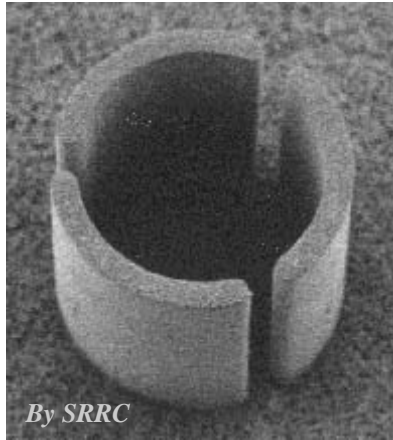


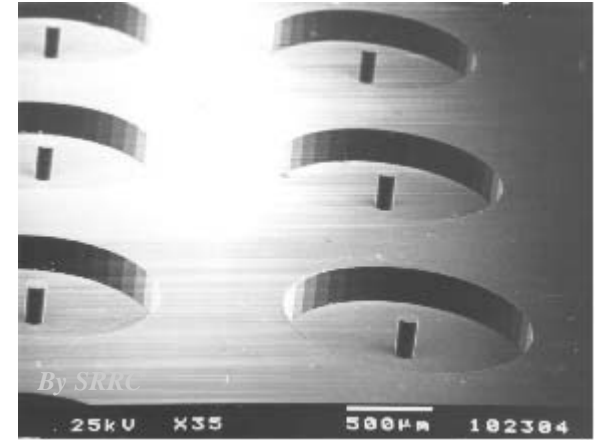
What is “LIGA”?



