

The Mayku Multiplier, food molds, and 10-times-faster part validation



Pressure forming technology holds the potential to revolutionize production processes for manufacturers in essentially every industry. Additionally, with more and more organizations relying on the in-house production of critical parts such as product casings, a deep understanding of pressure forming's industrial advantages becomes increasingly valuable.

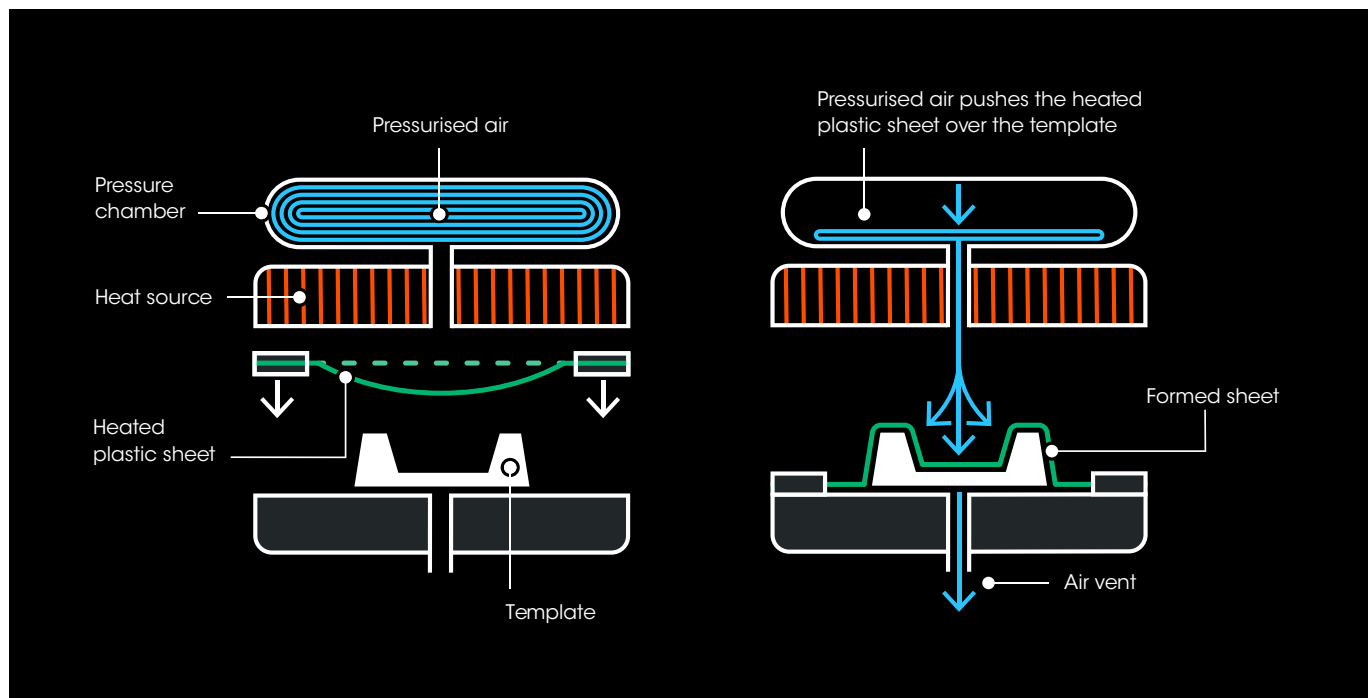
In this guide, we'll take a look at the role of pressure forming in part validation for product casings, highlighting the technology's precision, consistent quality, and ability to rapidly iterate. We'll also take a look at how seamlessly integrating the Mayku Multiplier into your existing operations can reduce delays and result in a faster time to market - keeping your organization effective, efficient, and operational.

Introduction to pressure forming

Pressure forming is a method of shaping heated plastic sheets using air pressure, producing molds or parts with rich detail and texture.

This technology is notable among manufacturing methods for its versatility, as it can accommodate a variety of materials used in final products. Pressure forming is relatively easy to master and can produce impressively detailed results in a short amount of time. Since the process is completed in minutes, it's an ideal method for mass production.

