.0-.25-.50-1-Ag-5 = \$93.00 + (17 x 7.50 = 127.50) + 4.50 = \$220.50

Micro Probe offers quantity discounts on these arrays based on the following quantities:

5 - 12 = 10% 13 to 24 = 15% 25 and up = 20%



Omnetics # A12623-001

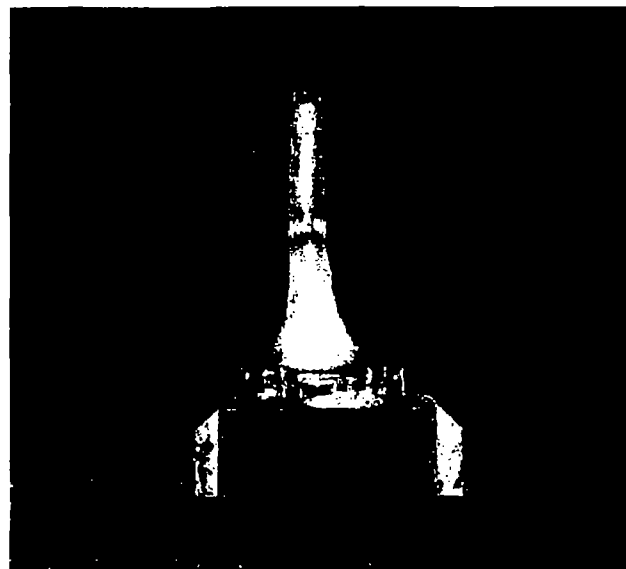
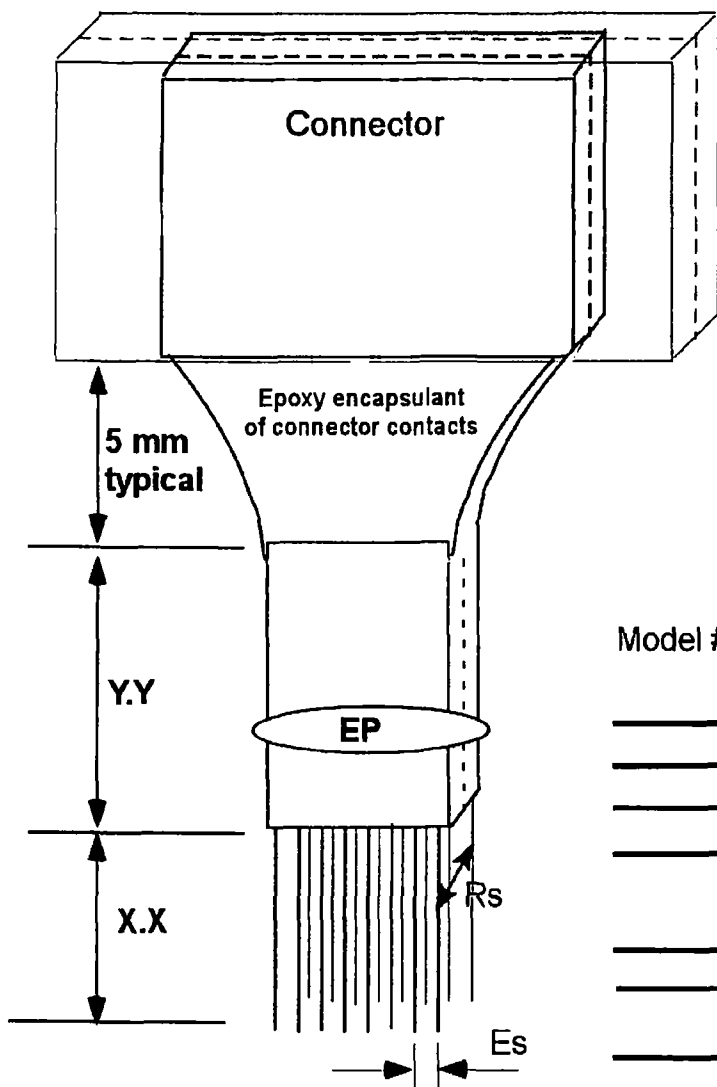


Omnetics # A11365-001

DESIGN SHEET FOR MICRO WIRE ARRAYS

This sheet is intended as a guide to assist potential users of our Micro Wire Arrays in specifying the dimensional characteristics and other parameters. Our unique fabrication process has been developed in order to optimize flexibility.

Although other connectors may be specified, we show here the Omnetics connector, model #A12623-001, only as an example. This connector has 10 positions. Many of our users have requested that we stack several of these connectors to obtain arrays of 20 or more electrodes in an array. The array shown below includes an epoxy "blob" gauging depth of insertion.



Model # (SS or PI)-N-#-Y.Y-X.X-Es-Rs-R-G-EP

- SS specifies Teflon insulated Stainless Steel
- PI specifies H-ML insulated Platinum/Iridium
- N is the number of electrodes
- # is the number of connectors required to satisfy the design requirements. Specify the number of rows as part of a sketch if possible.
- Y.Y is the length of the Polyethylene Glycol mold.
- X.X is the length the electrodes extend beyond the Polyethylene Glycol mold. (2 mm typical)
- Es may be specified as either 0.25 or 0.5 mm
- Rs is the distance between rows (typically 0.5 mm)
- Reference electrode typically with a 2mm exposure
- Ground - silver-Ag or SS ground wire
- EP is an optional epoxy "blob" used to provide a implant depth marker - specify distance from connector edge or electrode tips

* SS and PI wires are 0.002" (50 micron) diameter unless specified otherwise

We understand that there are potentially as many designs as there are experimental protocols. For this reason we want to work with the investigator in designing the most optimum array possible. Sketches are often helpful in assuring that your specifications are precisely incorporated into your multi-electrode array design. Please specify the location of the reference and ground electrodes if included in your design.

