

High precision temperature-controlled mold for Unconventional lithography

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Compared to conventional photolithography, unconventional lithographic techniques, for example nanoimprint, soft lithography etc., have drawn attention for cost effective, reliable process. However, these techniques are limited in scalability due to restriction for step-and-repeat process. To address this issue, we suggest a high precision temperature controlled rigiflex mold directly amenable to printing process with high resolution and site-specific accuracy. The surface temperature of the mold controlled by localized joule-heating could be uniformly tuned over a large area (20x10mm²). To prove the feasibility of versatile utilization of the mold, we demonstrated site-selective dewetting and nanoimprint for sub-100nm on a polystyrene (PS) film. In particular, this work also shows a great potential for large area patterning and hierarchical structuring readily using step-and-repeat process.