

FABRICADEMY 2022-23
TUTORIALS



3D BIOPRINTING TUTORIAL

PETRA GARAJOVÁ

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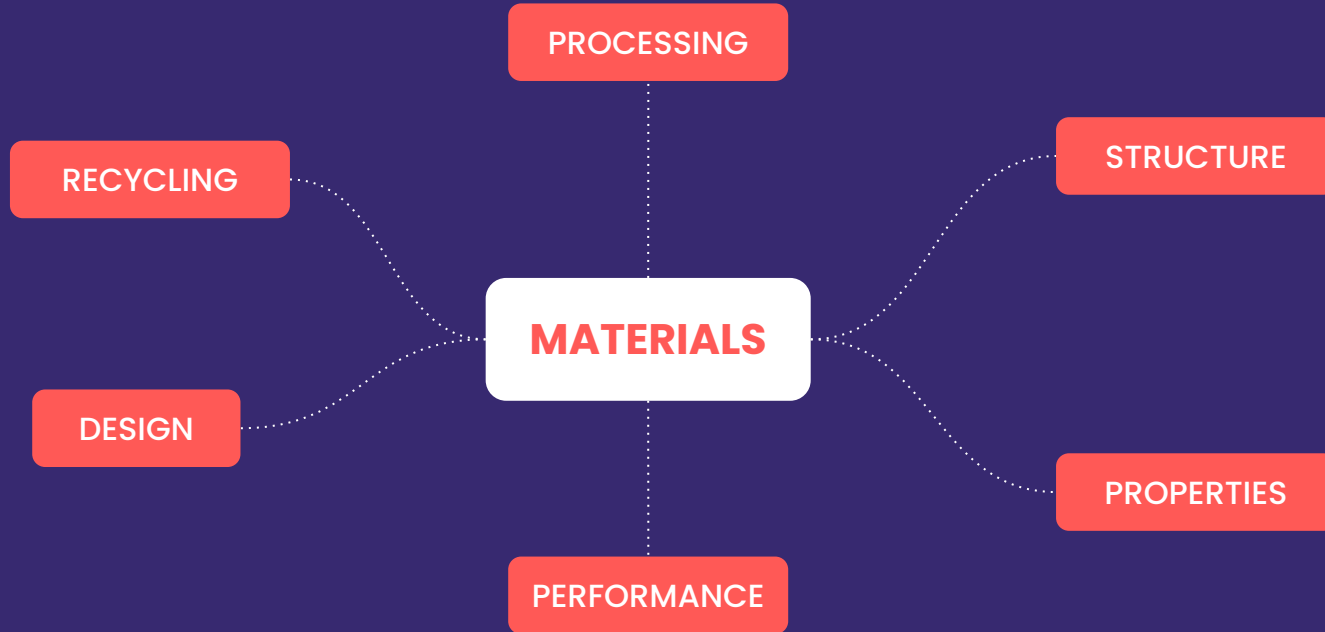
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MATERIAL PRACTICE



MATERIAL PRACTICE



FABTEXTILES

EXTRUDED KOMBUCHA, 2021/22

MATERIAL PRACTICE



MATERIALITY RESEARCH GROUP 3D PRINTING BIOPLASTICS

MATERIAL PRACTICE



FAB LAB BARCELONA 3D PRINTED POTATOES, 2020

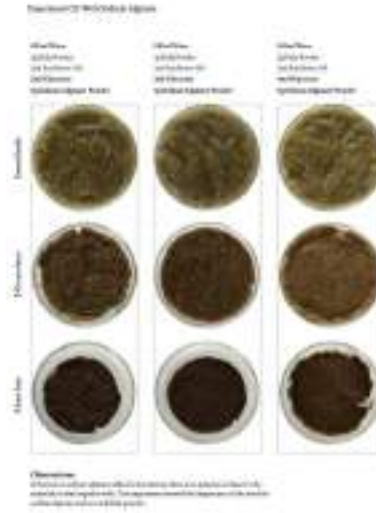
MATERIAL PRACTICE



BLAST STUDIO UK
3D PRINTED MYCELIUM & CLAY

JUSTIN SHEINBERG IAAC
MYCELIUM & RECYCLED CLAY

MATERIAL PRACTICE



ILAENA MARIA NAPIER - IAAC AMBER LAMINARIA, 2020/21

ADDITIVE MANUFACTURING

SCALE



BIO



DESKTOP



CUSTOMIZED



ROBOTIC ARM



LARGE SCALE

ADDITIVE MANUFACTURING

MATERIALS



FILAMENTS

PLA

PET G

ABS

TPU (FLEX)



