

Supporting Information

Title: Shape Memory Soft Robotics with Yield Stress Fluids

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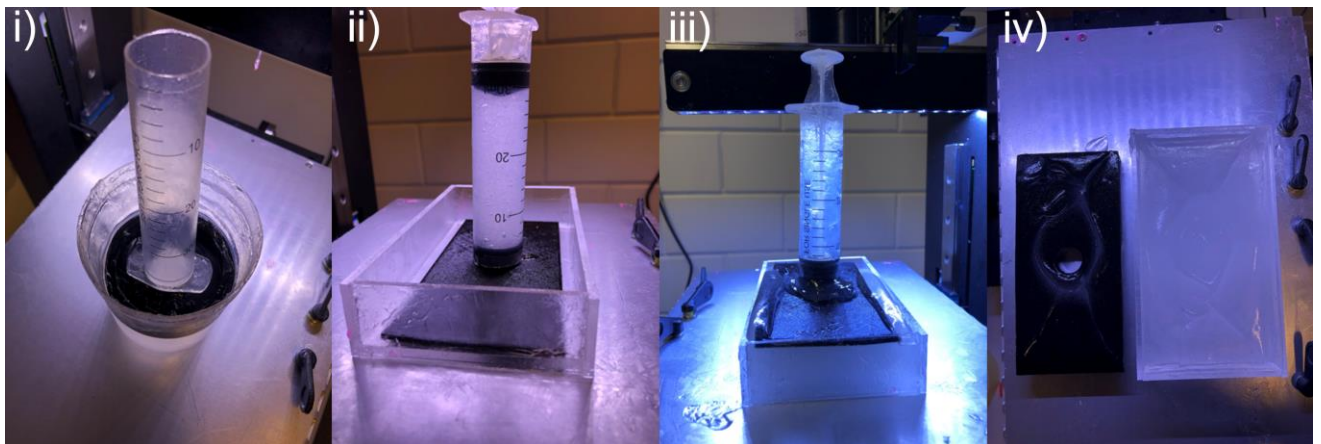


Figure S1: Vat suspension filling procedure. (i) A mixing container filled with oil dispersed with silica is fitted with a disk and syringe. The disk is pressed into the oil-silica cup, which fills the 30cc syringe. (ii) The filled syringe is then placed onto another rectangular plate that fits the final container vat. (iii) The full syringe is used to inject the suspension material into the vat and entirely filled by repeating processes in i) and ii). (iv) Once the vat is filled, the rectangular injection plate is removed from the vat and is ready for EMB3D printing.

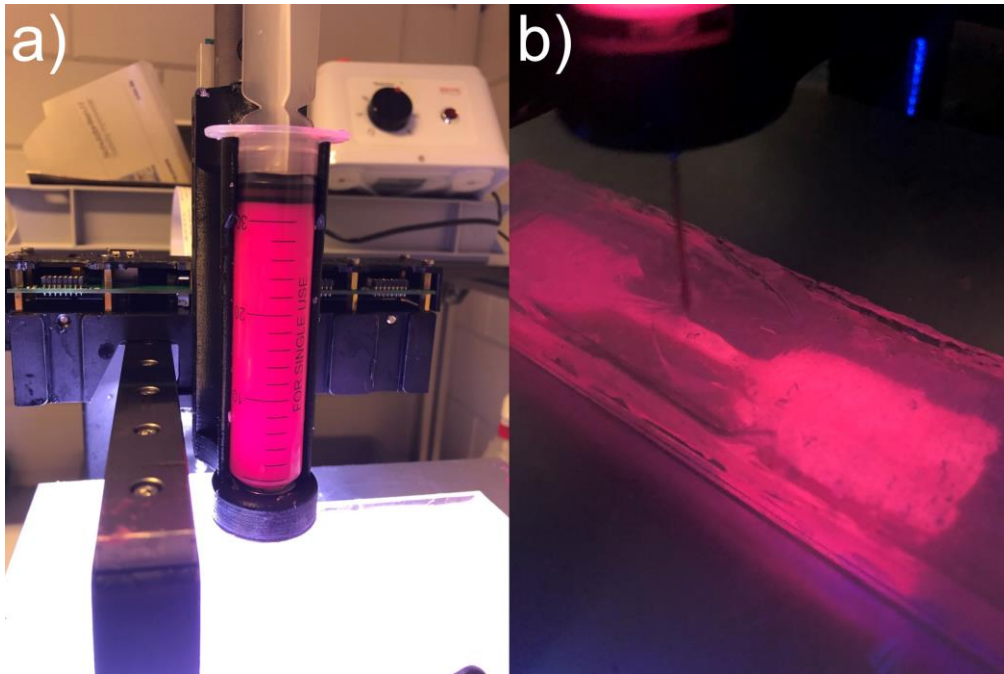


Figure S2: EMB3D printing of tensile testing bars. (a) A silicone-filled syringe is attached to the Hyrel 3D printer. (b) EMB3D printing of a silicone tensile testing bar.

