

Filter Disks

For standard stirred cell and vacuum filtration apparatus

Product Numbers: FD Product Family

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INSTRUCTIONS FOR USE – BETA UNIT EVALUATION

Provided Kit Materials

- Pre-Cut Silicone Gasket Set (12)
- 13 / 25 mm Filter Disk membranes (6)
- 6-postion Shipping Tray

Required Equipment & Supplies

Equipment

- Vacuum filtration apparatus, 13/25 mm diameter
- Vacuum source

Supplies

- Tweezers suitable for membrane manipulation (SiMPore K6TWZR, or equivalent)
- User-supplied tubing or fluidic interface(s)

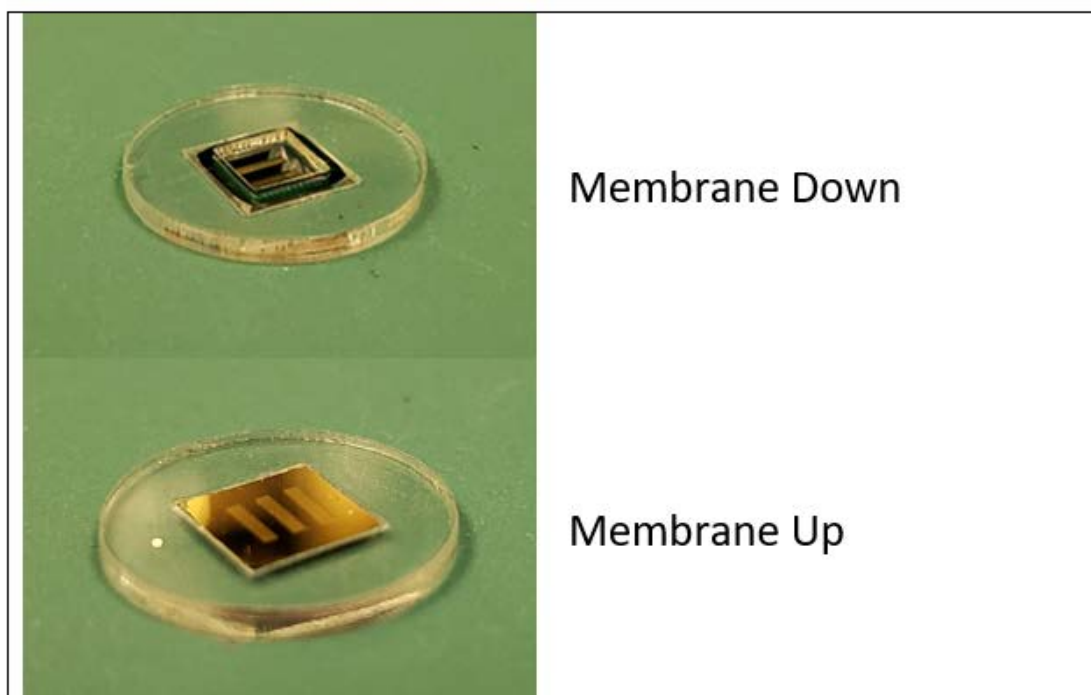


Figure 1. Filter Disk geometry showing the membrane down and membrane up (usage) device orientations

INSTRUCTIONS

Please read all **instructions** before proceeding.

NOTE: HANDLE FILTER DISC ONLY BY THE PLASTIC HOUSING TO PREVENT FILTER DAMAGE.

NOTE: Some debris along the perimeter of the membrane chip may be observed. This material is Si, SiN, and Au in composition and will not interfere with your analysis.

Device Installation and Filtration

1. Assemble filtration apparatus as per vendor instructions
2. Using tweezers or gloved fingers, retrieve and install one silicone gasket onto the frit or outflow support of the filtration device
3. Using tweezers transfer a membrane filter disk and place onto the gasket from above such that the membrane is **up**

NOTE: Reference Figure 1 (above)

4. Repeat the process in step 2 with another silicone gasket, ensuring at no time to contact the membrane surface.

NOTE: Any contact with the membrane surface may damage or destroy the membrane.

5. Add the upper funnel assembly or media inlet device assembly and securely fasten with vendor-supplied hardware
6. Attach a vacuum source and filter accordingly.

NOTE: Do not exceed 15 PSI differential pressure as membrane damage may occur

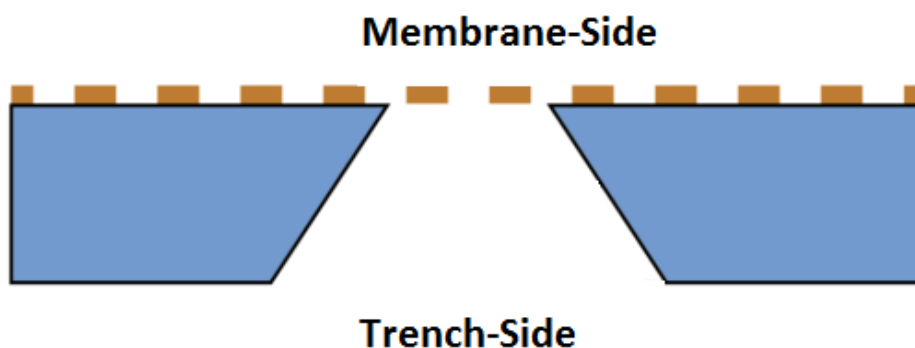


Figure 2. Membrane chip organization. SiMPore membranes are deposited across the surface of a silicon wafer support material. Access to the ultra-thin membrane is achieved by etching trenches through the thicker silicon wafer support, yielding the cross-sectional geometry shown above.