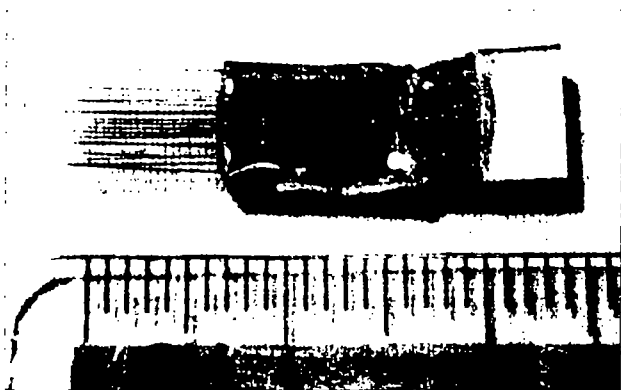
A typical part # *SS-9-1-10.0-2.0-25-0-0-Ag-0*, would represent a single row stainless steel array with 9 micro wires including a silver ground wire, a 10 mm length of carbo wax, electrodes extending 2 mm beyond the carbo wax mold, 0.25 mm spacing between electrode wires with no reference electrode or epoxy "blob".

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Multi-electrode Arrays

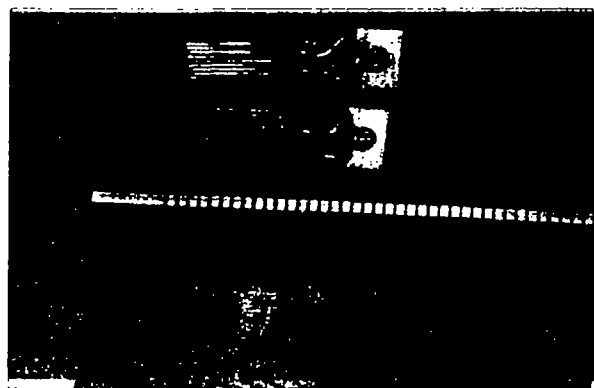
- Unlock your multi-channel recording possibilities with our unique microrecording arrays
- Omnetic's Connectors are compatible with many existing multi-channel recording systems
- Can be specified with tungsten or Pt/Ir core conductors
- Excellent for chronic as well as acute studies
- Available in a variety of configurations
- Suitable for small or large animal models

18 Electrode Array



These arrays were developed in cooperation with the Visual Research Laboratory at the California Institute of Technology. They were originally designed with chronic use applications in mind. However, they are equally effective for acute studies as well. The arrays can be designed having different spacing, lengths, metal type, impedance values, and connectors models. The number of rows in an array may also be specified.

36 Electrode Array



The arrays shown use sharpened 0.003" diameter wires. The array on the left is tungsten and the two on the right are Pt/Ir. They are insulated with Parylene-C, a biocompatible polymer which is especially well suited for chronic studies. The microelectrodes shown are on 400 micron centers.

Design and Specifications of Multi-Electrode Arrays

Although Micro Probe can fabricate arrays having many different configurations utilizing the 18 contact Omnetics connector, we list here a sampling of our standard designs and how to specify the many variables associated with these arrays. Please refer to the Design Sheet for Multi-Electrode Arrays to obtain specific guidelines in designing your arrays and selecting options. Any of our electrodes designs can be used in fabricating these arrays.

Metal type WE-tungs. Pt-Plat/Irid.	Electrode length zz.z=mm	Polymide no/yes 00/PT	Insulation thickness microns	Tip Impedance x.x=megohms	Tip Profile A/B/H	Electrode Diameter (1) 3/5/10	Dist. btw. Electrodes microns	Number of Electrodes n=8 to 64	Ground Electrode (2) yes/no	Low Z Ref. Electrode (3) yes/no
EX. 1-WE	8.0	00	3	0.3	A	3	400	36	1	1
EX. 2-WE	6.5	00	3	0.5	B	5	300	18	1	1
EX. 3-PI	9.0	PT	3	0.5	A	10	500	12	1	0

- (1) Electrode diameters are 3=0.003" (75 um), 5=0.005" (125 um), and 10=0.010" (250 um).
- (2) The Ground electrode is of the same metal type with the same overall dimensions but without any insulation.
- (3) The Low Z reference electrode has the same metal type and dimensions, but with an impedance of 25 kilohms.

Ex. 1: WE-8.0-00-3-0.3-A-3-400-36-1-1 – This 36 electrode array uses 0.003" tungsten microelectrodes without Polymide Tubing. impedance values of 0.3 megohms with A tip profiles. The electrodes are on 400 micron centers, extend 8.0 mm beyond the epoxy mold and with a single ground and differential electrode.

Ex. 2: WE-6.5-00-3-0.5-B-5-300-18-1-1 – This 18 electrode array uses 0.005" tungsten microelectrodes, no Polymide Tubing. Impedances values of 0.5 megohm with B tip profiles. The electrodes are on 300 micron centers, extend 6.5 mm beyond the epoxy mold and the array has a single ground and differential electrode.

Ex. 3: PI-6.0-PT-3-0.5-A-3-200-12-1-0 – This 12 electrode array uses 0.003" diameter Platinum/Iridium microelectrodes with Polymide Tubing to within 4 mm of the tip. The tip impedances are 0.5 megohms and have the A tip profile. The electrodes are on 500 micron centers, extend 6.0 mm beyond the epoxy mold, and has 1 ground and no differential electrode.

Pricing –These arrays are priced based on the number of electrodes (n), metal type, and whether Polymide Tubing is specified. There is no price differential for tip profile selection, impedance, or any dimensional parameters within our capabilities. Ground and Low Z ref. Electrodes are included in the total count, (n).

