

## Filling MicroClime™ Environmental Lids

### Introduction

The Labcyte® MicroClime environmental lid (patent pending) minimizes edge effects and preserves the concentrations of solutions in microplate wells. Unlike standard microplate lids, the MicroClime lid incorporates a unique, fluid-absorbing matrix. The absorbed fluid creates a vapor barrier that protects the sample from the exterior environment, especially near the edges of the microplate. The MicroClime lid is easy to use—simply place it on or lift it off a microplate. No specialized tools are required, and it is compatible with robotic plate lidding systems. The lid can be filled with many different fluids, using either a hand-held syringe or automated bulk fillers.

When filled with anhydrous DMSO, the MicroClime lid prevents evaporation and hydration of DMSO in compound library plates during storage. It also stops evaporation of ultra-low-volume DMSO droplets in screening assays. The lid can also be filled with water to prevent evaporation in aqueous assays.

### Filling Areas

In the schematic of the MicroClime lid below, the gray areas indicate the filling areas. You can dispense fluid into the short sides (left and right) with a hand-held syringe or a recommended bulk filler, or into the long sides (top and bottom) with a recommended bulk filler. Note that the filling troughs on the short sides are wider which allows easier filling.

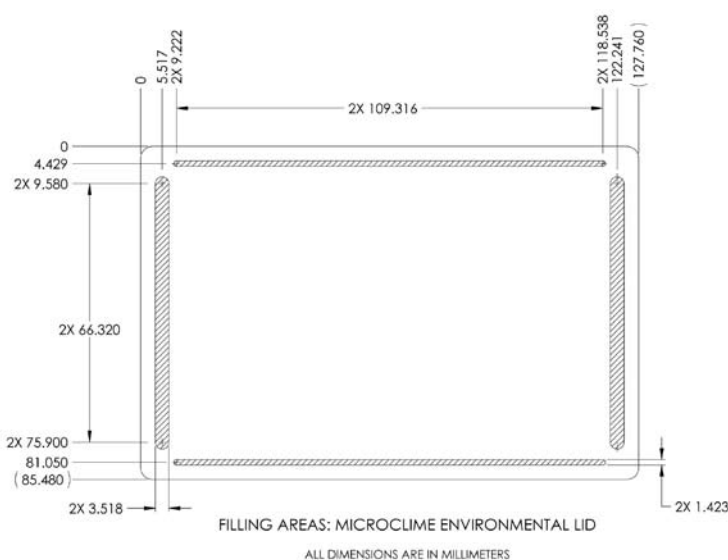


Figure 1.

Centrifuging the lids is not recommended. The fill openings are not sealed, therefore liquid will be pulled out of the absorbent matrix. Centrifuging at high speed may result in cracking the lid.

### Maximum Fill Volumes

For aqueous solutions: 8 mL; for DMSO or other hygroscopic solutions: 7 mL (to allow for increase in volume as the solution absorbs water.) If the relative humidity of the lab allows hydration to lower than 70% DMSO, less fluid should be used in the lid to compensate for volume increase. When filled properly, there will be a gap in the middle of the felt where it has not been wetted, as shown in Figures 2a and 2b. The gap should be open on at least one edge of the lid to allow air to escape as the solution expands and/or hydrates. The vapor that protects the plate disperses evenly throughout the vapor barrier, so all edge wells are equally protected regardless of the gap.

