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| Objective |
| Batch name: Process template |
| This process flow is a guideline on how to spin coat, expose, and develop SU-8 on 100 mm substrates such as Si, SiO2 and Borofloat, using manual spin coater, mask aligner and submersion developer.This is an example process flow to be used as a template. It should contain:* The objective of the process
* Substrates/samples used in the flow - both actual samples to be processed (device wafers) and any monitor samples for the different process steps
* The Process flow main processes and steps
* Recommended: Figures illustrating the sample before and after each main process step

How to use this template (works only with the .dotx template file):* Fill out the fields in the header
* Add process steps by using Quick Parts under Insert (your cursor should be located at the beginning of the next (empty) step)Select the “Process Step” item
* Other document parts can be inserted the same way: Substrates, Figures, etc.
* The Content (TOC) on the last page is an option, but provides a nice overview for very long process flows
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| Substrates |
| Substrate | Orient. | Size | Doping/type | Polish | thickness | Box | Purpose | # | Sample ID |
| Silicon  | <100> | 100 mm | n (Phos.) | SSP | 525 ±25 µm |  | Device wafers | 2 | S1-S2 |
| Silicon  | <100> | 100 mm | n (Phos.) | SSP | 525 ±25 µm |  | Test wafers | 1 | T1 |

Comments: Number of wafers is for illustration only

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| Figures |
| Figure | Caption | Step | Figure |
|  | After SiO2 depNot part of this process flow example | 2.1 |  |
|  | After lithography | 3.5 |  |
|  | After BHF etchNot part of this process flow example | 4.1 |  |
|  | After resist stripNot part of this process flow example | 4.4 |  |
|  | After lithographyNot part of this process flow example | 5.6 |  |
|  | After metal depositionNot part of this process flow example | 6.1 |  |
|  | After lift-offNot part of this process flow example | 6.2 |  |

Comments:Click here to enter text.

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| --- | --- | --- | --- |
| Step Heading | Equipment | Procedure | Comments |
| 1. Preparation
 | **All wafers** |
| * 1. Wafer selection
 | Wafer box | Take the wafers from the storage and put them in a wafer box.  | Note the wafer IDs in the batch traveler |
| 1. SiO2 deposition
 | **All wafers** |
| * 1. Not part of this process flow example
 |  |  |  |
| 1. Lithography – standard
 | **All wafers** |
| * 1. Surface treatment
 | 250C oven*Or*Oven: HMDS – 2 | At least 30 min. Overnight bake for better dehydration Vacuum bake with no HMDS**Recipe:** 09 | This treatment takes a long time |
| * 1. Syringe preparation
 | Fumehood 09 | Pour resist in syringe at least one day before useKeep syringe in a resist storage cabinet | Mark syringe with resist type, your name, group name and date |
| * 1. Coat wafers
 | Spin Coater: RCD8 | **Resist:** SU8-2075**Automatic dispense system:** 4 ml ≈ 8 sec @ 2 bar**Spin:** Target thickness: 100 µmGyrset: Yes2 step spin process:Spreading: 700 rpm, 50 rpm/s, 25sThinning: 2000 rpm, 500rpm/s, 30s | Adjust dispense time and dispense pressureResist thickness can be measured on FilmTek or ellipsometer |
| * 1. Softbake
 | SU8 hotplate | **Recommended procedure from manufacturer:**

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| Step 1: ramp 5 min to 60°C, stay for 10 min |
| Step 2: ramp 5 min to 90°C, stay for 20 min |
| Step 3: ramp 1 hour to 25°CThe softbake step depends strongly on the mask structures |

 | Place wafers on SU8 HP immediately after spin coatingHigh baking temperature is known to produce cracks - especially in cornersIf this is a problem, we recommend reducing the baking temperature and increase the time - a very rough rule of thumb is that if you divide the temperature by 2, the time should be multiplied with 10If structures are critical, a test should be done |
| * 1. Exposure
 | Aligner: MA6-2 | **Mask:** your mask**Exposure mode:** Global contact or soft contact**Exposure dose:**231 mJ/cm2 **Exposure time:**21 s @ 11 mW/cm2 | Further information is available on labadviser:https://labadviser.nanolab.dtu.dk/index.php?title=Specific\_Process\_Knowledge/Lithography |
| * 1. Post exposure bake
 | SU8 hot plate |

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 | Place wafers on SU8 HP immediately after spin coatingHigh baking temperature is known to produce cracks - especially in cornersIf this is a problem, we recommend reducing the baking temperature and increase the time - a very rough rule of thumb is that if you divide the temperature by 2, the time should be multiplied with 10If structures are critical, a test should be done |
| * 1. Develop
 | SU8 Developer bench | Develop in PGMEA5 minutes in First Bath5 minutes in Final Bath | Development time in first bath is minimum 1 minute per 20 µm resist thickness |
| * 1. Rinse
 | SU8 Developer bench | Rinse with IPA |  |
| * 1. Inspection
 | Optical microscope | Check pattern and alignment marks |  |
| 1. SiO2 etch
 | **All wafers** |
| * 1. Not part of this process flow example
 |  |  |  |
| 1. Lithography – Lift off
 | **All wafers** |
| * 1. Not part of this process flow example
 |  |  |  |
| 1. Aluminum pattern
 | **Only device wafers!!** |
| * 1. Not part of this process flow example
 |  |  |  |
| 1. Linewidth measurement
 | **All wafers** |
| * 1. Not part of this process flow example
 |  |  |  |

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