

# Fabrication Process of Fresnel Lens by Electrohydrodynamic Instability

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## Abstract

Fresnel lenses have been widely used in various optical systems, including long-distance optical communication and optical information processing [1]. The circular diffraction grating with an outwardly extension line density creates point foci of different order via constructive interference. Conventional Fresnel lenses fabricated by thin film deposition or electron beam writing have sundry problems, including a low focusing efficiency, narrow fabrication tolerance and high coast of process. Here, interest in lateral structure in polymer films, fabricated by electrohydrodynamic instability (EHDI), was renewed by the potential development as a new method [2]. This EHDI method creates stripe or pillar shapes using optically isotropic materials according to the electrode structure by electric fields. In this paper, we suggest the fabrication of binary type Fresnel lenses by using EHDI of the optically anisotropic layer. This method is simple, fast, and reliable fabrication for creating high resolution Fresnel lens.

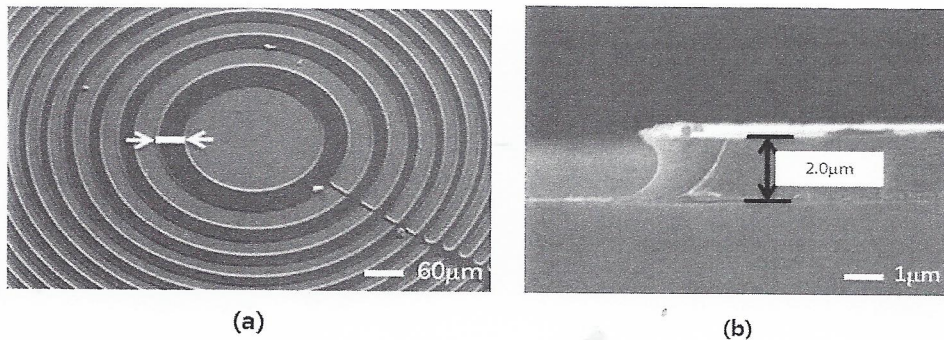


Figure 1. FESEM image of (a) top-view and (b) cross section of Fresnel lens

## References

- [1] N. Kitaura et al., *Opt. Eng.*, **34**, 584 (1995)
- [2] S. Y. Chou, L. Zhuang, *J. Vac. Sci. Technol. B.*, **17**, 3197 (1999)