

Material Recipes

BioComposites

In order to compare and test, it's better to test the same base with different fillers.

PLASTICIZER: Glycerin

POLIMER: Alginate as the common ingredient

STIFFENING and Fibre: Eggshells, Coffee, Acorn paste (from Dying), Seaweed powder

CURING: For curing, the vinegar it's used in some recipes, however, in our experiences we used Calcium Chloride Hydrated 10%. Because it can be tested a. er, if will be only used when/if necessary.

VEHICLE: Tap water

Preparing the EggShells (© Midushi Kochhar, at <https://materiom.org/recipe/122>)

Step one: Preparation of eggshells: Collect as many eggshells as you need from your home, neighbours, cafes, etc.

Step two: Wash the eggshells thoroughly and boil them for about 15 mins to kill all bacteria.

Step three: To dry the eggshell, you can use one of these two methods:

1. Place the eggshells in the oven at 100 degrees for 15 minutes.
2. Place the eggshells in the microwave for 1 minute at high temperature, then 3 minutes at med-high.

Both methods work, but the eggshells need to be dried out; brittle but not burnt. Subtle crackling sound means that the eggshells are ready.

Preparing the Shell Sand

Step one: Filter the Shell Sand to remove the darker and bigger parts (mostly oyster).


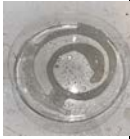
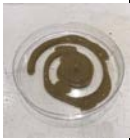
Step two:


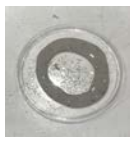


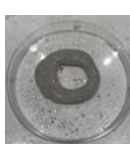

1. White Powder - Use the filtered sand
2. Dark Powder - Use a mortar to powder the remains

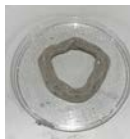


Recipes tests

Date: 2020.11.13

code	name	image	PLASTICIZER	POLIMER	STIFFENING	CURING	VEHICLE	CONCLUSIONS	based on
1 AE -1	Alginate Eggshell biocomposite		5 ml Glycerine	2 gr Alginate	7,5 gr Eggshell		50 ml Water	Very liquid.	Annie Ferla e eggshell biocomposite
2 ASS-W	Alginate Shell Sand White biocomposite		5 ml Glycerine	2 gr Alginate	7,5 gr Shell sand White part (Pet Stores)		50 ml Water	Still fluid, better result. Move Forward for more stiffness.. Filter the shell sand removing the dark big parts. Use the white sand.	Annie Ferla e eggshell biocomposite
3 ASS-D	Alginate Shell Sand Dark biocomposite		5 ml Glycerine	2 gr Alginate	7,5 gr Shell sand Dark parts to powder			Very liquid. Filter the shell sand removing the dark big parts. Mortar the dark parts of to powder.	Annie Ferla e eggshell biocomposite


4 ASS-W2	Alginate Shell Sand White biocomposite		5 ml Glycerine	2 gr Alginate	15 gr Shell sand White part (Pet Stores)		50 ml Water	Tested with 4 gr Alginate and became too stiff. Returned to 2 gr.	Annie Ferla e eggshell biocomposite
5 ASS-W3	Alginate Shell Sand White biocomposite		5 ml Glycerine	2 gr Alginate	30 gr Shell sand White part (Pet Stores)		50 ml Water	Better results before casting. Move Forward with more ShellSand	
6 ASS-W4	Alginate Shell Sand White biocomposite		5 ml Glycerine	2 gr Alginate	15 gr Shell sand White part (Pet Stores)	5 ml Vinegar	50 ml Water	Became very lumpy and sticky.	
7 ASS-W5	Alginate Shell Sand White biocomposite		10 ml Glycerine	2 gr Alginate	15 gr Shell sand White part (Pet Stores)		50 ml Water	Too stiff.	
8 ASS-W6	Alginate Shell Sand White biocomposite		5 ml Glycerine	2 gr Alginate	60 gr Shell sand White part (Pet Stores)		50 ml Water	Move Forward with more ShellSand	
9 ASS-W7	Alginate Shell Sand White biocomposite		5 ml Glycerine	2 gr Alginate	75 gr Shell sand White part (Pet Stores)		50 ml Water	Move Forward with more ShellSand	



10 ASS-W8	Alginate Shell Sand White biocomposite		5 ml Glycerine	2 gr Alginate	90 gr Shell sand White part (Pet Stores)		50 ml Water	Too hard to extrude. Move back.	
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Date: 2020.11.16



Sugar as a Plasticizer

“Sugar acts as an effective plasticizer but makes film more brittle because of changes in hydrogen bond network and in matrix mobility through the interaction between water and plasticizer.”(Ployetchara et al.) 2018 · <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6098788/>

code	name	image	PLASTICIZER	POLIMER	STIFFENING	CURING	VEHICLE	CONCLUSIONS	based on
11 SSS	Shell Sand Sugar biocomposite		15gr Sugar		70gr ShellSand filtered and grained		15 ml Water	Does not work well extruding. Left to dry to test the result.	Sauerwein, M. https://doi.org/10.4233/uid:1ffe3bd6-9592-40be-9a2a-7830778db093

12 AE-2	Alginate EggShells		4 ml Glycerine	2 gr Alginate	30 gr Shell sand White part (Pet Stores)		30 ml Water		
13 AC	Alginate Coffee		10 ml Glycerine	5 gr Alginate	20 gr Coffee grains		75 ml Water	Very hard to extrude by hand with the syringe. Good to work as BioComposite	Pilar Bolumburu http://159.65.21.231/recipe/171

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14 AE-3	Alginate EggShells Biocomposite		4 ml Glycerine	2 gr Alginate	30 gr EggShells		50 ml Water		
15 AE-4	Alginate EggShells Bioplastic		40 ml Glycerine 20 ml Sunflower oil	24 gr Alginate	30 gr EggShells		400 ml Water	Recipe for BioYarn Good to extrude with the syringe.	Alginate Bioplastic base recipe