

Safety Instructions

Use a lab coat or apron for keeping yourself clean

Clean your working area before, throughout and after the process.

Don't touch your face and pull your hair back.

Developed within SHEMAKES
EU funded project GA No 101006203

The development of this manual was based on previous documentation, organized by Remix El Barrio, FabLab Barcelona within SISCODE EU project. It has been adapted and remixed.

sh=ma=kes



Biomaterial Design

An immersive demonstration.

Station 1

CASTING

Alginate based bioplastic
(cold recipe)

Materials & Tools

Materials

4gr Sodium Alginate
200ml Water
8gr Glycerin
Olive Oil
Dried shredded food waste
(coffee grains, orange peels,
avocado pits, eggshells, tea
leaves, etc.)

For Spraying :
10 gr calcium chloride
100 or 200? ml water

Tools

Blender
Pot
Embroidery hoop D: 20cm
Texture dense fabric
Digital Scale
Sprayer bottle
Syringe

Safety Equipment

Kitchen paper
Disposable gloves
Lab Coat
Oven glove

Alginate based bioplastics

Step by step instructions

Process overview

- Step 1 : Prepare the sodium alginate mix
- Step 2 : Prepare the calcium chloride mix
- Step 3 : Prepare and spray the mold
- Step 4: Pour and spray the mix
- Step 5 : Dry
- Step 6 : Remove from the mold

Step 1: Prepare the sodium alginate mix

Add the sodium alginate to the water.
Blend the mix until it becomes homogeneous.
Add the glycerine and blend again.
Add the filler and blend again.
Place in the fridge overnight, to loose bubbles.

Step 2: Prepare the calcium chloride mix

Mix 100ml of water with 10 grs of calcium chloride.
Stirr until completely dissolved.
Place the mix in the sprayer bottle.
Shake the bottle before use.

Step 3: Prepare and spray the mold

Take the waterproof texture dense fabric, place and fix it in the embroidery hoop.
Spray the textile mold with calcium chloride.
Remove excess with a paper towel.

Step 4: Pour and spray the mix

Take the bubble free sodium alginate mix.
Pour the mix onto the textile mold.
Tap the mold so the mix distributes evenly over the surface.
Spray the surface of the mix with calcium chloride.
Remove excess with a paper towel.

Step 5: Dry

Let dry over a radiator or in a dehydrator
Ideally give the temperature and humidity for the dehydrator

Step 6: Remove from the mold

Take out of the frame after 7 days.
Pull slowly from the border of the bioplastic until completely



Safety Instructions

Working with an induction heat plate is safer

Do not stand inhaling over the pot if there is alcohol in the recipe

Use towels to pick up hot pots

Use a lab coat or apron for keeping yourself clean

Clean your working area before, throughout and after the process.

Don't touch your face and pull your hair back.

Developed within **SHEMAKES**
EU funded project GA No 101006203

The development of this manual was based on previous documentation, organized by Remix El Barrio, FabLab Barcelona within SISCODE EU project. It has been adapted and remixed.

Biomaterial Design

An immersive demonstration

2 MOLDING

Pine resin bioplastic

sh=ma=kes



Materials & Tools

Materials

45gr of pine resin
5gr Carnauba Wax
20ml Alcohol 96°
Dried shredded food waste
(coffee grains, orange peels,
avocado pits, eggshells, tea
leaves, carrot, yerba mate,
etc.)

Tools

Vessels
Wood Molds
Electric stove
Pot
Silicon spatulas
Spoons
Sieve
Syringe
Scale
Baking paper

Safety Equipment

Kitchen paper
Disposable gloves
Lab Coat
Oven glove

Pine resin bioplastics

Step by step instructions

Process overview

- Step 1 : Prepare the materials
- Step 2 : Prepare the mold
- Step 3 : Prepare the mix
- Step 4 : Pour into the mold
- Step 5 : Let cool and remove

Step 1: Prepare the materials

Make sure you have all your tools and materials.
Select the dried organic waste to use as a filler.
Blend the dried organic waste to the desired particle size.

Step 2: Prepare the mold

Place baking paper on the bottom part of the mold.
Press with the top part of the mold to fit the shape.
Reserve a piece of baking paper same size for the top, to use after pouring the mix.

Step 3: Prepare the mix

Melt the resin with the alcohol.
Cover the pot with the lid.
When the resin has melted, remove the lid carefully not to breathe the vapours. Best to remove the lid in exterior.
Add the wax and mix the ingredients until you have an homogenous mix.
Add waste material as filler
Mix again and cover for some minutes

Step 4: Pour into the mold

Take the mix and pour quickly into the mold using the spatula.
Cover with the prepared baking paper.
Press with your hands to distribute the mix evenly.
Press with the top mold firmly.
Compact down.

Step 5: Let cool and remove

Let the mixture cool down
Remove the top mold
Remove the top baking paper
Remove the piece from the bottom mold and bottom baking paper.

