

Supplementary information for:

Direct laser writing of hydrophobic and hydrophilic valves in the same material applied to centrifugal microfluidics

Disk and layers

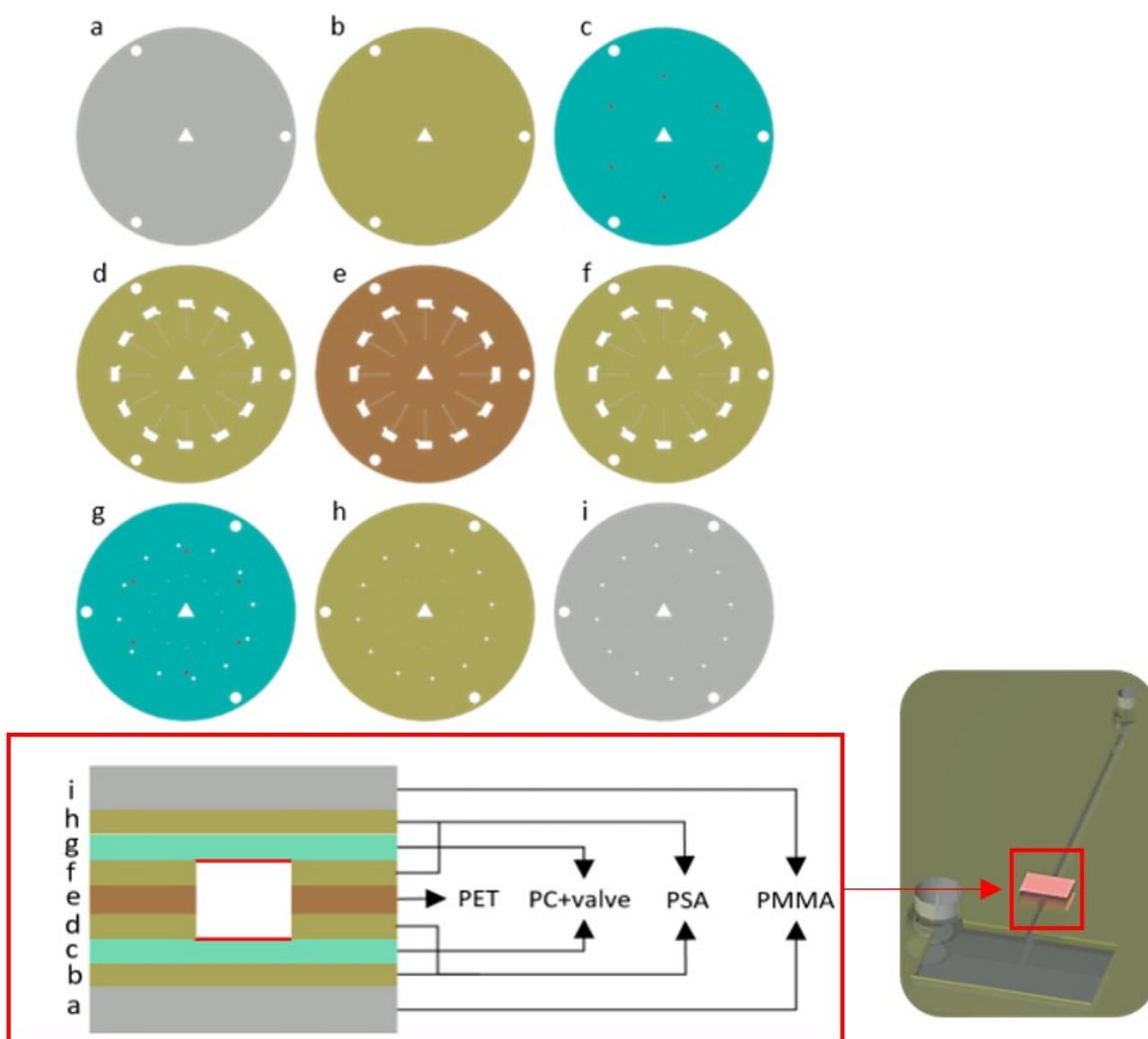


Figure A1 – Disk layers.

