

## Material Innovations Enabling Advanced Nanofabrication for Lab to Fab Application

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For more than 20 years, micro resist technology GmbH (mrt) has been developing, manufacturing and selling innovative photoresists, special polymers and ancillary materials for micro- and nanolithography applications. Due to our highly specialized products we are a trusted supplier of global high-tech markets such as semiconductor industry, MEMS, optoelectronics, nanotechnology and other emerging technologies.

Beside photoresists for UV / DUV-applications and e-beam lithography mrt has focused on the development and fabrication of resist materials for the next generation lithography applications. Beside improved versions of positive and negative tone photoresists the innovation is mainly set on nanoimprinting materials and hybrid polymer materials. Basically, two different variants of NIL have been developed so far: thermal NIL (T-NIL), in which a thermoplastic polymer is used, and photo-NIL, in which a liquid photo-curable formulation is applied. Our nanoimprint resists are mostly applied as etch mask for pattern transfer into various substrates, like Si, SiO<sub>2</sub>, Al or sapphire. The unique key features of our products are outstanding film forming and imprinting performance beside excellent pattern fidelity and plasma etch stability.

In addition to these new NIL materials micro resist technology offers a broad portfolio of UV-curable hybrid polymer products for micro-optical applications. Their excellent optical transparency and high thermal stability makes them perfectly suitable for the production of polymer-based optical components and waveguides. The main fields of application are micro lenses, diffractive optical elements (DOE), gratings, and single-mode or multi-mode waveguides.

New developments in NIL- and hybrid polymers will be demonstrated, discussed, and first application results will be given.

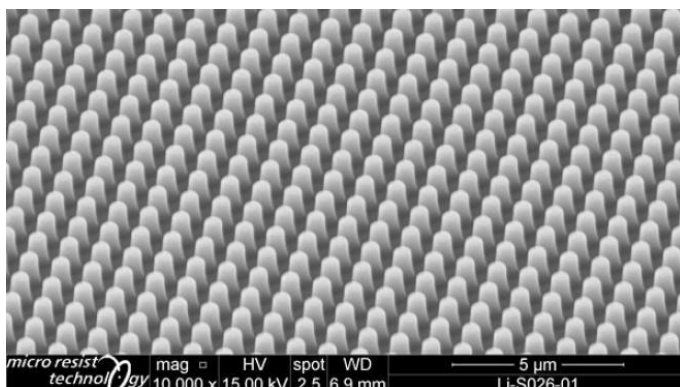


Fig. 1: Resist pattern generated by photo-NIL

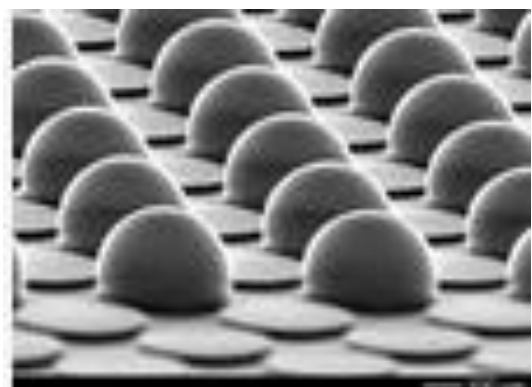


Fig. 2: Photo lens array made from OrmoCere® by Ink Jet Printing