Metal Type	Base Price for n electrodes	+ no. of Electrodes	+ PT if specified	= Total Cost
WE-Tungsten	n=1-18-\$250 or n=19-36-\$525	+ n x \$12.50	+ n x \$2.50	= \$
PI-Platinum/Iridium	n=1-18-\$250 or n=19-36-\$525	+ n x \$24.50	+ n x \$2.50	= \$

Pricing for examples from above:

Ex. 1: WE-8.0-00-3-0.3-A-3-400-36-1-1 = 525.00 + (36 x 12.50 = 450.00) = \$975.00

Ex. 2: WE-6.5-00-3-0.5-B-5-300-18-1-1 = 250.00 + (18 x 12.50 = 225.00) = \$475.00

Ex. 3: PI-6.0-PT-3-0.5-A-3-200-12-1-0 = 250.00 + (12 x 24.50 = 294.00) + (12 x 2.50 = 30.00) = \$574.00

- For arrays specifying more than 36 electrodes, add \$250.00 to base price for multiples of 18 or less electrodes.
- Additional charges may be added for extra ordinary configurations. Please provide drawings for evaluation of feasibility.

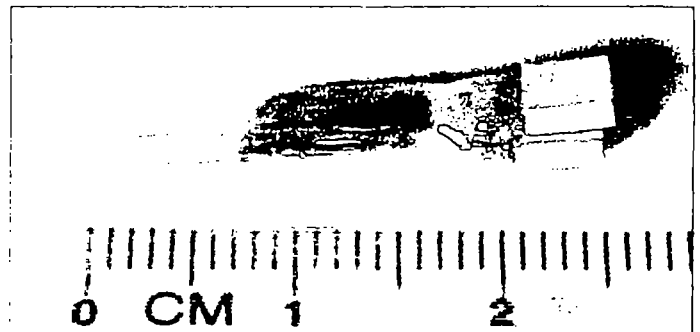
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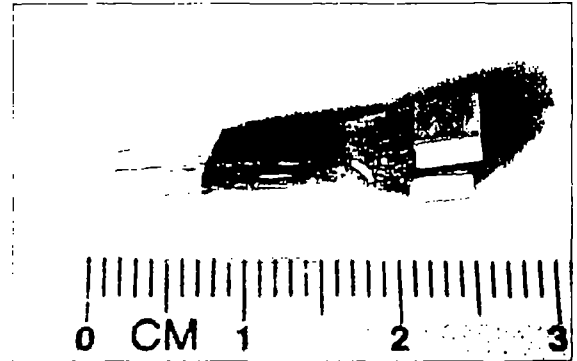
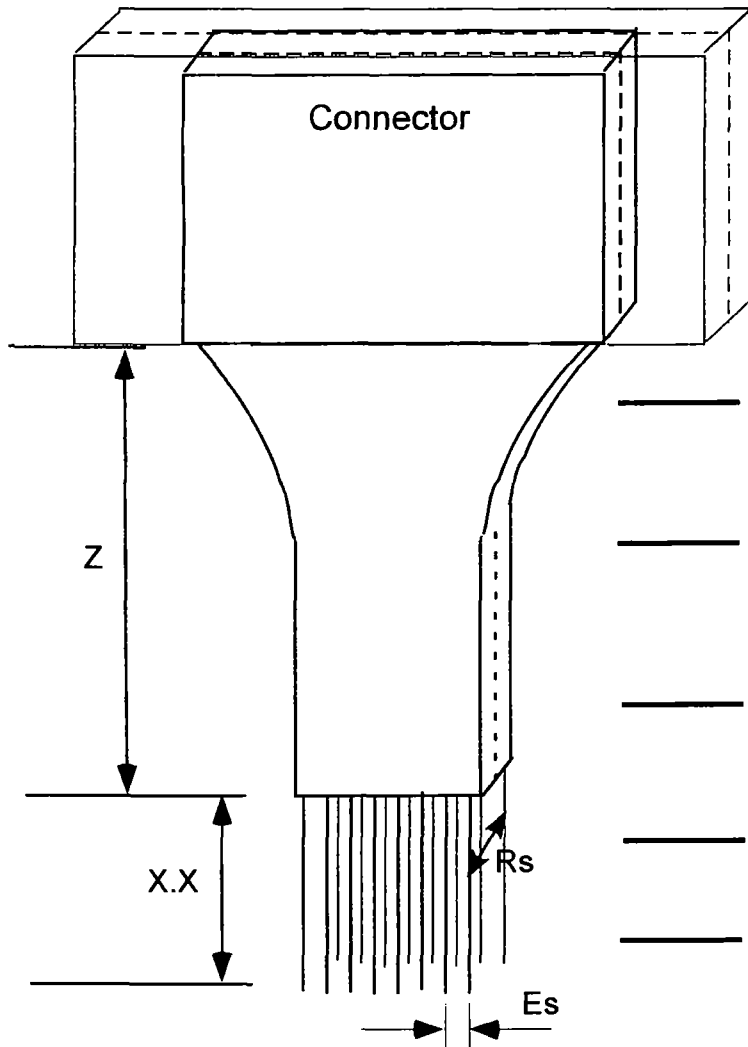
Email:Mprobe1@aol.com



DESIGN SHEET FOR MULTI-ELECTRODE ARRAYS

This sheet is intended as a guide to assist potential users of our Multi-electrode arrays in specifying the dimensional characteristics and other parameters. Our unique fabrication process has been developed in order to optimize flexibility. Electrodes within an array may have different lengths beyond the epoxy mold as well as different impedance values if desired.

Although other connectors maybe specified, we show here the Omnetics connector, model #A8141-001, only as an example. This connector has 20 positions with 18 contacts, 8 on one side and 10 on the other. Many of our users have specified the Omnetics #A11365-001, a 10 contact single row connector which is about twice as large.



- Z is the length of the epoxy mold beyond the connector to the point where the electrodes are emerging from the epoxy mold. (5 mm min.)
- X.X is the length of the electrodes beyond the epoxy mold. Several of our users have requested that these lengths be staggered. Please specify staggered lengths on a separate drawing.
- Es is the inter-electrode spacing. This dimension may also be different for individual electrodes. (0.10 millimeters minimum)
- Rs is the distance between rows of electrodes. (0.35 mm minimum)
- R is the number of rows in your array
- *All dimensions should be specified in millimeters
- **Impedance** values may be specified anywhere from 10 kilohms to 3 megohms. The reference electrode is set to 25 kilohm unless otherwise specified.

