

# Injecting Convenience

Ready-to-use capillaries for  
micromanipulation and microinjection



# Ready-to-use microcapillaries – Less prep, more experiments

## **Microcapillary production – a tedious, costly, and time-consuming handcraft**

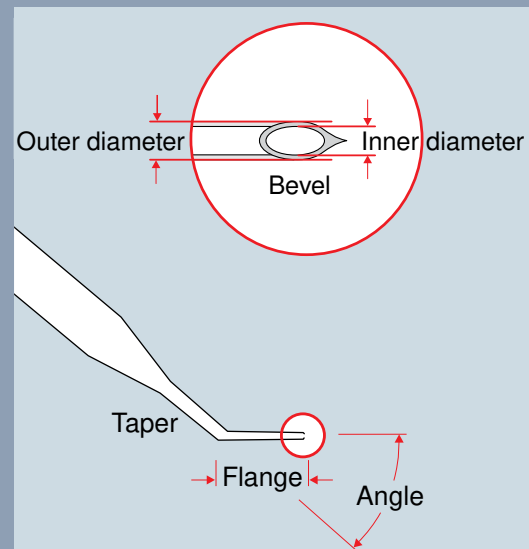
A significant amount of time in micromanipulation applications is spent producing the right microcapillaries with high reproducibility. This is especially true with precious samples, where maximizing survival rate and success ratio is essential. Depending on the microcapillary needed, the production includes sourcing of raw material, pulling the capillaries, tapering the tips, bevelling the tips, and fire-polishing the base. It also includes maintaining several costly instruments with low net usage time that need constant, tedious optimization by skilled professionals. Eppendorf microcapillaries are ready-to-use, providing researchers with more time for experiments.

## **Safe time and costs: Ready-to-use consistency**

All Eppendorf microcapillaries are produced ready-to-use with high batch-to-batch production consistency within narrow specifications. All glass capillaries are inspected for particles and for fulfilling geometrical specifications. A heat-polished base ensures maximum lifetime and leak tightness of capillary holder seals.

## **Mimimize experiment interference: Sterility, cytotoxicity, and endotoxins**

Individually packaged and sealed microcapillaries are sterilized by gamma irradiation. The achieved sterility assurance level (SAL) of  $10^{-6}$  is the same necessary for surgical instruments. Assorted microcapillaries are also tested for cytotoxicity and endotoxins/pyrogens by sensitive MEA- and LAL-tests.



Microcapillaries are complex structures (e.g. TransferTip® (ES)). Producing them is time-consuming, tedious, and costly because it includes multiple steps and instruments.



## Eppendorf Glass Microcapillaries

- > Ready-to-use and individually packaged
- > High batch-to-batch production consistency (100 % visual inspection)
- > Sterilized via validated gamma irradiation to SAL  $10^{-6}$
- > Assorted capillaries tested for cytotoxicity (MEA) and endotoxins/pyrogens (LAL)
- > Designed to optimize experiment outcome by minimal cell/organism trauma, fine fluid control and high force transfer
- > Fit into all capillary holders with standard diameter
- > Intended for research use only



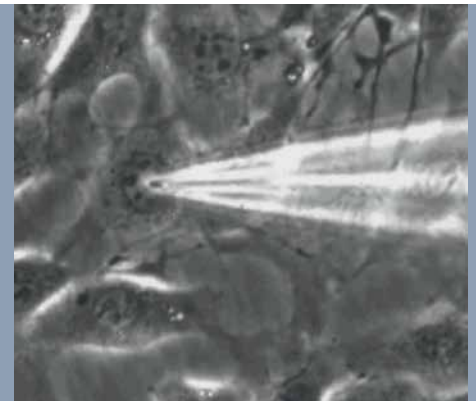
### Microinjection into oocytes, embryos and small organisms

- > Production of genetically modified animals using pronuclear and cytoplasmic injection (e.g. CRISPR & TALEN)
- > Applications in animal reproductive medicine (e.g. mouse ICSI)
- > Serial injection into fish embryos (e.g. Zebrafish, Medaka)
- > Injection into *C. elegans*, other worms, insects, etc.



