# SPR 220-7.0 Positive Photoresist Photolithography Process

**Purpose:**

This process is designed for the patterning of a 14-15µm uniform layer on a 4-inch wafer[i]. SPR 220-7.0 is a positive photoresist designed for a wide range of film thicknesses with a single coat and is ideal for thick film applications.

**Equipment:**

1. Solitec Spinner and Hotplate (or SVG Track Coater)
2. Karl-Suss MA4

**Materials:**

1. HMDS: (Hexamethyldisilazane) Used for chemical drying of hydrated specimens
2. SPR 220-7.0: A positive tone, general purpose, multi-wavelength resist
3. MF CD-26: A standard photoresist developer

**Process:**

1. Prebake a clean wafer at 120°C for 750 seconds using a hotplate.

(If using the Solitec, center the wafer on the appropriate chuck)

2. Coat the wafer with HMDS. Spread for 18 seconds at 400rpm and spinning for 45 seconds at 1000rpm.

3. Coat the wafer with 6mL SPR 220-7.0 using a plunger, pushed through a 0.45 micron filter. Spread the photoresist for 30 seconds at 400rpm then spin for 80 seconds at 1000rpm.

4. If using the Solitec Spinner: Manually remove any edge beading with acetone and a textwipe.

If using the SVG Track Coater: Use the EBR (edge bead remover) for 30 seconds at 1700rpm.

5. Softbake at 105°C for 360 seconds using a hotplate.

6. Expose for 33 seconds on hard contact mode using the CI-1 setting on the KarlSuss.[ii]

7. Allow for a 3 hour delay.

8. Proceed to a post exposure bake (PEB) at 110°C for 300 seconds using a hotplate.

9. Allow for a 45 minute rehydration step.

10. Develop in CD-26 for approximately 15 minutes by immersing in the developer and agitating the solution. Immediately rinse in DI water and dry with nitrogen.

[i] This process demonstrates vertical sidewall formation resulting in an approximate film thickness of 14.3 microns.
[ii] This exposure time results in spaces that are slightly larger than lines. Reducing exposure time may fix this but note that downstream process steps may be affected.