Material Transfer Controlled by Elastomeric Layer Thickness

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Electronic Supplementary Information (ESI)

Movie S1- Thickness controlled adhesive transfer. A metallic washer is transferred multiple times to progressively thinner compliant substrates ($t_1 = 5.4 \text{ mm}$, $t_2 = 3.4 \text{ mm}$, $t_3 = 1.2 \text{ mm}$).

Movie S2- Control of the transfer process. Glass squares (1 cm wide by 1 mm thick) are placed on a 3.4 mm thick substrate and when transfer is attempted to a less confined substrate, such as a 5.3 mm thick substrate they are not transferred. However, when contacted with a more highly confined substrate, such as a 1.2 mm thick substrate they are selectively transferred. The glass squares are coated with colored tape to provide contrast.

Movie S3- Selective retrieval by sub-surface patterning. The stamp picks up 5 mm wide by 0.5 mm thick silicon wafers and is then brought into contact with the patterned substrate (step patterns located in the colored regions) and upon separation the wafers are selectively transferred onto the step patterns as $t_3>t_2$ and remaining wafers are not transferred as $t_1>t_3$. The effective substrate thickness above the rigid step is $t_2 = 1.6$ mm, $t_1 = 4.5$ mm where the step is absent, and the stamp thickness is $t_3 = 3.3$ mm ($t_1>t_2$).

Movie S4- Roll to roll transfer. 5 mm wide by 0.5 mm thick silicon wafers are placed on a donor substrate and the roller retrieves the wafers. The inked roller is then rolled over the thin compliant substrate and the wafers are transferred. The rigid roller is coated with a thick compliant substrate ($t_1 = 3.6$ mm) and the planar substrate with a thin compliant substrate ($t_2 = 0.37$ mm).