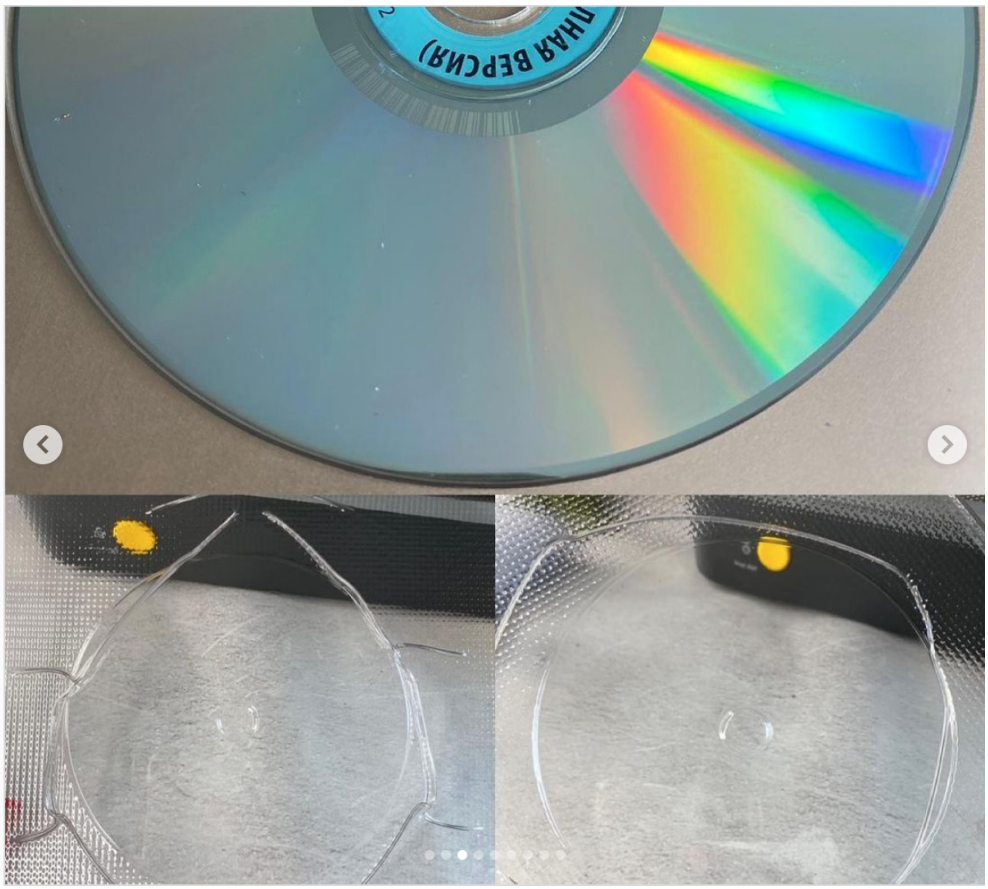
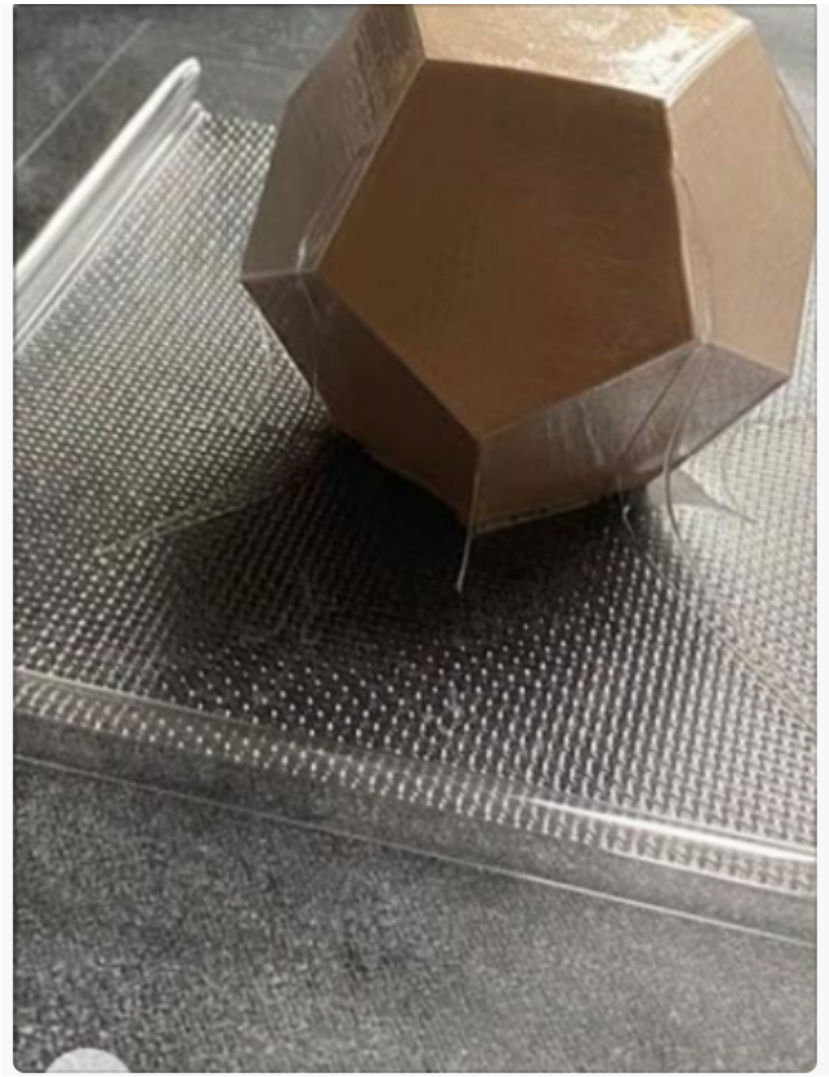
https://www.instagram.com/p/CO2h3YJNLaL/?igshid=172t4nzno3etd