Lithography



Electroplating

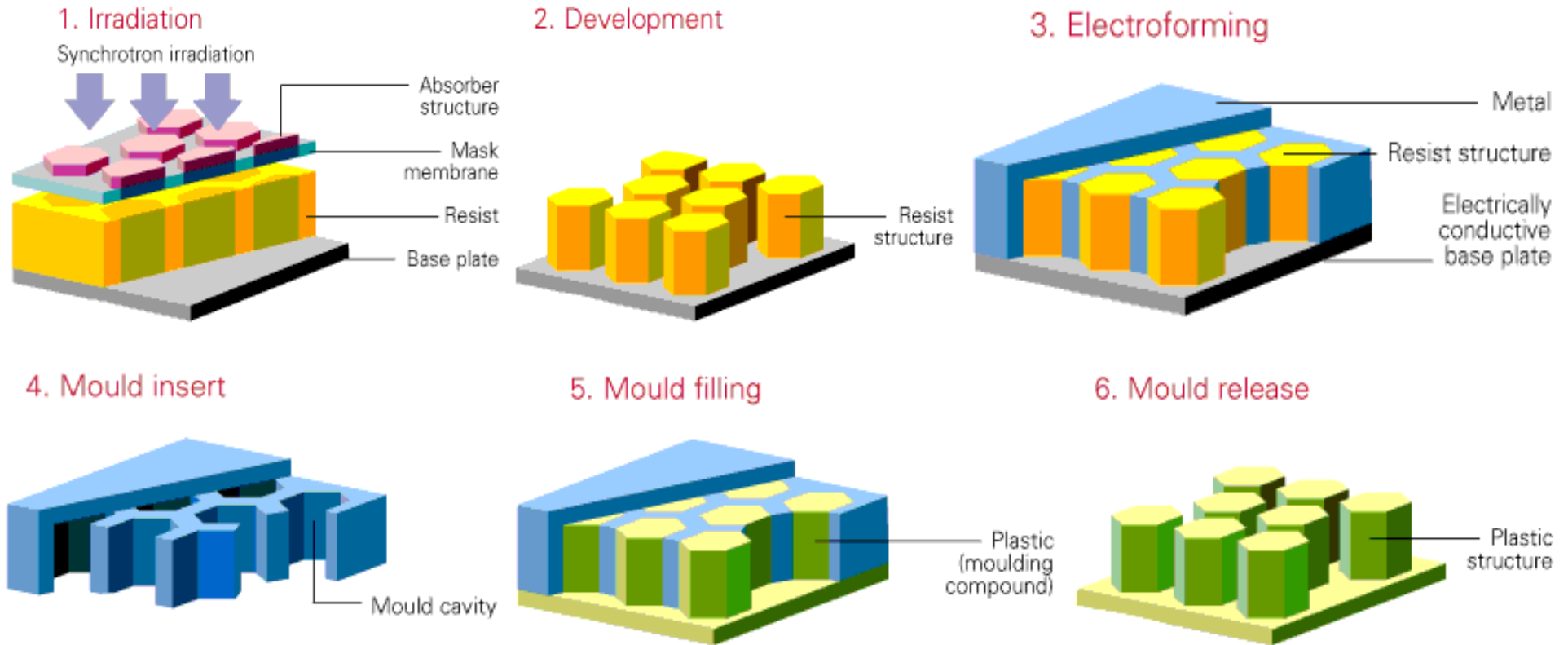


Molding

- LIGA is the abbreviation from the German words, “Lithographie”, “Galvanik”, and “Abformung”
- In LIGA process, a mold insert is made by deep lithography coupled with micro electroforming; mass production is then carried out by molding technique.
- The mass-production tool is the “mold”, but not the “mask”.