### Removal or cell transfer

- > Stem cell transfer
- > Nuclear transfer
- > Transplantation of cells
- > Selection and isolation of individual cells (e.g. biopsies)
- > Single cell picking

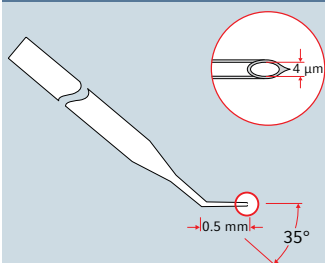


### Other application examples

- > Semi-automatic microinjection into adherent cells
- > Injection into 3D cell culture or organoids
- > Positioning and selection of microparticles
- > Microdissection of chromosomes, etc.
- > Automatic dispensing of cell suspensions or solutions

## Cell transfer capillaries

### TransferTip RP (ICSI)



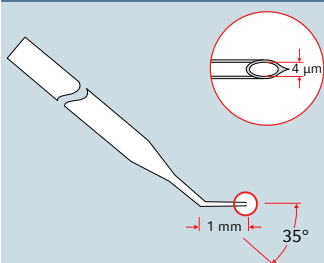
#### Applications

- > Sperm transfer into oocytes

#### Description

- > 4  $\mu\text{m}$  inner diameter
- > 35° tip angle
- > 0.5  $\mu\text{m}$  flange length
- > Fine tapered and rigid tip flange for optimal cell penetration
- > Heat-formed spike eases penetration
- > Sterilized via validated gamma irradiation
- > Non-cytotoxic (as proven by mouse embryo assay)
- > Capillary safe for optimum protection

### TransferTip R (ICSI)



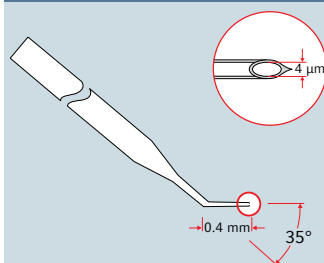
#### Applications

- > Sperm transfer into oocytes

#### Description

- > 4  $\mu\text{m}$  inner diameter
- > 35° tip angle
- > 1  $\mu\text{m}$  flange length
- > Rigid tip flange for successful penetration
- > Heat-formed spike eases penetration
- > Sterilized via validated gamma irradiation
- > Non-cytotoxic (as proven by mouse embryo assay)
- > Capillary safe for optimum protection

### TransferTip F (ICSI)



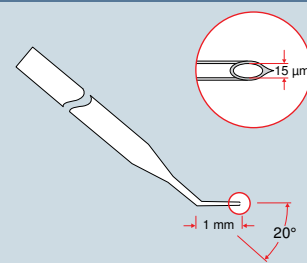
#### Applications

- > Sperm transfer into oocytes

#### Description

- > 4  $\mu\text{m}$  inner diameter
- > 35° tip angle
- > 0.4  $\mu\text{m}$  flange length
- > Fine tapered and flexible tip flange for minimal cell trauma
- > Heat-formed spike eases penetration
- > Sterilized via validated gamma irradiation
- > Non-cytotoxic (as proven by mouse embryo assay)
- > Capillary safe for optimum protection

### TransferTip (ES)



#### Applications

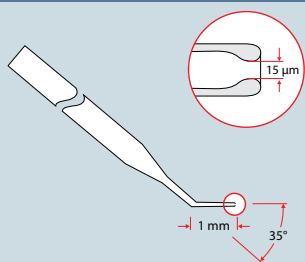
- > Transfer of ES cells into mouse blastocyst or morula

#### Description

- > 15  $\mu\text{m}$  inner diameter
- > 20° tip angle
- > Rigid flange, 1 mm length
- > Heat-formed spike eases penetration
- > Sterilized via validated gamma irradiation
- > Capillary safe for optimum protection

## Holding capillaries

### VacuTip I



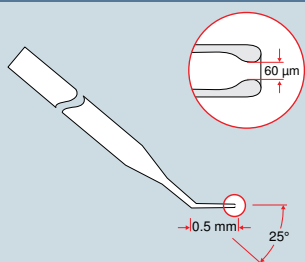
#### Applications

- > For holding oocytes, blastocysts, etc.