CUSTOMIZED

BIO-PATÉ



RESIN

SLA

SLS



MJP

POWDER



BIO

CELLS



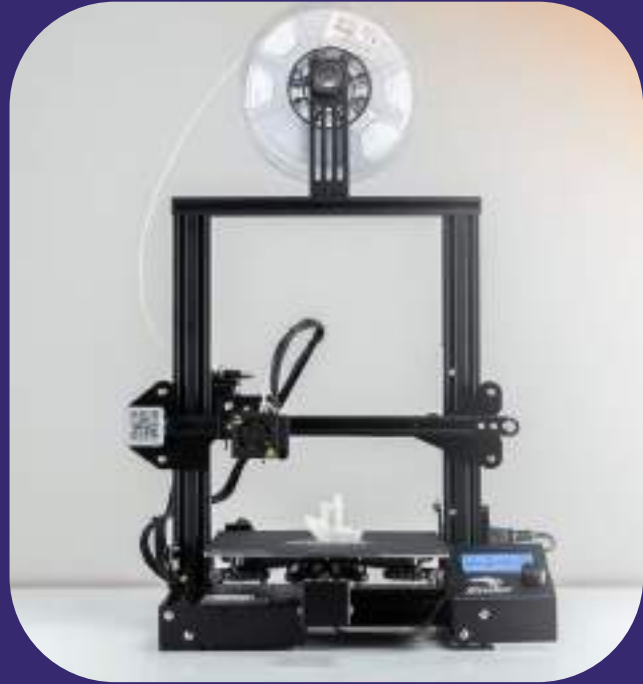
LARGE SCALE

CLAY

SOIL

CONCRETE

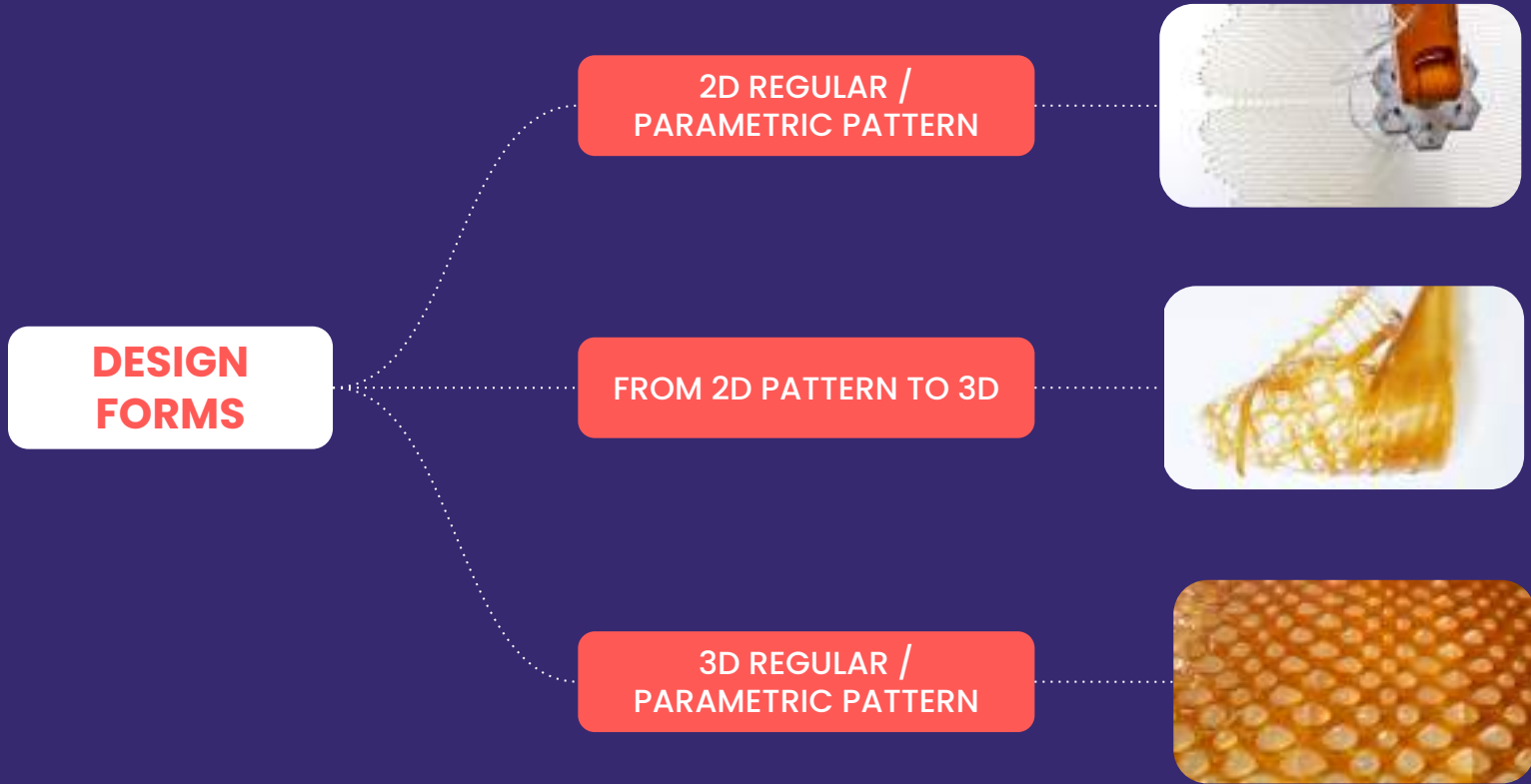
3D PRINTERS



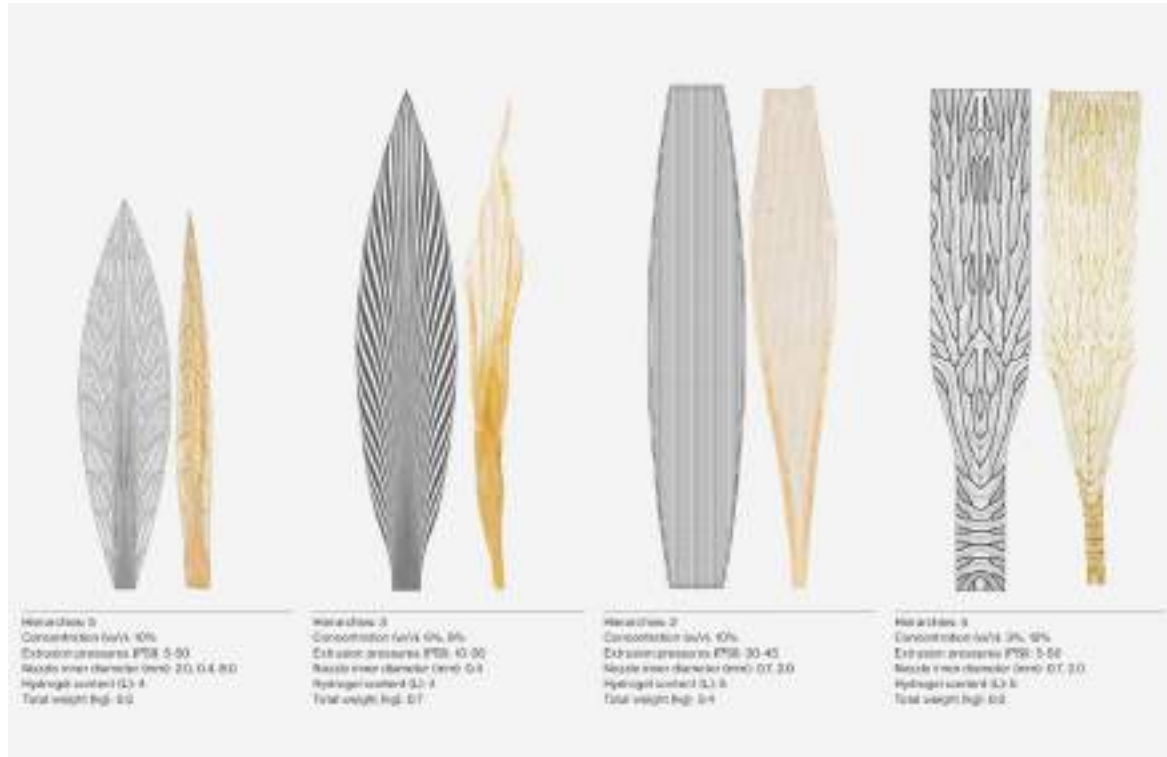
PRINTER MODIFICATION

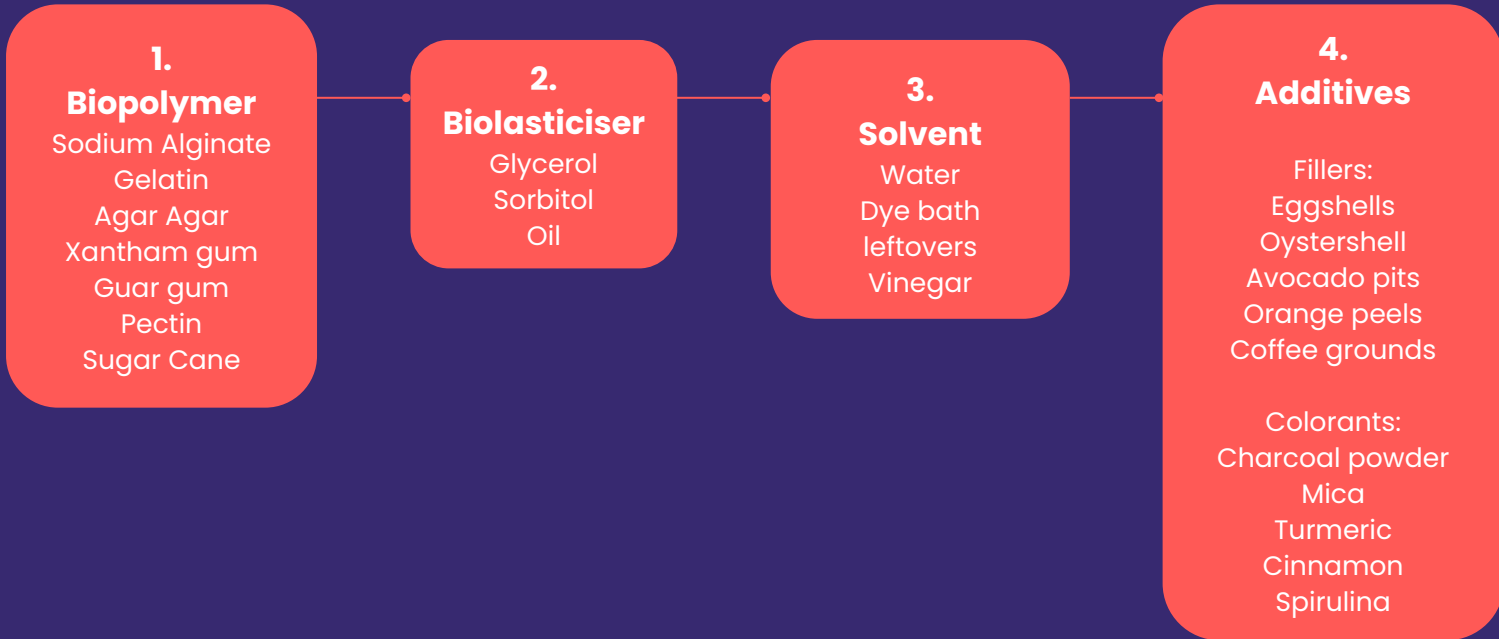


DESIGN PROCESS



DESIGN PROCESS - AGUAHOJA





RECIPES - MATERIOM LIBRARY



Oyster Shells & Sodium Alginate composite
by Marcos Georgiu



Live pomace & Sodium Alginate composite
by Serdar Asut



Egg Shells & Xanthan gum composite
by Ana Otero

RECIPES



Description: a cellulose gum is used in food as a viscosity modifier or thickener, and to stabilize emulsions in various products including ice cream. It is synthesized by the alkali-catalyzed reaction of cellulose with chloroacetic acid. It is also a constituent of many non-food products. Knitted fabric made of cellulose (cotton or viscose rayon) may be converted into CMC and used in various medical applications.

