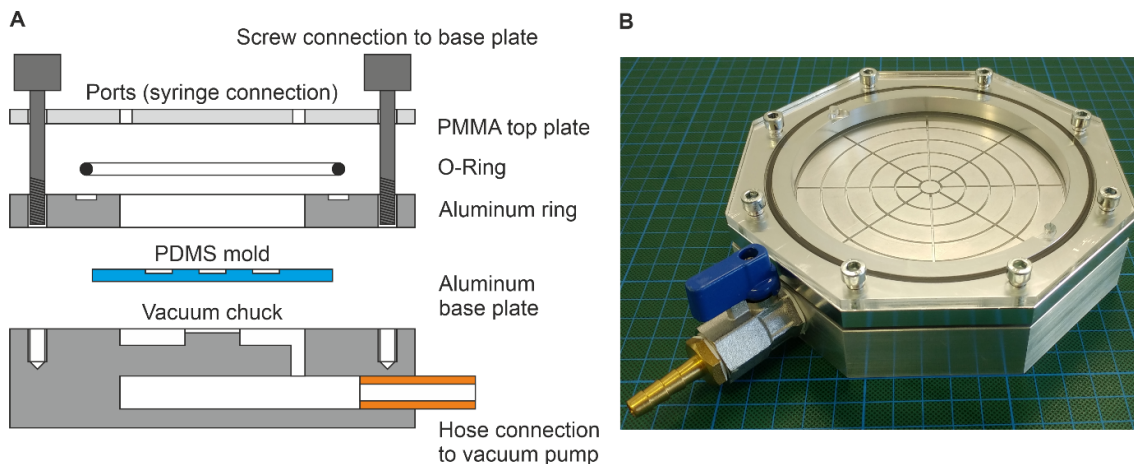


# Supplementary Information: Facile Patterning of Thermo-plastic Elastomers and Robust Bonding to Glass and Thermo-plastics for Microfluidic Cell Culture and Organ-On-Chip

## Epoxy mold fabrication

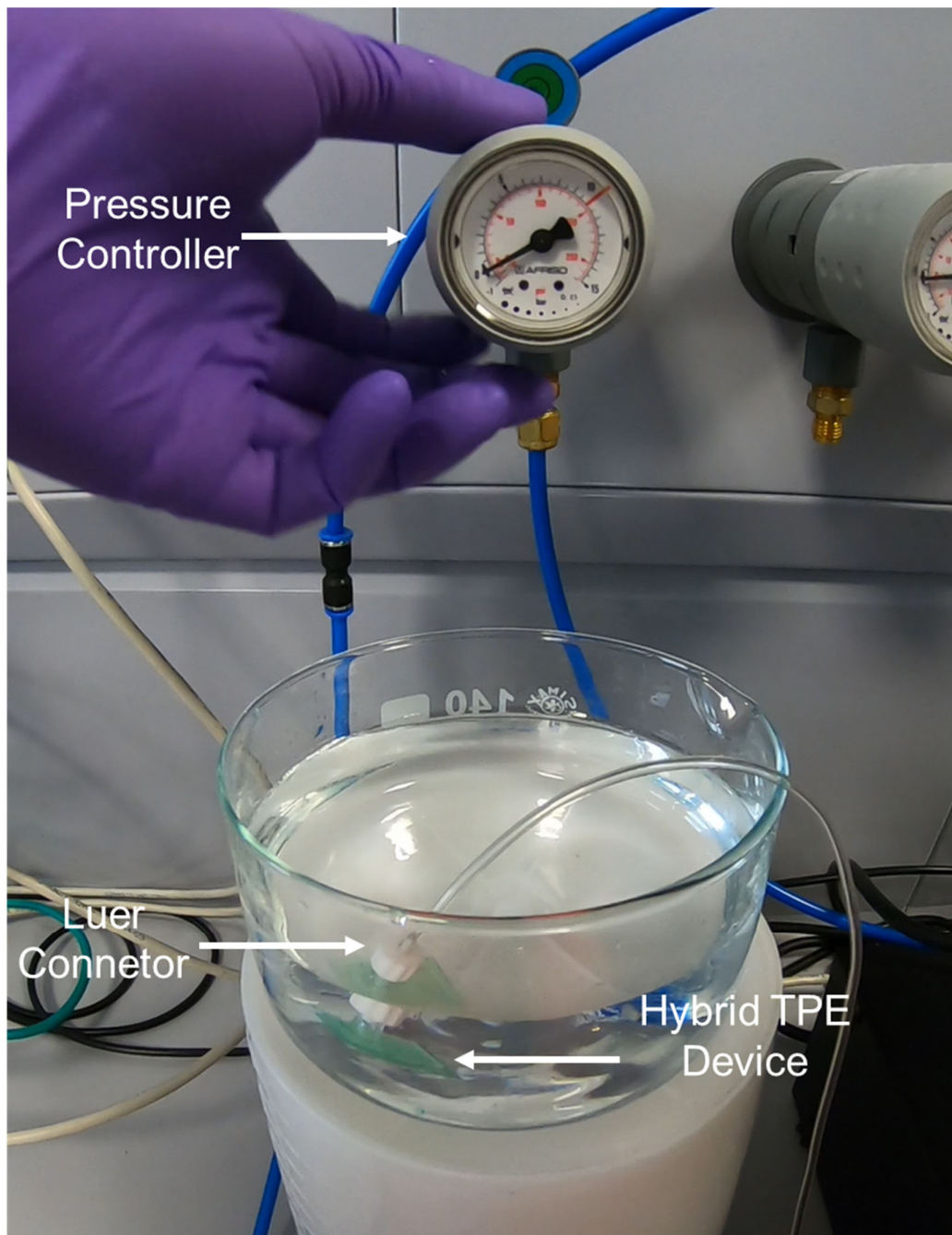
To fabricate the epoxy master mold used for the hot embossing of the PC/TPE-hybrid material, it is necessary to remove all air enclosed in the epoxy mixture. In order to perform this step while maintaining a flat epoxy, a custom aluminum tool was designed and fabricated by an external supplier (CNCTeile24). This tool allows for the placement of the PDMS negative mold and the application of a negative pressure through the PDMS layer to ensure full compression of the epoxy mixture against the PDMS features (Figure S1).



