

Operational Accuracy of SureShelves™ in Practical Aspiration Scenarios

Introduction:

Expansify™ respiring culture ware incorporates a series of gas-permeable silicone ridges and grooves engineered to enhance oxygen transfer, thereby supporting intensified culture of adherent, spheroid, and suspension cell types. Through direct contact with oxygenating surfaces, cells respire independently of media volume, effectively decoupling gas exchange from nutrient delivery. This design enables Expansify™ wells to accommodate large media volumes across the device without compromising oxygen availability. To facilitate efficient handling of these volumes, SureShelves™ are integrated into each well of the 24-well plate, enabling rapid, reproducible, and accurate liquid aspiration without the need for multiple pipetting steps or excessive operator intervention.

Procedure:

1. Wells were filled with 1 mL of cell culture grade water and wetted via centrifugation.
2. Wells were then overfilled with cell culture grade water, 5 mL total.
3. A single-use Pasteur pipette was used to aspirate a single row (n=6) to generate SureShelves™ evaluation data, see Figure 2 for location-based plate layout.
4. A single-channel P5000 pipette was used to quantify the remaining water volume within wells

A

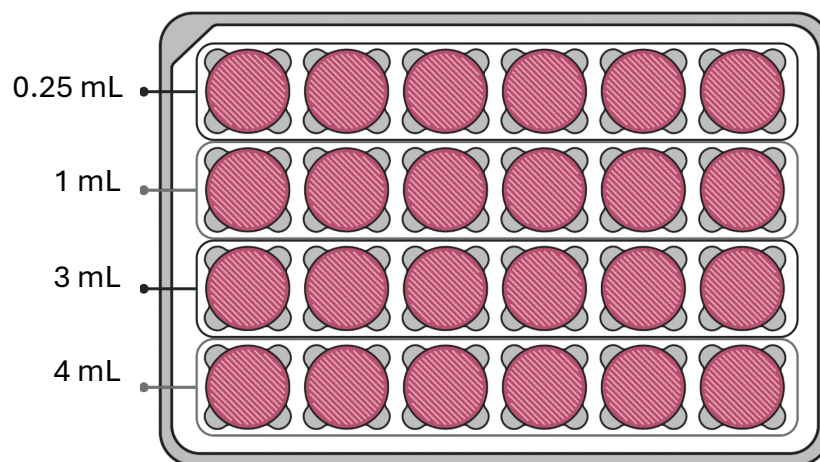
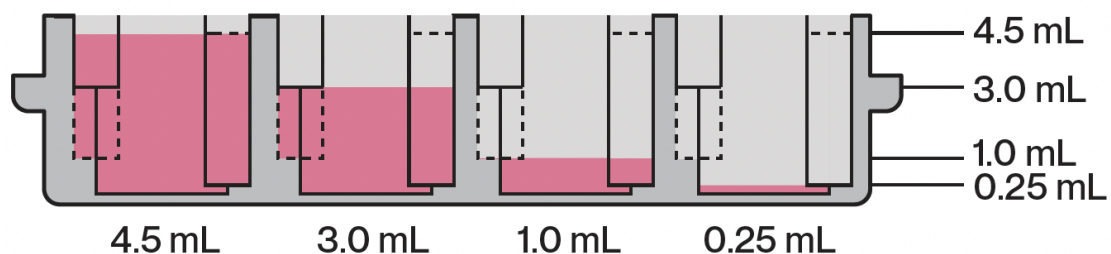


Figure 1: A) Location based map of where each SureShelves™ level was tested. **B)** Cross-sectional schematic of SureShelves™ illustrating media level at each height.

