



# INSTRUCTION MANUAL

**MicroFil™**

Non-Metallic Syringe Needle for Filling Micropipettes

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## ABOUT THIS MANUAL

The following symbols are used in this guide:



This symbol indicates a CAUTION. Cautions warn against actions that can cause damage to equipment. Please read these carefully.



This symbol indicates a WARNING. Warnings alert you to actions that can cause personal injury or pose a physical threat. Please read these carefully.

NOTES and TIPS contain helpful information.

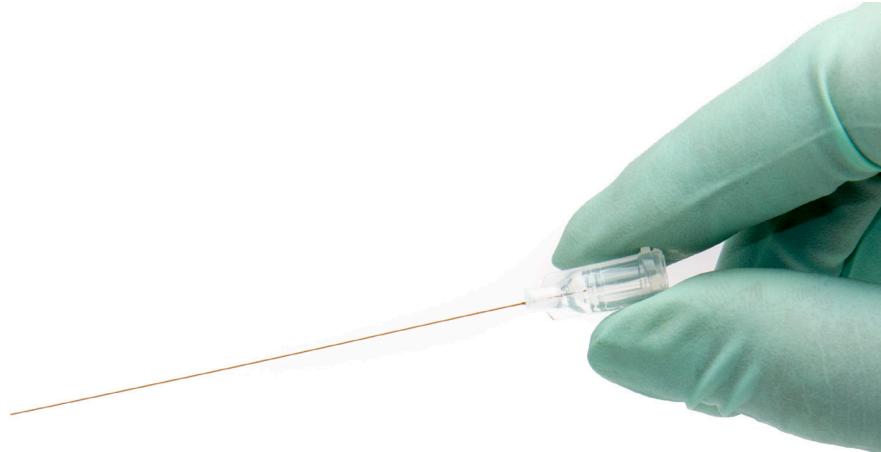


Fig. 1—MicroFil

## INTRODUCTION

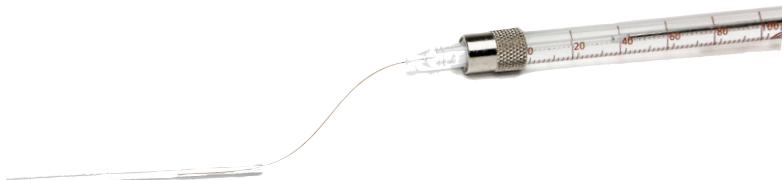
To properly fill a micropipette can be a challenging task. One current method involves the use of a long, stainless steel hypodermic needle.

Unfortunately, the KCl solution used in the filling process can corrode and plug the stainless steel needle in a few days if the needle is not thoroughly cleaned after each use. For pipettes used in the study of ion channels (e.g., patch pipettes), filling with a metallic needle may introduce metal ions into the filling solution. Furthermore, when a metal needle is filled with a solution containing EDTA or EGTA, the solution can become very acidic within several minutes because EDTA chelates metal ions from the needle and therefore release protons into the solution.

Clogging of the micropipette tip by particles present in the injecting solution is one of the major causes of failure in microinjection experiments. Proper filling methods can, however, significantly reduce clogging.

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WPI's MicroFil™ fills micropipettes easily and reliably. Its long and fine tip allows you to start the filling very close to the pipette tip, eliminating both air bubble formation and clogging due to the washing down of dust particles.



The MicroFil needle is constructed from a combination of plastic and fused silica — no metal components are used. The MicroFil needle can be stored for days with the filling solution inside without clogging. The MicroFil tip elasticity is sturdy and very flexible though not unbreakable. Since it is more flexible than stainless steel needles, moderate bending will not block or damage the MicroFil needle.



The combination of plastic and fused silica in the MicroFil tip is sturdier than simple plastic tips, allowing easy and repeated insertions into micro-pipettes. MicroFil's luer fitting allows easy coupling to syringes and syringe filters.

## Syringe Attachment

MicroFil's luer fitting allows easy coupling to syringes and syringe filters.

### **MicroFil MF34G**

The tip of model MF34G is 70 mm long, 0.164 mm OD, 0.1 mm ID (34 gauge 2.8" long). The fine, long tip will fit into most micropipettes intended for use in intracellular and extracellular recording as well as microinjection applications.

### **MicroFil MF28G**

The tip of model MF28G is 100 mm long, 0.35 mm OD, 0.250 mm ID (28 gauge, 3.9" long). MF28G is sturdier than MF34G but still flexible enough to allow a 360° bend. The longer tip of the MF28G can be effectively used for filling fine and long tubes such as those employed in WPI's Kwik-Tip microelectrodes, or to reach and fill corners that are difficult to reach by other means. Both MF34G and MF28G are equipped with luer syringe fittings for quick and easy connection to your filling syringe.

## Chemical Information

MicroFil's tubing is made of fused silica (quartz) coated with polyimide. The Luer fitting is medical grade polypropylene and the adhesive has passed medical VI class test. These materials are resistant to most acids, bases and organic solvents. To avoid dust contamination we recommend pre-rinsing the MicroFil with distilled water. Also, it is good practice to discard the first few microliters of filling solution before using the device. MicroFil, as shipped, is non-sterile. It can be chemically sterilized or autoclaved. However, repeated autoclaving may weaken the adhesive bond to the Luer fitting.