First of All - Vacuum forming can be a very much a case by case experiment as there are so many variations and outcomes so it will take some testing as each piece/design is unique. Understanding the rules of vacuum forming is key as there are some basic design principles that you need to take into account before you start designing for vacuum forming. This article explains more in detail:
https://www.mayku.me/blogs/news/how-to-design-for-vacuum-forming-and-mold-making-with-agustin-arroyo (edited)



1)Heating Issue - rather than relying on the Timer dial - look for when the material just starts to bow and sag, when you see it start to get 'bouncy', bring both trays down over your mold



2) There is a lot going on with this template and you won’t be able to form it in one go as the shape has **undercuts**.

Undercuts

What are Undercuts

They are small indents/overhangs, like small hooks that try and hold on to the edge of the mold as you’re trying to take it out

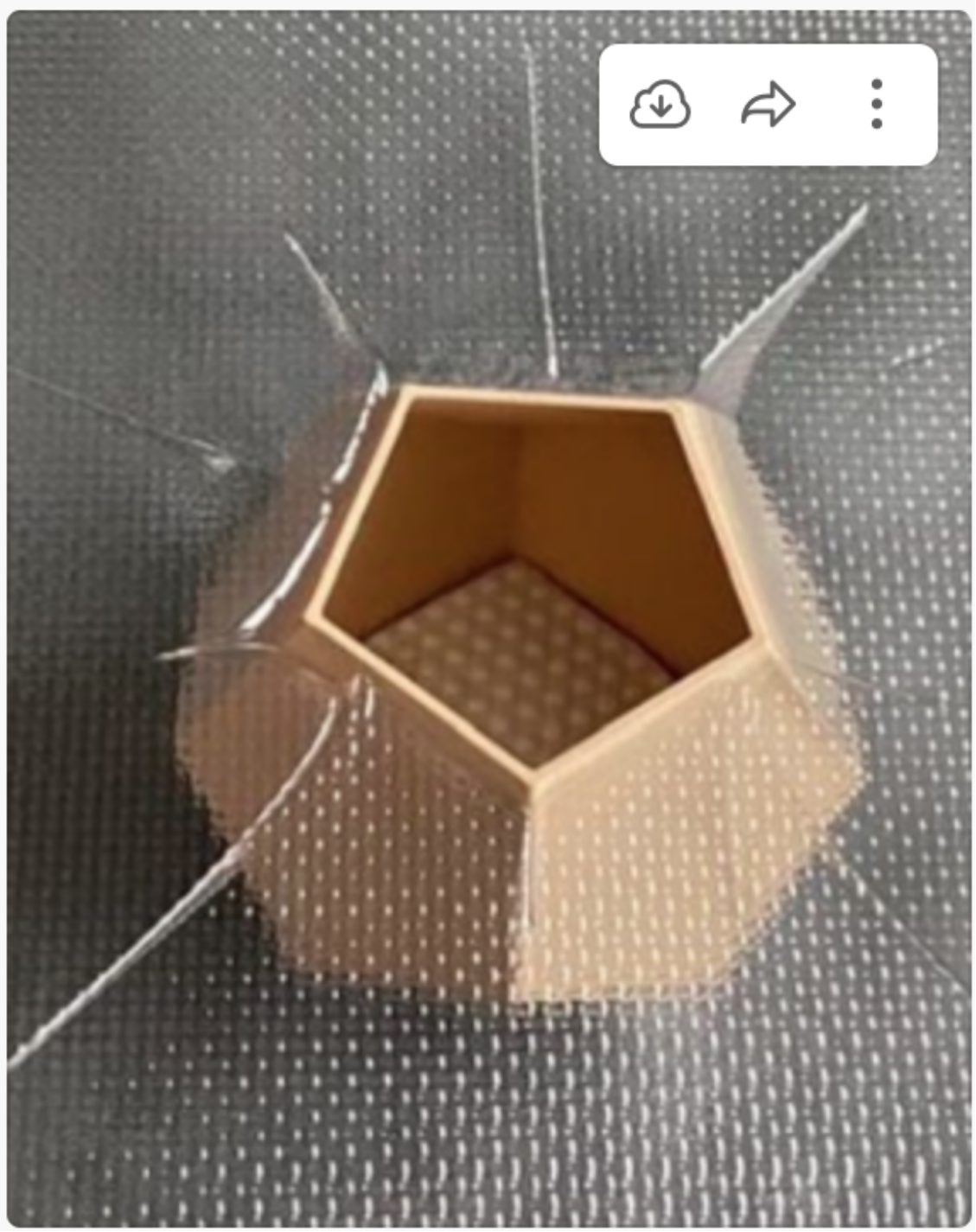
How can I avoid undercuts without compromising my design?

The reason why you need to avoid undercuts is because they make it difficult to remove your template from your mold as thermoplastic sheets haven't got the flexibility to easily remove your object without breaking the mold.

A good technique to get around this is to create a two / three part mold depending on your design, form and then assemble back together again. A good example of this is forming an apple.

Forming an Apple

Imagine you want to form an **Apple -** make two half hemispheres, cutting the apple in half and mold each half flat side down, then join the two halves together to make a two part mold. You will end up with a split line around the mold that you need to sand or shave off.



Webbing - why do **creases form?**

Webbing is when excess material folds over itself during forming

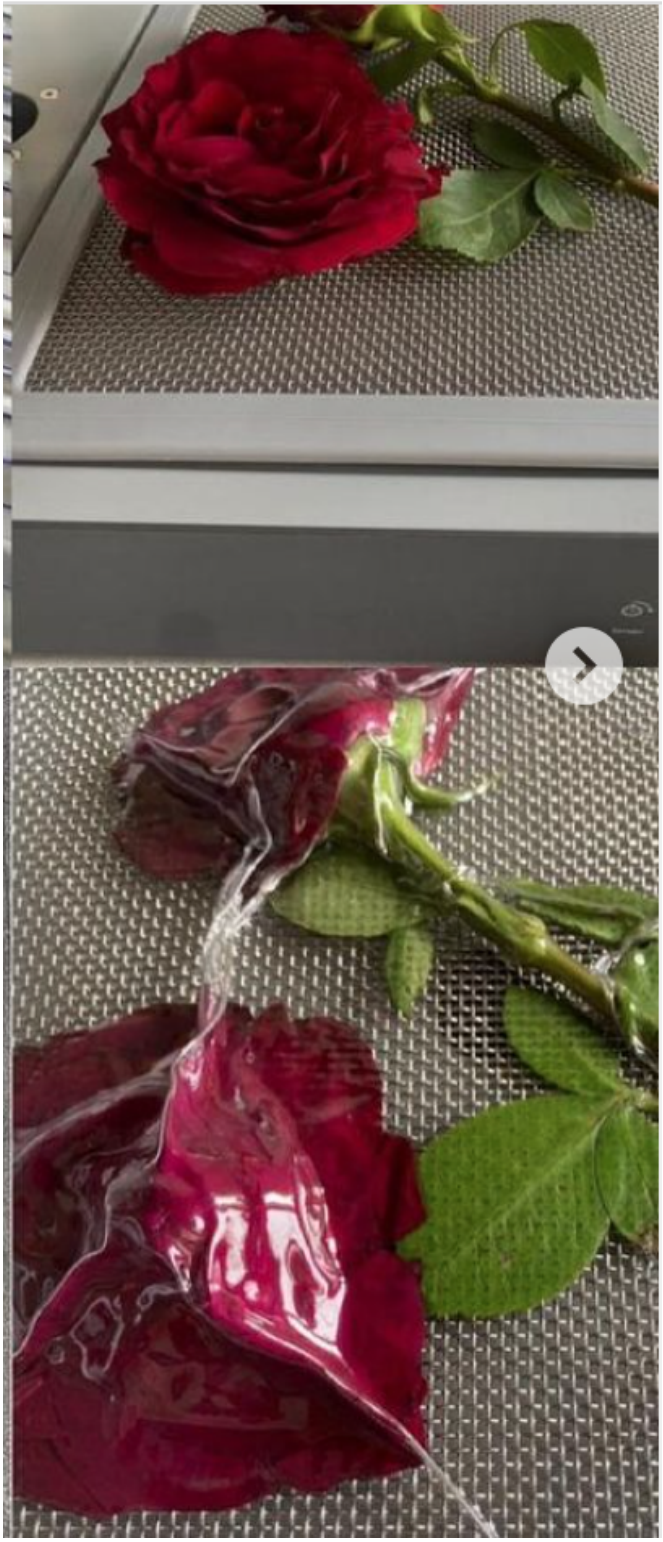
There are a few reasons why creases can appear:

