

AZ 1512 & 1529 photoresist baseline recipes

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OVERVIEW

AZ 1500 series photoresists are positive-tone resists with wide process latitude and good resolution in broadband and g/h/i-line exposure. They exhibit excellent performance for both wet- and dry-etch processes. This document contains standard recipes for using AZ 1512 (~1.1 μm thick) and AZ 1529 (~3.4 μm thick) in contact photolithography.

PROCEDURE

The following baseline recipes for AZ 1512 and AZ 1529 have been developed for use with Si wafers; process parameters may need to be adjusted for other materials.

- Setup:** Working volumes of photoresists are found in amber bottles on the shelf under the *Cee 200CB Coat-Bake System #1* tool; additional bottles are in the resist fridge. If using a bottle from the fridge, let the resist warm up to room temperature (~30 min) prior to use. Label a cleanroom wipe with the chemical name, user name, and date. Place a small beaker on the wipe, pour in the total volume of resist required to coat all wafers, and cover with a larger beaker, inverted over the top.
 - Allow ~1 mL for each 25 mm of wafer diameter (e.g., ~4–5 mL for a 100 mm wafer).
 - For square wafers, allow a little more (e.g., ~5–6 mL for a 4" × 4" wafer).
- Spin-coat:** Pour resist into the centre of the wafer and spin with the following settings:
 - AZ 1512 (1.1 μm thickness):** Spread – 500 RPM for 10 s; Spin – 5000 RPM for 40 s
 - AZ 1529 (3.4 μm thickness):** Spread – 500 RPM for 10 s; Spin – 3000 RPM for 60 s
- Softbake:** hotplate, vacuum hold, 100 °C for 60 s
- Rehydration:** An extended rehydration period is not required, since at 40% relative humidity, a 1 μm thick resist rehydrates within seconds, and a 3.5 μm thick resist within a minute.
- Exposure:** Using broadband exposure with the SUSS MA6 or ABM mask aligners (Grover, Bert), the following doses are recommended:
 - AZ 1512:** 100 mJ/cm²
 - AZ 1529:** 250 mJ/cm²

For the SUSS MA6, ensure that the 405 nm sensor is used when specifying the dose. For the ABM aligners, use the posted 365 nm + 405 nm total intensity to calculate the exposure time:

$$t = \frac{D}{I}$$

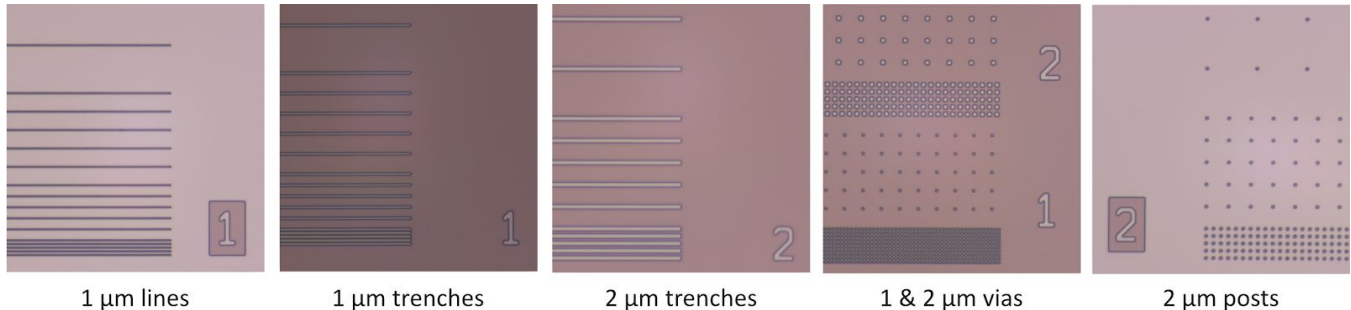
t – Exposure time (s)
 D – Exposure dose (mJ/cm²)
 I – UV light intensity (mW/cm²)

6. **Develop:** Use AZ 400k 1:4 developer, found under the litho wet decks. Developing manually with gentle agitation, the following develop times are expected (visual endpoint):
 - **AZ 1512:** 45 s
 - **AZ 1529:** 50 s
7. **Clean-up:** Dispose of AZ 400k 1:4 developer by pouring into the wet deck and rinsing copiously with DI water. Clean the developer glassware by rinsing it in the dump rinser. Clean the beaker which contained the resist by rinsing with acetone (3×), then with IPA (3×), into the solvent waste bottle. Dry beaker with nitrogen gun, inspect for resist residue, and repeat cleaning process if necessary. Once the beaker is free from resist residue, place it on the drying rack. Clean spinner and/or hotplate according to SOP, as appropriate.

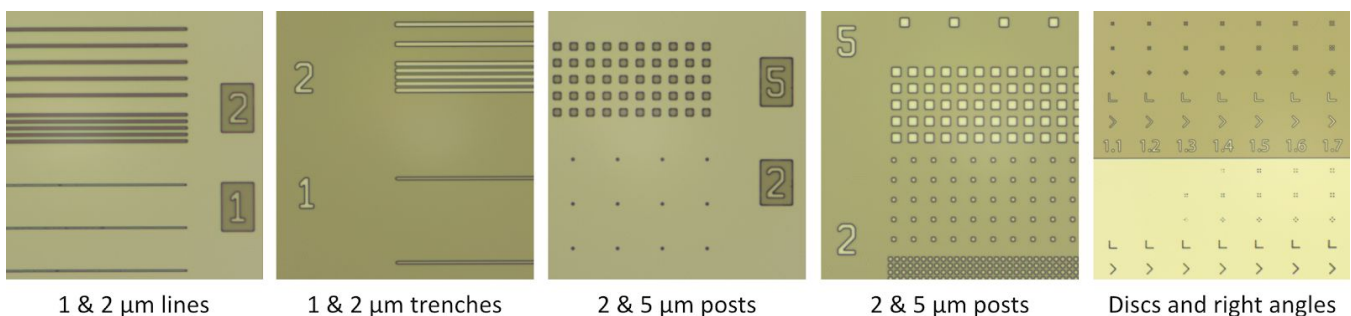
RESULTS

The AZ 1500 series resists have a wide exposure latitude. For example, similar results for AZ 1512 can be obtained with exposure doses ranging from 75 to 120 mJ/cm².

AZ 1512: 76 mJ/cm² (SUSS MA6), 40 s dev



AZ 1529: 253 mJ/cm² (Bert), 50 s dev



Version history

Aaron Hryciw, Stephanie Bozic, Scott Munro, 2019-03-14 (AZ 1500 series recipes.gdoc, .pdf)