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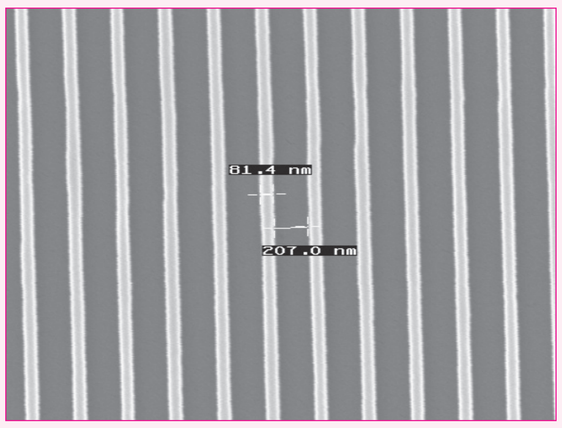
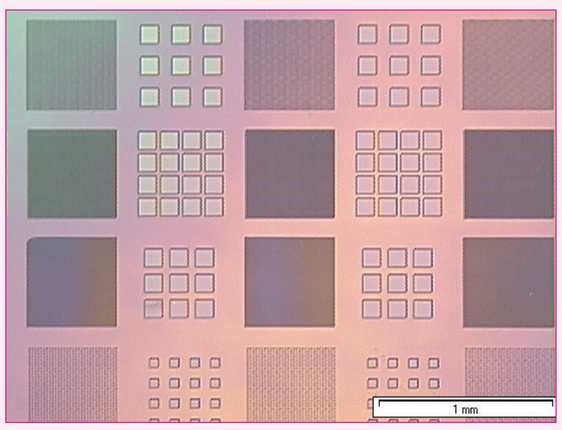
UV-curable Resist Formulation for UV- or Photo-NIL

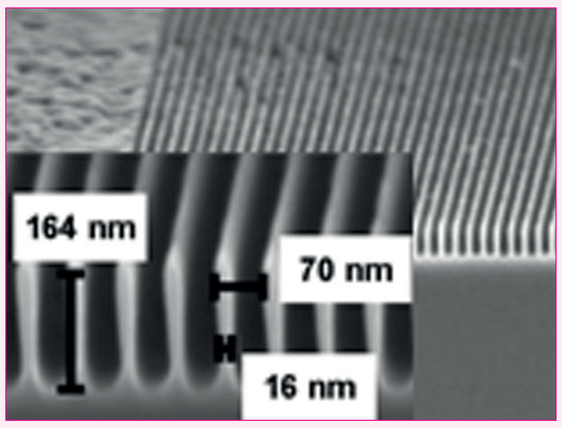
mr-UVCur21 – fast curing resist formulation for imprints with hard stamp materials



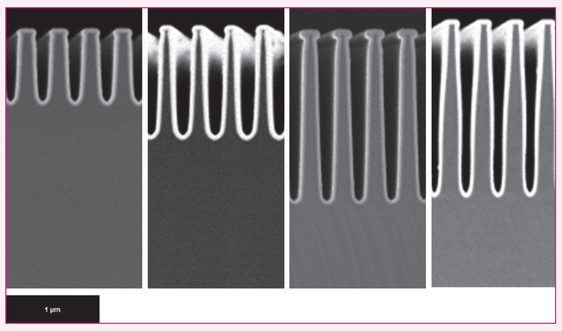
Imprinted 80 nm lines, pattern depth 110 nm (courtesy of AMO)



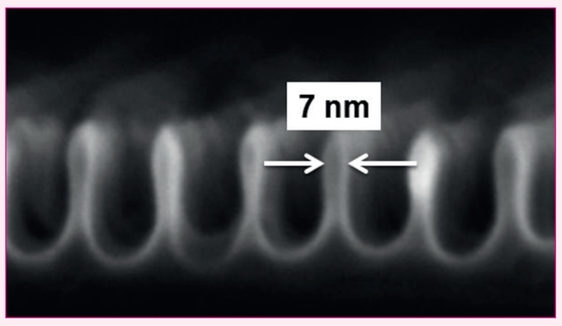
Excellent filling of mould patterns with demanding filling factors, 100x100 µm² squares (courtesy of AMO)



