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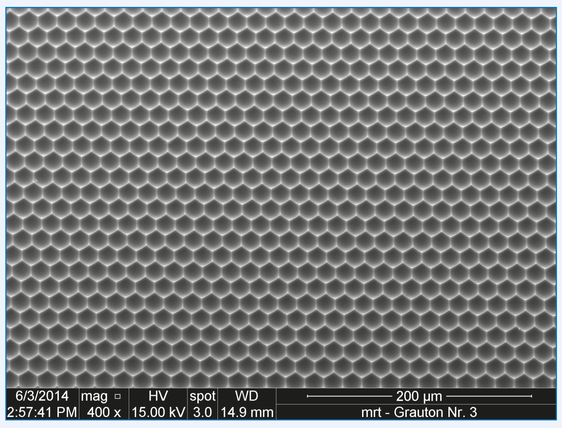
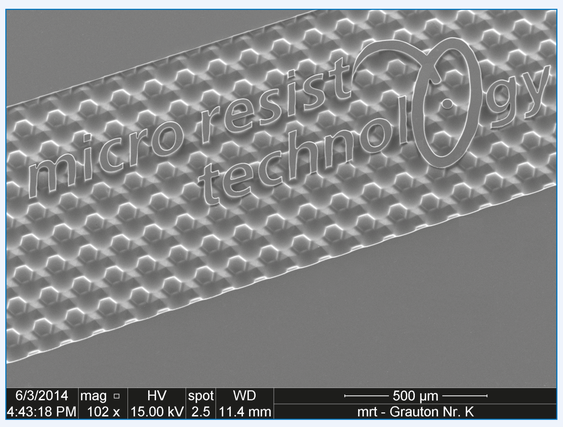
ma-P 1200G — Positive Greyscale Photoresist Series

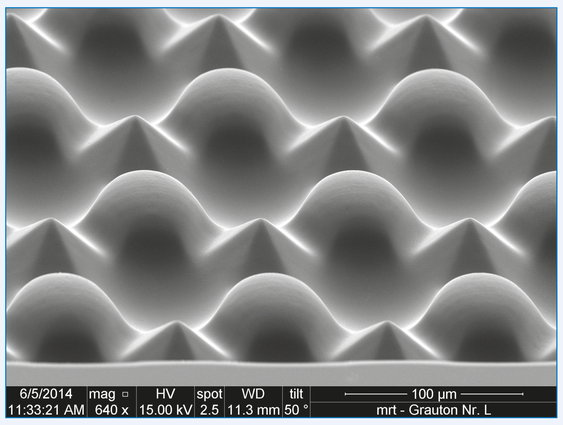
Positive Photoresists for Greyscale lithography



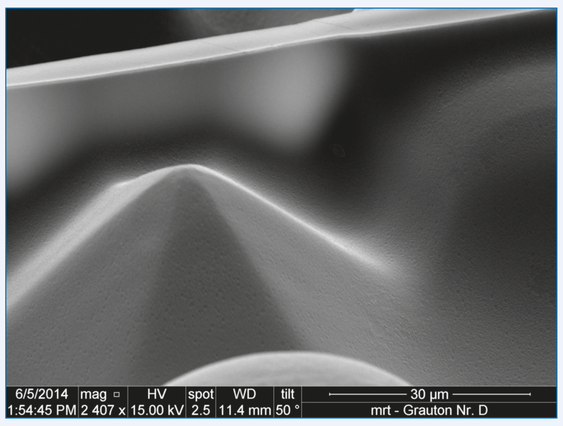
Hexagonal concave lenses, ~ 17 µm width



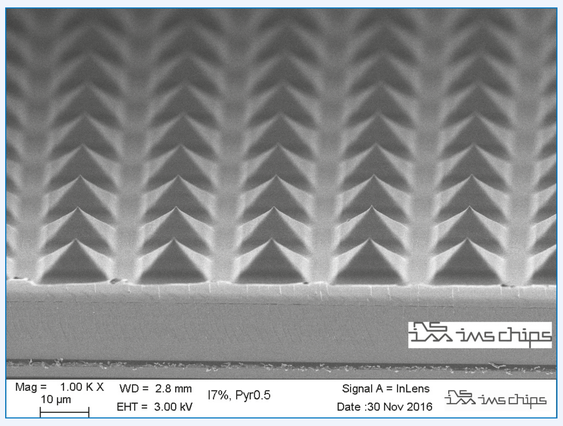
Convex and concave lenses and hexagonal pyramids in a honeycomb arrangement (hexagon diameter = 80µm)



As above, detailed view



Straight line among greyscale patterns



Pyramids - 10µm base, 5µm height, 45° angle

Exposures with DWL66+ at 405nm at Heidelberg Instruments; bottom picture courtesy of IMS Chips, exposure with VPG400 at 355nm

ls.18.02.06

Characteristics

Positive tone photoresist series specifically designed for the requirements of greyscale lithography. An application in standard binary lithography is also possible.