→ Learn more: [Introduction to pressure forming](#)



Pressure forming technology: A visual explanation

Pressure forming and vacuum forming fall under the category of 'thermoforming technology'. Though they're both similar techniques, pressure forming exerts much more force onto the heated sheet, enabling higher-quality outcomes and a broader range of materials. Some of the advantages of pressure forming over vacuum forming include:

Level of detail

Parts and molds are able to capture small details such as text or textures (less than $<1 \mu\text{m}$), offering injection mold-like precision.

Precise part tolerances

Parts offer precise tolerances when using female molds.

Surface finish

Parts and molds capture the template's exact surface finish.

Material thickness

Up to 5 mm material thickness.

Introducing the Mayku Multiplier

Industrial pressure forming on your workbench

The **Mayku Multiplier** is a desktop pressure former that can achieve resolution of less than 1 μm in sheet thicknesses of up to 5 mm. Combined with high-resolution 3D printing, the Multiplier can achieve injection mold-like quality parts from your workbench in a matter of minutes.

60 PSI

Generate pressure up to 60 psi – equivalent to 5 tonnes of force



Compatible with food-safe materials and processes



Integrated sensors for reliable performance and

380mm x 160mm

400 mm circular forming bed, 380 mm usable space, and 160 mm maximum draw height

0.5mm-5mm

Work with factory materials between 0.5 mm and 5 mm



Evolving functionality through firmware updates

225°C (440°F)

Heat materials up to 225 °C (440 °F)

<1 μm

Create parts with precise tolerances and capture details of less than <1 μm



Harrods



The benefits of pressure forming in food mold production

The Mayku Multiplier brings the best of pressure forming to the food and beverage industry, and can play a key role in manufacturing highly detailed prototypes for validation.

Cost savings

Desktop pressure forming eliminates the need for expensive tooling required for injection molding, reducing upfront costs and enabling cost-effective testing and validation of food molds.

Efficiency

The Mayku Multiplier enables you to create one-off injection mold-quality molds for part validation and testing before moving into full-scale production. This allows you to quickly identify design flaws and make the necessary changes early in the production process. Additionally, it reduces overall production time, as the Multiplier allows you to manufacture what you need, in-house and on-demand – without relying on third-party manufacturers.

Highly detailed prototypes

Pressure forming with the Mayku Multiplier produces highly detailed molds that closely resemble final injection molded parts. You'll see and hold a prototype that exhibits a true likeness of the final part, increasing the likelihood of approval and sales.

Production-ready material choice

The Mayku Multiplier can heat materials up to 200 °C and exert pressure up to 60 psi, making it compatible with a variety of production-ready materials, such as PMMA or PETG. These materials can range in thickness from 0.5 mm to 5 mm, and can possess flexible, transparent, or rigid properties.



Multiplier-made chocolate mold made by Philip Khoury - Head Pastry Chef at Harrods

Quality assurance

By performing part checks at each stage of the pressure forming process, final food molds can meet the required standards for optical clarity and other quality-related criteria.

Repeatable and consistent results

The Mayku Multiplier's customizable settings ensure a repeatable and consistent pressure forming process, resulting in reliable and high-quality food molds.

Seamless integration with existing workflows

The compact size and ease-of-use of the Mayku Multiplier make it suitable for existing workspaces and digital fabrication workshops. When used in conjunction with high-resolution 3D printing technologies like SLA, it can create injection mold-quality parts in just a few minutes from a desktop.

Furthermore, parts can be post-processed using various methods, ranging from quick manual trimming with commonly found workshop tools to precise and automated processes such as laser or CNC cutting.



Formlabs Form 3 SLA 3D printer and Mayku Multiplier

Application spotlight: From vacuum forming to pressure forming – a food mold success story

The customer

A business that uses a vacuum former to create and validate molds for its clients before committing to the costly process of injection molding. The current process involves designing a tool for the vacuum former, creating a single sample in PETG – which is thinner than the final product – and sending this less-detailed sample to the client for approval. However, this method has limitations, as the sample's quality can affect the client's decision to proceed with the final tooling.

