

# NARISHIGE



## MF3 Microforge

### A single device for customizable pipette production

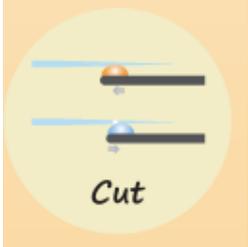
This device enables seamless pipette customization while observing the tip of a micropipette. The MF3 enhances microscope performance, offering brighter, higher-resolution observation compared to previous models. The microscope has been designed to be compact yet robust. It is engineered to easily position the pipette within the field of view, thus minimizing the risk of pipette breakage. The customization process is facilitated by operating the control knobs located near the microscope. The pipette's tip can be customized to suit specific applications thanks to the technique of cutting, bending, polishing, and spike creation. The critical heater settings for each technique are displayed on the screen, and the heater on/off is controlled via a foot switch. The brightness of the LED lamp is adjustable from low to high intensity.



## MF3 Microforge

### Versatile tool to fabricate pipettes of your preference!

The MF3 is used for the microfabrication of pipette tips, as shown in the images below.

 <p><i>Cut</i></p>	 <p><i>Bend</i></p>	 <p><i>Polish</i></p>	 <p><i>Spike</i></p>
<p>Cut pipette to specific OD according to the sample size.</p>	<p>Bend the tip for greater clarity under microscope with the D.O.F of lens.</p>	<p>Polish the tip to prevent cell rupture for holding or patch-clamp technique efficiently.</p>	<p>Create a spike for greater penetrating power for injection.</p>

The pipette manipulator unit is used to set the pipette and move it within the field of view. The XY control knobs beneath the microscope are used for fine positioning of the pipette tip. This design also facilitates the efficient inspection of pipettes, including measuring tip diameter and checking for damage.