Common use: It is used primarily because it has high viscosity, is nontoxic, and is generally considered to be hypoallergenic as the major source fiber is either softwood pulp or cotton linter.



Description: a naturally occurring anionic polymer typically obtained from brown seaweed due to its biocompatibility, low toxicity, relatively low cost, although the addition of divalent Ca^{2+} (calcium ions) results in mild gelation. It's a water-insoluble, gelatinous, cream-coloured substance that can be created through the addition of aqueous calcium chloride to aqueous sodium alginate.

Common use: in biology, but primarily known for its healing properties due to the compound's ability to encase enzymes in order to simulate new plant tissue.

SODIUM ALGINATE & CELLULOSE

RECIPE-01

<i>Material name</i>	<i>amount g / ml</i>
Sodium alginate	4 g
CMC	5 g
Water	200 ml
Glycerol	1 tbsp
Filler	5 spoons

Tools

Hand blender

Measuring cup

RECIPES



Description: is a galactomannan polysaccharide extracted from guar beans that has thickening and stabilizing properties useful in food, feed, and industrial applications. The guar seeds are mechanically dehusked, hydrated, milled and screened according to application. It has almost eight times the water-thickening ability of other agents (cornstarch) and only a small quantity is needed for producing sufficient viscosity. In addition to guar gum's effects on viscosity, its high ability to flow, or *deform*.

Common use: One use of guar gum is a thickening agent in foods and medicines for humans and animals.



GUAR GUM

RECIPE-02

<i>Material name</i>	<i>amount g / ml</i>
Guar gum	8 g
Water	200 ml
Filler	7 spoons

Tools

Hand blender

Digital scale

HANDPRINTING



SAUCE BOTTLE



SYRINGE



BAKERY TOOLS

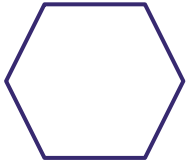
HANDPRINTING



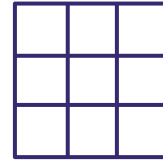
MARCOS GEORGIU
BIOGUN



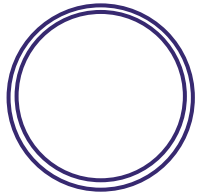
HANDPRINTING



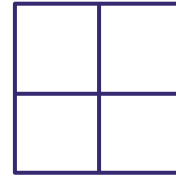
a. *Prototype_01*
Layers: 6
Nozzle: 2 mm



