

论文

基于DMD微光刻的导光板模板的制作方法

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摘要:

提出了一种基于数字微反射镜(DMD)微光刻的导光模板的制作方法。导光板的网点单元图形由DMD输入, 经过缩微光学成像系统缩微后, 在光刻胶干板上逐单元网点曝光, 再经过显影、微电铸得到导光板模板, 在PC薄板材上用微米级压印制成导光板, 厚度仅为0.381mm。采用自行研制的SVGwriting DMD激光直写系统, 图形的最小分辨率为2μm, DMD微光刻法无需掩膜版, 可实现不同形状、大小、微结构的单元网点图形及网点的排布, 便于大幅面的导光板模板的制作。

关键词: 激光直写;数字微反射镜;导光板;微光刻制

Method of fabricating light guide plate template based on DMD micro-lithography

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Abstract:

A flexible and efficient solution for fabricating the ultra-thin light guided plates (LGP) is presented. The approach is based on maskless lithography which is realized by the aid of a digital micro-mirror device (DMD). The image of microstructures created by DMD is projected by passing through a projection optical system to the substrate with a photoresist layer. After exposure, development and electroforming, a nickel template with patterned microstructures is obtained and can be used to fabricate LGP by hot embossing. The proposed method has the advantages of arbitrary microstructures created by DMD lithography and cost-effective mass production by embossing replication. A fabricated LGP with thickness down to 0.381mm was demonstrated, in which the microstructures have the resolution of 2μm. The process provides a effective scheme for fabricating large format LGP with more complex microstructures.

Keywords: laser direct writing; digital micro-mirror device (DMD); light guide plate (LGP); micro-lithography

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