1 - The tray was pulled down too quickly

2 - The sheet was too hot when you formed - so try again but this time don’t use the timer on the machine, look out for when your material just starts to bow and sag. When you see it starts to get 'bouncy' bring both trays down over your mold. This should stop the webbing you are experiencing.

3 - The objects edges are too sharp (try rounding them off)

4 - Lack of draft angles - Draft angles of three degrees or more are recommended



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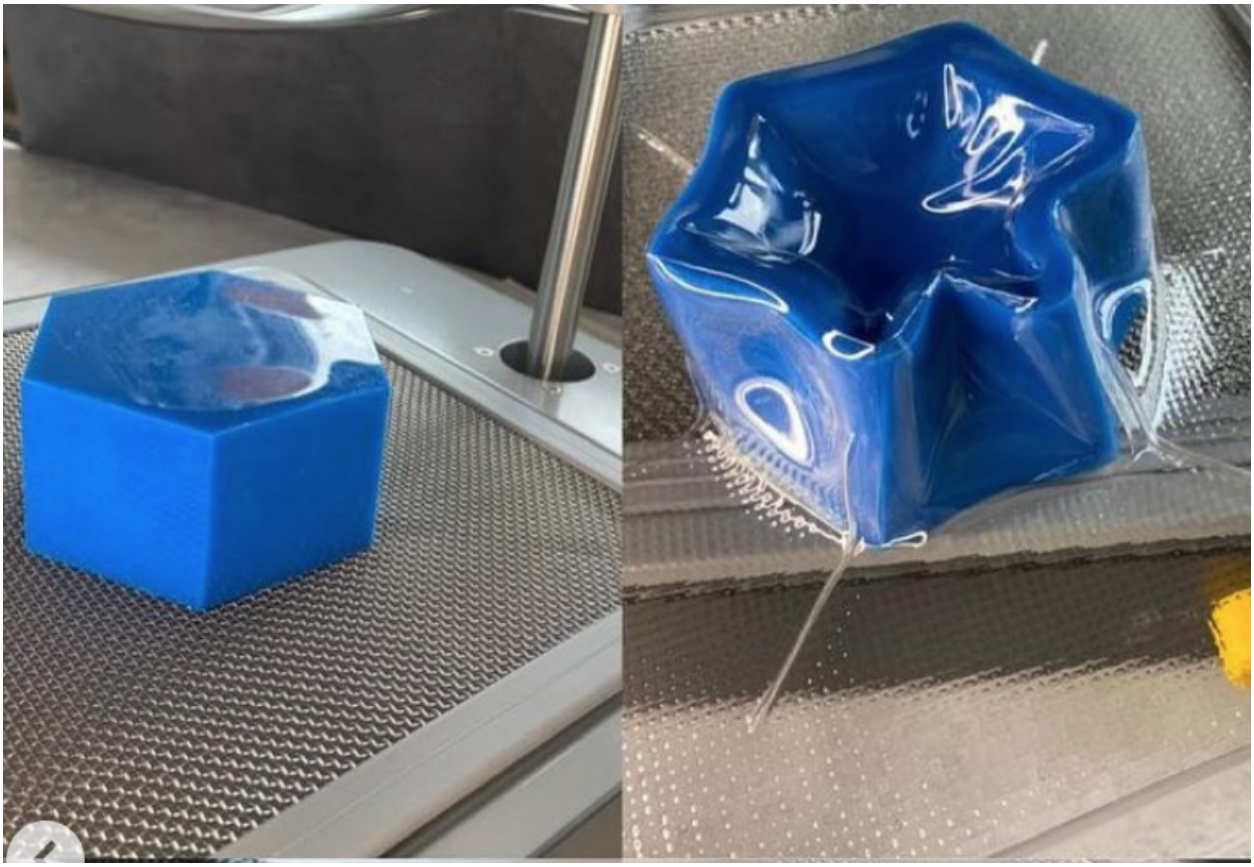
The Rose - Soft master shapes that go into the FormBox can’t be too soft otherwise it will just squish or flatten the template when the vacuum goes on. So - if you wanted to form a banana