Disk dimensions

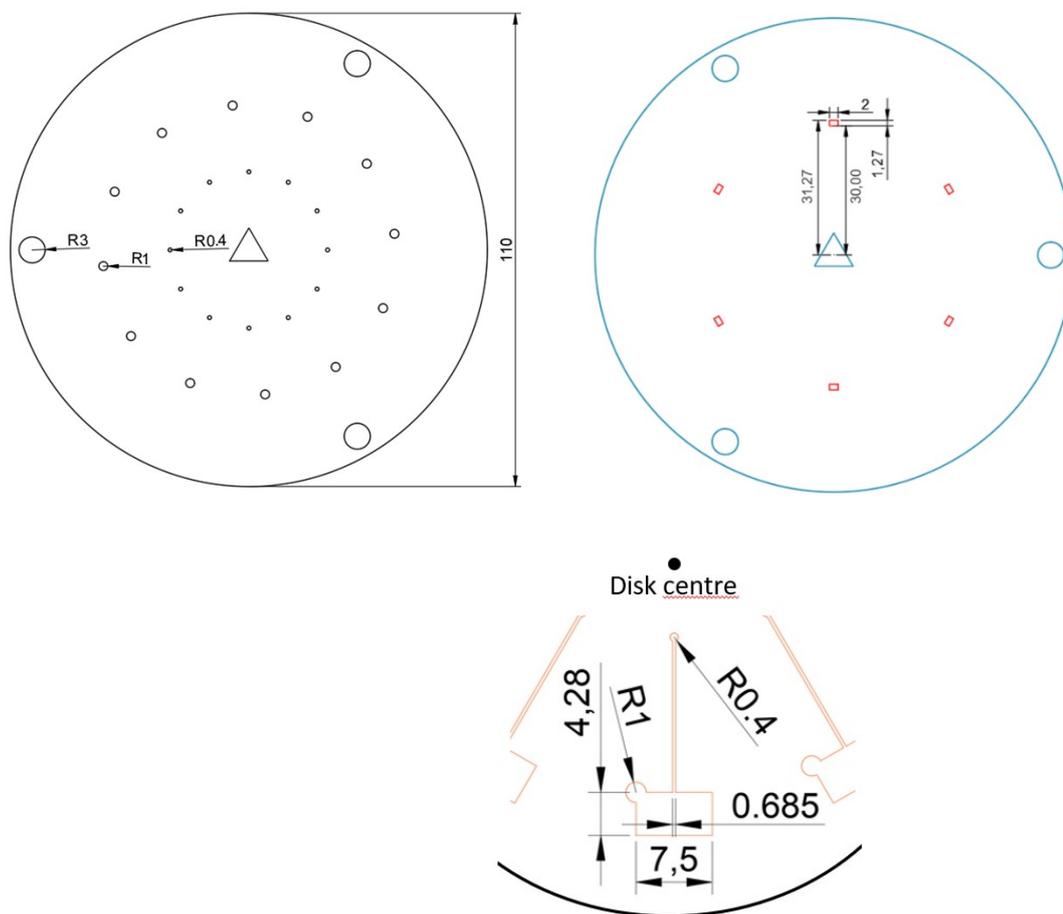


Figure A2 - Extra dimensions (mm) on the microfluidic circuit in the disks. (top/left) Top layer of PMMA, (top/right) layer of PC showing the distance of the valves and (bottom) the circuit layers that were cut on the PSA-PET-PSA assembly.