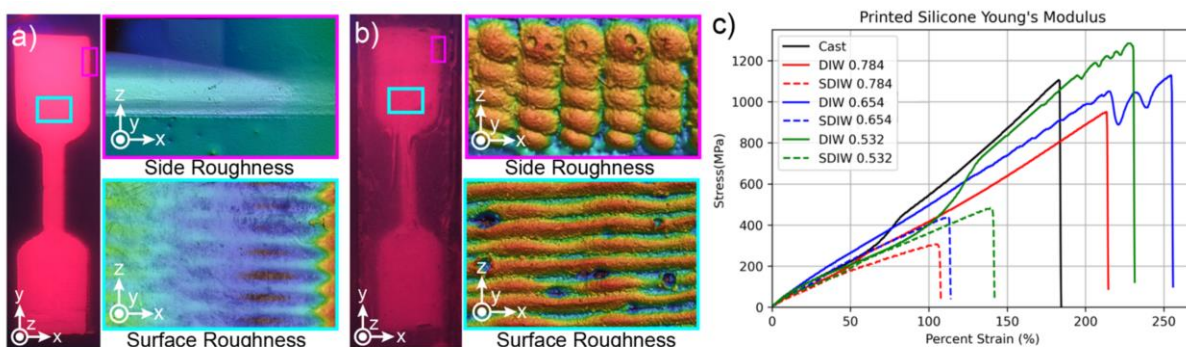


Figure S3: Cured silicone mechanical data. (a) Conventional DIW printed geometry with side and surface topology recorded using profilometer. (b) EMB3D printed geometry with side and surface topology recorded using profilometer. (c) Resulting tensile Young's Modulus from uniaxial strain of casted and printed devices using nozzle sizes 0.532mm, 0.654mm, and 0.784mm.

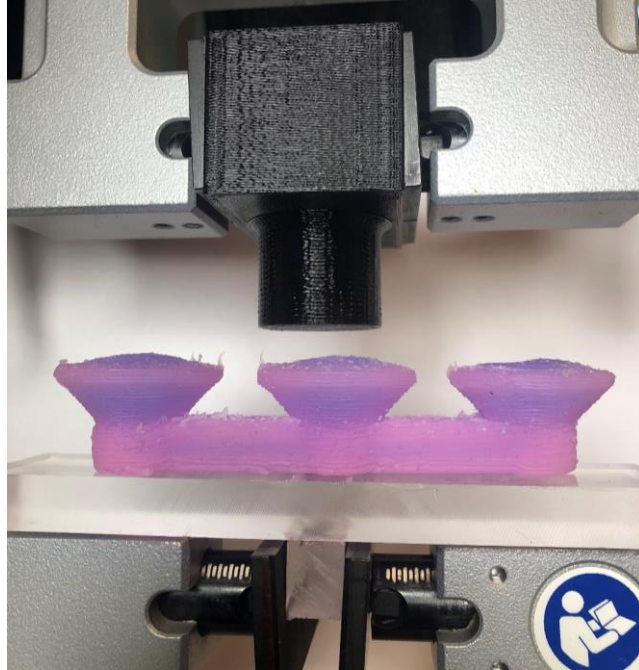


Figure S4: Compression testing setup for multi-reservoir devices. The (black) FDM printed cylindrical test geometry. The (pink) tri-reservoir device filled with oil-silica yield stress material. This image neglects the FDM printed device holder used to precisely place the reservoirs coaxial to the compressive strain.

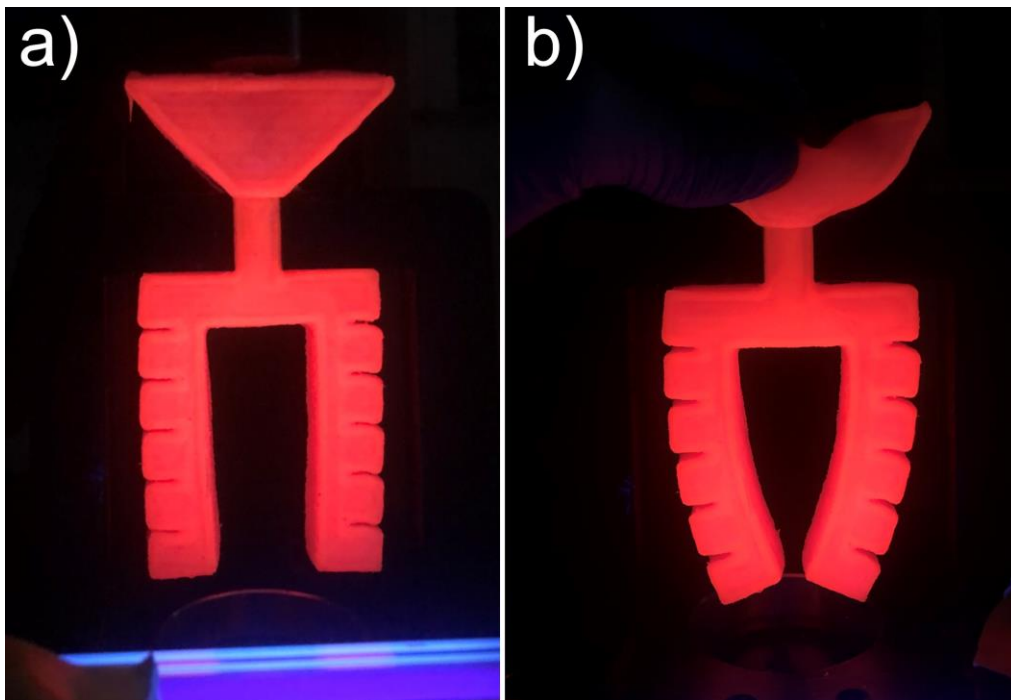


Figure S5: Mounted EMB3D gripper design. (a) Unactuated mounted gripper design. (b) Gripper design actuated by manually squeezing the trapezoidal reservoir by hand.