

INSTRUCTIONS FOR USING PARYLENE-C INSULATED MICROELECTRODES

These electrodes have been uniformly coated with the specified thickness of Parylene-C and the tips exposed in order to produce the requested impedance value (+/- 15%). Each electrode has been microscopically inspected, the surface oxide removed electrolytically, and the impedance measured at 1 KHz. Impedance values are marked on the box for all electrodes with an impedance greater than 0.1 megohm.

How to unpack

The electrodes are nested in foam slits for safe shipment and storage. To remove, grasp the electrode near the connector end, part the foam slit with your other hand, and do not allow the tip to touch any surface. Inspect the electrode and, if damage is suspected, examine the tip under a light microscope with at least X100 power. Please note that the insulation is tough enough so that if the tip was bent, the electrode could still read the correct impedance value.

Connection to the MicroElectrodes

The miniature pin connector (220-PO2) attached to the end of the electrode mates with the female connector (220-SO2), which is provided with each box ordered. If the connector must be removed in order to connect to the experimenter's micro-drive system, the Parylene-C insulation may be removed by either scraping it off with a scalpel blade or melting it using a small flame. Some investigators have found that wedging the back end of the electrode, after removing about 1 inch of insulation, into a hypodermic needle works quite well. The hypodermic needle conveniently plugs into a standard banana plug. MicroProbes for Life Science also sells an easy-to-adapt electrode holder, Model #250, which will mount directly into most micro-drive systems.

Cleaning and re-use

If you intend to re-use your electrodes or if you have trouble reproducing the measured impedance values as noted on the box (which may be the case after sterilization or prolonged storage), we recommend electrolytic cleaning of the surface. Apply 2 – 3 dc volts saline across the electrode, making sure that the electrode is the negative polarity with respect to the bath, which must be attached to the positive polarity. (If the positive polarity is applied to the electrode, the metal may dissolve, resulting in higher impedance values.) The impedances can be measured using MicroProbes for Life Science Model #IMP-1 Impedance Tester. If damage is suspected along the electrode shaft, test by slowly lowering the electrode into the saline bath and observing any abrupt drop in the impedance value. Depending of the initial value of the tip impedance, this action should result in a steady lowering of the impedance. This reduction is normal and is a result of the shunt capacitance associated with the electrode's thin insulation.

Please note that for higher impedance values, typically above 2 megohm, in which the electrode will be immersed more than 4 or 5 millimeters into a conductive medium, additional insulation should be considered. Polyimide tubing, which is used in our PT electrode models, is recommended.

How to sterilize

Rinsing microelectrodes in 70% alcohol for 2 to 3 minutes is usually sufficient to sterilize them. If more rigorous sterilization is desired, these electrodes have been proven to hold up well under all sterilization procedures, as long as they are not exposed to heats greater than 150 degrees centigrade.

Proceed to clean after using in neural tissue

Submerge the electrode in a 50% bath of bleach for 3 – 4 minutes, followed by 1 minute submersions each in isopropyl alcohol and distilled water. All three submersions should be done using a sonic cleaner. If a sonic cleaner is unavailable, increase soaking time for each step to 5 -10 minutes.