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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, maskless 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: MLA1*Or*MLA2 | **Design:**Your design file**Exposure dose:**MLA1: 250 mJ/cm2 MLA2: 1000 mJ/cm2 (375 nm)**Defocus:** MLA1: 0MLA2: -15 (pneumatic AF) | 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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| Step 3: ramp 1 hour to 25°CThe post exposure bake 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. 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
 |  |  |  |

Contents

[1 Preparation 3](#_Toc127864398)

[1.1 Wafer selection 3](#_Toc127864399)

[2 SiO2 deposition 3](#_Toc127864400)

[2.1 Not part of this process flow example 3](#_Toc127864401)

[3 Lithography – standard 3](#_Toc127864402)

[3.1 Surface treatment 3](#_Toc127864403)

[3.2 Syringe preparation 3](#_Toc127864404)

[3.3 Coat wafers 3](#_Toc127864405)

[3.4 Softbake 3](#_Toc127864406)

[3.5 Exposure 4](#_Toc127864407)

[3.6 Post exposure bake 4](#_Toc127864408)

[3.7 Develop 4](#_Toc127864409)

[3.8 Rinse 4](#_Toc127864410)

[3.9 Inspection 4](#_Toc127864411)

[4 SiO2 etch 4](#_Toc127864412)

[4.1 Not part of this process flow example 4](#_Toc127864413)

[5 Lithography – Lift off 4](#_Toc127864414)

[5.1 Not part of this process flow example 4](#_Toc127864415)

[6 Aluminum pattern 4](#_Toc127864416)

[6.1 Not part of this process flow example 4](#_Toc127864417)

[7 Linewidth measurement 4](#_Toc127864418)

[7.1 Not part of this process flow example 5](#_Toc127864419)