The challenge

The challenge lies in the discrepancy between the quality of the validation sample and the final injection molded product. The vacuum-formed sample lacks the detail of the end result, potentially influencing the client's decision to sign off on the tooling. Additionally, once the injection mold is complete, the client may request changes, consuming additional time and resources.



Multiplier-made food mold prototype

The solution

By adopting desktop pressure forming with the Mayku Multiplier, the testing and validation process remains flexible and in-house. The process involves creating a template or tool for the Multiplier using high-resolution 3D printing such as SLA or CNC machining. Then, using the Multiplier, a detailed, robust sample – one that is very similar to the final product – is created using 3mm transparent PETG and sent to the client for approval.



Multiplier-made food mold prototype and 3D printed template

Results with the Mayku Multiplier

Here are a few of the results the customer has achieved by integrating the Multiplier into its food mold prototyping and validation workflows.

- ✓ **Increased customer satisfaction.**
Higher likelihood of client approval due to more accurate representation of the final product
- ✓ **Faster iteration cycles.**
Earlier detection of potential changes, saving time in the production process
- ✓ **Higher-quality prototypes.**
Superior detail compared to standard vacuum forming or CNC machining from a single block
- ✓ **Faster validation**
Enabling you to better explore the entire manufacturing process, resulting in better overall optimization.
- ✓ **Improved efficiency**
With results that are right the first time, saving both time and money.

Key considerations

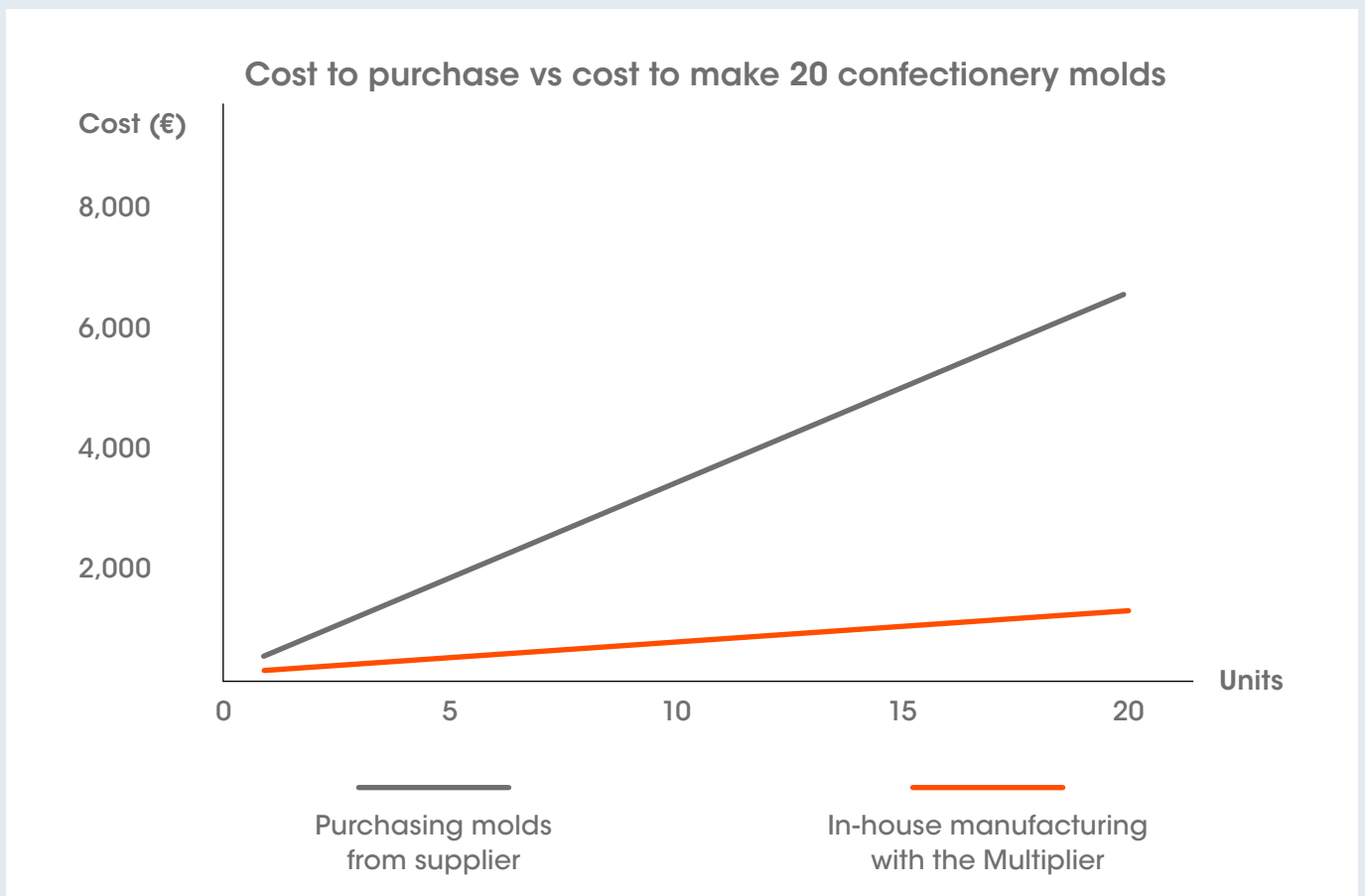
Creating highly detailed food molds in-house using pressure forming reduces time and cost. It also leads to increased ROI and customer satisfaction.

