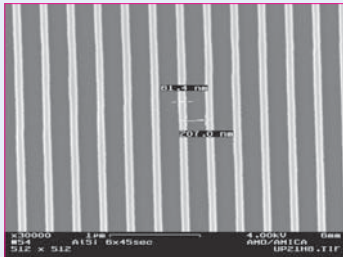
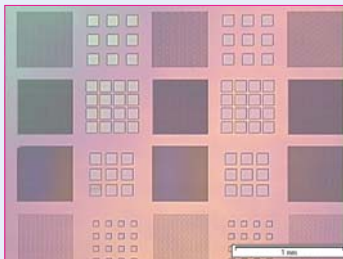


UV-curable polymers for UV-based nanoimprint lithography

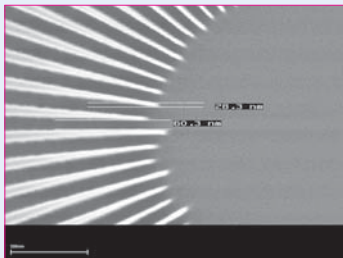
mr-UVCur21 and mr-UVCur06 – fast curing polymer systems for pattern transfer



80 nm lines imprinted in mr-UVCur21, pattern depth 110 nm (Courtesy of AMO)



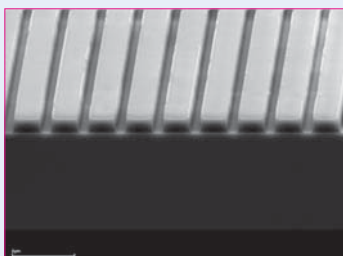
Excellent filling of mould patterns with demanding filling factors, 100x100 µm² squares, mr-UVCur21 (Courtesy of AMO)



Imprinted lines, sub-30 nm resolution (Courtesy of AMO)



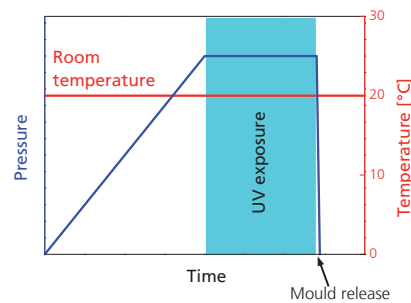
800 nm squares, 1200 nm pitch, imprinted in mr-UVCur06, large-area imprint (Courtesy of Profactor)



350 nm trenches, mr-UVCur06, residual layer thickness < 10 nm (Courtesy of Profactor)

Attributes

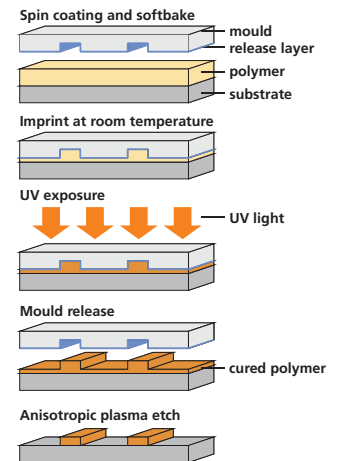
- Compatibility with various nanoimprint tools:
 - Wafer-scale or step&repeat UV-imprints
 - Imprinting in vacuum or under atmospheric pressure
- Excellent film quality and thickness uniformity
- Short cycle times** due to fast filling of mould cavities
- Pattern **resolution below 30 nm** (mr-UVCur21, limited by the mould, not by the polymer)
- 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 polymer)
- Appropriate adhesion promoter available



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, SiO₂, Al

Process Flow



Technical Data

UV-curable Polymer	mr-UVCur06	mr-UVCur21	mr-UVCur21SF
Coating method	Spin coating	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	50 nm	< 30 nm	< 30 nm
Aspect ratio	< 2	> 2	> 2
Ready-to-use solutions for various film thicknesses * (3000 rpm)	240 nm	100nm 200nm 300nm	1.6 µm (spin coating)
Diluents	mr-T 1070	mr-T 1070	mr-T 1070
Adhesion Promoter	mr-APS1	mr-APS1	mr-APS1

* Different film thicknesses are available on request for mr-UVCur21