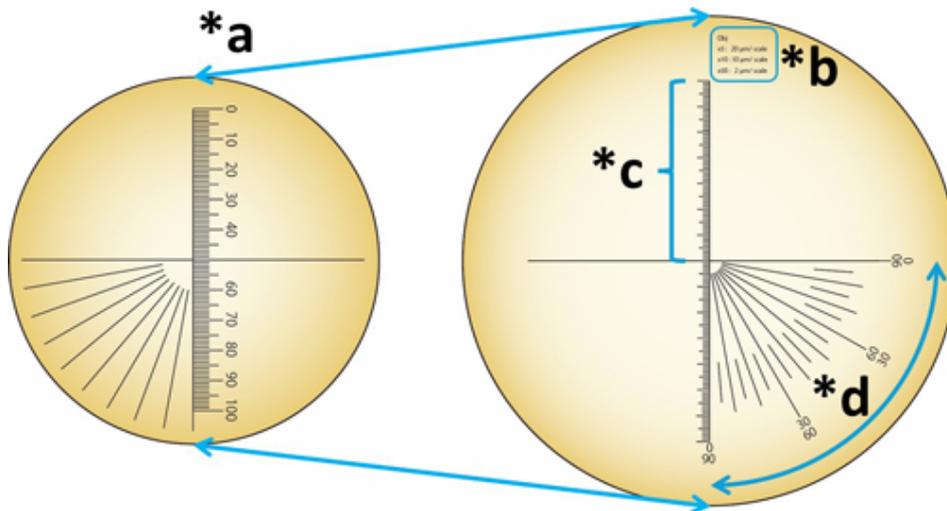
	
<p>Pipette manipulator unit (left)</p>	<p>XY control knobs (front)</p>

## MF3 Microforge

### Improvements in microscope design and usability

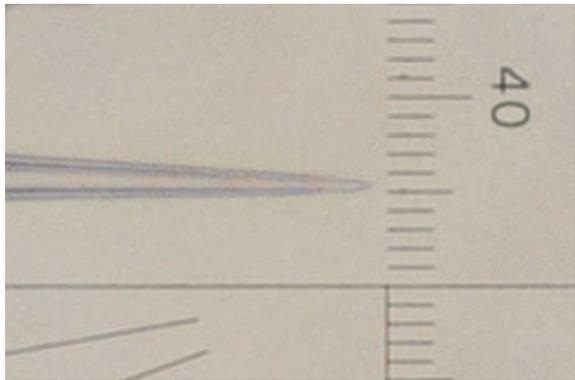
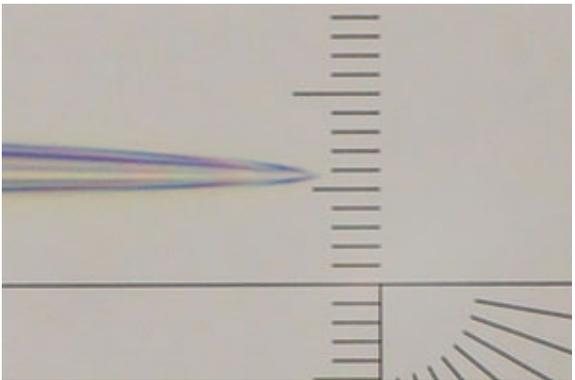
The microscope unit has been upgraded to provide a bright, clear field of view. In comparison to previous models, the MF3 offers a brighter, clearer field of view, facilitating enhanced visibility during pipette observation and customization tasks, including cutting, bending, polishing, and spike creation.

In addition to the enlarged lens field of view (\*a), enhanced operability is achieved through modifications to the micrometer (\*b/c/d). Additionally, misalignment during objective lens changes has been reduced, making it easier to locate pipettes within the field of view even at high magnifications. The product includes 10x eyepieces and 5x/10x objective lenses as standard accessories, with the option to add the MF3-LO50 Objective lens 50x (sold separately).



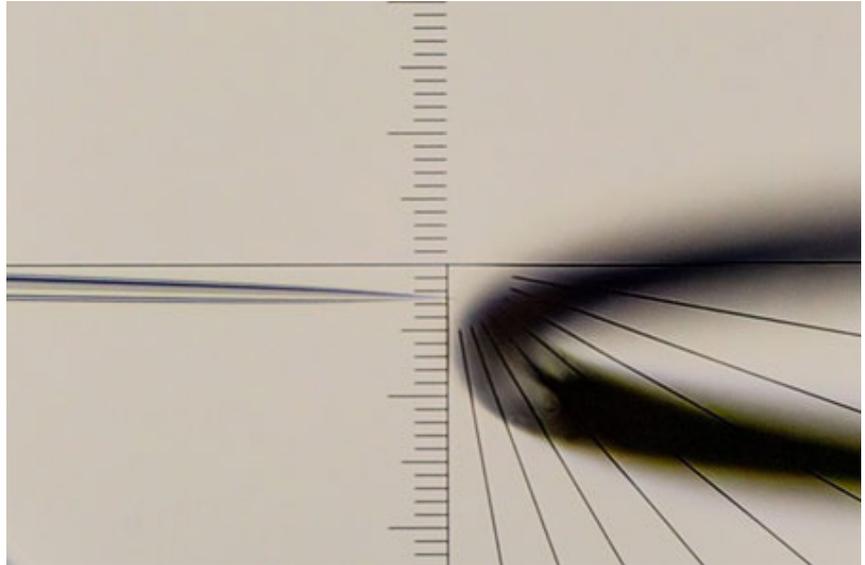
- The field of view area has been expanded by approximately 78%, providing a clearer field of view compared to the previous models with a diameter of 15mm to 20mm.
- An eyepiece includes guides to facilitate the confirmation of micrometer units at each objective lens magnification.
- The new-designed micrometer facilitates the reading of the numerical value indicating pipette diameter (thickness).
- The new micrometer features angle gauge lines marked in 5-degree increments, facilitating precise and consistent angle measurement during pipette bending.

