**Manufacturing micro lens arrays**

Pattern reflow of positive resists ma-P 1200G/ ma-P 1200

**Method**

Cost-effective method for manufacturing micro lens arrays, no expensive tools for mould manufacture necessary apart from those for standard UV lithography:

Pattern reflow of positive tone photoresist ma-P 1200G or ma-P 1200 and subsequent pattern transfer by:
- UV moulding with hybrid polymers OrmoStamp® and OrmoComp® or
- RIE (and optional UV moulding with hybrid polymers)

**Formation of photoresist mould:**
- Standard UV lithography of ma-P 1200G or ma-P 1200 to form pillars
- Pattern reflow on hotplate, temperature ramp 4-8K/ min from 100°C, 10 min hold time at 150°C (ma-P 1200G) or 160°C (ma-P 1200)
- Lens structure controlled by height/ diameter ratio of original ma-P 1200G/ ma-P 1200 pillars, half spheres obtained with ratio 1 : 3

**Pattern transfer:**
- UV moulding with UV curable OrmoStamp®
- Flood exposure with ~3000 mJ/ cm² before resist removal from OrmoStamp® patterns
- ma-P 1200G removal with acetone with ultrasound or with mr-Rem 700, ma-P 1200 removal with mr Rem 700 with ultrasound
- Application of antisticking layer to OrmoStamp®
- OrmoStamp® mould for multiple UV moulding of OrmoComp® micro lens arrays

**RIE**

- Pattern reflow of positive resists ma-P 1200G or ma-P 1200
- Substrate e.g. Si
- Reflow of ma-P 1200G or ma-P 1200 and pattern transfer
- Patterned ma-P 1200G/ ma-P 1200
- Pattern Transfer:
- UV molding with OrmoStamp® hybrid polymer
- Glass OrmoStamp®
- UV transparent mould
- Applying antisticking layer
- UV molding with OrmoComp® hybrid polymer
- Lens array of cured OrmoComp® (formed with the above mould)
- Pattern transferred into OrmoComp® by UV moulding
- Pattern transferred into Si by RIE

**Moulding**

- Pattern transferred into OrmoStamp® by UV moulding
- Lens array transferred into OrmoComp® by UV moulding

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