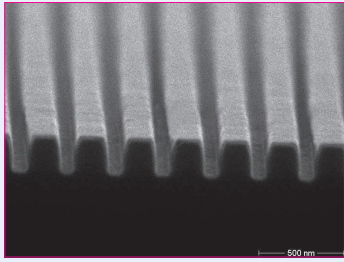
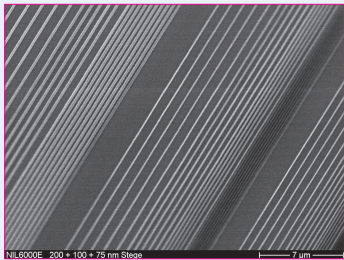


# Photochemically Curing Resist for Thermal Nanoimprint Lithography

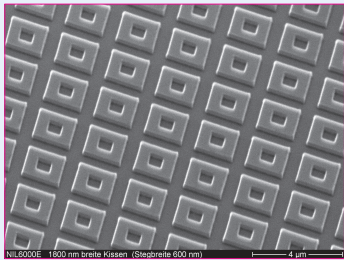
## mr-NIL 6000E — High performance resist with decreased imprint temperature



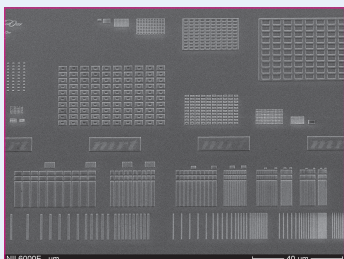
100 nm trenches, 300 nm pitch



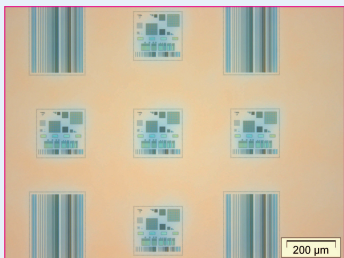
200 nm, 100 nm and 75 nm lines



1800 nm squares, 600 nm line width



Overview over patterns with different size (75 nm to 2 µm)



Uniform filling of patterns with different size (75 nm to 2 µm)

### Solid resist film after spin coating

### Isothermal imprint process

Imprinting at lower temperature than with previous product mr-NIL 6000

### Unique features

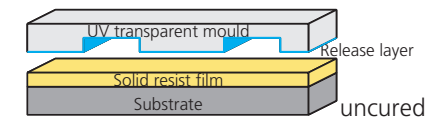
- Excellent film quality on various substrate materials, e.g. Si, SiO<sub>2</sub>, Al, Al<sub>2</sub>O<sub>3</sub>
- Designed for combined thermal and UV nanoimprint Lithography
  - T<sub>g</sub> ~ 1 °C before curing
  - Imprinting, curing by UV flood exposure during imprinting, and mould release at the same temperature
  - Lower imprint temperature (65 – 70 °C) than previous product mr-NIL 6000, less thermal load
- Very low residual layer thickness < 10 nm
- Excellent pattern transfer fidelity
- High plasma etch resistance comparable to conventional novolak-based photoresists
- Ready-to-use solutions
- Safe solvents

### Applications

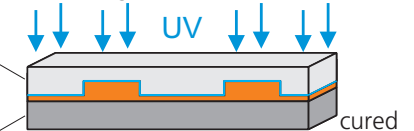
- Fabrication of nanopatterns for nano-optical devices, photonic crystals, high-brightness LEDs
- Etch mask for pattern transfer processes
- Dry and wet etching
- Single and multilayer systems
- Combined nanoimprint and photolithography

### Process

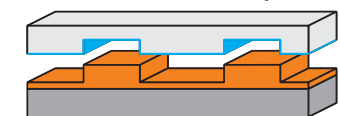
Spin coating and prebake



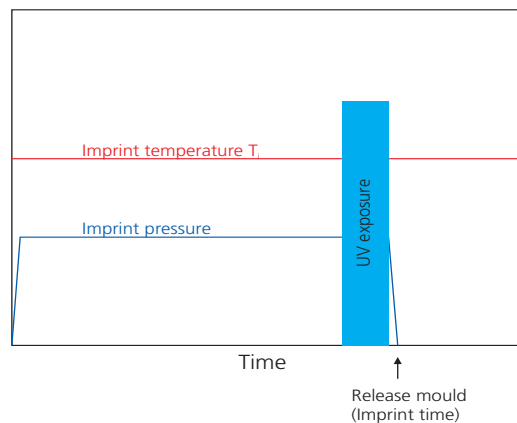
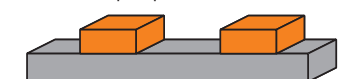
Nanoimprint @ T<sub>i</sub> > T<sub>g</sub>, UV flood exposure and annealing



Mould release @ T<sub>i</sub> < T<sub>g, cured</sub>



Anisotropic plasma etch



Type <sup>1)</sup>	Thickness <sup>2)</sup>
mr-NIL 6000.1E	100 nm
mr-NIL 6000.2E	200 nm
mr-NIL 6000.3E	300 nm

<sup>1)</sup> different film thickness up to 1 µm available on request

<sup>2)</sup> spin coating @ 3000 rpm, 30 s