3d-printing with stamps or construction bricks

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CHALLENGE
Many manufacturing processes like the thermoforming of plastic materials, plastic injection moulding or the production of carbon composites require moulds that are usually produced by a milling process. This mould production is highly material and cost intensive. Current rapid prototyping procedures need special support constructions that generally cannot be reused or recycled. Moreover, the fabrication of these support constructions is a very time consuming process. Therefore, this procedure is disadvantageous both for economical and environmental reasons.

INNOVATION
The innovation is a method for generating precise moulds which is both material and time saving and therefore highly economic. The basic idea is the recycling capability of mould components. For this purpose an efficient stamp system is combined with a customary 3D printer. The material and time savings are achieved by solely printing the material that cannot be formed by the stamp system. Only the upper part of the object (shown dark in Fig. 1 and 2) is printed in high quality. The lower part of the object (light grey) is formed by stamp positioning.

The method can be used for Fused Deposition Modeling (FDM) or Fused Filament Fabrication (FFF). Usually the filament is printed as a solid material. However, a usage with liquid materials hardening on the stamps is also conceivable. Thus the printing of silicones would be achievable. The method is equally to be used for polyurethane.

An alternative method at the moment patent-pending uses little construction bricks instead of stamps for the purpose of material saving.

COMMERCIAL OPPORTUNITIES
3D printing, plastics production, production of composite materials, rapid prototyping

DEVELOPMENT STATUS
Prototype