7. Process all liquid through the filter to dryness, then disassemble and place the

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membrane on a clean, dry surface until analysis.

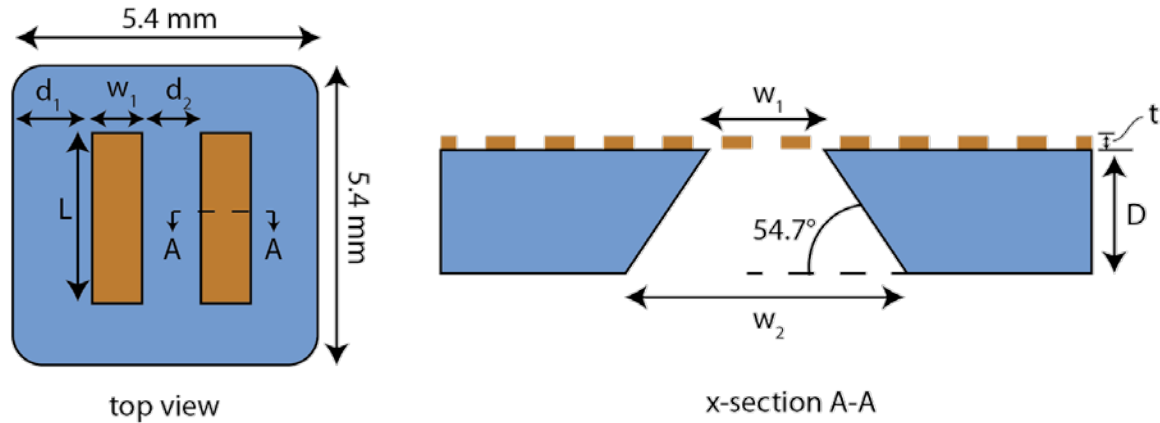
TIPS AND TROUBLESHOOTING

- **Inspection:** Prior to assembling the device, carefully inspect the membrane filter disks and gaskets for debris. If found, CDA or compressed N₂ may be used to clean the surface(s).
- **Filtration:** The liquid flow rate through the membrane filter disk will vary depending on pore size cutoff, membrane porosity, and fluid properties. Generally, clear water samples should filter at a rate of 100 ml/min with suitable backpressure (~8-20 PSI). Flux through the membrane will slow or may stop completely if a cake layer forms, particularly with heterogenous particulate suspensions. If fouling occurs, discontinue filtration, and either dilute the sample with deionized water or process a smaller volume with a new membrane filter disk
- **Proper Sealing:** Good device performance is achieved when a tight seal is made between the silicone gaskets and membrane filter disk. During assembly, ensure no excessive movement or misalignment of the device layers has occurred, which could affect filtration performance. Poorly aligned gaskets may cause fluid leakage from the sides of the device, or create an aspiration of air into the system when vacuum is applied.

PHYSICAL PROPERTIES

Property	Value
Membrane Composition:	Silicon Nitride (SiN)
Membrane Surface Area	1.4 mm ² (single slot), 6.3 mm ² (three slot)
Maximum Differential Pressure	15 PSI
Membrane Thickness	100 nm (NPN) / 400 nm (SiN)
Pore Size Cut-Off	varies
Porosity	varies
Surface Charge	Neutral to slightly negative
Surface Coating	Varies (Low Binding, 120nm Au, 200nm Al)
Wetted Components Material(s)	Si, SiN, Au/Al, Medical Grade PSA

MEMBRANE SPECIFICATIONS



Dimension Type	Dimension ID	Membrane Window Format (Dimensions in um)						
		1 Slot	2 Slot	3 Slot	4 Slot	5 Slot	1 Square	
Frame Thickness	D	310 μm						
Window Width	W1	700	700	700	300	150	1000	2000
Membrane Window Length	L	2000	2500	3000	3000	3000	1000	2000
Frame Window Width	W2	1138	1138	1138	738	538		
Edge Margin (Sides)	d1	2300	1625	1100				
Window Gap	d2	N/A	750	500				
Membrane Surface Area	A	1.4mm²	3.5 mm²	6.3 mm²	3.6 mm²	1.5 mm²	1 mm²	2 mm²
Example Applications		Cell Culture, Flow Cells, Microfluidics		Dead-End Filtration, Microfluidics			Cell Culture	

Sterilization

Filter disks may be sterilized via Ethylene Oxide, Hydrogen Peroxide Gas, 70% IPA immersion, gamma, UV, and E-Beam irradiation after removing from the plastic bag. **Do Not** Sterilize via steam autoclave as device damage may occur.

Chemical Stability

Devices are incompatible with strong bases, as membrane degradation may occur. Avoid long exposure durations to solvents, as this may compromise device integrity. Do not apply solvents, acids, bases, organics, or other compounds that are incompatible with the stated device components.

Device Storage

Store in a clean and dry environment. Prolonged exposure to UV may discolor plastic housing but should not affect filter performance.

STANDARD WARRANTY

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TRADEMARKS AND PATENTS

This product is Patent-pending: U.S. Applications No. 62/719,013 and No. 62/754,946.

This product uses U.S. Patent No. 9,789,239.