**Comparison images of resolution using the same pipette**

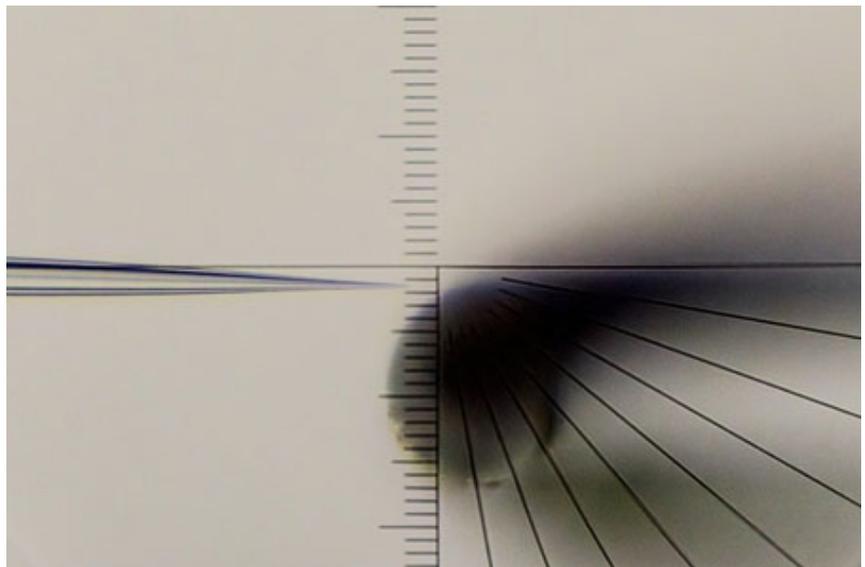
	
<p>MF2 Total magnifications: 525x</p>	<p>MF3 Total magnifications: 500x</p>

**MF3**  
**Microforge****Micrometer readout: 10x eyepiece images (cropped)**

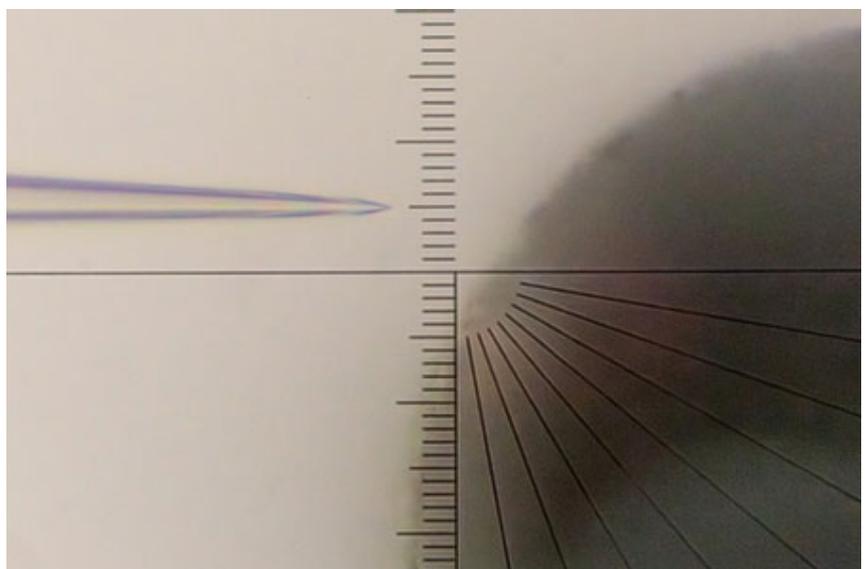
**Total magnifications 50x**  
Objective lens 5x and Eyepieces  
10x  
20 $\mu$ m (per 1 scale)



**Total magnifications 100x**  
Objective lens 10x and  
Eyepieces 10x  
10 $\mu$ m (per 1 scale)



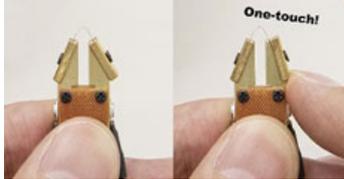
**Total magnifications 500x**  
Objective lens 50x and  
eyepieces 10x  
2 $\mu$ m (per 1 scale)



\* By adding the Objective lens 50x (MF3-LO50, sold separately), pipette observation and processing tasks can be performed with the MF3 at a total magnification of 500x.

