**Shipley Protocol:**
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**Materials & Ordering Information:**
1. Substrate
2. Acetone
3. Isopropanol
4. DI water
5. HDMS (hexamethyldisilazane)
6. Shipley Photoresist (S1818)
7. MF-319 (Photoresist Developer)

**Substrate Pretreatment:**
1. Wipe substrate of any residue or dust.
   a. Use acetone to better clean the substrate.
2. Soak substrate in acetone for ten minutes.
   a. After soaking, rinse the substrate with isopropanol before next step.
3. Soak substrate in isopropanol for ten minutes.
   a. After soaking, rinse the substrate with DI water before next step.
4. Soak substrate in DI water for ten minutes.
   a. After soaking, rinse the substrate with DI water.
   b. Using filtered air, blow dry the substrate until it is dry.
5. Dehydrate Substrates
   a. Place the substrate in the oven at ~200°C for 30 minutes, then cool to RT shortly before spin-coating.
   *Make sure to turn on oven before starting this experiment to preheat the oven.
6. Clean up when done pre-treating the substrate.
   a. Place used chemicals in appropriate bins.
   b. Return containers to appropriate location.
   c. Ensure all surfaces are dry and clear of chemicals.

**Coating:**
1. Remove chuck from spinner and line the spinner bucket with aluminum foil.
   a. The chuck is easily removed by pulling up.
   b. Get a piece of aluminum foil large enough to cover the bucket and its sides.
   c. Make a small hole in the middle of the foil and lay it inside the bucket.
   d. Form the aluminum foil around the edge of the bucket so that SU-8 will not splatter on the walls.
   e. Make sure there is no foil going into the vacuum hole in the center.
2. Place appropriate chuck on the spinner.
   a. Make sure the substrate covers the entire chuck to prevent splatter.
3. Place the substrate on the center of the chuck.
   a. Once in position, turn on the vacuum so that the substrate does not move.
4. Apply 5-8 drops of HDMS onto substrate.
   a. Apply across the surface of substrate.
   b. If bubbles appear, “suck” them back into the dropper until no bubbles exist.
5. Spin at Recipe 0.
   a. Turn on spinner controller if necessary
   b. Press “recipe” on the keypad
   c. Then enter “0”
6. Apply 3-5 droppers full of Shipley onto substrate.
   a. Apply across the entire surface of substrate but NOT over the substrate edges
   b. If bubbles appear, “suck” them back into the dropper until no bubbles exist.
7. Clean up after using the spinner.
   a. Remove foil from spinner bucket and discard.
   b. Clean any residue on spinner.
   c. Make sure the vacuum switch is turned off.

**Soft Bake:**
1. Soft bake on hotplate at 120°C for 4 minutes.
2. Cool to room temperature.

**Exposure:**
1. Turn EVG 620 on.
   a. Turn on the main switch (red) on EVG 620, key must be in “off” position.
   b. Turn on the lamp power, located under the bench. Then press “start” to fire lamp.
      * The lamp must be heated ten minutes prior to usage.
   c. Turn on the key switch.
   d. Turn on the PC power, located under the bench in the cabinet.
2. Run EVG 620 Software
   a. Log in.
   b. Use File-Open to find the appropriate recipe, located in “C:\Program Files\EVG\EVG6XX\Recipes\Shipley”.
      i. 250 mJ/cm²
   c. Press “Run,” then follow the instructions on the screen.

**Develop:**
1. Immerse substrate in MF-319.
   a. Agitate so that the developer removes exposed Shipley.
   b. Developing time varies from 1-4 minutes.
2. Remove the substrate and rinse with DI water.
3. Blow dry with filtered air

*Inspect the device prior to hard bake!*
**Hard Bake:**
1. Place the substrate in the oven at ~120°C for 30 minutes.
   a. Cool to RT.
   *Make sure to turn on oven before starting this experiment to preheat the oven.

**Completion:**
1. Turn off PC.
   a. Close EVG Software.
   b. Shutdown Windows.
2. Turn off the key switch.
3. Cool lamp.
   a. Turn off power and Turn it back
   b. Wait for ten minutes.
4. Switch off the power.
5. Turn off the main switch.