# SPR 955-CM 0.7 Positive Photoresist Photolithography Process

**Purpose:**

This process is designed for the patterning of a thin uniform layer on a 4-inch silicon wafer. SPR 955-CM 0.7 is a positive photoresist designed for optimum features at 0.7 micrometer thickness.

**Equipment:**

1. Solitec Spinner and Hotplate (or SVG Track Coater)

2. Karl-Suss MA4

**Materials:**

1. SPR 95- CM 0.7: A positive tone, i-line, high-throughput photoresist

2. MF CD-26: A standard photoresist developer

**Process:**

Begin with a clean 4-inch wafer. If necessary, clean with an EKC (or PRS-3000) bath for 5-10 minutes, rinse with DI water, dry with nitrogen gun. Dehydrate the wafer 110°C for 10 min. Allow the wafer to cool before proceeding to coat.

<u>If using the Solitec Spinner and Hotplate:</u>

1. With the wafer centered on the appropriate chuck dispense enough SPR 955-CM photoresist to cover at least a 2-inch diameter area in the center of the wafer. Try to keep the pool of photoresist centered and even. Avoid bubbles in the photoresist as best as possible.

2. Follow the recipe for your desired thickness as outlined in Table 1:

**Table 1: Standard recipes for 0.7 and 1.0 micron thickness for SPR 955-CM**

| Thickness: | 0.7 microns | 1.0 microns |
| --- | --- | --- |
| **Spread** | Use "Spread" function at 660 rpm for 4.5 seconds | Use "Spread" function at 450 rpm for 5 seconds |
| **Spin**[a] | Use "Spin" function at 3400 rpm for 50 seconds | Use "Spin" function at 1680 rpm for 60 seconds |
| **Soft Bake**[b] | Use hotplate at 110°C for 60 seconds | Use hotplate at 110°C for 60 seconds |
| **Expose**[c] | Use KarlSuss to expose for 3 seconds on soft contact using CI-1 | Use KarlSuss to expose for 3.7 seconds on soft contact using CI-1 |
| **Post Exposure Bake**[d] | Use hotplate at 110°C for 90 seconds | Use hotplate at 110°C for 90 seconds |
| **Develop** | Submerge and agitate in CD-26 for 60 seconds immediately followed by a DI rinse and dry with nitrogen | Submerge and agitate in CD-26 for 60 seconds immediately followed by a DI rinse and dry with nitrogen |

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[a] Speeds and times based off of data sheets and tested for accuracy. Results indicate desired feature height is an approximation.

[b] Immediately following the soft bake, allow wafer to cool for 30 seconds before exposing.

[c] This is an i-line process (22mW/cm, 365 nm wavelength light) using a photospeed of 81.4 $mJ/cm^2$.

[d] Following the post exposure bake, allow wafer to cool for 30 seconds before developing. A latent image of your features should be visible at this point.

## If Using the SVG Track Coater:

1. To spread, spin and soft bake use Program 1 for 0.7 µm thickness or Program 2 for 1.0 µm thickness. Check to make sure the proper program is in place before running the program.

2. After wafer cools proceed to expose, post exposure bake and develop using the recipe referenced in Table 1.