

CLAY

**3D PRINTING MANUAL
WITH EXTRUSION OF PASTES**

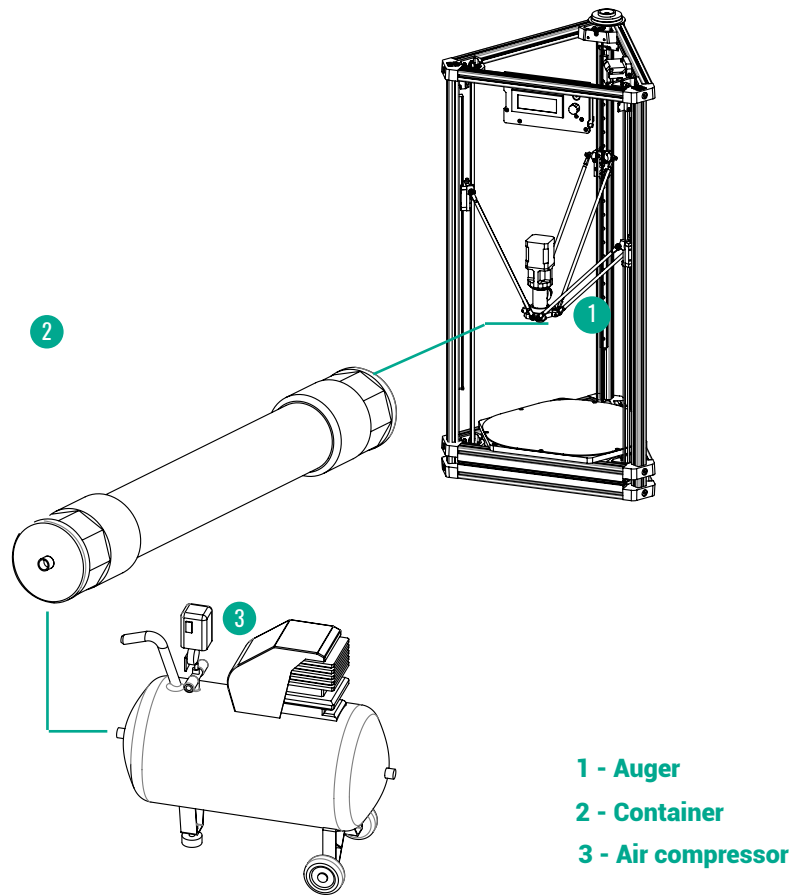
ILARO.ORG

Modified Printer for extrusion of pastes

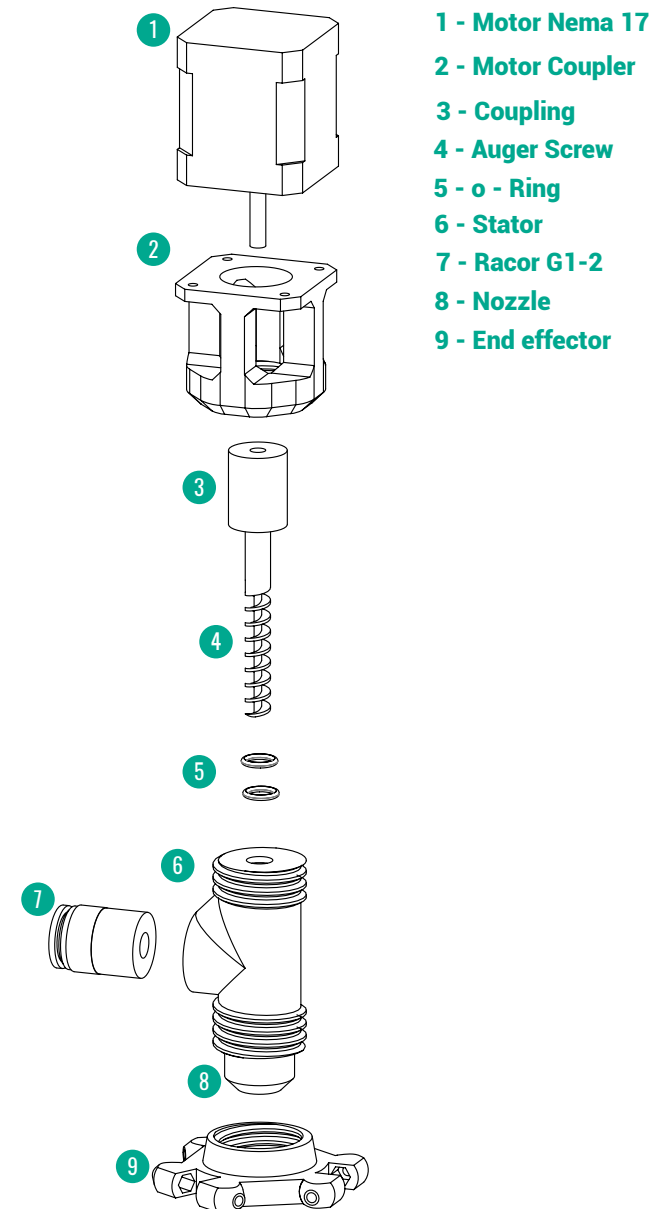
CALYPSO DELTA printer modified for 3d printing of paste extrusion. The extruder has been modified and has an inlet that is connected to a clay container. This clay is extruded thanks to the force of an air compressor at 4 -6 bar.

A motor connected with a coupler to a worm screw has been incorporated that allows to control the passage of the clay and to make retractions.

