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| Objective |
| Batch name: Process template |
| This process flows is a guideline on how to use ESPACER on top of CSAR6200 e-beam resist. |

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| Step Heading | Equipment |  | Comments |
| 1. Pretreatment | | |  |
| * 1. Surface treatment | BHF dip  *or*  HMDS | BHF dip for Si substrates (30 sec, H2O 5 min)  HMDS treatment for SiO2 and III-V substrates | Generally, pre-treatment is not recommended. |
| 1. Spin coat of ZEP | | |  |
| * 1. Coat wafers | Spin Coater | **Resist:** CSAR 6200  **Spin:** 60 sec @ 4000 rpm (~180 nm)  **Softbake:**  1 min @ 180 °C (hotplate) | Use syringe with filter or disposable pipette (cleaned by N2 gun). Softbake is not a crucial step according to AllResist |
| 1. Coat with ESPACER (only for non-conductive substrates) | | |  |
| * 1. Coat with ESPACER | Spin Coater: Manual All Purpose | **Spin:** 60 sec @ 4000 rpm  **No Softbake** | Spun on like resist, no baking  Espacer is stored in the refrigerator in Cx1 |
| 1. E-beam exposure | | |  |
| * 1. E-beam exposure | E-beam writer | Dose: 200 - 350 µC/cm2; a dose-test is required. See e-beam logbook for inspiration. | Dose depends strongly on substrate material, thickness of resist, critical dimension, load of pattern, and developer type and time. |
| 1. Removal of ESPACER | | |  |
| * 1. Removal of ESPACER | Petribowl, fumehood in C-1 or D-3 | Rinse in H2O  Blow dry with N2. |  |
| 1. Development & Rinse | | |  |
| * 1. Develop-ment | Petribowl, fumehood in D-4 | Develop with AR 600-546, 60 sec  Rinse in IPA, 60 sec  blow dry with N2 |  |
| 1. Lift-off and Strip | | |  |
| * 1. Lift-off | Petribowl, fumehood in D-3 | Remover AR 600-71  USE REMOVER AR 600-71 ONLY AT ROOM TEMPERATURE.  Rinse with IPA. | **For lift-off of metal:** Leave the wafer or chip in remover AR 600-71 for 1-2 hours; this normally lifts greater parts of the metal. If this is not enough, use ultrasonic 10-20 seconds.  Metal deposited in Alcatel is slightly easier to lift than metal deposited in Wordentec. |