#### Description

- > 15  $\mu\text{m}$  inner diameter
- > 100  $\mu\text{m}$  outer diameter
- > 35° tip angle
- > Flange length 1 mm
- > Smooth, rounded tip end for gentle holding
- > Sterilized via validated gamma irradiation
- > Non-cytotoxic (as proven by mouse embryo assay)
- > Capillary safe for optimum protection

### VacuTip II



#### Applications

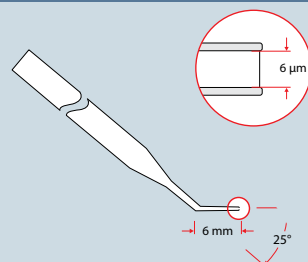
- > For holding oocytes, blastocysts, etc.

#### Description

- > 60  $\mu\text{m}$  inner diameter
- > 110  $\mu\text{m}$  outer diameter
- > 25° tip angle
- > Flange length 0.5 mm
- > Smooth rounded tip end for gentle holding
- > Sterilized via validated gamma irradiation
- > Non-cytotoxic (as proven by mouse embryo assay)
- > Capillary safe for optimum protection

## Capillaries for Piezo-assisted cell transfer

### Piezo Drill Tip Mouse ICSI



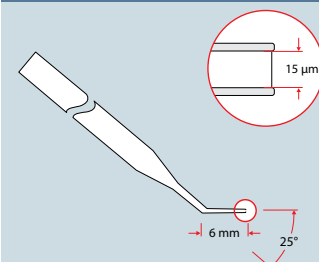
#### Applications

- > Piezo-assisted transfer of sperms into mouse oocytes

#### Description

- > 6  $\mu\text{m}$  inner diameter
- > 25° tip angle for optimal pulse transfer
- > 6 mm flange length
- > Non-polished, blunt tip end for optimal piezo pulse force transfer and minimal trauma
- > Sterilized via validated gamma irradiation
- > Capillary safe for optimum protection

### Piezo Drill Tip ES



#### Applications

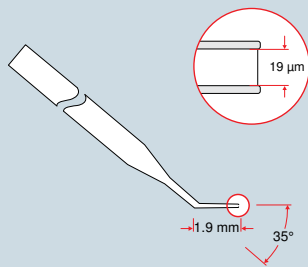
- > Piezo-assisted transfer of embryonic stem cells into blastocysts

#### Description

- > 15  $\mu\text{m}$  inner diameter
- > 25° tip angle for optimal pulse transfer
- > 6 mm flange length
- > Non-polished, blunt tip end for optimal piezo pulse force transfer and minimal trauma
- > Sterilized via validated gamma irradiation
- > Capillary safe for optimum protection

## Biopsy tips

### Biopsy Tip I



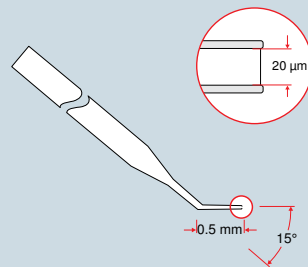
#### Applications

- > Laser-assisted biopsy of cells and organelles

#### Description

- > 19 µm inner diameter
- > 35° tip angle
- > 1.9 mm flange length
- > Rounded tip end to minimize oolemma trauma
- > Sterilized via validated gamma radiation
- > Non-cytotoxic (as proven by mouse embryo assay)
- > Capillary safe for optimum protection

### Biopsy Tip II



#### Applications

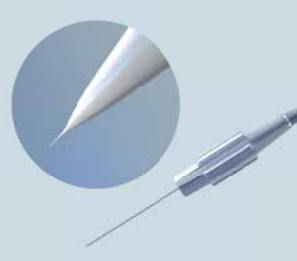
- > Laser-assisted biopsy of cells and organelles

#### Description

- > 20 µm inner diameter
- > 15° tip angle
- > 0.5 mm flange length
- > Rounded tip end to minimize oolemma trauma
- > Sterilized via validated gamma irradiation
- > Non-cytotoxic (as proven by mouse embryo assay)
- > Capillary safe for optimum protection

## Microinjection capillaries

### Femtotips®



#### Applications

- > Injection into adherent cells
- > Near-surface injection into oocytes, early stage embryos (e.g. Medaka fish) and smaller organisms

