Rapidly creating high detail custom molds with Forma Moulds

Above: Form being removed from the Mayku Multiplier

Mold making is a critical step in the prototyping, development and manufacture of many different products from consumer tech to food manufacture. It's a highly skilled, technical craft that brings ideas into the physical realm, whether a single prototype or a small to medium batch production.

Forma Moulds are a UK based mold manufacturer that design, prototype and develop molds for a vast swathe of different clients around the world like Hilton hotels, Caterpillar and Grey Goose vodka. Their innovative approach to mold making enables them to deliver specific client needs fast and affordably with a small and nimble team utilizing the latest in 3D printing and pressure forming technology.

In the past year Forma Moulds have grown their mold making facility from a couple of hundred square feet to a 5000 square foot facility. They have implemented the Multiplier in their workflow to increase the speed and efficiency of their operation in delivering molds to customers.

Forma Moulds were approached by Bandwidth Production to create a set of highly detailed molds for silicone guitar/bass pickups which will have the electrical parts cast within the molds. Forma Moulds turned to the Multiplier to both prototype and batch produce these molds for their clients.

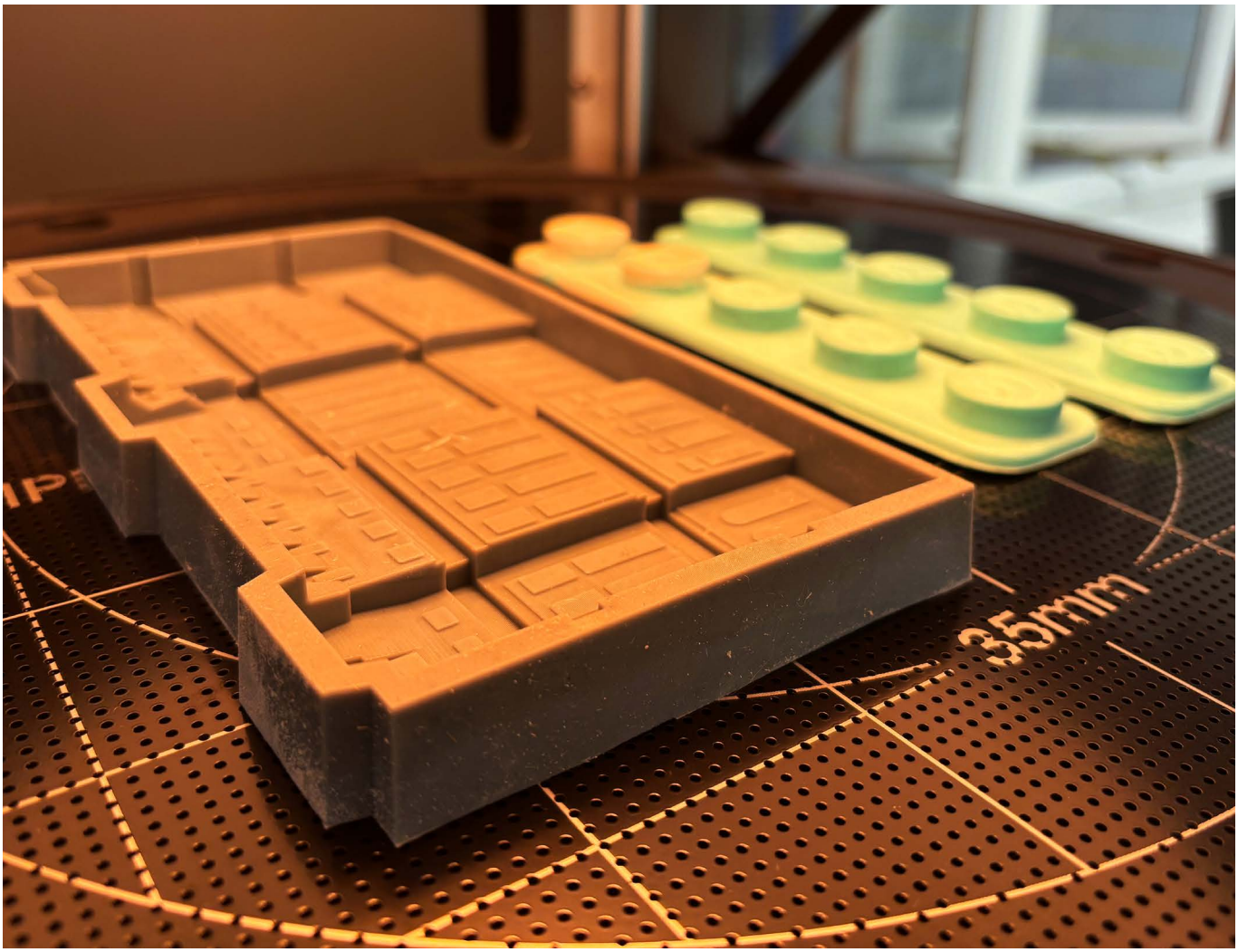
The Challenge: Highly detailed, cost effective molds, fast