We understand that there are potentially as many designs as there are experimental protocols. For this reason we want to work with the investigator in designing the most optimum array possible. Sketches are often helpful in assuring that your specifications are precisely incorporated into your multi-electrode array design. Please specify the location of the reference and ground electrodes if included in your design.

of Rec. or Stim. Elect.
 Polyimide tubing yes no
 Reference elect. yes no
 Ground elect. yes no
 Drawing incl. yes no

Metal selection:
 Tungsten-75 um
 Tungsten-125 um
 Pt/Ir-75 um
 Pt/Ir-250 um

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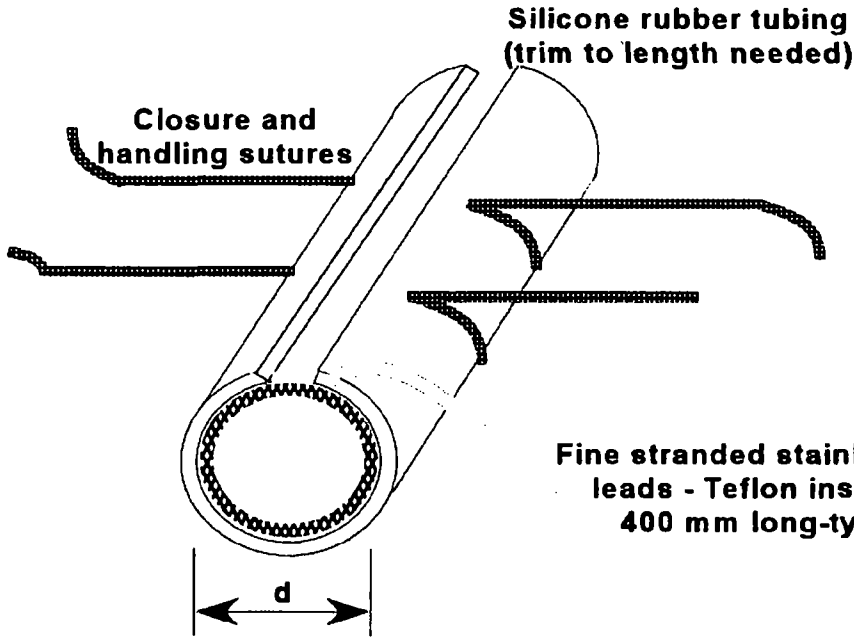
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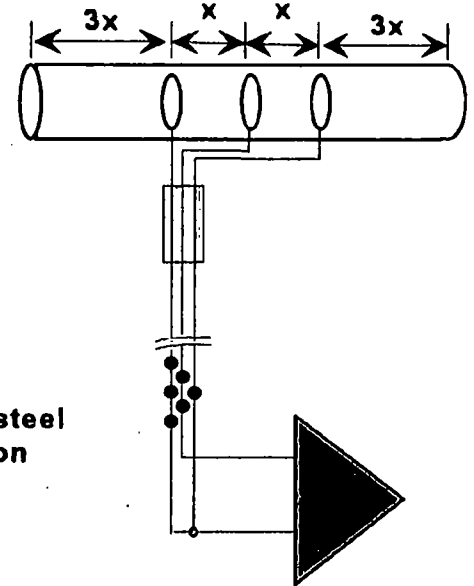
www.microprobes.com

NERVE CUFF ELECTRODES

Chronically implanted or used in place of mineral oil pools for reliable recordings and stimulation of nerve trunks



d = 1.5 to 10 mm i.d.
(should be 1.4 x nerve o.d.)



n = 1 to 9 contacts
(identified by knots in ends)

Model # NCdxn

Example: NC356

3 mm i.d. - suitable for moderate size mammalian peripheral nerves

5 mm spacing - ideal for most myelinated fibers

6 contacts - two tri-polar recording sets, or one tri-polar recording plus one bipolar stimulating with intervening ground

Nerve Cuff Electrode Pricing:

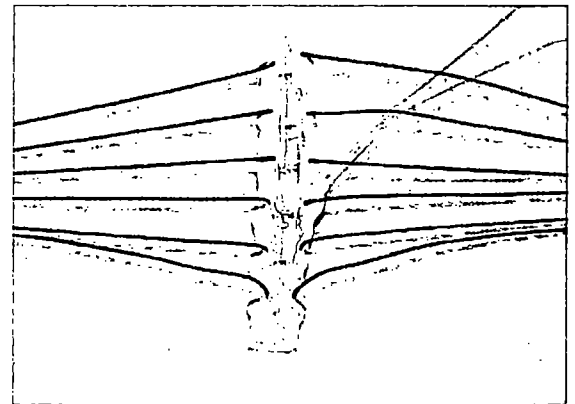
NCdxn - d = inside dia. in mm,
x = distance between contacts in mm
n = # of contacts

NCdxn (each) \$105.00 + (n X \$25.00)