16 nm lines transsferred into Si by cryo-etching (courtesy of Molecular Foundry)



Nanostructured Si-electrodes fabricated by cryo-etching
(courtesy of Helmholtz-Zentrum Geesthacht)



7 nm lines transsferred into Si by cryo-etching (courtesy of Molecular Foundry)

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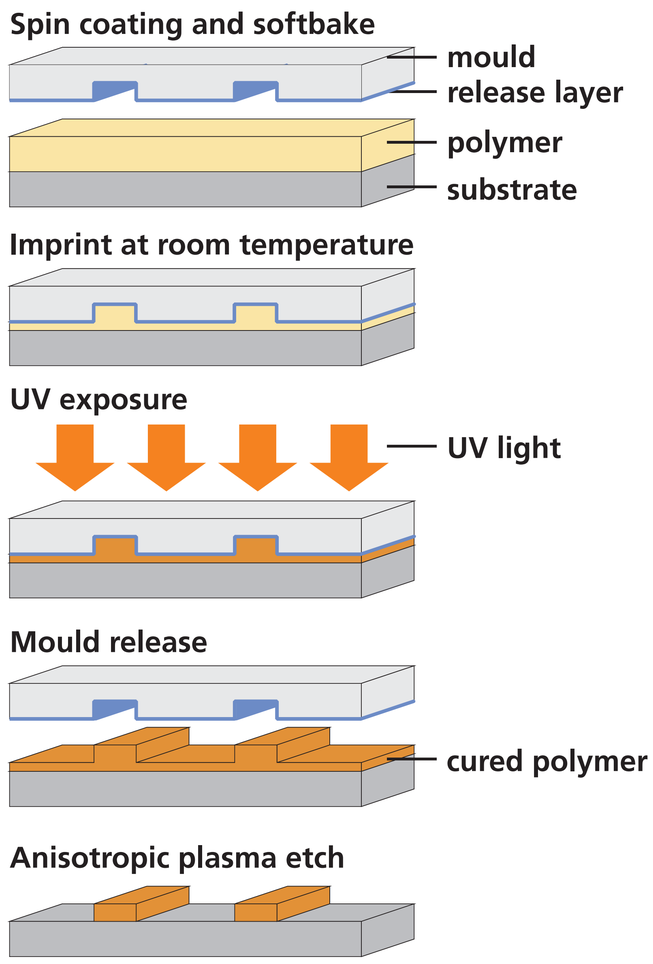
Unique Features

- Suitable in combination with hard stamp materials (e.g. SiO_2, OrmoStamp®)
- Compatibility with various nanoimprint tools:
  - Wafer-scale or step&repeat UV-imprints
  - Imprinting in vacuum or under atmospheric pressure
- Excellent film quality and thickness uniformity
- Short cycle times due to fast filling of stamp cavities
- Pattern resolution below 30 nm
- Very low residual layer thickness (< 10 nm)
- Short curing times, low UV doses, compatibility with various UV lamps and filter systems
- High plasma etch resistance, no residues after oxygen plasma etching (silicon-free resist)
- Appropriate adhesion promoter available (mr-APS1)
- Not suitable in combination with PDMS working stamps

Applications

- Etch mask for pattern transfer processes (dry and wet etching)
- Fabrication of nanopatterns
  - Data storage
  - Nano-optical devices, sub-wavelength optical elements
  - Photonic crystals
  - Micro- and Nanofluidics
  - Microelectronics
- Coating of various substrate materials, e.g. Si, SiO_2, Al

Process Flow



Technical Data

UV-curable NIL resist	mr-UVCur21	mr-UVCur21SF
Coating method	Spin coating	Dispensing, spin coating
Process conditions	Imprint: room temperature process, low imprint pressures (>100 mbar), imprint in vacuum or under atmospheric pressure UV exposure: broad band or i-line, curing time few seconds	
Smallest feature size **Aspect ratio**	< 30 nm > 2	< 30 nm > 2
Ready-to-use solutions for various film thicknesses[1] (3000 rpm)	100nm 200nm 300nm	1.6 µm (spin coating)
Diluents	mr-T 1070	mr-T 1070
Adhesion Promoter	mr-APS1	mr-APS1

[1] Customized film thickness available on request