\* MF3 lenses are exclusively compatible with the MF3. Please note that eyepieces and objective lenses from older Microforge models (such as the MF-830, MF-900, and MF2) are not compatible with the MF3 and cannot be used.

## Additional features

<p>1. Heater set-up: Horizontal</p>  <p>For cutting, bending, polishing, and spike creation</p>	<p>2. Heater set-up: Vertical</p>  <p>For polishing with high-power magnification</p>	<p>3. Digital display for heater value</p>  <p>The digital display instantly shows the heater value from dial adjustment.</p>
<p>4. "Burnt" warning feature</p>  <p>For when a heater connection platinum wire fault is detected.</p>	<p>5. Easy-on-the-eyes LED lamps</p>  <p>The brightness of the LED lamp can be fine tuned with a dial, increasing comfort during long hours of use.</p>	<p>6. Easy PT heater wire replacement</p>  <p>With spring-loaded clips, seating the thin heating element before tightening the screw, is now easier than ever.</p>

# MF3

## Microforge

### Optional products (sold separately)

Model	Product	Remarks
<a href="#">MF3-LO50</a>	Objective lens 50x	By adding the Objective lens 50x ( <a href="#">MF3-LO50</a> , sold separately), the MF3 can be used at a total magnification of 500x. It is ideal for processing electrodes for electrophysiology and injection pipettes.
<a href="#">HIC-1.2</a>	End cap with stainless steel collar	The <a href="#">HIC-1.2</a> is required when holding a 1.2mm diameter pipette. The included dedicated injection holder cap <a href="#">HIC</a> (for 1mm diameter) will be replaced for the use.
<a href="#">HIC-1.5</a>	End cap with stainless steel collar	The <a href="#">HIC-1.5</a> is required when holding a 1.5mm diameter pipette. The included dedicated injection holder cap <a href="#">HIC</a> (for 1mm diameter) will be replaced for the use.
<a href="#">H-7</a>	Pipette holder	When holding glass pipettes of different diameters (1mm to 1.5mm) for electrophysiological recording, the <a href="#">H-7</a> is recommended.

**MF3**  
**Microforge****Specification**

<b>Accessories included</b>		Eyepieces (one with micrometer and diopter adjustment, one without) 5x Objective lens, 10x Objective lens Pipette holder Heater manipulator Foot switch Spare heater (PT-B, 150µm) Hex wrench Silicone rubber gasket (HI01PK01) Power cord
<b>Movement range</b>	<b>Heater manipulator</b>	X14mm, Y14mm, Z14mm
	<b>Pipette manipulator</b>	X12mm, Z28mm
	<b>Microscope</b>	Y (Focus-Coarse/Fine coaxial knob) 30mm X (Swing-Fine control knob) approx. 5° Z (Tilt-Fine control knob) approx. 3°
<b>Total magnifications</b>		50x/100x: 5x/10x objective lens, 10x eyepieces 500x: 50x objective lens ( <u>MF3-LO50</u> , sold separately) and 10x eyepieces
<b>Glass capillary</b>		ø1mm * The holder is compatible with capillaries of 1.2mm and 1.5mm diameters, requiring the separately sold <u>HIC-1.2</u> and <u>HIC-1.5</u> , respectively.
<b>Working voltage</b>		AC100V - 240V, 50/60Hz
<b>Power consumption</b>		13W
<b>Dimensions/Weight</b>		W210mm × D313mm × H343mm, 4.6kg

Specifications are subject to change without notice.

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