Example: NC352 would be \$105.00 + (2 X \$25.00) = \$155

The total price will depend on the number of contacts n

NC352



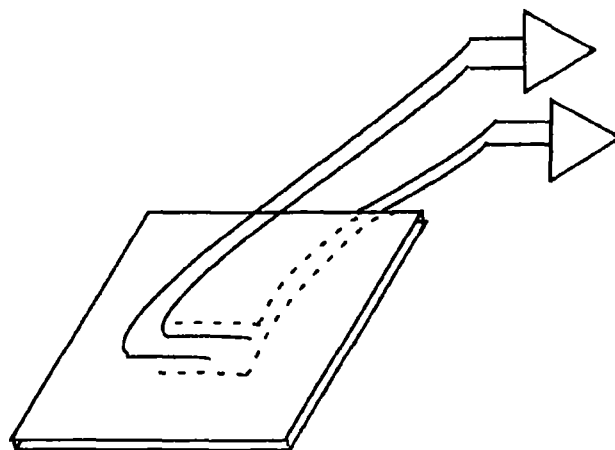
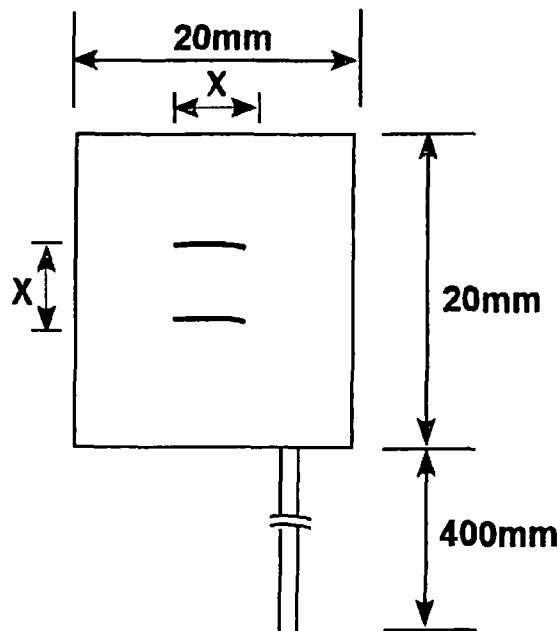
NEW: We are now offering our cuff electrodes with 0.01" diameter Pure Platinum wire. These lower impedance cuff electrodes are excellent for recording and hold up extremely well for heavy stimulation protocols. Add \$35.00 per lead and specify NCdxn(Pt)

MICRO-PROBE INC

615 Fredrick Ave., Suite 307
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Phone:(301) 330-9788 * Fax:(301) 330-9667
www.microprobes.com

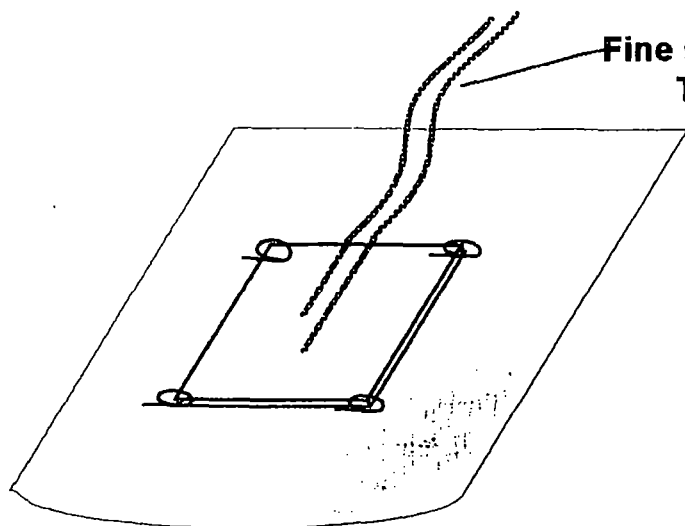
EMG PATCH ELECTRODE

EMG Patch Electrodes are excellent for chronic recordings of muscle potentials. They are easily secured using suture. The patch concept allows optimal bipolar configuration while "shielding" out cross-talk sources from the adjacent muscles.

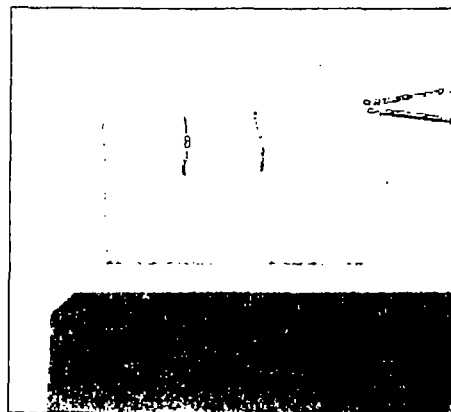


Double sided - use between two muscles

**Dacron reinforced silicone rubber, 0.007" sheet
(trim to required size and suture to fascia at corners)**



**Fine stranded stainless,
Teflon jacketed**



**EP103 single sided, X = 3mm EP203 double sided, X = 3mm
EP105 single sided, X = 5mm EP205 double sided, X = 5mm**

Special designs quoted on request - send sketch.

**Custom options include multiple contacts on one or both sides,
special orientations and intervals.**

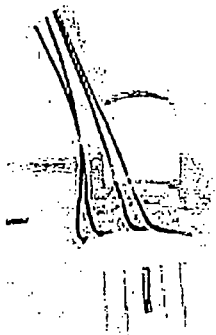
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MICRO PROBE INC

Micro Infusion Pump Electrode Array

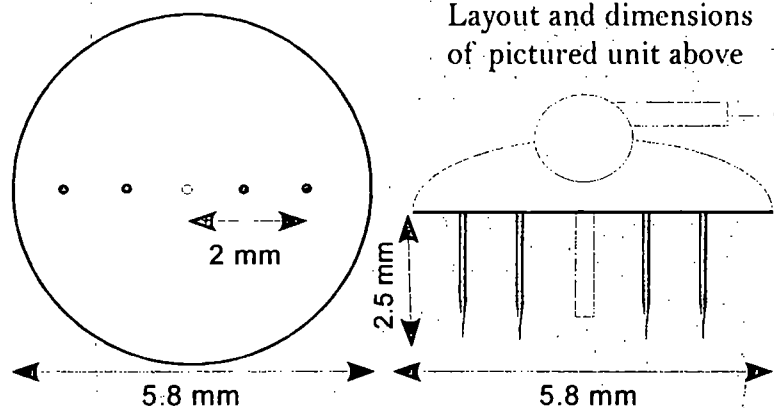
Together with the California Institute of Technology we have developed a truly unique totally implantable system which will allow the infusion of drugs, chemicals, and other agents while recording from local neural tissue. This systems incorporates Alzet's Brain Infusion Kit II. "Alzet osmotic pumps are miniature, implantable pumps used for research in mice, rats, and other laboratory animals. These infusion pumps continuously deliver drugs, hormones, and other test agents at controlled rates from one day to four weeks without the need for external connections or frequent handling." (copied from Alzet web site)

Our design configuration has been made to be very flexible. It can be fabricated to use any one of our dozens of electrode models, making it an extremely valuable research tool. The researcher may specify a number of dimensional and electrode characteristics such as the number of electrodes, the length of individual electrodes, the length of the canula, spacing between electrodes and electrode impedance. The researcher is encouraged to work with us in the selection of compatible connector systems.