Laser ablation details

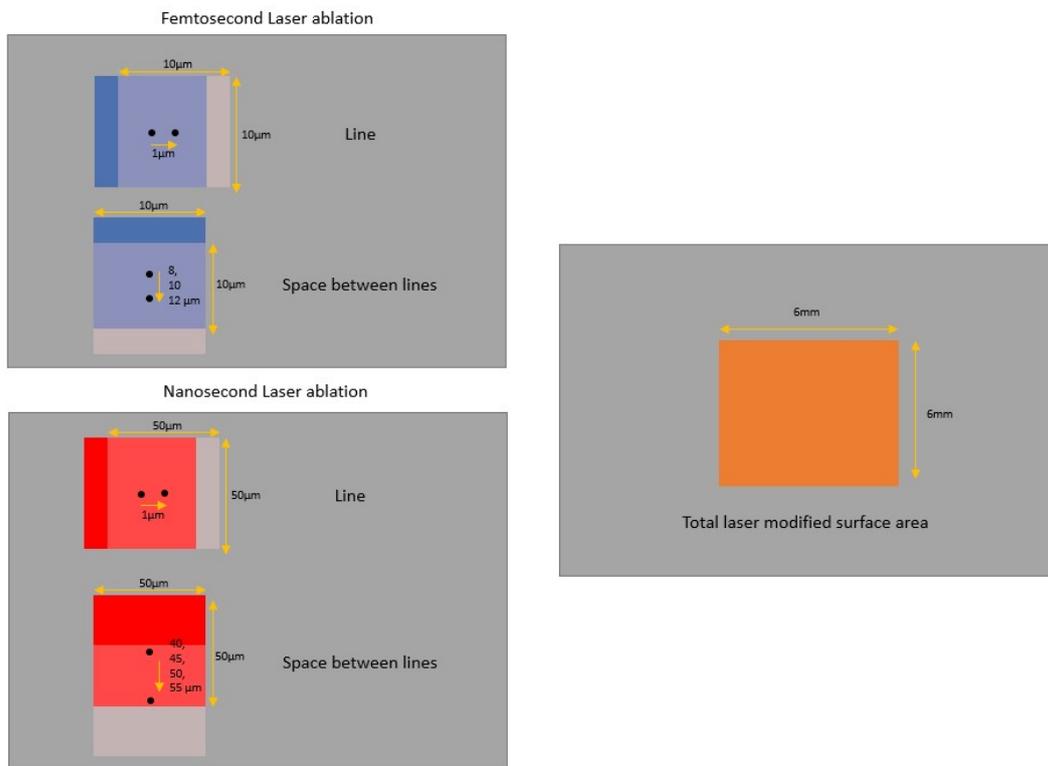


Figure A3 – Ablation procedures showing the spot sizes, and the stage movement direction to create the lines and space between lines.

Microfluidic device made to measure the contact angle inside the channel

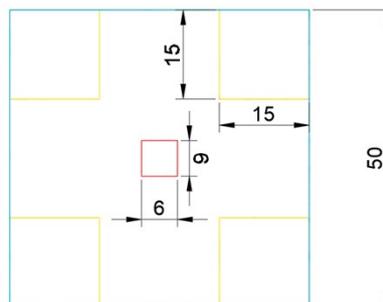


Figure A4 - Extra dimensions (mm) for the built microfluidic device for contact angle measurement inside of the channel.

Table for hydrophobic surface.

Table A1 - Table of values for the hydrophobic surfaces seen in Figure 2.

Spacing between laser passes (um)	Fluid flow	Power	Contact angle (°)	Stdv (°)
40	Advancing	13mW	149	4
		5mW	145	6
	Receding	13mW	143	4
		5mW	135	5
	Static	13mW	126	2
		5mW	129	1
45	Advancing	13mW	154	4
		5mW	159	5
	Receding	13mW	142	6
		5mW	154	3
	Static	13mW	129	2
		5mW	136	1
50	Advancing	13mW	149	4
		5mW	152	5
	Receding	13mW	145	4
		5mW	149	3
	Static	13mW	132	2
		5mW	129	2
55	Advancing	13mW	164	5
		5mW	158	5
	Receding	13mW	156	4
		5mW	155	5
	Static	13mW	147	1
		5mW	132	1
N/A	Advancing	Control	84	3
	Receding	Control	82	3
	Static	Control	79	3

Capillary force in the microchannels produced by nanosecond laser

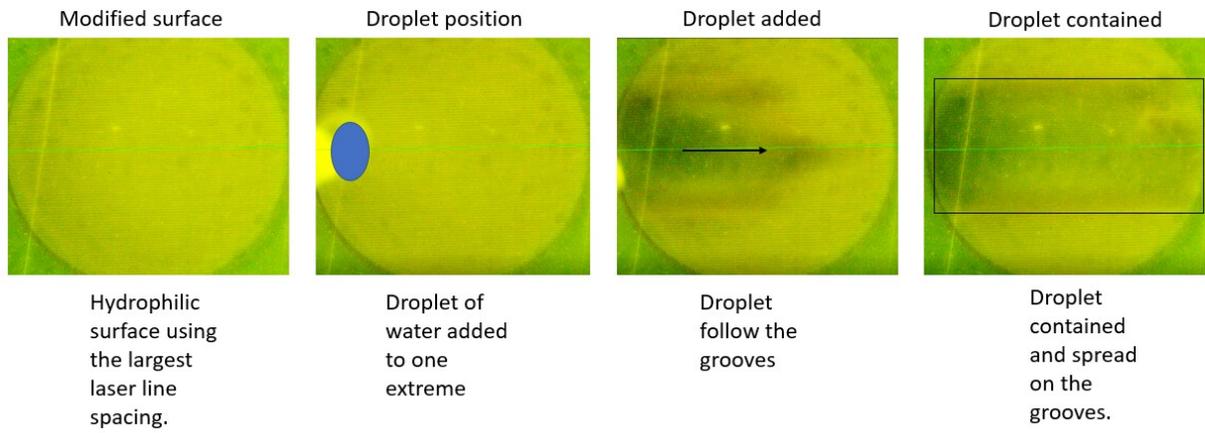


Figure A5 – Fluid pulled and contained by the capillary force created by the nanosecond laser surface medication using the largest spacing.