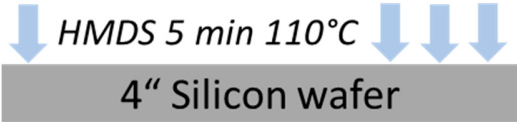

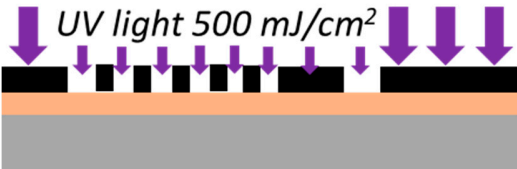








Supplementary information 1: Fabrication process

Table S1: Illustrated process plan

1	Array structuring	
1a	Adhesion promotion	 <p><i>HMDS 5 min 110°C</i></p> <p>4" Silicon wafer</p>
1b	Resist coating <i>Softbake (5 min, 110°C) not depicted</i>	<p><i>Ma-P 1420, 3000 rpm, 2 ml</i></p> 
1c	Mask alignment and exposure	 <p><i>UV light 500 mJ/cm²</i></p>
1d	Development <i>Hardbake (10 min, 110°C) not depicted</i>	<p><i>Ma-533/S, 60s</i></p> 
1e	Deep reactive ion etching	<p><i>ICP dry etching of Si</i></p> 
1f	Ashing of the resist in ICP Wafer cleaning	<p><i>Resist removal (O₂ plasma)</i></p> 
2	Backside structuring	
2a	Resist coating <i>Softbake (1 min, 110°C) not depicted</i>	<p><i>Ma-P1215, 3000 rpm, 2 ml</i></p> 
2b	Development <i>Hardbake (5 min, 110°C) not depicted</i>	<p><i>Ma-D531, 10s</i></p> 
2c	Array protection <i>Hardbake (20 min, 110°C) not depicted</i>	<p><i>Ma-P1275, 1000 rpm, 4 ml</i></p> 

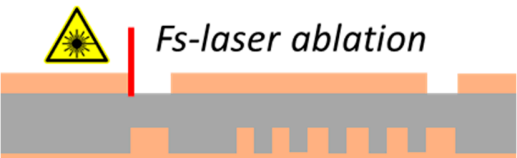

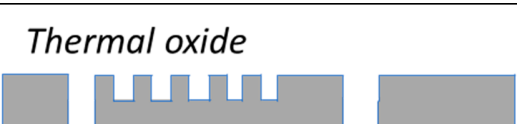
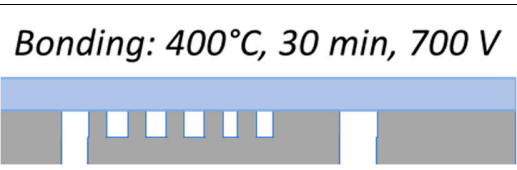
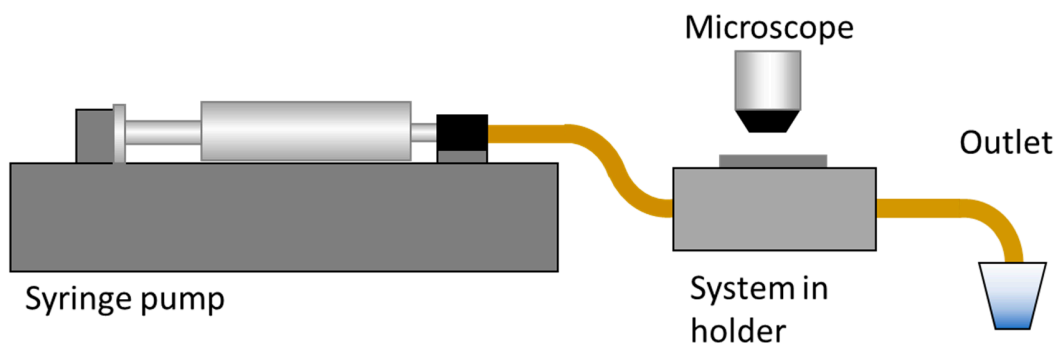
2d	Structuring the fluidic vias <i>By fs-laser ablation</i>	 <i>Fs-laser ablation</i>
2e	Resist removal and wafer cleaning <i>Removal by acetone, cleaning by H₂SO₄:H₂O₂ (2:1)</i>	 <i>Resist removal and cleaning</i>
3	Oxide layer	
	Thermal oxide 300 nm	 <i>Thermal oxide</i>
4	Wafer bonding	
	Anodic bonding <i>Wafer and cover cleaning by H₂SO₄:H₂O₂ (2:1) not depicted Cover: 0.5 mm borosilicate glass</i>	 <i>Bonding: 400°C, 30 min, 700 V</i>
5	Dicing not depicted	

Table S2: Process parameters for dry etching of the DLD arrays resulting in a height of 120 μm . The temperature was constant in all steps at 5 °C. Gas flows are given in sccm (standard cubic centimeter per minute).

