

MicroCaster™ Microarrayer System

Application Note #753: MicroCaster – A Tool for Building Protein Microarrays available in PDF format at www.whatman.com or can be requested by phone or e-mail.

I. Disinfecting

The entire MicroCaster slide holder and microarrayer hand tool can be disinfected by carefully wiping with 5% bleach, followed by sterile water and ethanol. Always remove any bleach residue from the unit after disinfecting.

For cleaning the microarrayer pins between each transfer from the source plate, place four pipette tip box covers or small containers onto your work surface. The four wash reservoirs and blot station will accommodate one 5% bleach bath, two distilled water baths, and an alcohol bath.

If you use bleach, you must remove it from the pins before placing them into a source plate. We recommend at least two additional distilled water dips to dilute out the bleach.

It is important that the pins be dry before going into the source plate. For this reason, we recommend using a final alcohol dip and air-drying the pins. It is important that the liquid in the baths not get into the holes on the bottom float plate, as that will interfere with the pins floating freely. Fill the baths with just enough liquid to cover the “high water mark” of the liquid in the microplates. Because the pins can be bent easily, it is best not to touch the pins on the bottom of wells or baths. Hydrogen peroxide may also be used to disinfect the pins as long as it is rinsed off with distilled water. The percentage of hydrogen peroxide necessary will vary between applications.

II. Care

After each day's use we recommend that the pins be cleaned in an ultrasonic bath with MICRO-90® ultrasonic detergent at a 1/100 dilution. Rinse in two baths of distilled water, dip twice in alcohol, and air dry. Avoid long periods of soaking in bleach or detergent baths. If you use an ultrasonic bath, hold the arrayer in the bath without letting the pins touch the bottom of the reservoir (the vibrating bottom surface of the sonicator's reservoir may damage the pin tips). After the tips have been cleaned and rinsed, treat them with MicroCaster Pin Conditioner. The guide pins on the indexing unit and base unit should be treated with a light coating of silicone grease occasionally.

III. Setup

NOTE: Please see Figures 1 and 2 for illustrations of the various subcomponents.

Remove the MicroCaster array tool from the indexing unit.

Remove the indexing pins from the indexing unit.

Disassemble the indexing unit by removing the indexing deck from the base unit.

Place FAST® Slides or coated glass slides into base unit:

Slide 1 – Lower near edge of the slide into near bay, pressing against the spring-loaded bar on the near left side. Level the slide into the bay, and secure it gently against the far left top frame of the bay.

Slide 2 – Lower far edge of the slide into far bay, pressing against the spring-loaded bar on the far left side. Level the slide into the bay, and secure it gently against the near left bottom frame of the bay.

Replace the indexing deck to the base unit: Align the slots on the underside of the indexing deck over the four pins in the base unit.

Return indexing pins to starting position: Slide the top deck of the indexing unit into the left and nearest position.

Horizontal Indexing Set (Eight Holes): Place the horizontal indexing pin into the first (left) alignment hole.

Vertical Indexing Set (Twelve Holes): Place the vertical indexing pin into the first (near) alignment hole.



MicroCaster™ Microarrayer System (continued)

IV. Arraying

Hold the MicroCaster array tool in the proper orientation to the indexing unit:

Look at the guide holes on the bottom side of the MicroCaster array tool. Hold the array tool with the large guide hole on the left and the small guide hole on the right.

Place the pins of the MicroCaster array tool into the appropriate wells of a microplate. Slowly raise the pins out of the liquid. The speed at which the pins are raised out of the liquid is important. Removing the pins very fast out of the liquid will result in larger hanging drops on the tips of the pins, which could result in overlapping spots. We recommend raising the pins out of the liquid at a moderate, consistent speed every time. It is also important that the pins be removed from the center of the wells and not near the sides of the wells, as this can affect drop size as well.

Align the guide holes on the MicroCaster array tool to the guide pins over slide bay 1 on the MicroCaster indexing unit.

Lower the MicroCaster array tool onto the guide pins until it is resting on the spring-loaded standoff pins of the array tool.

Press firmly and quickly down on the top of the MicroCaster array tool with both hands. The motion should be a rapid, crisp motion to deposit the liquid onto the slides. Remove the MicroCaster array tool from the indexing unit.

If transferring samples from the same wells of the microplate to make duplicate arrays or slides, the pins do not need to be cleaned in between transfers. Dip the pins of the MicroCaster array tool into the microplate again and align it over slide bay 2. Press firmly and quickly down on the top of the MicroCaster array tool with both hands.

If transferring samples from the next set of wells, dip the pins through the series of water and ethanol baths as described above (or bleach, water, ethanol, if desired).

Move the horizontal indexing pin one position to the right.

Repeat the steps above for dipping into the microplate, arraying on the FAST® Slides or coated glass slides, and cleaning the pins in between transfers. After moving the horizontal indexing pin through all eight holes, move the vertical indexing pin to its second position (moving away from you).

Move the horizontal indexing pin back to its original starting position on the far left.

For each of the twelve holes in the vertical indexing set, move the horizontal indexing pin through each of the eight holes in the horizontal indexing set in order to generate a 768-spot array.

V. Instructions for Coating Replicator Pins with Surfactant

A. Prepare 1:5 Dilution of MicroCaster Pin Conditioner

40 ml MicroCaster Pin Conditioner

160 ml distilled H₂O

Mix well. Store in covered dish at room temperature for multiple uses.

B. Coat Pins

1. Dip replicator pins into MicroCaster Pin Conditioner up to the halfway point of the pins.
2. Visually inspect slot pins for air bubbles in slots.
3. Blot onto 3MM blotting paper.
4. Repeat steps 1 through 3 one time.
5. Let pins air dry, or use hot air dryer to dry pins and slots.
6. Set up three dH₂O reservoirs (e.g., tip lid boxes).
7. Dip replicator pins into first dH₂O reservoir. Swirl to mix.
8. Blot onto 3MM blotting paper.
9. Repeat through remaining reservoirs.
10. Dip replicator pins into isopropanol. Swirl to mix.
11. Blot onto 3MM blotting paper.
12. Repeat steps 10 and 11 one time.
13. Air-dry or use hot air dryer to dry pins.
14. Replicator pins are now ready for use.