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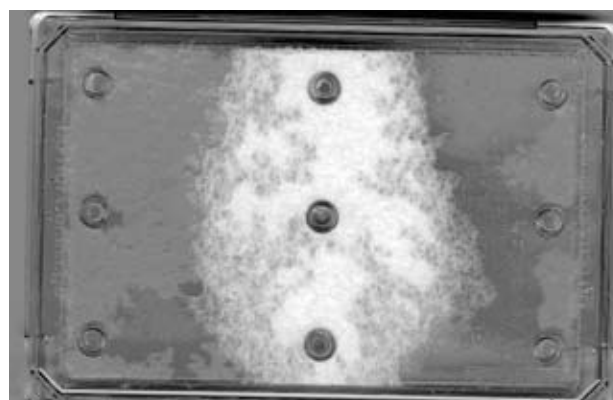


Figure 2a. Image of a lid filled from short sides

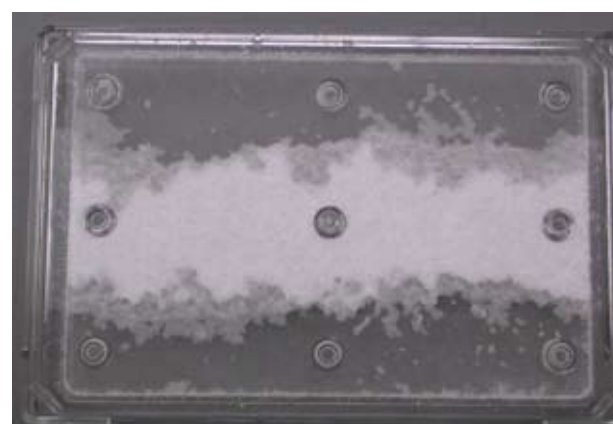


Figure 2b. Image of a lid filled from long sides



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### Filling MicroClime™ Environmental Lids

#### With Manual Syringe

1. Use a hand-held syringe equipped with a blunt needle (16 gauge or more).
2. Dispense 3.5 mL DMSO (or 4 mL water) into the left-side trough on the short side of the MicroClime lid over a period of 15 seconds by sweeping the needle slowly up and down the left-side trough.
3. Repeat Step 2 with the right-side trough. The filled lid should resemble the image in Figure 2a.
4. If large drops are left in the troughs, a lab tissue should be used to clean off the lid.
5. To view a video of syringe filling please see:  
<http://www.labcyte.com/downloadablemovies.aspx>
  - a. Filling MC lid using single tip syringe.

#### With 8-channel Bulk Filler: FlexDrop™ dispenser

Prerequisite: A Labcyte Adaptor (Labcyte Catalog # LL-0300-FA-F) is required to correctly position the lid with the filler.

If the Flexdrop is connected to a PC via the RS-232 port, the following protocols may be used:

- a. <http://www.labcyte.com/documents/Microclime/FlexDrop-DMSOFill.doc>
- b. <http://www.labcyte.com/documents/Microclime/FlexDrop-WaterFill.doc>

Otherwise, follow the following protocol guidelines:

1. Select the reagent with correct viscosity settings (for water set to 0 and for DMSO set to 35).
2. Create a 384-well plate type used to dispense into the left side trough of the MicroClime lid on the short side with "x offset" = 161 mm, and "y offset" = 7.35 mm
3. Create a 384-well plate type used to dispense into the right side trough of the MicroClime lid on the short side with "x offset" = 148 mm, and "y offset" = 7.35 mm
4. Create a protocol that dispenses 73 µL DMSO (125 µL of water) into column 1 of the left side trough on the short side of the MicroClime lid.
5. Link the protocol to a second protocol which dispenses 73 µL DMSO (125 µL of water) into column 24 of the right side trough on the short side of the MicroClime lid.
6. Repeat Steps 4 and 5 once by creating copies of these protocols and linking them, creating a total of Six linked protocols for DMSO (four linked protocols for water).

7. When the filling is completed properly, the filled lid should resemble the image in Figure 2a.
8. If drops are seen in the troughs, a laboratory tissue should be used to clean off the lid.
9. To view videos of automated lid filling with the FlexDrop please see: <http://www.labcyte.com/downloadablemovies.aspx>
  - a. FlexDrop and DMSO Fill Video
  - b. FlexDrop and Water Fill Video

#### With 12-channel Bulk Filler: Hudson Control micro10 Dispenser

Prerequisite: A Labcyte Adaptor (Labcyte Catalog # LL-0300-FA-M) is required to correctly position the lid with the filler.

