

## Microreplicated Optical Structures

There is a wide range of different micromachining techniques that are suitable for mastering. Processes like anisotropic and isotropic wet etching as well as deep reactive ion etching (DRIE) in silicon wafers are used routinely. Other frequently used IC-based lithography processes for mastering are e-beam, laser and ultraviolet (UV) lithography of thick resists. In addition, sophisticated conventional workshop tools, for example micromilling and micro-electro discharge machining (EDM), are important complementary techniques in order to fabricate micromold inserts with an interface to the macroscopic world.

### Replication in polymeric materials

Micro replication in polymers is a new technology that makes possible cost-efficient, high volume production of microstructures. The technique is essentially identical with the method of fabricating CDs. Many of our LGP products are produced by this method by world leading CD makers. First a master (original structure) is produced, then a mold insert is made by electroplating and finally replicas are made through injection molding. In order to achieve high precision microstructures the master is made by silicon micromachining, using high precision lithography and etching technologies. Nickel is then electroplated on the structured silicon surface to act as a mould insert.

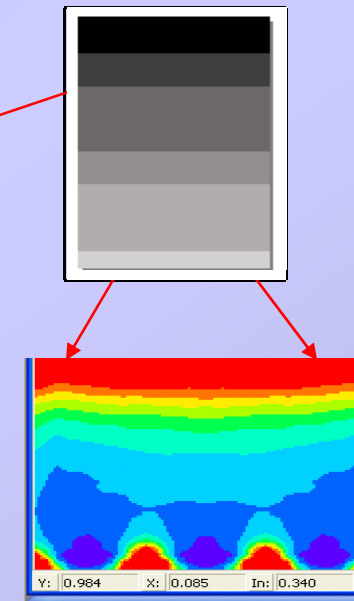
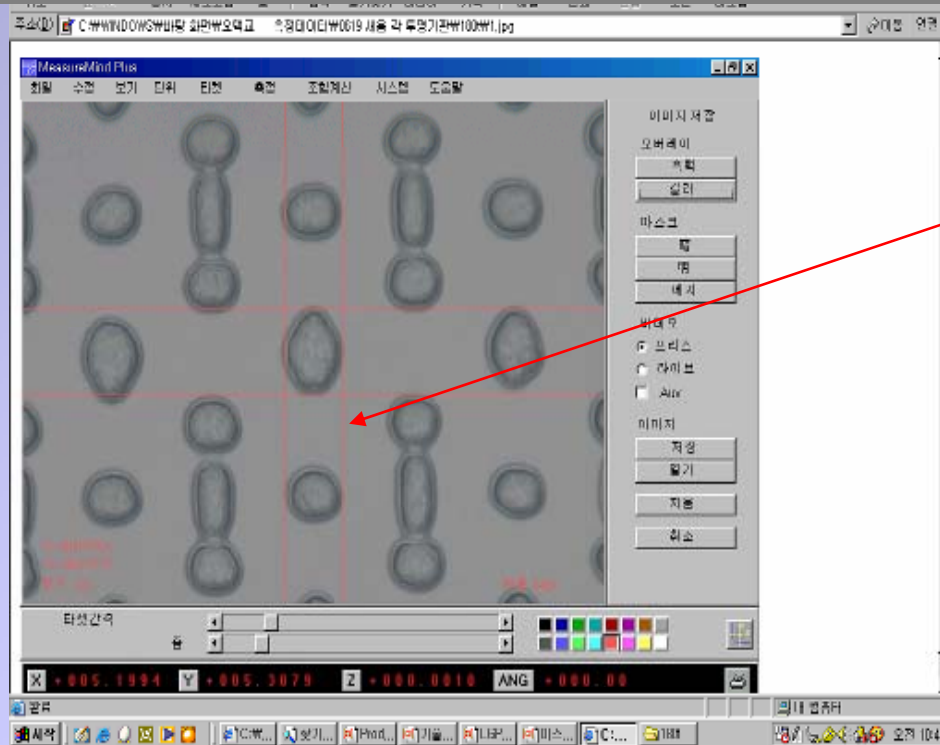
### Proprietary Rapid Prototyping

In most cases of new LGP design there is a need to go through several iterative solutions. Production of masters would place a significant financial burden and require a long leading time. Visus offers a number of proprietary rapid prototyping techniques with considerably reduced NRE costs along with an optical design and/or optimization of your application.

# Advanced Microreplication Technology

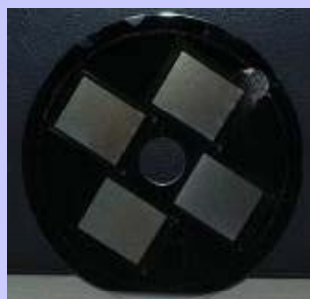
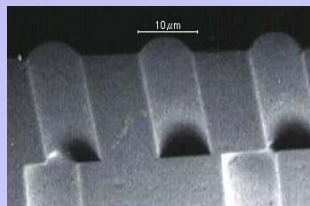
## Micro-lens Array (5-10microns) Backlight for Samsung 2.2" LCD for Mobile Phones

Pattern Generation Process by Visus Photonics ->  
Type of Pattern: Sphere, Rectangular & Prismatic & Cylindrical Discontinuous Groove, Aspherical Lenses, CPC



**Extractor Design: VISUS PHOTONICS**

## Extractor Pattern Transfer



Sticking film above the stamper (0.3T)

PR application

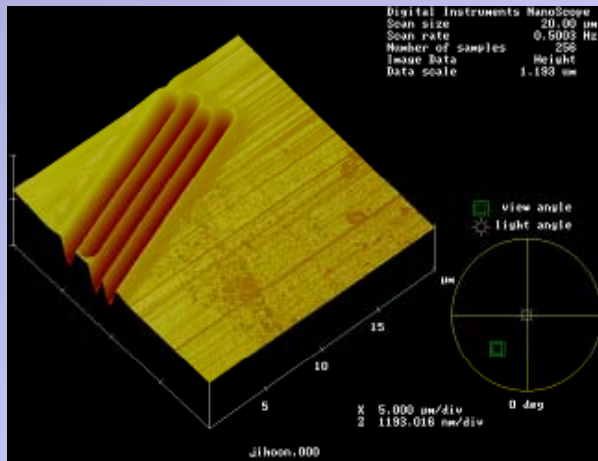
Exposure

Developing

Etching

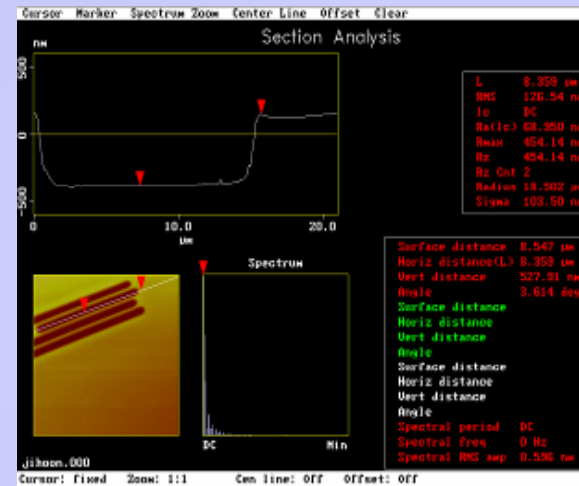
Replicating

Measuring and Evaluating the replicated LGP



Surface-shape of Pattern

AFM



Surface analysis

AFM

=> Feed Back data for making 5 micro depth with AFM

- Compare the stamper and replicated LGP for the detailed dimensions : re-control the replicating conditions

## BLU Assembly & Inspection

Assembly process



Inspection Process