## MAINTENANCE

To avoid clogging the tip, flush your MicroFil after each use.

## Cutting

MicroFil can be cut to a desired length by rolling a razor blade on it. However, this may leave a small crack or a small barb on the tip. To get a flat cut, score the coating of the tubing with a ceramic cleaving stone or a diamond cutter and pull directly apart, making sure not to pull at an angle.

## Custom MicroFil

All MicroFil products, including custom orders, can be shipped immediately. Custom orders for special needs can be made using nine sizes of MicroFil tubing in lengths up to 50 cm — except for CMF90UxxL which has a maximum length of 10cm because of its high resistance to flow. Quantity discounts are available. Specify the length when ordering by inserting the length (in centimeter increments) into the part number in place of the XX's.

## PRODUCT CODES

<b>MF34G-5</b>	MicroFil, 34 ga., 67 mm long (pkg of 5)
<b>MF28G-5</b>	MicroFil, 28 ga., 97 mm long (pkg of 5)
<b>MF28G67-5</b>	MicroFil, 28 ga., 67 mm long (pkg of 5)
<b>CMF20GxxL</b>	MicroFil, 20 ga., 700 µm ID, 850 µm OD (pkg of 4)
<b>CMF22GxxL</b>	MicroFil, 22 ga., 530 µm ID, 700 µm OD (pkg of 4)
<b>CMF23GxxL</b>	MicroFil, 23 ga., 530 µm ID, 665 µm OD (pkg of 4)
<b>CMF26GxxL</b>	MicroFil, 26 ga., 320 µm ID, 430 µm OD (pkg of 4)
<b>CMF28GxxL</b>	MicroFil, 28 ga., 250 µm ID, 350 µm OD (pkg of 4)
<b>CMF31GxxL</b>	MicroFil, 31 ga., 100 µm ID, 238 µm OD (pkg of 4)
<b>CMF34GxxL</b>	MicroFil, 34 ga., 100 µm ID, 164 µm OD (pkg of 4)
<b>CMF35GxxL</b>	MicroFil, 35 ga., 75 µm ID, 144 µm OD (pkg of 4)
<b>CMF90UxxL</b>	MicroFil, approx. 36 ga., 20 µm ID, 90 µm OD (pkg of 4)

# WARRANTY

WPI (World Precision Instruments) warrants to the original purchaser that this equipment, including its components and parts, shall be free from defects in material and workmanship for a period of 30 days\* from the date of receipt. WPI's obligation under this warranty shall be limited to repair or replacement, at WPI's option, of the equipment or defective components or parts upon receipt thereof f.o.b. WPI, Sarasota, Florida U.S.A. Return of a repaired instrument shall be f.o.b. Sarasota.

The above warranty is contingent upon normal usage and does not cover products which have been modified without WPI's approval or which have been subjected to unusual physical or electrical stress or on which the original identification marks have been removed or altered. The above warranty will not apply if adjustment, repair or parts replacement is required because of accident, neglect, misuse, failure of electric power, air conditioning, humidity control, or causes other than normal and ordinary usage.

To the extent that any of its equipment is furnished by a manufacturer other than WPI, the foregoing warranty shall be applicable only to the extent of the warranty furnished by such other manufacturer. This warranty will not apply to appearance terms, such as knobs, handles, dials or the like.

WPI makes no warranty of any kind, express or implied or statutory, including without limitation any warranties of merchantability and/or fitness for a particular purpose. WPI shall not be liable for any damages, whether direct, indirect, special or consequential arising from a failure of this product to operate in the manner desired by the user. WPI shall not be liable for any damage to data or property that may be caused directly or indirectly by use of this product.

## Claims and Returns

Inspect all shipments upon receipt. Missing cartons or obvious damage to cartons should be noted on the delivery receipt before signing. Concealed loss or damage should be reported at once to the carrier and an inspection requested. All claims for shortage or damage must be made within ten (10) days after receipt of shipment. Claims for lost shipments must be made within thirty (30) days of receipt of invoice or other notification of shipment. Please save damaged or pilfered cartons until claim is settled. In some instances, photographic documentation may be required. Some items are time-sensitive; WPI assumes no extended warranty or any liability for use beyond the date specified on the container.

Do not return any goods to us without obtaining prior approval and instructions from our Returns Department. Goods returned (unauthorized) by collect freight may be refused. Goods accepted for restocking will be exchanged or credited to your WPI account. Goods returned which were ordered by customers in error are subject to a 25% restocking charge. Equipment which was built as a special order cannot be returned.

## Repairs

Contact our Customer Service Department for assistance in the repair of apparatus. Do not return goods until instructions have been received. Returned items must be securely packed to prevent further damage in transit. The Customer is responsible for paying shipping expenses, including adequate insurance on all items returned for repairs. Identification of the item(s) by model number, name, as well as complete description of the difficulties experienced should be written on the repair purchase order and on a tag attached to the item.

\* Electrodes, batteries and other consumable parts are warranted for 30 days only from the date on which the customer receives these items.



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