The unit shown to the left utilizes 75 micron diameter Platinum/Iridium microelectrodes sharpened to 1 to 2 microns and have an impedance of 0.3 megohm. The electrode is insulated with Parylene-C, a biocompatible polymer. The electrodes are 2.5 millimeters long and the canula is 2.0 millimeters long. Connection is made through 30 gauge insulated copper wire. This design has been used in chronic experiments in the Vision Laboratory at the California Institute of Technology in primates.

Pricing: The above unit sells for \$195.00. Prices will be relative to the type and number of electrodes as well as what connector is selected. Pricing will not normally depend on dimensional specifications.



Please contact Micro Probe, Inc. so we can discuss your particular application. Together we can develop a system perfect for your specific animal model and experimental protocol.



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ACCESSORY ITEMS

Thin wall Polyimide tubing

Polyimide tubing also known as kapton is an excellent primary or secondary insulator. It is fabricated in multiple layers to produce a stable pinhole free structure. Because the chemical makeup is composed of a fully cured aromatic polyimide the tubing is unaffected by most solvents and chemicals, is non-burning, is radiation resistant and offers continuous service up to 200 deg. C with intermittent service up to 400 deg. C

Part #	I.D. nominal	Wall Thickness	Length - inches	Price for 5 feet
MIL-38	0.0039"	0.0005"	12.5	\$35
MIL-33	0.0071"	0.00075"	12.5	\$35
MIL-30	0.0098"	0.0010"	12.5	\$35
MIL-28	0.0122"	0.0010"	12.5	\$35
MIL-27	0.0142"	0.0010"	12.5	\$35
MIL-23	0.0220"	0.0010"	12.5	\$35
MIL-20	0.0299"	0.0010"	12.5	\$35

Stainless Steel (Elgiloy) Rod

- *Stainless Steel Alloy for Electro-deposited Iron Stain and for vibrating probe studies
- *Straightened and cleaned

Part #	Size in inches	Quantity	Price
M220	0.009" X 3"	250	\$175.00
M221	0.009" X 5"	250	\$195.00

Platinum/Iridium Rod

- *Straightened and cleaned
- *Part #M231 is 80/20% Pt/Ir
- *Part #M232 is 70/30% Pt/Ir

Part #	Size in inches	Quantity	Price
M231	0.01" X 2.2"	100	\$650.00
M232	0.003" X 2.2"	100	\$650.00

Micro Connectors

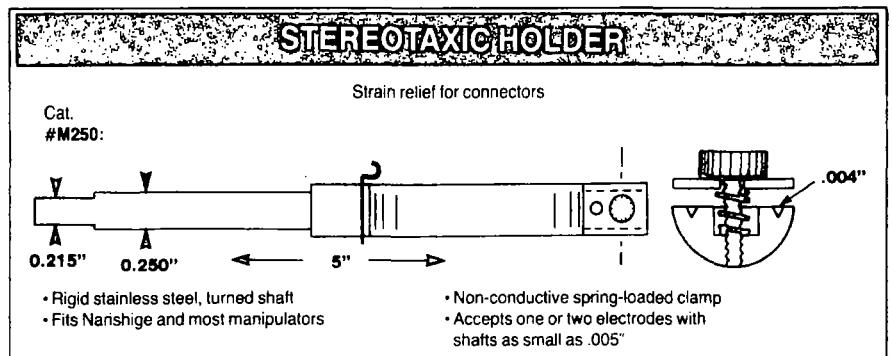
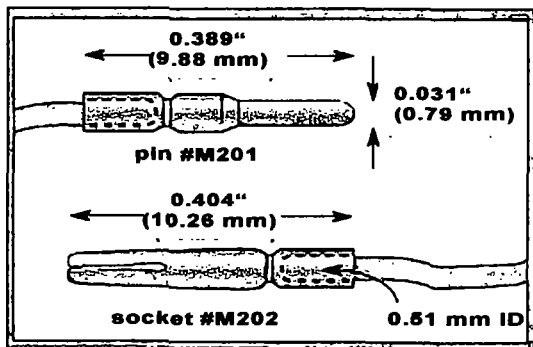
- *Microminiature gold-plated mating pins
- *Fit Amphenol series 220-223 connectors
- *Mates with pins on all Micro Probe electrodes
- *Ideal for most custom configurations

Part#	Size (in)	Quantity	Price
M201(male)	0.389" X 0.050"	100	\$75.00
M202(female)	0.404 X 0.050"	100	\$95.00

Tungsten Rod

- *Straightened and Clean

Part #	Size in inches	Quantity	Price
M210	.005" X 3"	250	\$125.00
M211	.005" X 5"	250	\$165.00
M212	.010" X 3"	250	\$125.00
M214	.020" X 3"	250	\$125.00



Price: \$145.00 each

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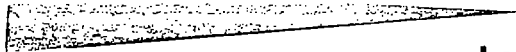
www.microprobes.com

Tungsten Micro-Needles

Tungsten micro-needles are typically used for micro-dissections. They are made from high quality tungsten. Select from either a sharp, less than 1 micron tip, or a blunted 3 or 5 micron tip. All micro-needles provide lateral stability as well as minimal spring action during manipulation. These Micro-needles are 50 mm (2 inch) long and are supplied in a box of 10. Select from either a 125 or 250 micron shaft diameter.

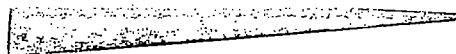
Catalog No.

