

Teaching faster, cost effective and accessible prosthetic molding techniques at Wimbledon College of Art



Thermoforming is a widely used technology in setmaking, costume and prop making for the film, theater and television industry. Vacuum forming is widely used for creating lightweight low volume and low detail props quickly, however although it is a more powerful technology, pressure forming has previously been an inaccessible process to students.

*Above:
An EVA 1.5mm
form taken of a
plaster nose*

The University of the Arts London have four Multiplier pressure formers operating across four of their university sites in the capital. We visited one of those sites, Wimbledon College of Art, who have been using the Multiplier and 1.5mm EVA sheets to save costs and reduce the time involved in student mold making projects.

Accessible pressure forming in the workshop

The Multiplier is located in an extensive workshop that acts as a resource for several courses in the school. The workshop includes various tools including CNC machines, 3D printers, woodworking/metalworking tools and plastic fabrication tools like traditional vacuum formers. The vacuum former requires a workshop technician to be present when using the machinery as it requires specialist knowledge of the process.

With the Multiplier, the technicians have allowed students to use it without supervision as the machine is able to guide them through the process of pressure forming on the Multiplier screen with no prior knowledge of the process.

They have also built a wheeled trolley for the machine with ample storage underneath for material and practice samples. They also use this trolley for moving the Multiplier to different locations in the university.



Left:
Trolley built for
the Multiplier



Left:
EVA form of a
plaster head
template

Reducing material wastage

There is also an on site materials shop where students can purchase materials like wood, metal and thermoforming sheets to work with. When students are using the vacuum former, they suggest that students purchase 3-4 thermoforming sheets as there is a high likelihood that they will not get a satisfactory result the first time. When using the Multiplier, tutors advise just purchasing one sheet at a time as they have found the Multiplier to have an incredibly high success rate.

Cutting production time and costs

One of these courses, the BA (Hons) Technical Arts for Theatre and Performance, teaches students how to make life-sized props, animatronics and prosthetics for film, theater and the wider entertainment industry.

One of the modules on this course teaches students how to make a prosthetic appendage that can be applied seamlessly to a person's face for dramatic effect. The established means for producing these appendages looks like this:

1. Produce alginate cast of persons face
2. Cast the alginate mold in plaster
3. Sculpt the appendage on to the plaster cast using sulfur free wax clay
4. Cast the plaster and appendage in silicone
5. Create a fiberglass jacket to support the flexible silicone structure
6. Latex brush or spray the appendage and part of the face
7. Demold the latex appendage and part of face when dry
8. Apply latex appendage to person/actor and blend in with makeup



Above: Appendage sculpted on to a plaster head

The problem

Step 4 of this process: casting the plaster appendage and wax sculpt in silicone is an expensive and time consuming process. Up to £30/\$40/€35 of silicone is required to make the silicone mold and it takes 24 hours to cure that silicone.

Silicone molding is also a very messy process that requires a vacuum chamber to remove air bubbles as a pre-process before the silicone is poured.

It is not possible to use a vacuum former for this process because it does not replicate the fine level of detail that is present in the hand crafted wax sculpt.

The solution

The technicians in Wimbledon have now replaced the silicone molding process in this instance by forming 1.5mm EVA sheets over plaster casts in the Multiplier

Plaster is an optimal material to use with the Multiplier as it is a porous material and does not require air holes in order to create a perfect form. The Multiplier can achieve less than one micron level of replication when using EVA 1.5mm so exact replication of the sculpt is preserved, which is impossible to achieve with vacuum forming.



Left:
Plaster cast
head used
as a template

The cost of a single sheet of 1.5mm EVA is £10 representing a 70% cost saving per student project.

The process of using the EVA sheet in the Multiplier takes a maximum of fifteen minutes including cooling and demolding in comparison to the 24 hours it takes for silicone to cure creating a significant time saving for the students.

EVA forming is also comparatively a very 'clean' process when compared to silicone and does not require any pre-processing steps such as a vacuum chamber.

	Mayku Multiplier	Silicone molding
Material cost	£10	£30
Time	15 minutes	24 hours
Clean process	Yes	No

This is one example of how the Multiplier is cutting time and costs for students at the University of the Arts London whilst providing access to technology previously out of reach to the creative professionals of tomorrow.

For more information, feel free to reach out below to understand more about how the Multiplier can operate in educational establishments.



Talk to a Mayku Expert