**Figure S1.** (A) Schematic side view and (B) picture of the custom built aluminum tool for the casting of the epoxy master mold.

### Bond strength assessment

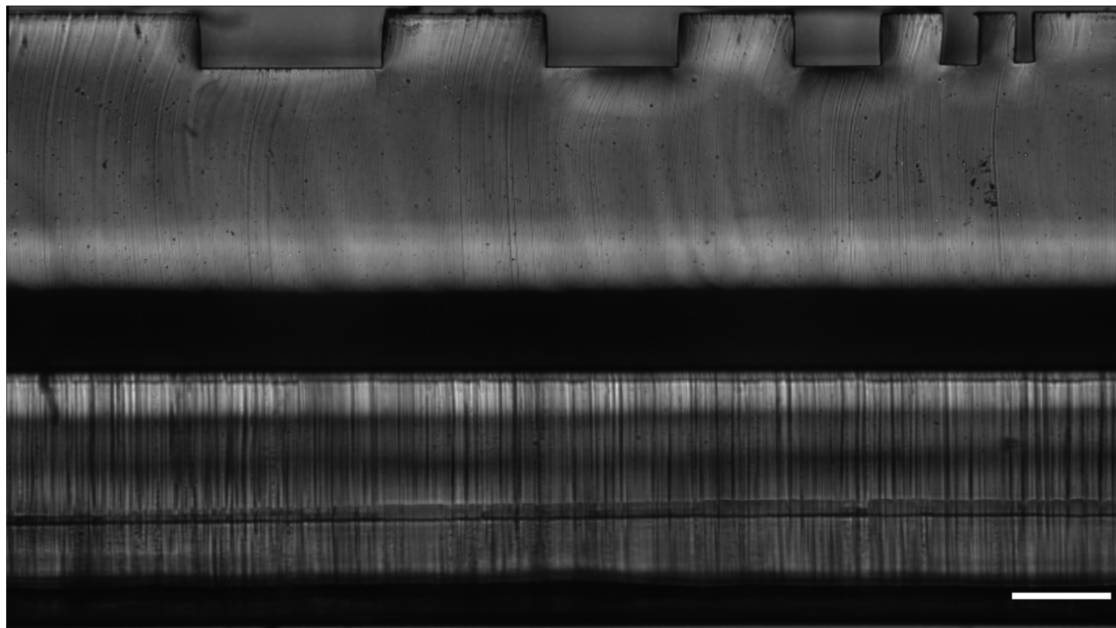
To determine the robustness of the bonding methods used, the microfluidic chips were submerged in a water basin as the applied pressure was increased (Figure S2). This allowed early detection of air bubbles resulting from structure failure caused by delamination.



**Figure S2.** High pressure setup used for assessing bonding strength. The pressure controller was connected to the PC/TPE-hybrid chip using PTFE tubing and a luer connector.

### PC/TPE-hybrid characterization

The PC/TPE-hybrid is fabricated using a 750  $\mu\text{m}$  thick sheet of TPE and a 500  $\mu\text{m}$  foil of PC. During the embossing step, some of the material is ejected towards the sides of the mold resulting in a composite with a final thickness of 1100  $\mu\text{m}$ , which retains properties of both the original materials (Figure S3).



**Figure S3.** Side view of the composite PC/TPE-hybrid material. Scale bar represents 200  $\mu\text{m}$ .

### **Analysis of rhodamine diffusion in microfluidic channels**

The source code of the custom python script for the analysis of rhodamine diffusion in the microfluidic channels is accessible online (<https://github.com/loslab/rhodabs>) and in the supplementary HTML file.