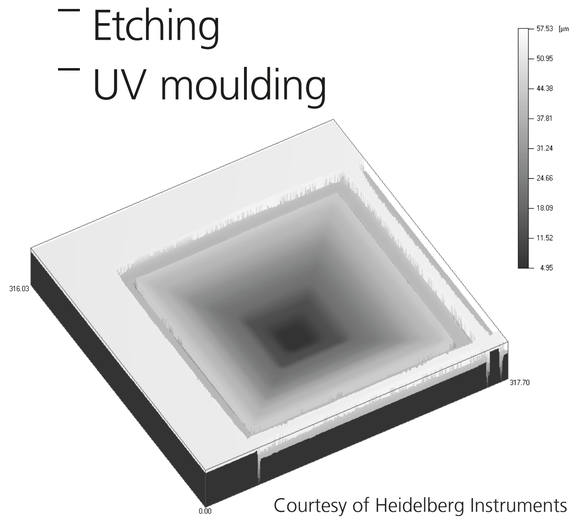
- Reduced contrast
- Film thickness up to 60 µm and higher
- 50 - 60 µm depth range of the patterns possible in greyscale lithography
- Spectral sensitivity 350…450 nm
- High intensity laser exposure possible without outgassing
- Aqueous alkaline development, for greyscale lithography with TMAH based developers, for standard binary lithography also with metal ion bearing developers
- Suitable for electroplating
- Suitable for dry etch processes e.g. with CHF_3, CF_4, SF_6
- Suitable for pattern reflow after standard binary lithography

Applications

Use of manufactured 3D patterns in micro-optics, MEMS and MOEMS, displays

Pattern transfer by

- Electroplating
- Etching
- UV moulding

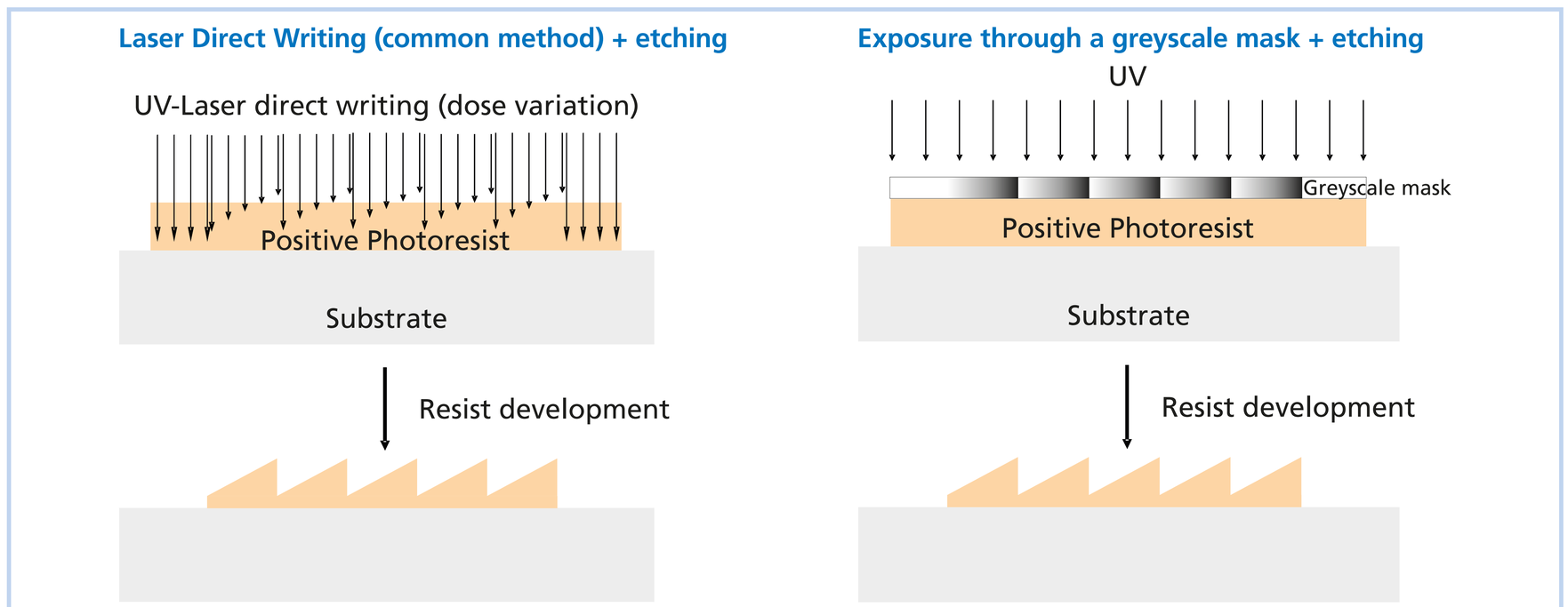


Courtesy of Heidelberg Instruments

~ 53 µm pattern depth in
~ 58 µm thick ma-P 1275G

Exposure with µPG301 at 390 nm at Heidelbberg Instruments

Process flow



Film thickness

Resist	ma-P	1215G	1225G	1275G			
Film thickness	µm	1.5	2.5	9.3	15	30	60
Spin-coating	rpm	3000	3000	3000	1500	500	1000
Time	s	30	30	30	30	60	4