b. *Prototype_02*
Layer: 3
Nozzle: 3 mm



c. *Prototype_03*
Layers: 4
Nozzle: 3 mm



d. *Prototype_04*
Layers: 3
Nozzle: 3 mm

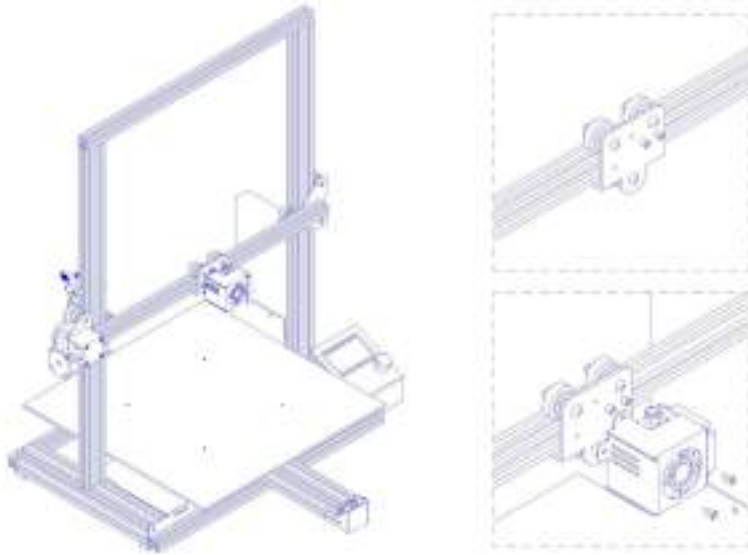


PASTE PRINTING KIT

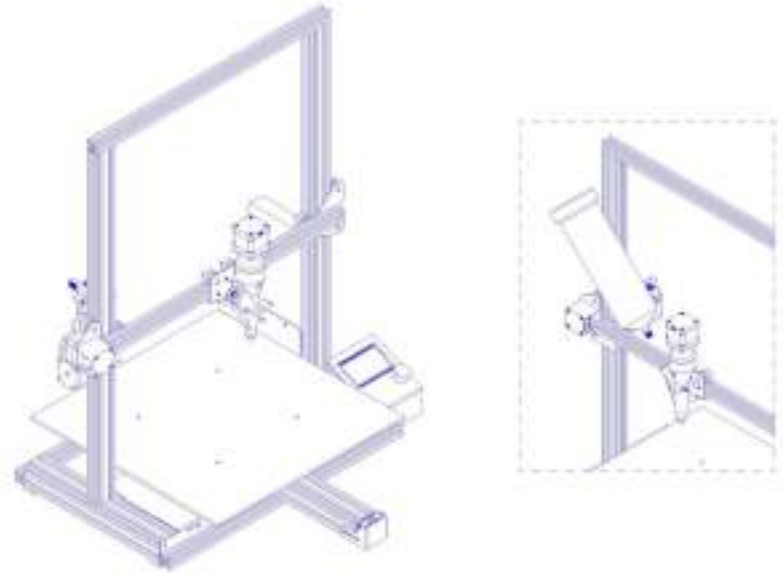