Traditionally, mold making can be a time consuming process. First a master template or buck is needed with the necessary design constraints of mold making included - with draft angles, venting slots, undercut assessment, insert placement and material selection all dialed in. Forma Moulds uses high resolution 3D printing and CNC'ing to make their master templates, but to make the molds that customers require, CNC and 3D printing is usually prohibitively expensive for multiple units.

Therefore, silicone molding is the de facto option that Forma Moulds provides to clients. This involves mixing the silicone, degassing it in a vacuum chamber and then pouring the silicone around the template, degassing again and then letting it cure, and repeating this process for a two part or multi part mold. This process captures maximum amounts of detail, however the laborious and highly skilled nature of the process has to be passed on to the client, which can be less cost effective for an array of clients that may want to test a part first or want a small number of parts from their molds.

In this instance, Bandwidth Productions needed a highly detailed mold with multiple cavities inside, at a fairly low cost so that they could make a small batch of silicone guitar pickups that electronics could be cast into. Silicone was the final part material that they needed, and they needed it fast.

Below: Master templates positioned on the Mayku Multiplier forming bed



The Solution: Creating high accuracy molds for casting silicone parts fast

Forma Moulds opted to use the Multiplier to deliver a batch of highly detailed molds to their customer. Their approach was unique in its ability to deliver a batch of molds quickly and cost effectively, whilst retaining high amounts of detail.

The Multiplier was installed in their Research and Development department where they have a variety of technology including 3D printing to push the limits of mold making processes. The machine took an hour to set up and get tested before they proceeded with some product development for their client.

First, they tried printing the master templates of the guitar pickup CAD model with an FDM printer, however the Multiplier picked up the layer lines of the FDM 3D print. This was a characteristic that the client did not want present in the final product.

So, they tried SLA printing on a FormLabs 3L. They printed two parts, with five cavities for the pickups in each part. With this in hand they then made an EVA mold in 1.5mm EVA on the Multiplier which took around five minutes as opposed to the 24 hours it would take them to make a silicone mold, removing an entire time consuming step in their usual process.

They then cast high shore hardness silicone into this EVA mold to make extra sets of tooling. Multiplying their tooling with this process enabled them to produce more molds from a single sheet of Mayku material as several tools can be placed on the bed of the Multiplier at once, increasing their yield per sheet.

Left: The Mayku Multiplier in the Forma Moulds workshop

They then used 1.5mm HIPS in the Multiplier to make a single full part to show to the client. An image of this HIPS part was then sent to the client for signoff before full production began.

As the final guitar pickups were going to be cast in silicone, they could use the more cost effective HIPS to make the molds as the silicone would be soft, making it easy to remove from a rigid mold. They could then pass this saving on to the customer who in turn ordered more molds at a lower per unit cost, creating more value for their customer.

With sign off from the customer in place, they proceeded with mold production and created a total of ten molds for the customer, with five cavities in each, enabling the customer to produce 50 silicone guitar pick-ups in one casting.

The Results:

Using the Multiplier, Forma Moulds were able to deliver a small batch of ten highly detailed, cost effective molds to their client faster than their traditional silicone molding methods. This helped the clients produce a small batch of their guitar pick-ups post BBy with a short turnaround for a completely custom and time sensitive job.

Now, with the tooling in place, upon confirmation of a future order from their client, Forma Moulds are able turn around new molds orders in half a day for their client, ensuring future business and value for customers.

> “ High quality, easy production process, dare I say, satisfying. Its informative display allows you to allocate your time and resources better, we cannot understate the potential it unlocked. We can now make injection style moulds - so thin, malleable moulds for food and medical grade applications, faster and at lower tooling costs, ultimately making it more cost effective. ”
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> **George Preston, Lead Product Designer at Forma Moulds**

Above: Final molds and templates used with the Mayku Multiplier

Ready to start producing professional molds with the Mayku Multiplier?

With in-house pressure forming, the Mayku Multiplier allows for the quick and cost-effective production of custom molds.

If you're interested in exploring the benefits of in-house prototyping with the Mayku Multiplier, contact a Mayku Expert today.

Talk to a Mayku Expert

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