

A Study on the Fine pattern generation Using Elastic Restoration of Blankets

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Generally, in the printed electronics processes, there is a limitation that nm-class pattern transfer can not be performed. So many studies have been conducted to reduce line width, a kind of that applies printing process. In this study, a reduced pattern was fabricated by applying elastic deformation to reverse offset printing process like figure 1.

Reverse offset printing is a pattern printing process in which an ink is coated on a blanket, a pattern is removed using a cliché, and the remaining pattern is transferred to the substrate. It has been implemented up to a linewidth of 1 μ m.

This study suggests a new concept proposal for fine pattern generation by using elastic deformation of Blanket in reverse offset printing process.

The procedure of the experiment was the same as the reverse offset printing process.

Silver ink was applied uniformly on the blanket fabricated with elastomer and the unnecessary pattern was turned off by fabricated Cliché. The remaining pattern was transferred to the substrate and confirmed by microscope.

Elastomer substrate with pattern transferred is increased, the line width of the pattern becomes thinner.¹

However, when the deformation exceeds a strain of a specific numerical value, crack was occurred.²

Subsequently, changes in fabricated patterns were compared and analyzed.

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¹ R M. Stach, E. C Chang, C. Y. Yang and C. Y. Lo, Post-Lithography pattern modification and its application to a tunable wire grid polarizer (2015)

² W. J. Hyun, E. B. Secor, M. C. Hersam, C. D. Frisbie, and L. F. Francis, High-Resolution Patterning of Graphene by Screen Printing with a Silicon Stencil for Highly Flexible Printed Electronics (2015)

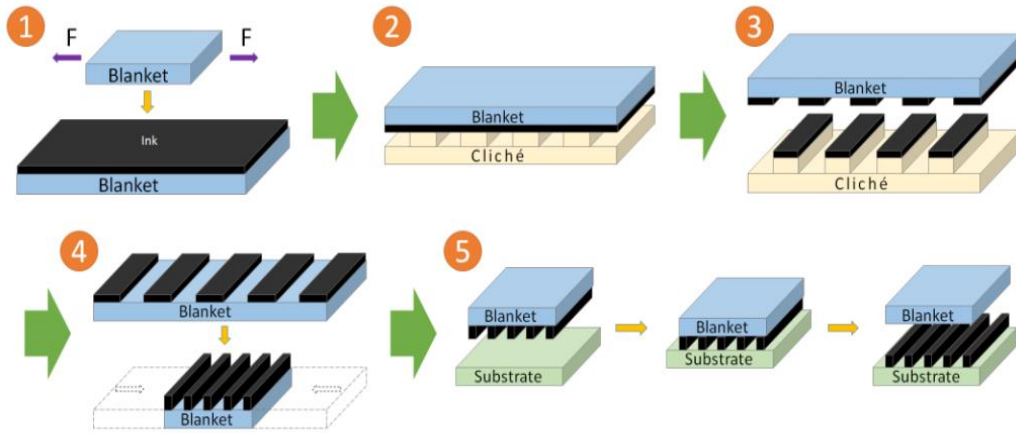


Figure 1: A new concept of fine pattern generation process using elastic deformation of blanket