

# Bioplastic (gelatine-based)

A (naturally) yellow, flexible biosilicon, gelatin-based. This silicon is rather flexible considering it's thickness, but is quite hard when compared to silicone rubber baking trays for example that often contain softeners. Thinner sheets are more flexible, thicker less. Starch-based rubber recipe results in more flexible slabs.

# RECIPE

## Ingredients

1. Gelatine powder - 48 gr  
Functions as the polymeer (so it becomes a solid)
2. Glycerine - 48 gr  
Functions as plasticizer that bonds with the gelatine (makes it flexible).
3. Water - 240 ml/gr  
To dissolve and mix the polymer and plasticizer

## Tools

- Cooker or stove (optional: temperature controlled)
- Pot, scale, spoon
- Moulds (use a modular mold or a textured surface. Smooth acrylic molds result in shiny biosilicon).

## Variations

- Add a natural colorant such as a vegetable dye or water-based ink (e.g. hibiscus, beetroot, madder)
- Add less glycerine for a rigid biosilicon
- Stiffeners such as fibres, yarn or natural debris may be added for more structure and reinforcement.
- Fillers such as almond or sunflower oil, can be added to prevent additional shrinkage but might affect stickiness.



## Method

### 1. Preparation

- Weigh your ingredients
- Prepare the mold and find a place where you can leave it for a while, ideally near an open window where there's air flow.

### 2. Mixing and dissolving the ingredients

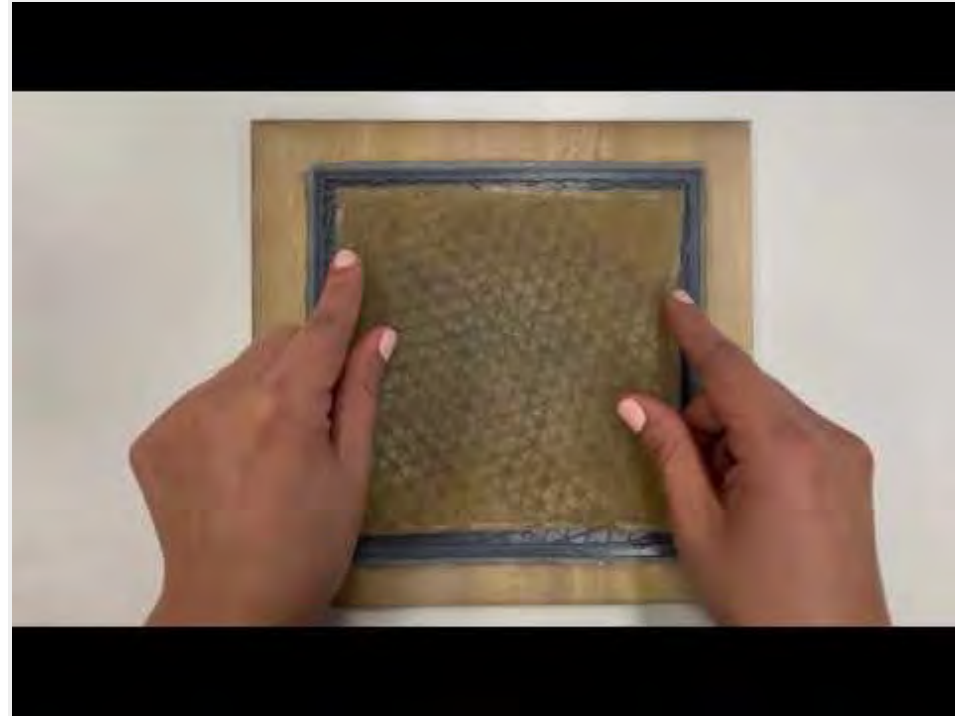
- bring the water to the boil
- optional: add natural dye if you wish to use color
- add the glycerine
- add the gelatine
- keep the temperature below 80 degrees celcius while stirring *very very slowly and gently* to avoid making bubbles. I prefer a simple spoon to do this, not a whisk.

### 3. Cooking the ingredients

- Simmer and slowly stir the mixture between 60-80 degrees celcius for 20-25 minutes, until it's like a syrup.
- Longer cooking time allows more water to evaporate and as a result it will shrink less during drying. Make sure it's still liquid enough to pour.

### 4. Casting

- Cast into the mould slowly to avoid bubbles
- Pour from the middle and hold still, let the liquid distribute itself.
- Put the mould away to dry in a cool place with lots of air flow (like near an open window). A warmer place might speed up the drying process but also allow bacteria to grow faster and can result in fungal growth.



## Drying/curing/growth process

- Mold depth: 3 x 3mm layers
- Shrinkage thickness: 20-30 %
- Shrinkage width/length: 10-20 %

## Shrinkage and deformation control

Letting it dry up to ten days to get to the final form. It will be very flexible at first but will slowly harden. Tends to curl up if it is not pressed down during drying (the design of this mold allows for airflow even when pressed). Laying it on a smooth surface helps to keep it flat, it "sucks" onto the surface.

## Curing agents and release agents

None.

## Minimum wait time before releasing from mold

3 days

## Post-processing

Trim, cut or process the slab before it is completely dry and hardened for nice clean cuts.

Store in a dry and ventilated room.

## Further research needed on drying/curing/growth?

Casting larger volumes without growing fungus/mold and deformation would require further experimentation.



A recipe from:  
<https://class.textile-academy.org/2020/loes.bogers/files/recipes/biosilicon/>