B



Well Specific Percent Deviation from Nominal

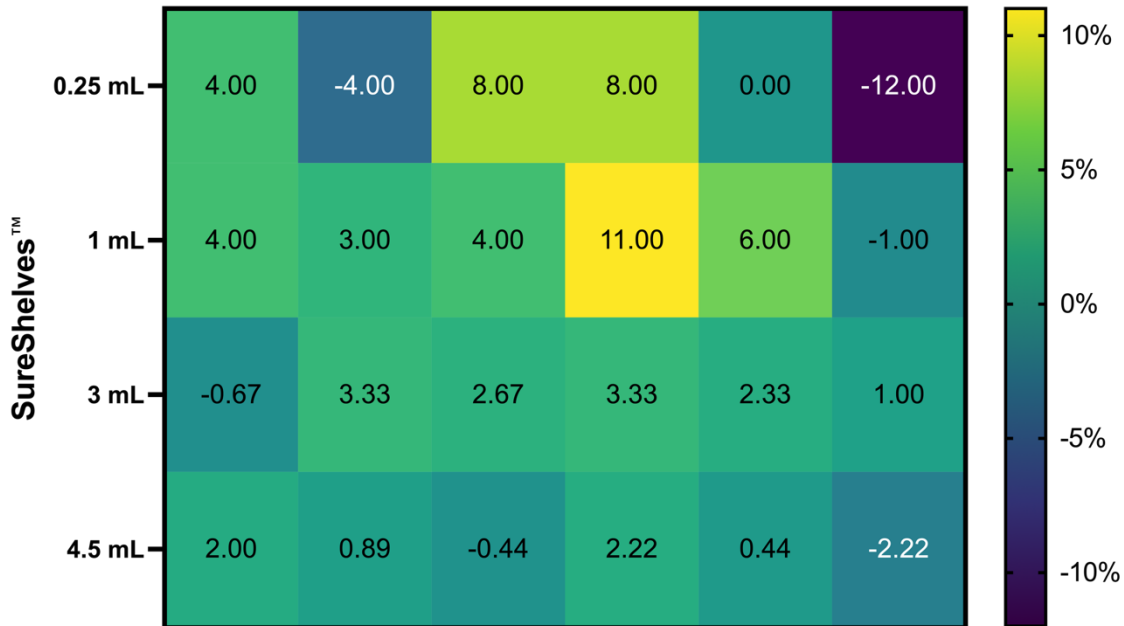


Figure 2: Spatially resolved heat map of percent deviation from the nominal SureShelves™ volume. Each cell represents an individual well measurement at its corresponding position within the 24-well plate.

Volumetric Deviation from Nominal

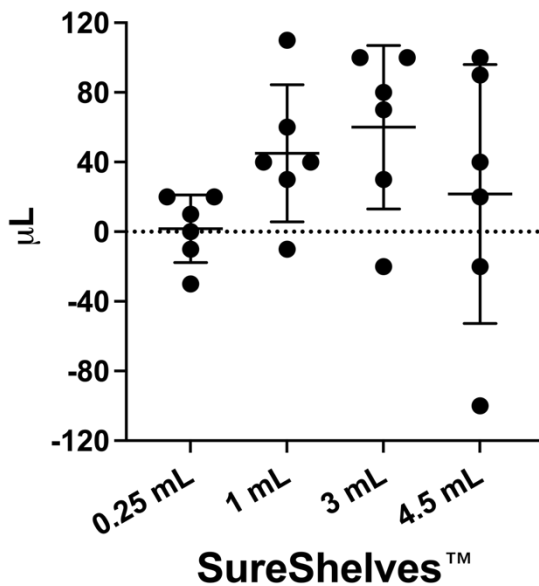


Figure 3: Average volumetric deviation following aspiration with SureShelves™, error bars represent standard deviation (SD) of experimental measurements (n=6). 4.5 mL SureShelves™ delivered a mean volume of 4.52 ± 0.074 mL (SD); 3 mL SureShelves™ delivered 3.06 ± 0.047 mL (SD); 1 mL SureShelves™ delivered 1.05 ± 0.039 mL (SD); and the 0.25 mL SureShelves™ delivered 0.25 ± 0.019 mL (SD).