With the Multiplier, you can make high-quality food molds that are ready for validation within a day – directly from your desktop or workbench. This is a considerable efficiency increase compared to fast and low-quality vacuum forming or expensive and slow CNC alternatives.

Each Multiplier-created food mold costs around €16, (€46 including template manufacturing using SLA 3D printing). This offers an 85% cost reduction compared to CNC machining.

Additionally, the Multiplier provides a reduced cost-per-part compared to the traditional CNC machining workflow, which has linear costs. Once the thermoforming template is created, the only remaining costs are those of the material and post-processing (if applicable).

Manufacturing method	Detail level	Cost	Time	Process efficiency
Vacuum forming	✗ Low	Low	Fast	Low
CNC machining	High	✗ High	✗ Slow	Low
Pressure forming	✓ High	✓ Low	✓ Fast	✓ High



How to create food molds with pressure forming

Here's a quick look at how the Multiplier and our tailored support can ensure your success in each stage of your workflow in manufacturing high-accuracy food molds.

1. Application audit.

Our expert team provides tailored on-boarding to desktop pressure forming that addresses the specific challenges your company faces.



2. CAD design.

Guided by our educational resources on thermoforming design and team support, you'll design a thermoforming template that is aligned with thermoforming design principles



3. Template manufacturing.

Create templates with different technologies, including 3D printing and CNC machining. We recommend manufacturing templates using a high-resolution 3D printing process like SLA. [Learn more about template design and manufacturing here.](#)

4. Material selection.

The Multiplier is compatible with hundreds of thermoformable materials. For food molds, 3 mm PMMA is often used.



5. Pressure forming process.

Use **Custom Mode** on the Multiplier to fine-tune your machine for 3 mm PMMA, ensuring repeatable, consistent form.



6. Part finishing.

Perform quality checks and remove excess material to prepare the part for installation.



Multiplier-made food mold prototype and 3D printed template

Start manufacturing high-quality food molds in-house

The future of manufacturing hinges upon innovative technology that enhances factories' capabilities – ensuring they are able to quickly and flexibly adapt to fluctuating market changes and production demands.

By integrating desktop pressure forming into their production lines for food molds, these factories equipping themselves with an industry-shaping, in-house technology they can utilize to work more efficiency, with faster iteration cycles and lower costs, to create high-quality prototypes that closely resemble final products.

Ready to learn more about how you can integrate the Mayku Multiplier into your factory for the in-house manufacturing of food molds? Get in touch with a Mayku Expert today!



Talk to a Mayku Expert