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Drop footprints in a curing elastomer: Extreme rapid printing of an elastic solid CLAUDIO FALCN[1], Universidad de Chile, PIERRE-THOMAS BRUN, JOEL MARTHELOT, PEDRO M. REIS, Massachusetts Institute of Technology — Interfaces between liquids that are static or in motion display a myriad of complex shapes and structures which can be both beautiful to the eye (e.g. water jets in fountains) and useful towards technological applications (e.g. fast inkjet printing). We harness this idea to imprint shapes in an elastic solid formed by depositing water drops on a rapidly curing elastomer, which are then removed. The distorted water/elastomer interface can be controlled by the fluid's surface properties and the water volume. As the elastomer is cured, the drop shape is imprinted into the elastomer which can be computed from classical fluid mechanics, and confirmed by experimental measurements. We expand this notion to the rapid fabrication of drop shapes using the Rayleigh Plateau instability of a water column deposited on the curing elastomer's surface. The water column breaks into a line of drops via the instability, which allows us to control the volume of each drop and their separation, and thus the imprint into the elastomer.

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