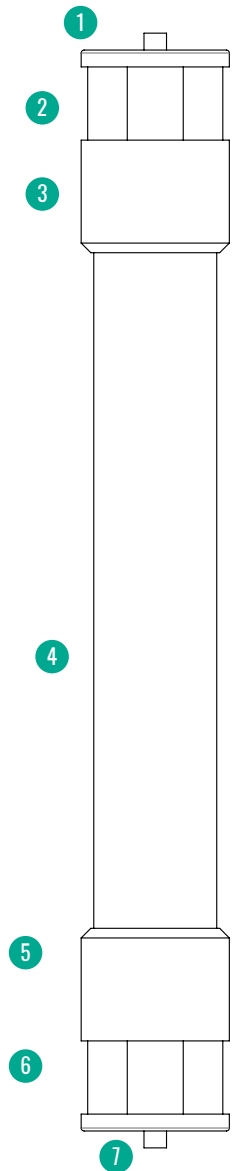
The nozzle is 2.5 mm and 5 mm in diameter. The maximum printing volume is 280 diameter x 340 mm.



1.Auger



2.clay container



1 - Racor G1-2

2 - Plug 2" inches

3 - Thread 2 "inches

4 - PVC tube pressure 63 mm diameter

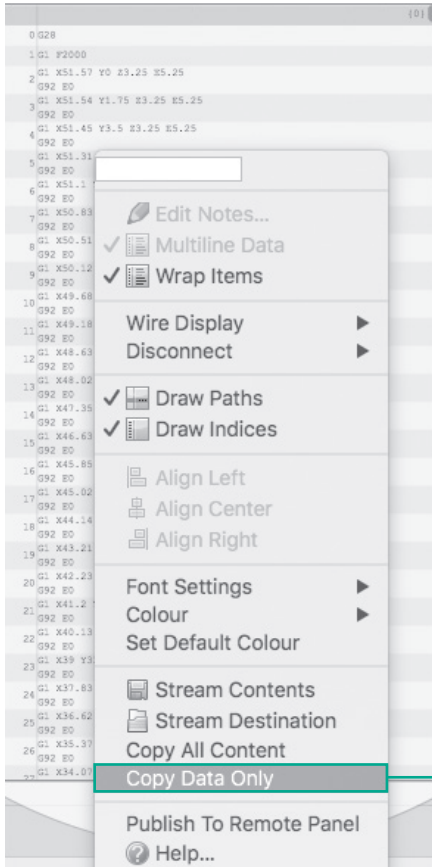
5 - Thread 2 "inches

6 - Plug 2" inches

7 - Racor G1-2

STEP 1

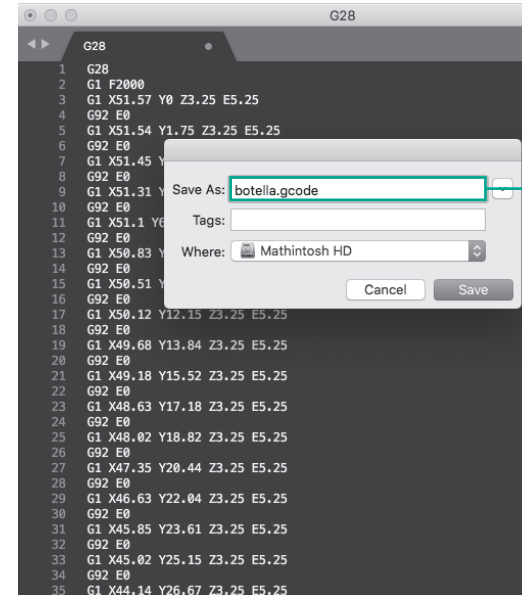
Export the file from Grasshopper



To print in 3d we need to export the code that we will find in the Grasshopper file. Select the last panel and right click. Select "Copy Data Only".

STEP 2

Export as .gcode



Next we will open a text or source code editor such as "Sublime text". or by default the one that we will have in the computer as "notes".

Copy the code and save it on an SD card as: name.gcode

STEP 3

preparation

For the load of paste we will be able to use:

- High temperature stoneware without deflocculant
- High-temperature B2 porcelain without deflocculant.

It is important that the paste is not deflocculated since normally the ceramic powders come prepared to make molds, the deflocculant allows that with less amount of water the clay has fluidity and plasticity. For 3d printing we are interested in the clay maintaining its original structure and not being processed.

We will calculate a proportion that has the consistency that we look for to extrude with the printer.

1 part water x 3 part clay



for this container we need 1900 grams of Stoneware.



we need 633,33 ml of water

STEP 4

container



Knead with your hands on a flat surface until a homogeneous dough is obtained.



without letting air bubbles into the container.



close the container making sure that it is tight and there are no air leaks.

STEP 5

Connect to air compressor



Connect the container to the air compressor by adjusting the tube well, making sure that no air is lost.



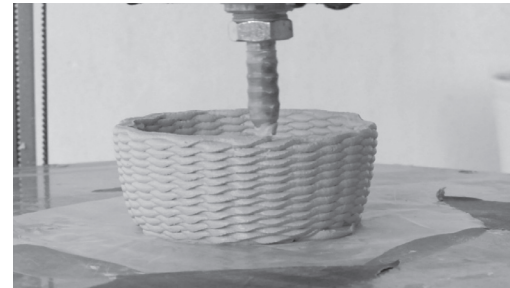
Adjust the air force of the compressor.
Normally we use a paste of this density between 4 to 6 bars. We must fix this force well so that a homogeneous piece comes out.

STEP 6

Printing the file



Connect SD to the printer slot on the left side of the screen. Automatically the menu of the sd card will appear and with the metallic button we will look for our file.
Otherwise we will search in the printer menu "Print file".



Our file will then be printed.
We must continuously ensure that the force of the air is constant and that the container does not lose air.

If the part does not extrude well it is possible that :

- clay has dried in the nozzle.
- Do not have enough force to extrude the paste and we must raise the bars of the compressor.
- The code is not correct.
- Lose air

MANUAL by
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