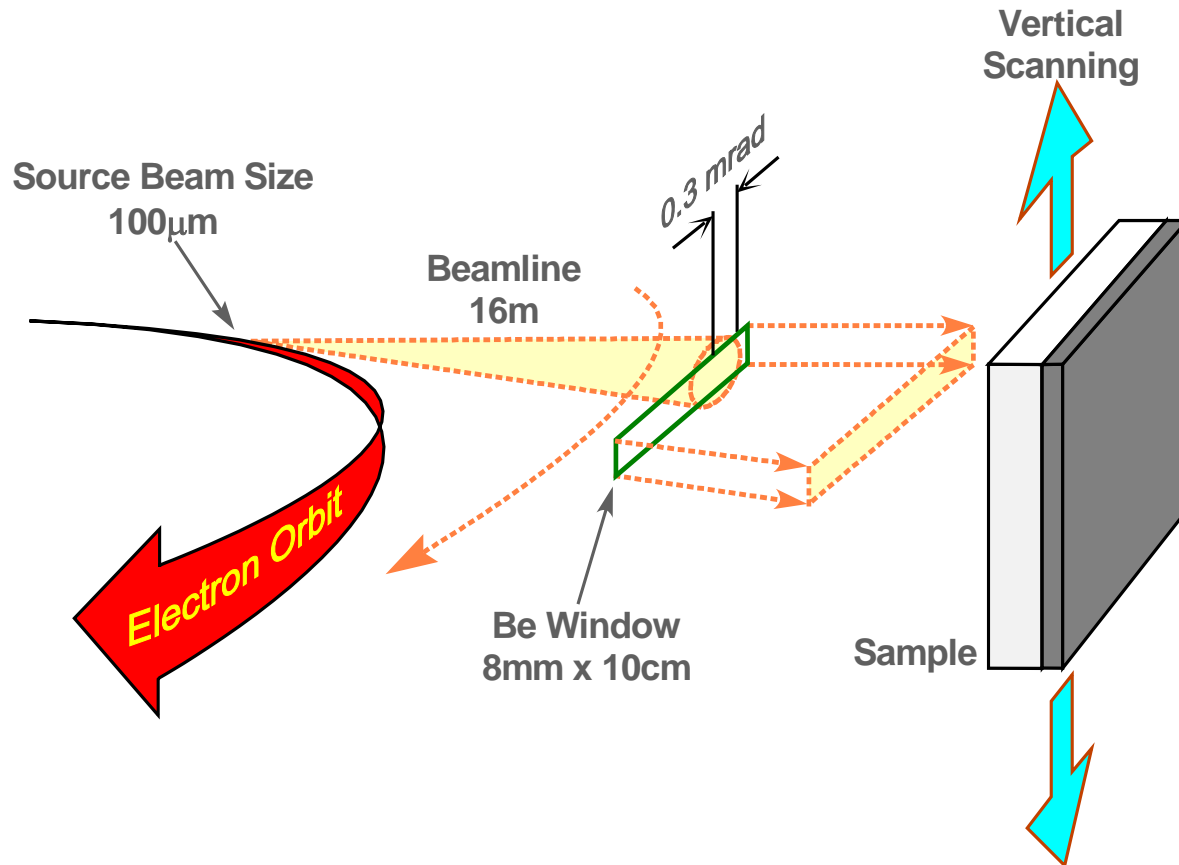
Typical LIGA Process



Source: IMM homepage



SR X-ray Exposure



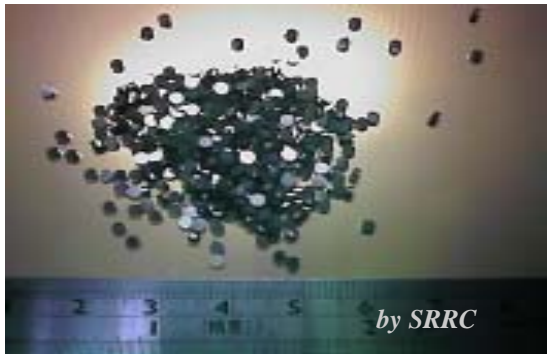
Why SR X-ray?

- ❑ High intensity
- ❑ High collimation

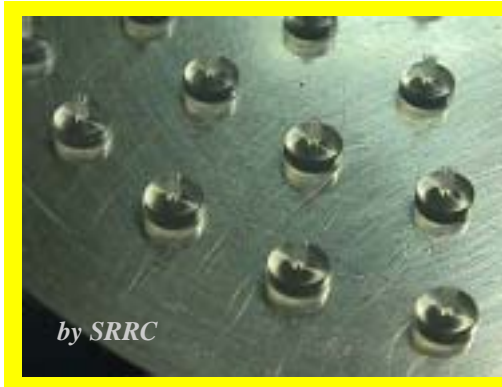
Vertical and Horizontal
Divergence $\sim \pm 0.3$ mrad



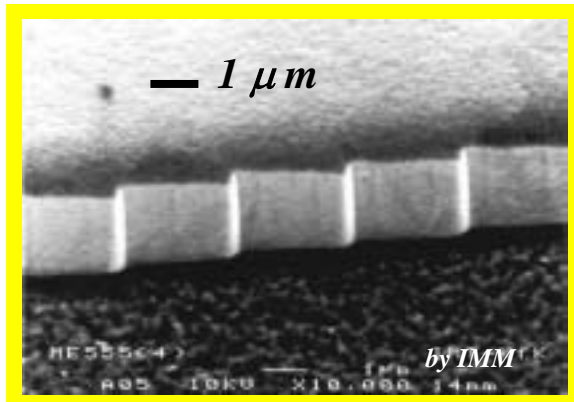
Why "LIGA"?



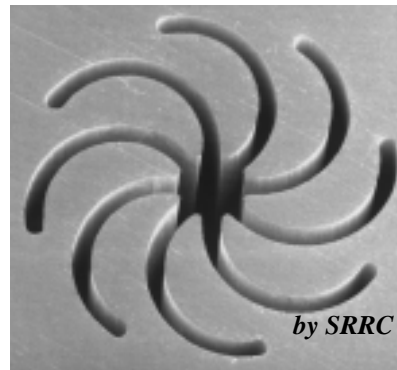
- *mass production*



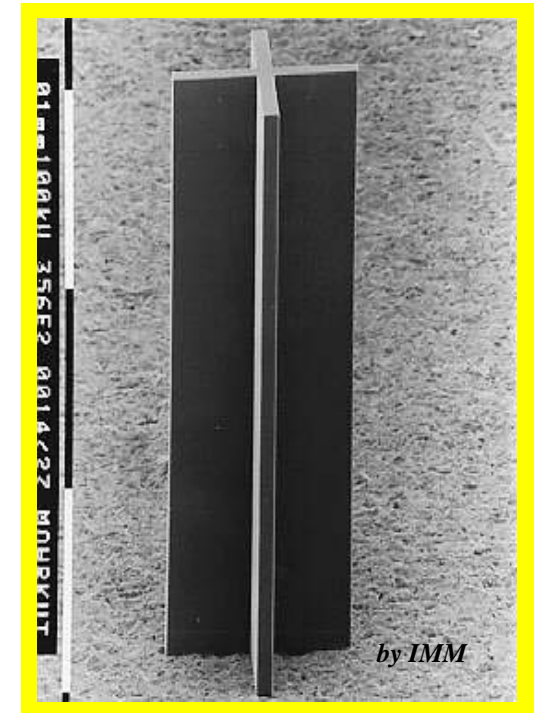
- *any materials*
(polymer, metal, ceramic)



- *high precision* (submicron)
- *low surface roughness* (~30 nm)



- *any lateral pattern*



- *high aspect ratio* (>50)