you’d freeze it first. If you want to form a sponge you’d have to make a solid version first by either making a one time use gelatin mold then plaster or another means.
Another thing to take into consideration is the intricate design of the rose with its layers.

Cake Cutter - Lack of draft angles - The sharp 90 degree angles in the template are causing the plastic to crease. It’s recommended to add at least 1º of draft for every 2cm of height.
How can I avoid the creases without compromising my design?

Place a cookie cutter on a piece of cardboard (secure with a little glue) and then add tiny 0.5mm air holes right up against the outer and inner cavity wall. This will help to form the sheet nicely around your shape
Same with the Bronze cookie cutter - add air holes



3D print melted when formed in the FormBox. If this happens it means that the walls of the 3D printed part was not thick and strong enough to withstand the heat.
What type of printing material did you use?
There are a few things you can do to improve the structure of the 3D print.
You can either re-print the shape again with thicker walls but this is going to take time or **improve the 3D printed structure** by filling the print with Mayku Pour or Crystacast so a bit like making a PLA 3D print as a 'shell' and then fill the print with the mayku pour plaster so it goes totally solid.
View in full how to re-cast a 3D print in Alexandre Chappel YouTube video here:
https://www.youtube.com/watch?v=OZNXWHWMmbI&t=4s

3:46

Alternatively, try using a different material with a higher heat resistant material such as ABS or HIPS

You can read more in our 3D Printing Guide here: How to make vacuum forming templates: https://www.mayku.me/blogs/news/3d-printing-guide-how-to-make-vacuum-forming-templates

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3D Printing Guide: How to make vacuum forming templates

FDM 3D Printing is just one of the many technologies that can be used to create templates. You can also laser cut or CNC machine them, but FDM 3D printing is unbeatable when it comes to ease of use and versatility. In this guide, we'll explore the advantages FDM 3D printers offer when creating vacuum forming templates, slicing recommendations, and recommended materials. Why use an FDM 3D printer to create templates? FDM 3D printers are one of the most accessible manufacturing tools. But, what makes them so popular? Here are some of the main advantages this technology offers. Available materials With an FDM 3D printer, you can create objects in a wide range of materials. In this guide, we'll… Show more

https://www.mayku.me/blogs/news/3d-printing-guide-how-to-make-vacuum-forming-templates

Car - The car will be hard to form - Undercuts

The wooden animals - Objects are too placed too close together on the Forming Bed - If you are placing multiple objects on the plate, ensure that you leave at least 3cm between them. Leave more space for taller or larger objects.

Perfume bottle - undercuts and lack of draft angles

*** How can I avoid adding draft angles and not compromise my chosen object?

Place perfume bottle on a piece of cardboard (secure with a little glue) and then add tiny 0.5mm air holes right up against the cavity wall. This will help to form the sheet nicely around your shape.

Unless you would like a white finish, try our 0.5mm Cast Sheet