ma-P 1200G — Positive Greyscale Photoresist Series

Positive Photoresists for Greyscale Lithography

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 CHF₃, CF₄, SF₆
- 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

Process flow

Laser Direct Writing (common method) + etching

Exposure through a greyscale mask + etching

Film thickness

<table>
<thead>
<tr>
<th>Resist</th>
<th>ma-P</th>
<th>1215G</th>
<th>1225G</th>
<th>1275G</th>
</tr>
</thead>
<tbody>
<tr>
<td>Film thickness µm</td>
<td>1.5</td>
<td>2.5</td>
<td>9.3</td>
<td>15</td>
</tr>
<tr>
<td>Spin-coating rpm</td>
<td>3000</td>
<td>3000</td>
<td>3000</td>
<td>1500</td>
</tr>
<tr>
<td>Time s</td>
<td>30</td>
<td>30</td>
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Spectral sensitivity

- Exposures with µPG301 at 390 nm at Heidelberg Instruments
- Bottom picture courtesy of IMS Chips, exposure with VPG400 at 355nm

Process:

- Exposure with µPG301 at 390 nm at Heidelberg Instruments; bottom picture courtesy of IMS Chips, exposure with VPG400 at 355nm

Negative 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 CHF₃, CF₄, SF₆
- Suitable for pattern reflow after standard binary lithography

Applications

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

- Pattern transfer by
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