Si wafer preparation for SU-8 photoresist processing

(good for all other wafer photoresist preparations)

Justification: Proper wafer preparation for SU-8 photoresist processing is an essential step for successful SU8 patterning. Every kind of impurities on the wafer surface could reduce or prevent SU-8 adhesion that will be ended in partial or total loss of the pattern.

Wafer preparation.

1. Rinse the wafer with acetone (a few seconds of soaking could be beneficial).
2. Replace acetone on the wafer surface with rinse by IPA.
3. Rinse the wafer with DI water flow for 15-30 sec.
4. Dry the wafer in N2 flow.
5. Bake the wafer on a hot plate at 150C for at least 15 min.

If the above doesn't provide sufficient SU-8 adhesion, take additional steps:

1. Oxygen plasma treatment. O2 flow 2 sccm; 150 Watt; 2-3 min.
2. Bake the wafer on a hot plate at 150C for at least 15 min.
3. Cover the wafer with HMDS for 30 sec and then spin 3000 rpm for 30 sec.
4. If the steps above do not help, clean the wafer with piranha solution, rinse with DI water and bake at 150 C for 15 min.

Laser Writer resolution calibration to allow sub-micron SU8 lines exposure by MA6.

Material: 2.5” Cr mask.
Laser Energy range: 7.8 – 10.2 mW
Drawn line width: 0.6 – 0.9 um.
Develop time: 60 sec
Cr etch time: 90 sec

Conclusions:

1. Heidelberg um101 spec resolution of 1 um is confirmed.
2. Relatively stable gap width achieved at Cr gap about 0.9 um (7.8-8.4 mW, 0.8 um design). Considering Cr layer thickness 0.15 um and isotropic Cr etching, the printed line width was about 0.6-0.7 um.
3. Attempts of further reduction of gap width was resulted in unstable gap with multiple necking defect up to interrupted line defects (9.9 mW, 0.6 um design).