Supplementary Materials:

Geometric Confinement of 3D Smectic Liquid Crystal Foams

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I. SDS foam under different geometric confinements:

To better understand the effect of elasticity on the assembly of 3D foams, we compared the behavior of smectic foams to that of SDS, which we fabricated in similar conditions as those of LCs: in the same containers (rectangular, square, and cylindrical), at airflow rates varying from 2 ml/min to 62 ml/min. The concentration of the soap solution used in this study is 1 wt% of SDS in pure water.

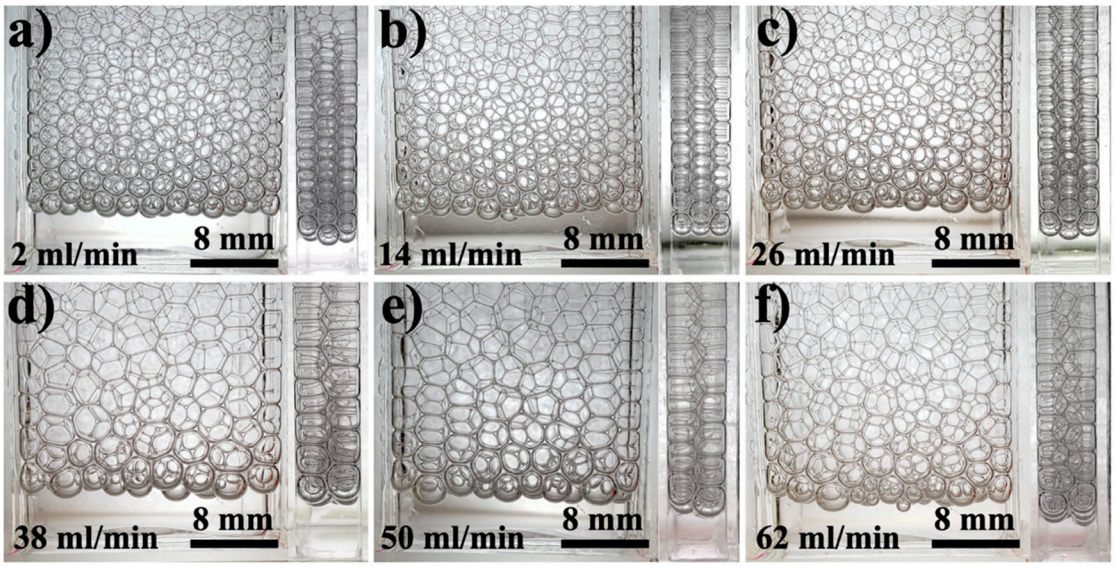

Figure S1. SDS foam confined in rectangular containers. Front view (left) and side view (right) of the foam at an airflow rate of: (**a**) 2 ml/min, (**b**) 14 ml/min, (**c**) 26 ml/min, (**d**) 38 ml/min, (**e**) 50 ml/min, and (**f**) 62 ml/min.

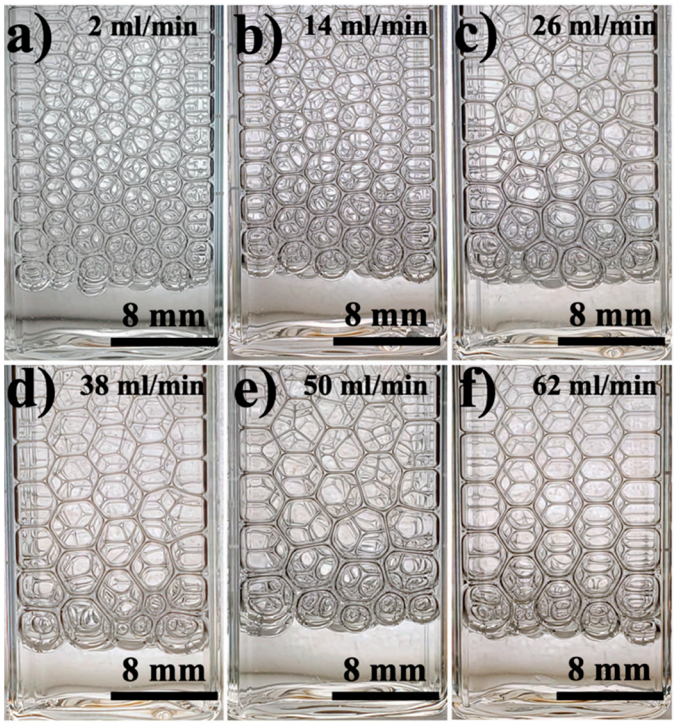

Figure S2. SDS foam confined in square containers. Images of the foam at an airflow rate of: (**a**) 2 ml/min, (**b**) 14 ml/min, (**c**) 26 ml/min, (**d**) 38 ml/min, (**e**) 50 ml/min, and (**f**) 62 ml/min.