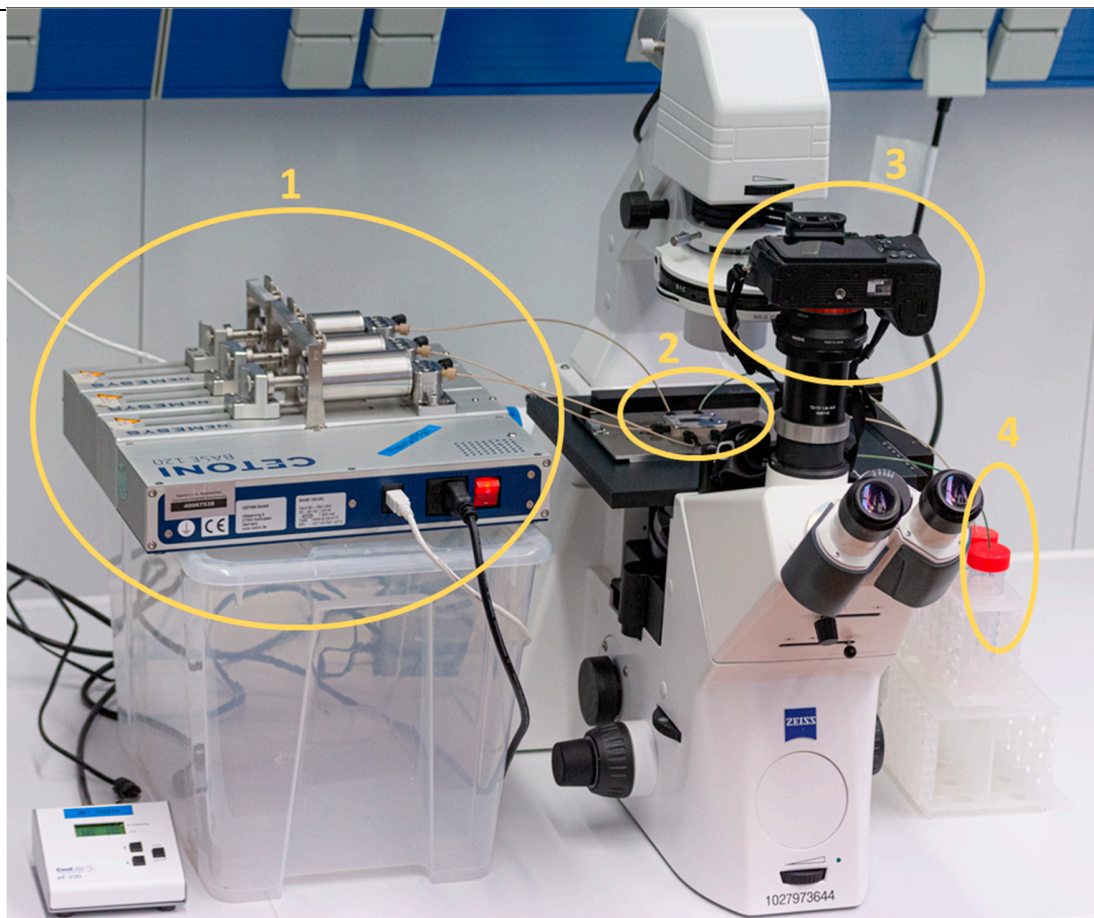
Parameter	Deposition step	Breakthrough step	Etch step
APC (chamber pressure)	35 mTorr (4.66 Pa)	30 mTorr (3.99 Pa)	40 mTorr (5.33 Pa)
ICP RF	1500 W	1300 W	1500 W
Table Power RF	5 W	45 W	0 W
SF6	10 sccm	200 sccm	200 sccm
C4F8	180 sccm	10 sccm	10 sccm
Time	2.3 s	2.1 s	2.7 s

Supplementary information 2: Experimental setup

The schematic experimental setup consisting of syringe pumps, holder with the system attached and the microscope for observation is depicted in Figure S1a. An actual photo of the setup with the different sections labeled is depicted in Figure S1b. Due to the high pressures involved, stainless steel syringes attached to three nemesys mid-pressure modules were used. For powering the modules, a nemesys base 120 module was used. The control of the syringes was done using the QMix elements software from Cetoni.



S1(a) Schematic view



S1(b) Photograph of the experimental setup: 1-syringe pumps; 2-System in holder; 3-Camera; 4-Waste. The PC to control the setup is not depicted.

Supplementary information 3: full fractionation profiles

Figure S2: Full fractionation profiles of all experiments.