PRINTER MODIFICATION

EXTRUDER

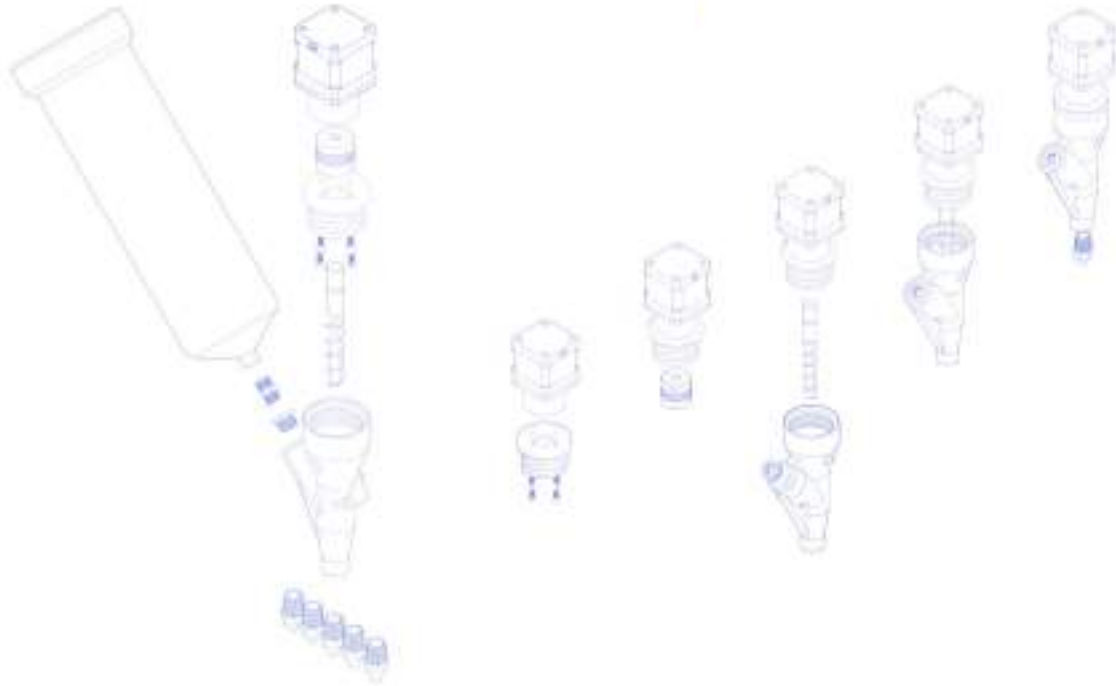


DESKTOP



CUSTOMIZED

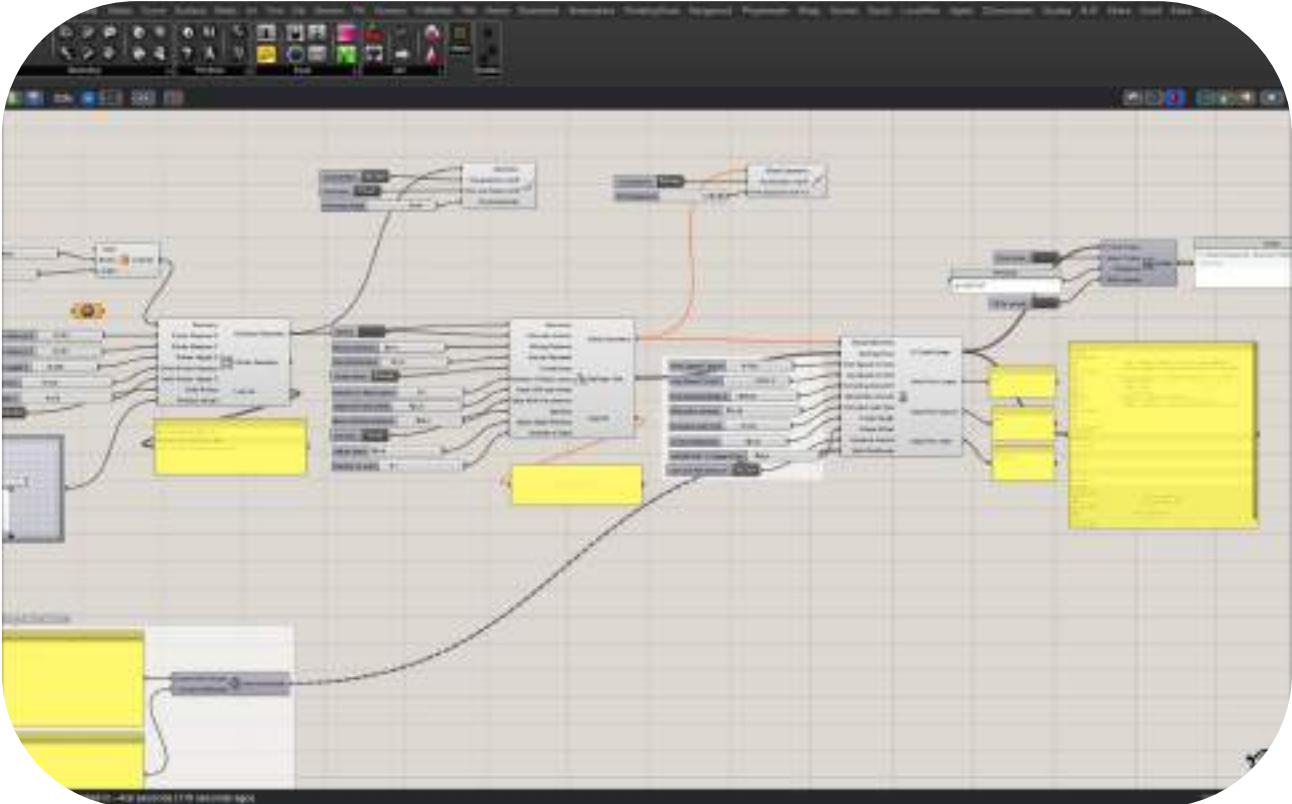
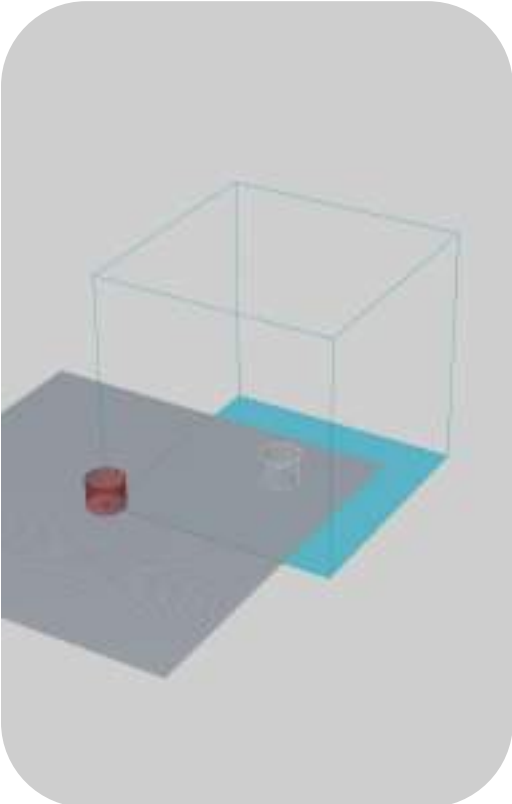
PRINTER MODIFICATION



