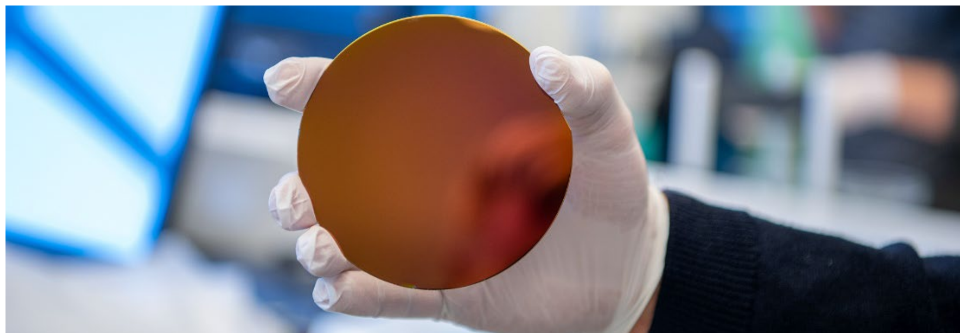
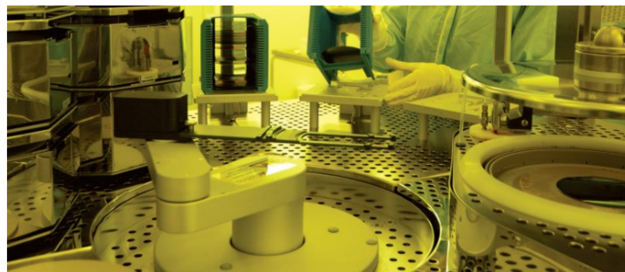


# Deep UV Stepper Lithography (DUV litho)

## Features:



- Medium & small resolution lithography
- Structures with critical dimensions down to ~200 nm
- Developing multiple chips on wafer scale for volume
- Fast & flexible iteration of the designs on a wafer

## DUV lithography description:

DUV lithography is a well-established lithographic process that allows users to transfer patterns on a substrate (e.g. SOI) with the use DUV light on a photomask (reticle). DUV is based on projection optics, since the pattern on the reticle is much larger than the final pattern developed on the photoresist. The substrate is exposed with the photoresist under DUV light by relative motion systems to imprint the structure layout. The development continues by exposing entire wafers with selected photomasks and the exposed regions are further processed with etching techniques. DUV allows for fast and flexible chip fabrication with wafer volumes. The DUV can be used in combination with EBL if higher resolution is needed.

## Our DUV system:

SiPhotonIC runs a **248nm light Canon FPA-3000EX4 DUV Stepper Lithography system**. The system is equipped with loaders of 4''/6''/8'' wafers. The smallest structures that can be obtained are 200nm of arbitrary shapes (180nm lines & spaces with optimized illumination).

The DUV tool is accompanied by a fully automated cassette-to-cassette spinner (Karl Süss gamma series). A fully automated cassette-to-cassette developer (Karl Süss gamma series) using 2.38% TMAH in water for developing DUV resists is collocated in the same room with the stepper and the aforementioned spinner.

## DUV specifications:

| Parameter | Notes |
|---|---|
| Light source | Wavelength: 248nm, pulse frequency: 1kHz, power: 10W |
| Image field size | 22mm x 22mm ~ 17mm x 26mm |
| Reticle magnification | 5:1 reduction |
| Alignment precision | 50nm |
| Substrate sizes | 4''/6''/8'' wafers |
| Resolution | >200nm (180nm lines with optimized illumination) |
| Resists | BARC - thin chemically amplified resist (300nm – 600nm)<br>BARC - thick chemically amplified resist (800nm-1600nm)<br>Negative resist (200nm to 1400nm) |

**For design & ordering options please refer to our *Prototyping Manual*.**

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