MN005S - \$62.00/pkg. 10



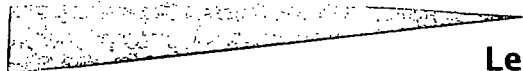
Less than 1 micron tip dia.
(125 um x 50 mm)

MN005B - \$62.00/pkg. 10



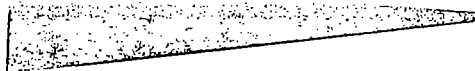
Approx. 3 micron tip dia.
(125 um x 50 mm)

MN0010S - \$62.00/pkg. 10



Less than 1 micron tip dia.
(250 um x 50 mm)

MN0010B - \$62.00/pkg. 10



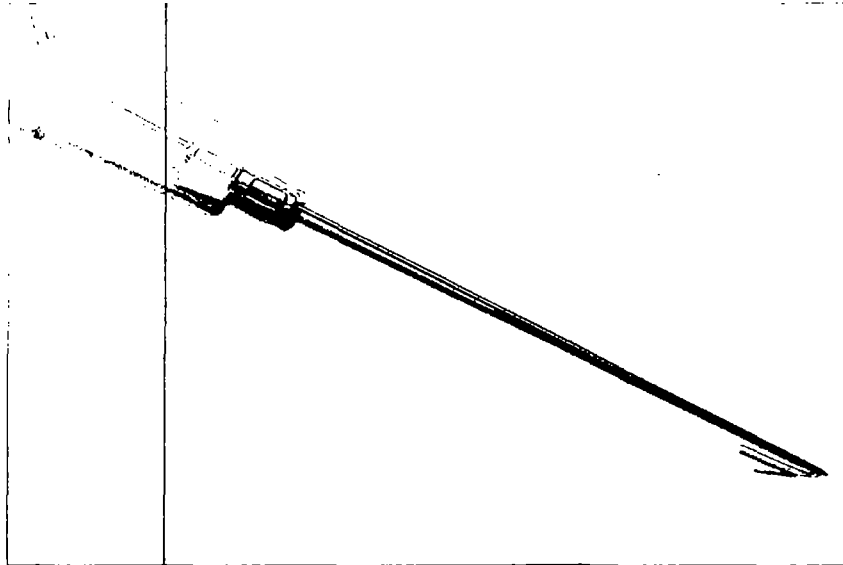
Approx. 5 micron tip dia.
(250 um x 50 mm)

Recommended to be used with a micro-pin vise. May be easily cut to desired length using an ordinary pair of diagonal cutters.

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EMG SUB-CUTANEOUS BIPOLAR HOOK ELECTRODES

The model EMT-2-30 sub-cutaneous bipolar hook electrode is a proven alternative to less stable needle electrodes for recording from muscle. A 27 gauge hypodermic needle is used to introduce the two 50 micron diameter stainless steel recording wires through the skin. The electrode wires are insulated with H-PN Red/bifilar, a biocompatible Poly urethane with a nylon over coat, and exposed approximately 500 microns at the ends. The the hypodermic needle is withdrawn after the electrode wires are inserted to the desired depth, leaving the flexible electrodes wires securely fixed in muscle tissue. Each electrode is individually packaged in a self sealing sterile pouch.



Model EMT-2-30

Hypodermic needle:	#27 gauge x 1.5 inches
Wire specifications:	#304 Stainless steel, 50 micron diameter
Insulation:	H-PN Red bifilar insulation (Poly urethane with a nylon over coat)
Length of wire:	30 inches beyond hypodermic needle (wire ends are exposed approx. 5 mm)
Electrode tip exposure:	0.5 millimeters
Packaging:	Sterile Pouch

Price: \$120 per quantity of 10

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Gaithersburg, Maryland 20877

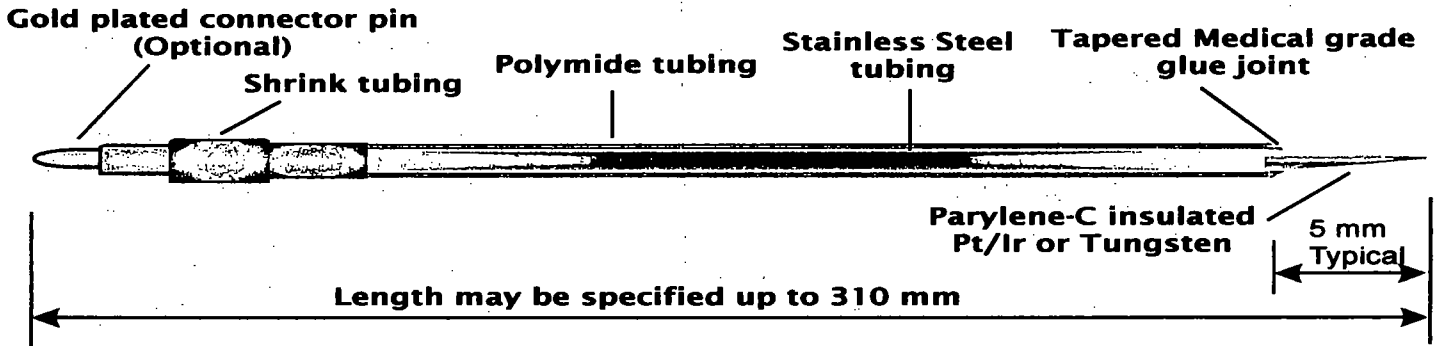
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INTRA-OPERATIVE MICROELECTRODES

