



Allresist and SwissLitho - Thermal scanning probe lithography

Allresist

- Development, production and distribution of photo- and e-beam resists as well as process chemicals for the manufacturing of electronic components
- Wide range of products - resists for (almost) all standard technologies
- Customised versions of process-specific resists according to our customer's requests - unique selling proposition

Heidelberg Instruments Mikrotechnik GmbH

- Development, production and distribution of the unique NanoFrazor lithography systems
- Consulting and support on nanofabrication processes and applications using the NanoFrazor
- Customized solutions for the fabrication of challenging nanostructures and nanodevices

Single nanometer manufacturing with NanoFrazor and thermosensitive resist Phoenix 8 I (SX AR-P 8 I 00)

Supplement and alternative to e-beam lithography

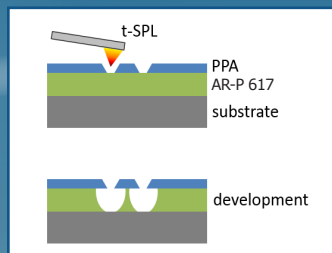
Resolution up to 10 nm and three-dimensional structures

Developed during the Eurostars project „PPA-Litho“ (2014-2017)

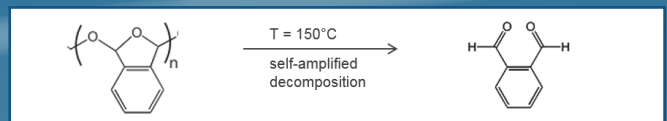


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Heated NanoFrazor tip evaporates the PPA resist

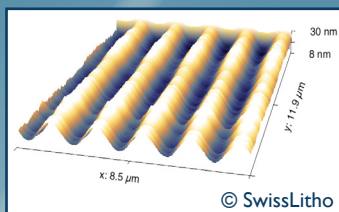


Lift-off process with 2-layer system PPA / AR-P 617



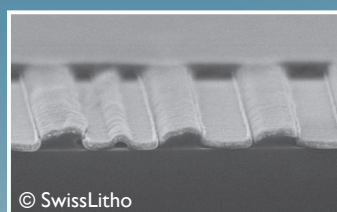
PPA decomposes into volatile monomer units when heated

Supplement: e-beam technology (self-developing resist system)

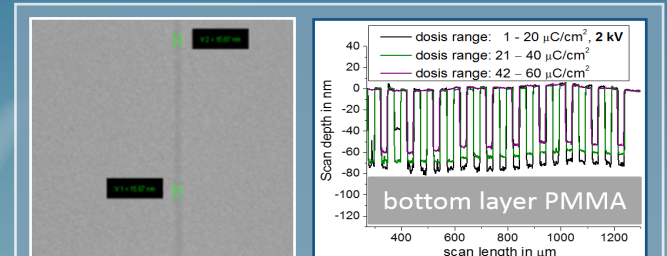


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3D profile CSAR 62, sinus pattern

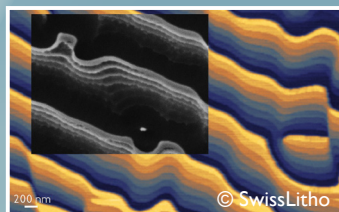


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Lift-off architecture



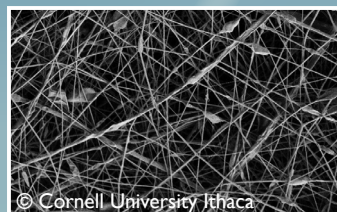
16 nm single line by e-beam lithography (N. Pyka, Raith GmbH)

Developed depth by different dosages in 2-layer system PPA/PMMA



© SwissLitho

Etched hologram



© Cornell University Ithaca

Transient PPA composite fiber mats via electrospinning (fiber diameter: 128 nm)

Dose variation with increasing acceleration voltage

2kV	5kV	10kV	20kV	30kV
Low	Medium	High	Very High	Extremely High

↑ Scan area ↑
Dose variations by e-beam exposure

PPA-based resist SX AR-P 8100/3 shows a very high sensitivity (dose to clear < 5 μC/cm² at 2 kV) and allows the preparation of 16 nm single lines. Increasing the dosage promotes cross-linking processes and results in a negative patterns.

RAITH
NANOFABRICATION