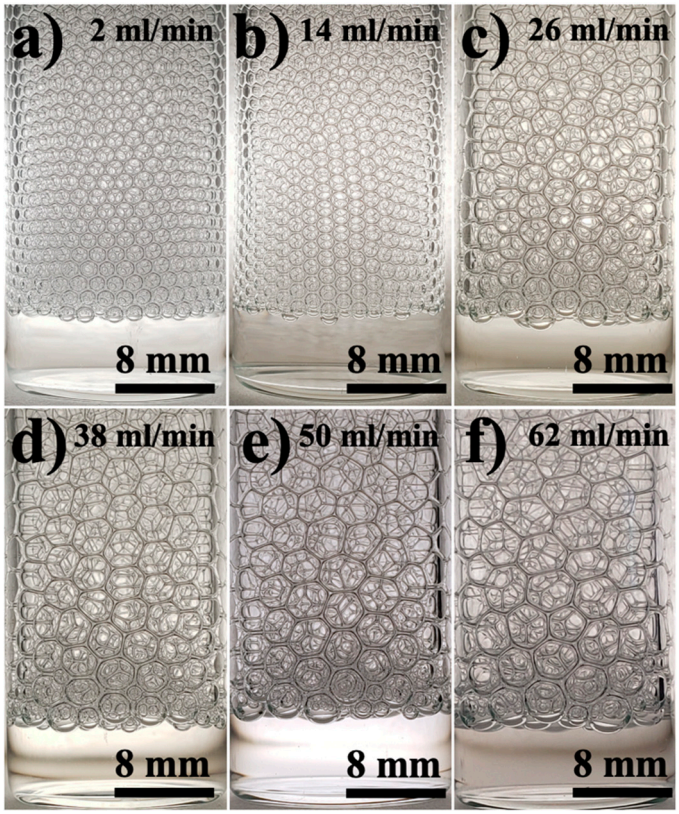

Figure S3. SDS foam confined in cylindrical containers. Images of the foam at an airflow rate of: (**a**) 2 ml/min, (**b**) 14 ml/min, (**c**) 26 ml/min, (**d**) 38 ml/min, (**e**) 50 ml/min, and (**f**) 62 ml/min.

II. Drainage of the SDS and LC foams:

To better understand the effect of drainage due to the gravity on the assembly of foams made with SDS and LCs, we measured the variation of the foam cell film thicknesses along the containers (near the wall) from the top (at the air interface) to the bottom (close to the foam solution). Using the Bin analysis method, all images taken during the experiments are divided into three sections from top to bottom (Bin1, Bin2, and Bin3). All data indicating the thickness of the cells are integrated and plotted in terms of geometric confinement and airflow rate. To visualize the drainage effect on the samples, we took the average value of the cell thickness from each Bin and found the percentage difference between the thickness value in Bin1 (top) and Bin3 (bottom). This method allowed us to obtain the percentage of cell thickness change due to the drainage under the influence of gravity as a function of the airflow rate, as shown in Figure S4. As this figure indicates, the airflow rate does not affect the thickness of the cells for both types of foam. However, there is a significant difference in drainage properties between the LC and the SDS. This difference is due to the viscoelastic properties of the LC that help resist gravity, unlike the SDS soap.

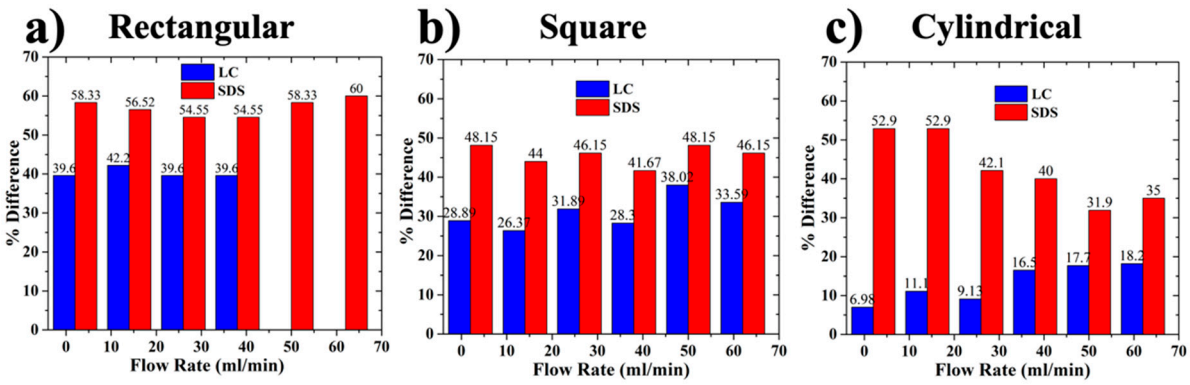

Figure S4. Drainage effect on the SDS and LC foams. Change in the cell film thickness between the cells located on the top of the foam in contact with the air and those at the bottom in contact with the material reservoirs under: (**a**) rectangular, (**b**) square, and (**c**) cylindrical confinements.