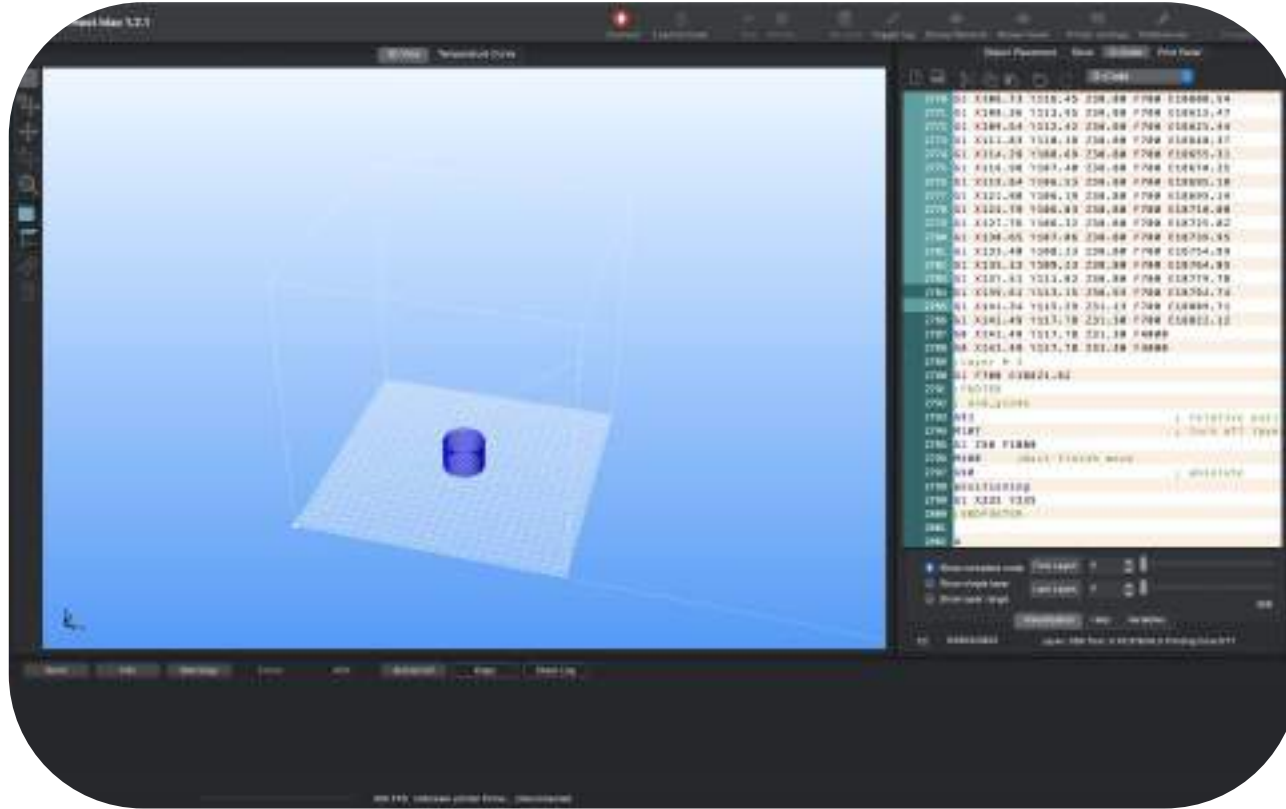
EXTRUDER ASSEMBLY

MACHINE ASSEMBLY

G-CODE - GRASSHOPPER

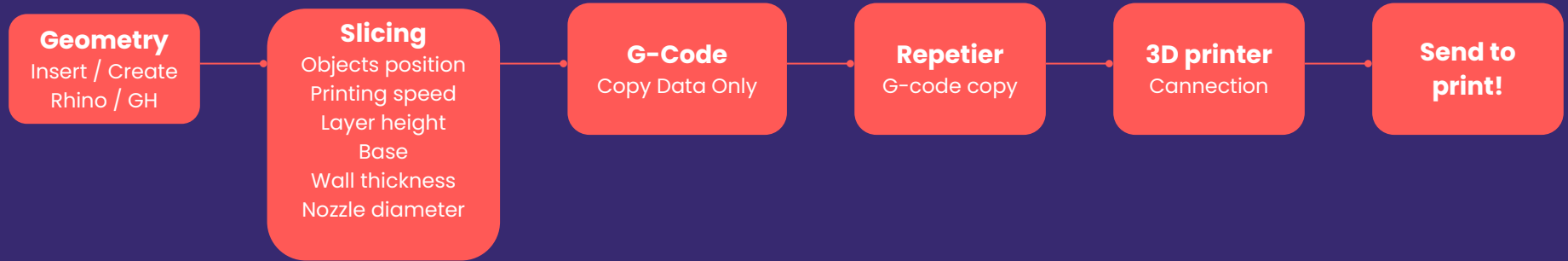


G-CODE - REPETIER

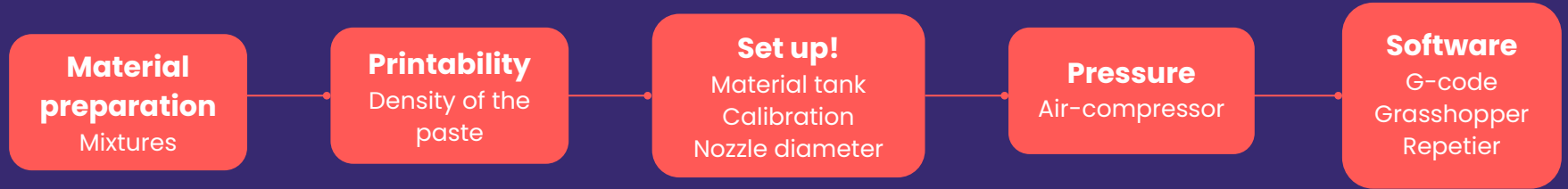


Repetier-Host

SEND TO PRINT

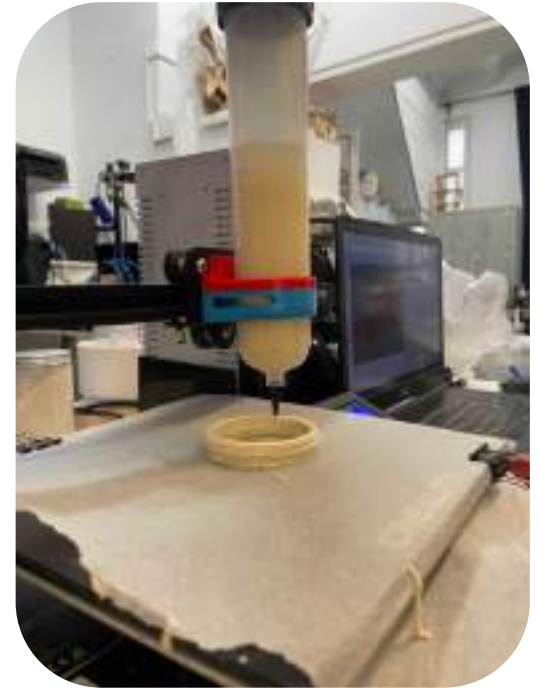
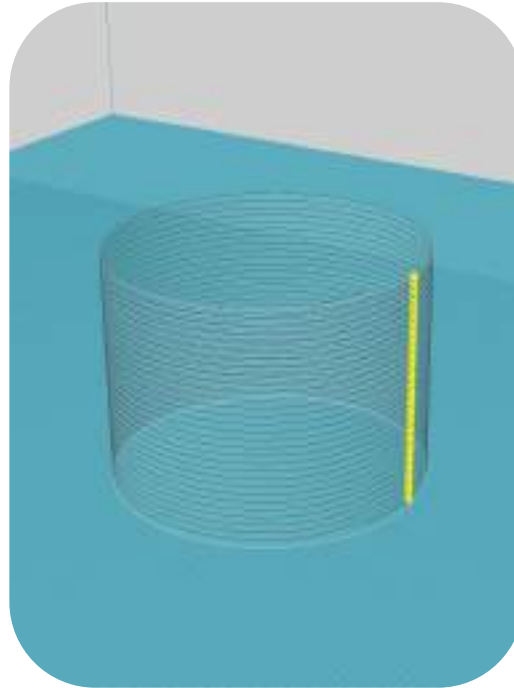


MACHINE SET UP



3D PRINTING SETTINGS & DOCUMENTATION

RECIPE_01	KERATIN TAPIOCA STARCH
Layer height	1.2 mm
Layers	5
Nozzle	2 mm
Printing speed	250 mm/s
Printing time	2 m 45 s
Pressure / Bars	3 bars
Drying	30 h
Size	70 x 70 mm



PASTE 3D-PRINTING



SODIUM ALGINATE & CELLULOSE

RECIPE-01

Sodium alginate	4 g
CMC	5 g
Water	200 ml
Glycerol	1 tbsp
Filler	5 spoons

Tools

Hand blender
Measuring cup

GUAR GUM

RECIPE-02

Guar gum	8 g
Water	200 ml
Filler	7 spoons

Tools

Hand blender
Measuring cup

THANK YOU!

Petra Garajová

Material Research

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Eduardo Chamorro

Paste Printing Kit

-

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Santi Fuentemilla

Paste Printing Kit

-

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