Electronic Supplementary Material (ESI) for Lab on a Chip.

Supplementary Information

3D printed metal molds for hot embossing plastic microfluidic devices

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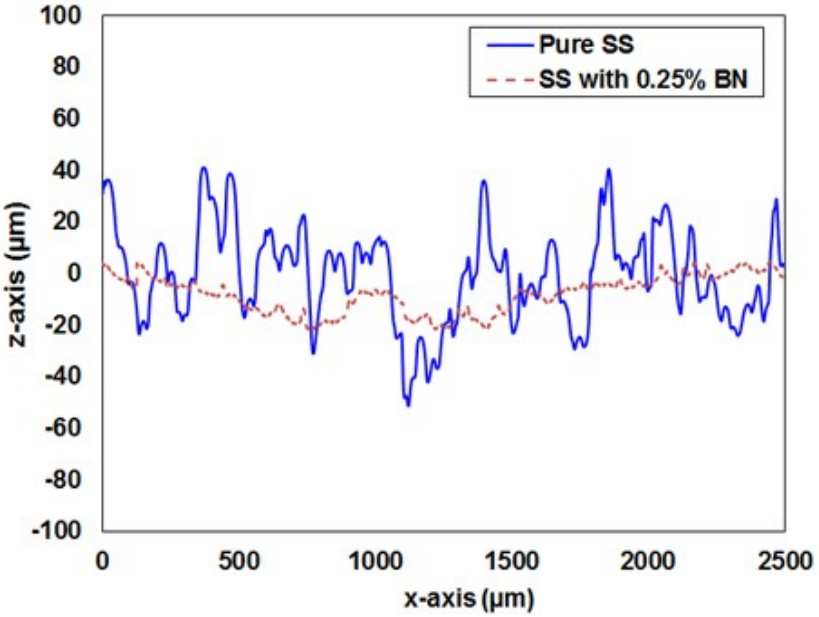

Figure S1: Surface profile scans of a pure SS mold (solid) and SS mold containing 0.25% wt. BN (dashed). Scans were generated using a NanoMap-500LS contact surface profilometer at a scan rate of 50 Hz.

Table S1. Transfer accuracy between the CAD design and 3D printed molds containing varying concentrations of BN.

% wt. BN	Width	Height
0	85.0%	96.5%
0.25	84.6%	87.4%
0.50	80.6%	55.5%
0.75	82.9%	17.5%

Table S2. Transfer accuracy between the CAD design with compensated dimensions and 3D printed mold containing 0.25% wt. BN.

	Target Dimensions	Compensated CAD Dimensions	Actual Dimensions	Transfer Accuracy (Compensated)
Width	400 µm	330 µm	395.8 ± 8.33 µm	98.9%
Height	500 µm	570 µm	501.2 ± 14.4 µm	99.8%

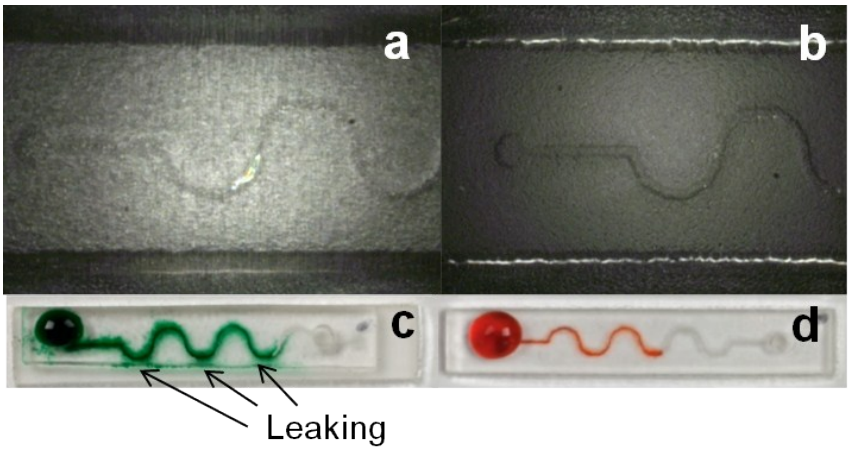

Figure S2: Influence of embossing parameters on the replication quality. Hot embossing performed at (a) 110°C with 0.5 tons, and (b) 120°C with 1 ton. Thermal bonding performed at (c) 60°C and (d) 80°C with 1 ton of force. Replicas were fabricated using the 3D printed mold containing 0.25% wt. BN.

