

smaller better nanostructures

25nm half-pitch EUV fabricated gratings now available

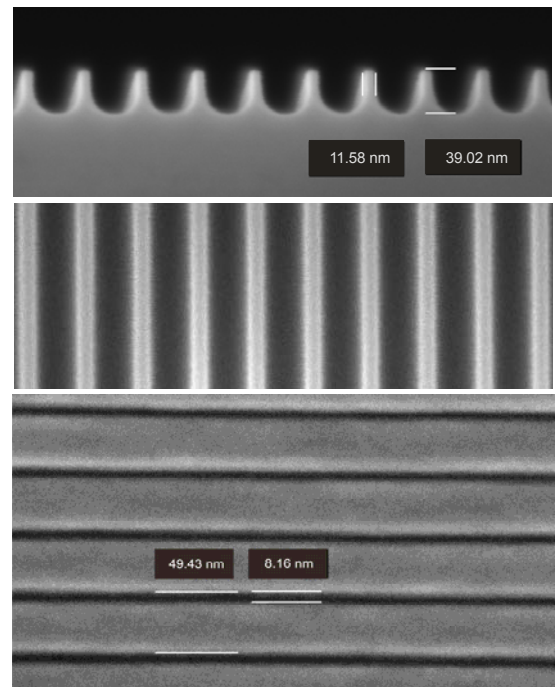
Eulitha continues to add higher resolution structures to its line of standard products. The newest such item is a 50 nm-pitch grating etched into silicon. These gratings are made with Eulitha's unique EUV interference lithography technology which means extremely smooth structures and none of the stitching or pixel related imperfections that are found in patterns of similar resolution produced using e-beam lithography.

The replication of these high resolution gratings were demonstrated by the Nanoimprint group at the Paul Scherrer Institute. Gratings with an etch depth of 40nm and a linewidth of 12nm (pitch 50nm) were imprinted in a modified imprint resist (mr-I 7030R) with intrinsic release properties provided by microresist technology GmbH. Well defined trenches were imaged after the thermal imprint process. The residual resist layer was subsequently removed and the replicated structures were etched into the Si substrate (image not shown). The full results will be presented at the [NNT conference 2010](#)¹.

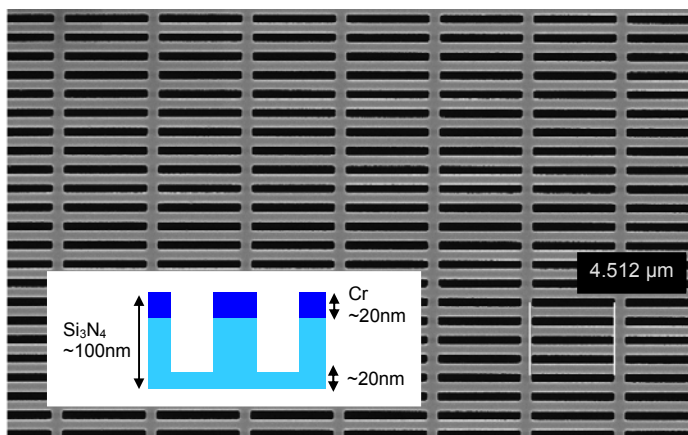
The 25nm half-pitch gratings are available as a standard product or in custom configurations. [Click here for more information including current prices.](#)

Figures (top to bottom): Cross-section and top-down views of the master grating and SEM image of the replicated structure in NIL resist.

¹ C. Dais, H. H. Solak, M. Altana, C. Spreu, H. Atasoy, J. Gobrecht, H. Schiff, *Thermal NIL of Large Area 12 nm EUV Interference Lithography Gratings into Resist with Improved Release Properties and Pattern Transfer*, Eulitha AG, INKA Institute, Paul Scherrer Institut, micro resist technology GmbH.



Deep etched EUV transmission gratings



SEM image of a 1µm period grating etched into a silicon nitride membrane. The cross section of this grating is shown in the inset.

Transmission diffraction gratings are required in many research and development projects such as characterization of EUV light sources or spectroscopy experiments in the EUV range. Because of high absorption by all materials in this spectral range (roughly 5-20 nm) the gratings must be made on thin membranes and the slits should have negligible absorption. Having long-standing experience in the fabrication of EUV transmission gratings Eulitha is now offering deep etched gratings for spectroscopy applications. The gratings are designed according to customer specifications, e.g. size, linewidth and grating pitch. The mechanical stability and durability of the membranes are ensured by an extremely thin (ca. 20nm) layer of silicon nitride left unetched in the slits and a crossbar structure. Our mature processes and expertise in processing the extremely fragile membranes enables us to offer high-quality gratings at affordable prices.