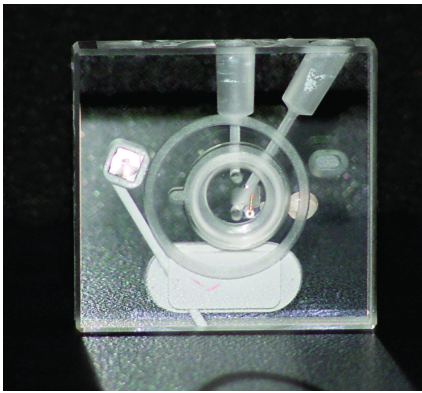


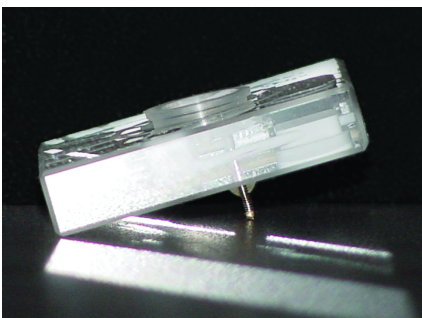
MultiMode SPM Accessories: New Silicone O-Ring for Fluid Cantilever Holders



Silicone O-ring showing "S"-shaped profile.



Bottom view of a fluid cell and silicone O-ring.



Side view of a fluid cell showing the flat sealing surface of the new O-ring.

The Digital Instruments MultiMode™ Scanning Probe Microscope (SPM) utilizes an optional fluid cantilever holders to enable operation in fluid environments. These cantilever holders can optionally be used with an O-ring to form an enclosed fluid environment with the ability to exchange liquids.

The previous O-ring design was based on a circular cross section design. The new O-ring design features an "S"-shaped profile with thin, flexible walls that greatly reduce lateral friction. The upper, tapered portion of the O-ring fits snugly and seals well around the cantilever chip pocket in the fluid cell. The lower part of the O-ring flares out to a flattened flange-like section that forms a reliable seal against the sample. Together, these features help prevent leakage and imaging artifacts due to lateral friction.

O-Ring Usage

The O-ring is best used by placing it carefully in the circular groove that runs around the cantilever chip pocket. Blunt-tip forceps are useful for gently stretching the O-ring around the glass. Once in place, the O-ring will stay securely and the assembly can be turned upside down. Place in the SPM head as usual, ensuring that your sample area is at least as large as the O-ring and there are no gaps at the edges.

In addition to the fluid on the sample itself, a small drop of fluid may be applied to the fluid cell before placing it on the sample. However, the overall fluid volume should be kept as small as possible (~50 microliters) to prevent leaks onto the scanner. Once in place and secured, use the stepper motor to bring the tip close to the sample as normal (keep the head as level as possible using the manual screws if you do not have a vertical engage scanner). When the tip is relatively close to the sample, the bottom of the O-ring should be well sealed against the sample.

The Luer fittings and silicone tubing provided in the fluid cell accessory kit can be used to facilitate the addition and removal of fluid. One effective strategy for avoiding leaks is to always pull fluid through the fluid cell under vacuum instead of pushing it through under pressure. A simple way to do this is to connect one port to tubing and place the free end of the tubing in a vial of your fluid. Connect the other port via tubing to an empty syringe. This technique ensures that, in the event of a poor seal, only air bubbles are introduced into the fluid cell rather than fluid leaking onto the scanner.

O-Ring Availability

The new O-ring is included with all current fluid cells orders. They can also be purchased separately:

Model FCPART (Fluid Cell Accessory Kit)

- 10 glass coverslips
- silicone tubing
- 5cc syringe
- lens paper
- 4 male Luer fittings
- 2 female Luer fittings
- 2 tube clamps
- 6 silicone O-rings
- and silicone grease

Model FCO-10 (Silicone Fluid Cell O-rings)

- Package of 10 silicone O-rings

Compatibility

The new silicone O-ring is compatible with the following MultiMode fluid cells:

- Model FC (Contact Mode Fluid Cell)
- Model MTFML (TappingMode™ Fluid Cell)
- Model ECFC (Contact Mode AFM Electrochemical Fluid Cell)
- Model MMTMEC (TappingMode AFM Electrochemical Fluid Cell)

The new silicone O-ring is not compatible with:

- Model MMTVFC (STM Electrochemical Fluid cell)
- Model MMMAD (Fluid Cell for Magnetically Actuated Drive TappingMode)

Specifications

Material:	Medical-grade silicone rubber
Solvent resistance:	Compatible with most dilute aqueous solutions and alcohols Poor resistance to most organic solvents (i.e. acetone, toluene, oils, etc.) Poor resistance to strong alkalis and acids

Note:
These guidelines are given for reference. Suitability for a given solvent can not be guaranteed and should be established prior to use.
Performance specifications are typical and subject to change without notice.

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