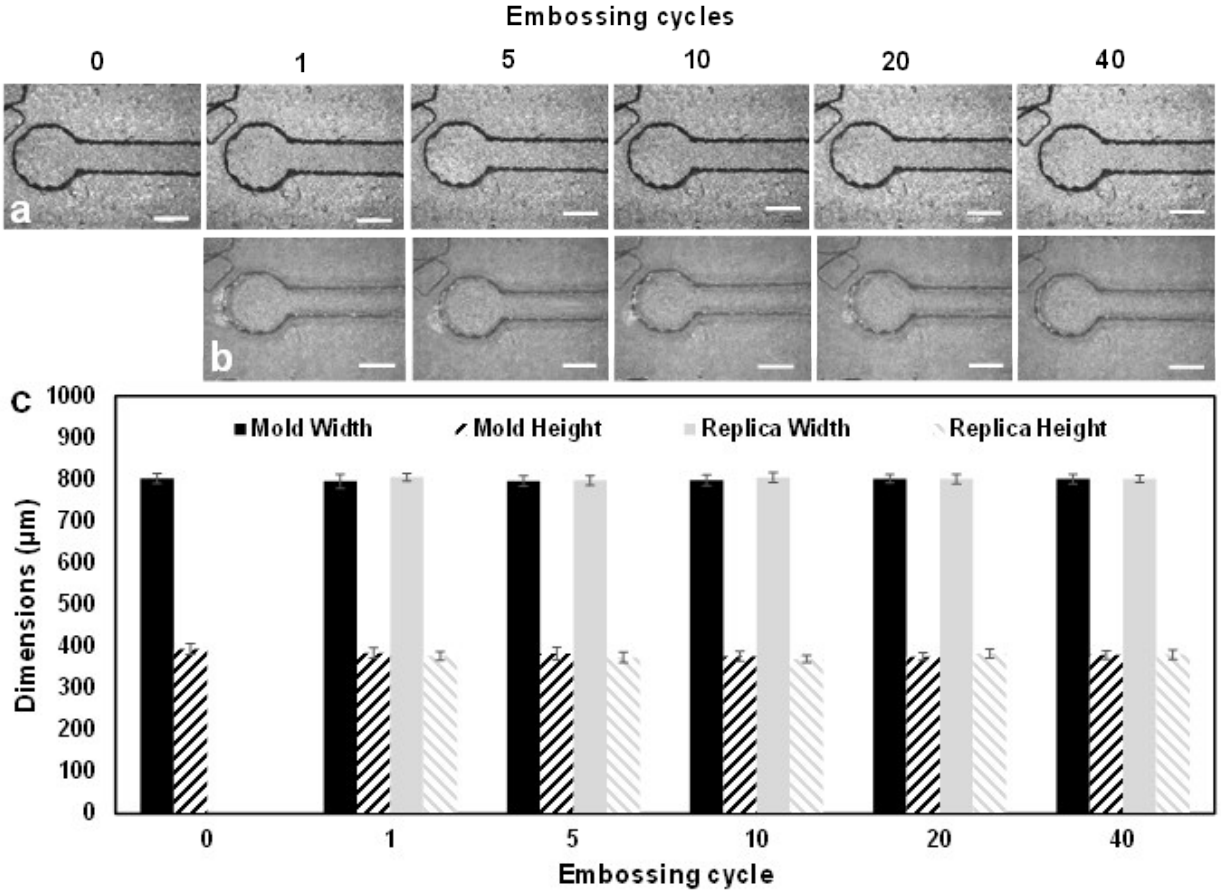

Figure S3: Reproducibility of 3D printed molds for multiple embossing cycles. Optical images of (a) the 3D printed mold and (b) PMMA replicas after 1, 5, 10, 20 and 40 embossing cycles. Scale bars, 1 mm. (c) Measurements of channel width (solid) and height (striped) for the mold (dark) and replicas (light) depicted in panels a and b. Bars represent the mean ± SD of three separate measurements.

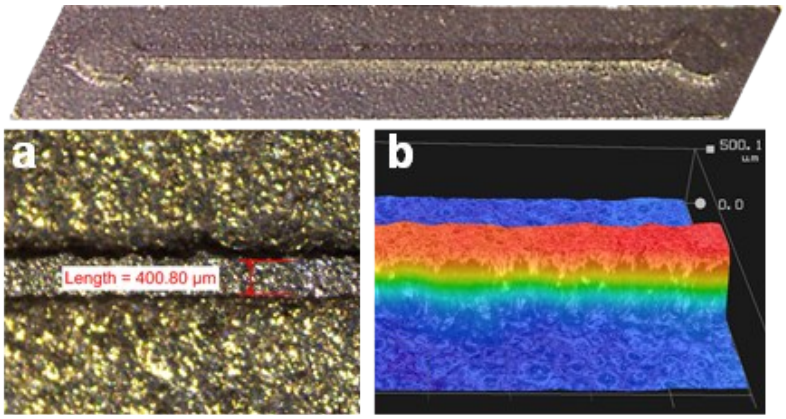

Figure S4: Optical image of the 3D printed mold containing 0.25% wt. BN with compensated dimensions. Results of the channel width (a) and height (b) measurements.