Follow the following protocol for a successful dispense in the lid

1. From the "Settings" menu enter the "Adjust Row/Column Spacing" submenu.
2. Set "Row Spacing" to "-510", and adjust the "Column Spacing" only if the tips are not centered left-to-right. Press "OK".
3. In the "Adjust Track/Next Height" Submenu, press "Yes" to "Move to Current Location".
4. Using the up/down arrows on the touch screen, set the tip height to less than 1 mm above the adaptor, and press "OK".
5. Place the MicroClime lid on the adaptor and enter the "Adjust Plate Origin" submenu. Use the "Down" button to lower the tip to just above the filling trough in the lid, and make sure the tips are aligned with the trough. Press "OK".
6. Exit the "Settings" menu and select "Dispense" menu. Enter the following settings:
  - a. Pump Volume: 290µL (for DMSO fill) and 330µL (for aqueous fill)
  - b. Pump Speed: 10 (Note that higher speeds will result in poor filling of the lid)
  - c. Height: 13
  - d. Depth: -9
  - e. Wells: 96
  - f. Tip Touch: Off
7. Enter the "Fill Pattern" submenu, and select "Rows Not Filled" for all but the first and last rows, then exit the submenu.
8. Enter the "Settings" menu, select "Enable/Disable Pump" and enter "No". Then, exit the menu.
9. To ensure proper filling of the lid, perform an empty dispense and check for positioning of the tips with the filling troughs in the lid. Slight contact of the tips with the lid is acceptable.

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#### Filling MicroClime™ Environmental Lids

10. When the filling is completed properly, the filled lid should resemble the image in Figure 2b.
11. If drops are seen in the troughs, a laboratory tissue should be used to clean off the lid.
12. To view videos of automated filling with the micro10, please see:
  - <http://www.labcyte.com/downloadablemovies.aspx>
  - a. Hudson and DMSO Fill Video
  - b. Hudson and Water Fill Video

#### Further Information

Please visit our website <http://www.labcyte.com/microclimelid.aspx> for a complete chemical compatibility list, Application Notes, videos and additional information about the MicroClime lid.

#### References

Ellson, R.; Kong, B.; Mutz, M.; Miller, M.; Bramwell, A.M.; Jamieson, R.B. "Compound Preservation in Closed Loop Screening", *11th Annual Conference of the Society for Biomolecular Screening*, Sept. 2005. <http://www.labcyte.com/documents/conference%20posters/compound.preserve.loop.pdf>

Ellson, R.; Kong, B.; Mutz, M.; Brown, C.; Browning, B.; Harris, D.; Qureshi, S.; Shieh, J; Wold, D. "In situ DMSO Hydration Measurements of HTS Compound Libraries" *Combinatorial Chemistry & High Throughput Screening*, 8(6):489-498, 2005.

Ellson, R.; Shieh, J.; "Managing Compound Library Health Through Solvent Restoration." *8th International MipTec Conference*, May 2005. <http://www.labcyte.com/documents/conference%20presentations/MiptecLabcyte2005.pdf>

"MicroClime Environmental Lids Reduce Edge Effects in Multi-well Plates" *Labcyte Application Note #0001*. <http://www.labcyte.com/documents/app%20notes/app.edge%20effects.8.pdf>



Figure 3. Filling a MicroClime lid with FlexDrop Dispenser.



Figure 4. Filling a MicroClime lid with Hudson micro10 dispenser.

For additional product or technical information on the Labcyte MicroClime™ environmental lids, please e-mail us at [MClid@labcyte.com](mailto:MClid@labcyte.com), visit our web site [www.labcyte.com](http://www.labcyte.com) or call (877) 742 6548. Outside the United States, call +1 (408) 747 2000.