#### Description

- > 0.5 µm inner diameter
- > Screw-in thread for quick assembly into FemtoJet capillary holder
- > Sterile
- > 100 % individual testing of every Femtotip using a flow parameter
- > Safe transport packaging

### Femtotips II



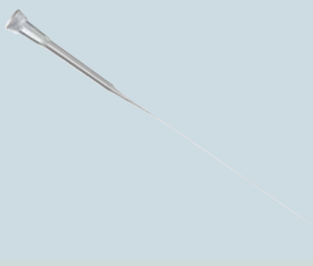
#### Applications

- > Injection into adherent cells
- > Deep injection into mammalian oocytes, early stage embryos (e.g. Zebrafish) and smaller organisms

#### Description

- > 0.5 µm inner diameter
- > Screw-in thread for quick assembly into FemtoJet capillary holder
- > Sterile
- > 100 % individual testing of every Femtotip using a flow parameter
- > Safe transport packaging

## Microloader™



#### Applications

- > Pipette tip for back-filling of Femtotips and other microcapillaries

#### Description

- > Extremely long, fine and flexible tip for filling of microcapillaries for microinjection and where additional reach is needed
- > Microloader tips and rack autoclavable
- > Highest precision and accuracy when used with Eppendorf pipettes for 0.5 to 10 µL (gray control button)



Learn more:  
[epENDORF.com/microcapillaries](http://epENDORF.com/microcapillaries)



## Ordering information

Description	Order no.
<b>TransferTip® RP (ICSI)</b> , for sperm injection using the ICSI technique, set of 25	5195 000.010
<b>TransferTip® F (ICSI)</b> , for sperm injection using the ICSI technique, set of 25	5195 000.001
<b>TransferTip® R (ICSI)</b> , for sperm injection using the ICSI technique, set of 25	5195 000.028
<b>TransferTip® (ES)</b> , for ES cell transfer, set of 25	5195 000.079
<b>VacuTip I</b> , holding capillary, set of 25	5195 000.036
<b>VacuTip II</b> , holding capillary, set of 25	5195 000.044
<b>Piezo Drill Tip Mouse ICSI</b> , for piezo-assisted mouse ICSI, set of 25	5195 000.087
<b>Piezo Drill Tip ES</b> , for piezo-assisted mouse ES cell transfer, set of 25	5195 000.095
<b>Femtotips®</b> , injection capillary, set of 20	5242 952.008
<b>Femtotips® II</b> , injection capillary, set of 20	5242 957.000
<b>Biopsy Tip I</b> , capillary for laser-assisted biopsy of cells and organelles, set of 25	5195 000.052
<b>Biopsy Tip II</b> , capillary for laser-assisted biopsy of cells and organelles, set of 25	5195 000.060
<b>Microloader™</b> , tip for filling Femtotips® and other glass microcapillaries, 192 pcs. (2 racks × 96 pcs.)	5242 956.003

All products are intended for research use only.

## Explore Eppendorf Micromanipulation Systems and Solutions: [www.eppendorf.com/cellmanipulation](http://www.eppendorf.com/cellmanipulation)



### InjectMan® 4 and TransferMan® 4r

Due to their intuitive and user-friendly operation Eppendorf micromanipulators enable you to perform even demanding applications. Customizable smart functions help to simplify and speed up your work.



### FemtoJet® 4i/x

With regard to precision and reliability our electronic microinjectors are setting standards in microinjection. They can be coupled electronically to the InjectMan or TransferMan 4r, e.g., for semi-automatic injection.



### CellTram® 4r Air/Oil

Our manual microinjectors have been designed for ultimate operational comfort and highest precision. They are ideal for safe and intuitive handling of your sample.



**Your local distributor:** [www.eppendorf.com/contact](http://www.eppendorf.com/contact)  
Eppendorf AG · Barkhausenweg 1 · 22339 Hamburg · Germany  
[eppendorf@eppendorf.com](mailto:eppendorf@eppendorf.com) · [www.eppendorf.com](http://www.eppendorf.com)

[www.eppendorf.com](http://www.eppendorf.com)