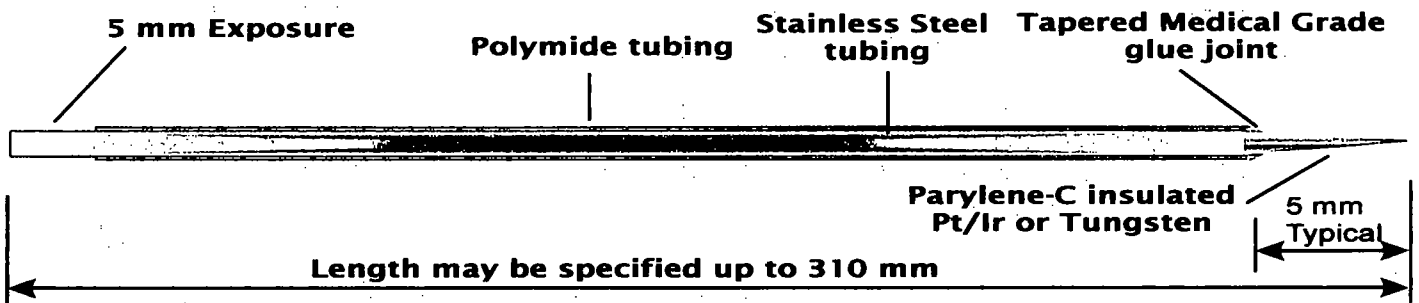
Our Intra-Operative electrodes are available in Tungsten and Platinum/Iridium core conductors. Our selection process has been designed to provide as much flexibility as possible so that the user may specify designs that are compatible with their surgical protocol and micro-drive system. The user may specify dimensional qualities, metal type, electrical connection option, electrode tip impedance, and the diameter of the core conductor. Care is taken to insure that the transition between the electrode and supporting shaft is smooth and even and that the eccentricity of the electrode is within 0.5 mm over a 40 mm length, which is very important for precise targeting of neuronal pools.

Platinum/Iridium or Tungsten Electrode with Connector



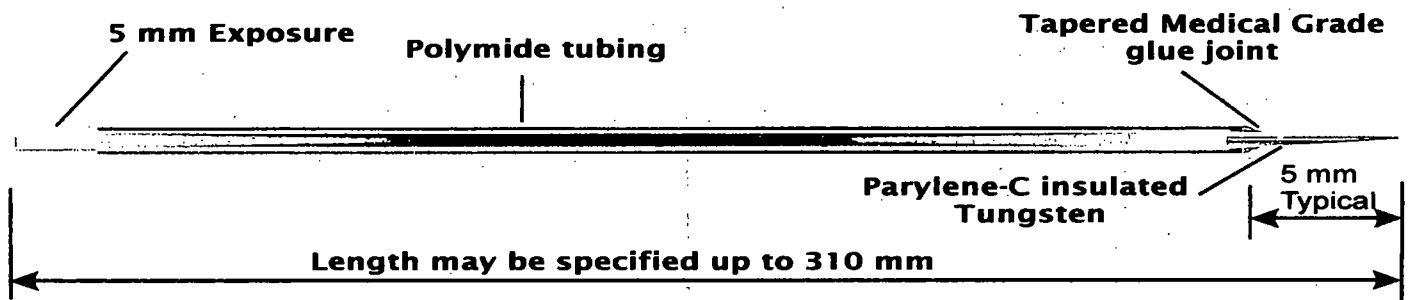
OR

Platinum/Iridium or Tungsten Electrode without Connector



OR

Tungsten Electrode without SS Tubing with or without Connector



Custom designs are welcome, including those with guide tubes.

Micro Probe, Inc.

Intra-Operative Deep Brain Microelectrodes

Platinum/Iridium Core Conductor

Part Number	<i>Electrode</i>		<i>Dimensions</i>		Tip impedance y.y	Connector yes/no	price pkg of 5
	Total length xxx	Total outside diameter	Core conductor diameter	Electrode tip diameter			
PlxxxPTSS3y.yA3C	Specify-mm	0.360 mm	0.075 mm	1-2 micron	Specify-megohm	yes	\$ 275.00
PlxxxPTSS3y.yA3	Specify-mm	0.360 mm	0.075 mm	1-2 micron	Specify-megohm	no	\$ 260.00
PlxxxPTSS3y.yA10C	Specify-mm	0.610 mm	0.250 mm	2-3 micron	Specify-megohm	yes	\$ 275.00
PlxxxPTSS3y.yA10	Specify-mm	0.610 mm	0.250 mm	2-3 micron	Specify-megohm	no	\$ 260.00

Tungsten Core Conductor

Part Number	<i>Electrode</i>		<i>Dimensions</i>		Tip impedance y.y	Connector yes/no	price pkg of 5
	Total length xxx	Total outside diameter	Core conductor diameter	Electrode tip diameter			
WExxxPTSS3y.yA3C	Specify-mm	0.360 mm	0.075 mm	1-2 micron	Specify-megohm	yes	\$ 235.00
WExxxPTSS3y.yA3	Specify-mm	0.360 mm	0.075 mm	1-2 micron	Specify-megohm	no	\$ 220.00
WExxxPTSS3y.yA5C	Specify-mm	0.410 mm	0.125 mm	1-2 micron	Specify-megohm	yes	\$ 235.00
WExxxPTSS3y.yA5	Specify-mm	0.410 mm	0.125 mm	1-2 micron	Specify-megohm	no	\$ 220.00
WExxxPTSS3y.yA10C	Specify-mm	0.610 mm	0.250 mm	2-3 micron	Specify-megohm	yes	\$ 235.00
WExxxPTSS3y.yA10	Specify-mm	0.610 mm	0.250 mm	2-3 micron	Specify-megohm	no	\$ 220.00

Tungsten Core Conductor without SS Tubing

Part Number	<i>Electrode</i>		<i>Dimensions</i>		Tip impedance y.y	Connector yes/no	price pkg of 5
	Total length xxx	Total outside diameter	Core conductor diameter	Electrode tip diameter			
WExxxPT3y.yA10C	Specify-mm	0.356 mm	0.250 mm	2-3 micron	Specify-megohm	yes	\$ 155.00
WExxxPT3y.yA10	Specify-mm	0.356 mm	0.250 mm	2-3 micron	Specify-megohm	no	\$ 140.00

Examples: PI295PTSS30.5A10 is a Platinum/Iridium electrode with a total length of 295 mm, having an outside diameter of 0.610 mm, an impedance of 0.5 megohm and no connector.

WE300PT31.0A10 is a Tungsten electrode with a total length of 300 mm, having an outside diameter of 0.356 mm, an impedance of 1.0 megohm, no stainless steel tubing, and no connector.

Custom Designs are welcome. Please call us to discuss your specific requirements and dimensional constraints.

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