Novel Diffuser for direct-type LED backlight system

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Abstract

A novel Diffuser with waveform-like structure for direct-type LED backlight system was fabricated by using a sequence of techniques including laser dragging, electroforming, and hot embossing. This technique can make diffuser high-efficiency diffusion in multi-dimension and mass manufacture. The micro-lens arrays of hemisphere-similar structure on the surface of diffuser possess high aspect ratio, non-zero curvature and which can perform excellent diffusivity and mixing of light without direct leaking. In addition, the high duplication from original mold through electroforming mold to polycarbonate sheet has also been demonstrated by electroforming and hot embossing, which indicates high feasibility of mass production.

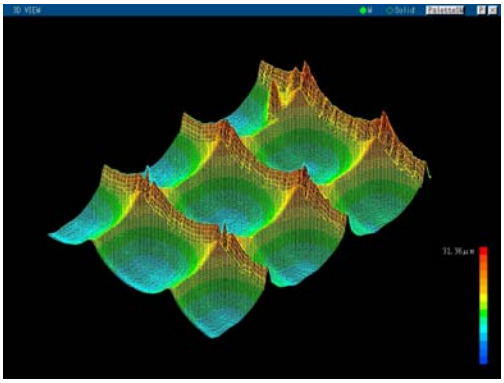

Figure 1. The 3D diagram of gap free hemisphere-similar structure

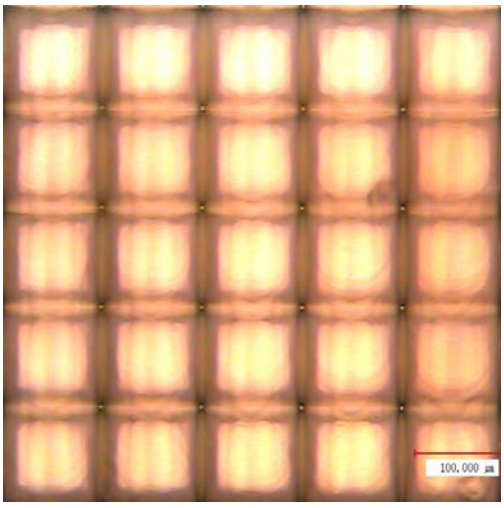

Figure 2. The top view of hemisphere-similar structured micro lens array