



COVIDMASK --- GIVE ME A HAND

3D printed soft bio-hazard mask

TEAM



William Amighetti

Physiotherapist / Project Promoter



Stefano Ala

3D Printing Specialist / Designer



Riccardo Prezioso

Doctor / Designer & Prototyper



Francesca Albano

Engineer / Project Strategist

CURRENT OVERVIEW IN ITALY



69.196

Total of the positive
tampons in Italy



21.937

Hospitalized



3.396

Intensive care
hospitalized



5.535

Health workers
positive to the
tampons



+8%

Valuation of the daily
pandemic growth

Covid-19 Infection

GIVE ME A HAND



COVIDMASK

A soft mask fitting perfectly with the facial features without irritating the skin. It displays interchangeable filters, unidirectional valves and it is entirely 3D printed.



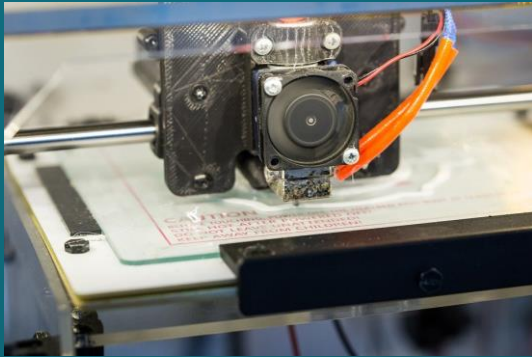
do not expose to heat

COVIDMASK



do not expose to heat*

AID NEEDED



Enrollment of more than 80 Italian FabLabs

The participation of the FabLabs could allow an increase of the production and a widespread distribution of the masks.



Reconversion of the industrial production

Companies working with laser cut technology and injection molding could deal with the massive production of the mask.



Upgrade of the FabLabs already acting in the area

Providing the FabLabs with the necessary material and 3D printers could allow an increase of the production.



Filter material supply to complete the filters.

Creation of an exchange network with certified TNT production companies to accomplish the production of the masks.

COMPONENTS



Mask – L/M/S

First part to be 3D printed and stitched to connect the two sides. Available in 3 sizes.

Made up of:

- Inner layer: certified flex fiber to be in contact with the skin.
- Outer layer: TPU



Filter with TNT

A support containing the TNT filter material to be put between the two components. Available in two versions: one with a joint and one with a threading.



Aluminium Stud

An aluminium or copper layer straightly contouring the nose and broadly reachable. It prevents the air to come out between the mask and the nasal wings.



Unidirezional Valve

It allows the exclusive one way passage of the air and, with the right configuration, it guarantees a superior duration of the filter material.

HYGROBAC S FILTER SYSTEM



Hygrobac S filter Covid Mask

Hygrobac S filters are commonly used for filtering the air entering mechanical respirators. The conversion of this filter into a "mask filter" allows the health care worker to have protection for 24 hours using a certified filter.



Filter and adapter

To allow the use of the Hygrobac S filter, we created a valve adapter made of TPU that allows the attachment of the filter directly on the body of the mask.

ASSEMBLY OF THE MASK



1. Open mask

Get all the material needed.



2. Stich the mask

Join the two sides of the mask and stitch them tightly with a cotton yarn.



3. Stiched mask

The result, after the stitching, must appear as in the image.



4. Insert the rubber band

Insert a 80 cm long rubber band into the side holes of the mask. Repeat on the other side.



5. Assembly of the stud

Put the layer on the higher section of the mask connecting the holes with the right protrusions, as shown in the image.

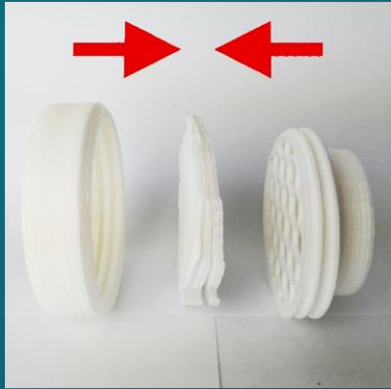


6. Final Result

The final result should resemble the image shown. Get sure that all the components have been properly put together.

ASSEMBLY OF THE TNT FILTER

JOINT FILTER



1. Assembly method

Arrange and assembly the components as shown in the image.

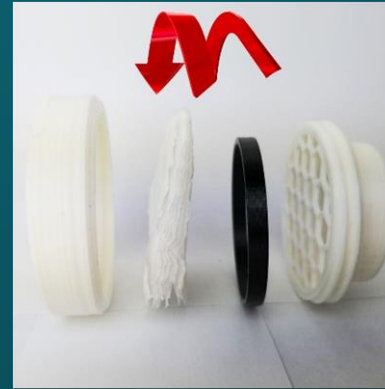
N.B.: The filter must get stuck.



2. Assembled Filter

Get sure that the refiner components fit together perfectly and that the air passes exclusively through the filter material.

THREADED FILTER



1. Assembly method

Arrange and assembly the components as shown in the image.

N.B.: The filter must be screwed.



2. Assembled Filter

Get sure that the refiner components fit together perfectly and that the air passes exclusively through the filter material.

ASSEMBLY OF THE UNIDIRECTIONAL VALVE



1. Unidirezional Valve

This valve allows the one way passage of the air depending on the type of assembly.



2.B IN membrane

Using this version, you must stitch the membrane on the inner side of the holder. In this way the passage of the air will be allowed in inspiration and forbidden in expiration.



2.A OUT membrane

Using this version, you must stitch the membrane on the outer side of the holder. In this way the passage of the air will be allowed in expiration and forbidden in inspiration.



3. Final result

Insert the protection cap, get sure that the components are properly assembled and that the air freely circulates through the valve.

CONFIGURATION WITH HYGROBAC S FILTER



Hygrobac S filter CovidMask

- Configuration for health workers.
- Essential components:
 - Mask;
 - Hygrobac S filter with con adapter;
 - Unidirectional Valve.
- Assemble as shown in the images.



FILTER – FILTER CONFIGURATION



Double filtered CovidMask

- Filtering configuration both in way in and out.
- Essential components:
 - Mask;
 - PLA Filter;
 - Certified filtering material.
- Assemble as shown in the images.



FILTER – U.D. VALVE CONFIGURATION



CovidMask with filter and unidirectional valve

- Filtering configuration only way in.
- Essential components:
 - Mask;
 - PLA Filter;
 - Certified filtering material;
 - Unidirectional Valve.
- Assemble as shown in the images.

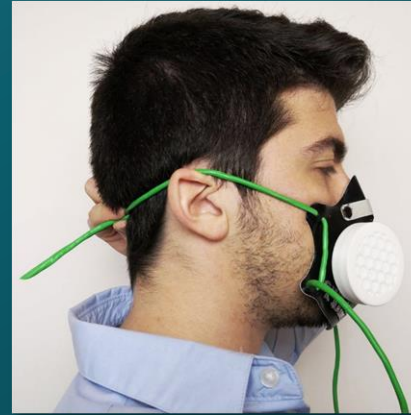


HOW TO WEAR IT



1. Mask on your face

Put the mask near your face and make it fit perfectly. Avoid wide movements of the mandible.



2. Higher rubber band

Tie the higher rubber band behind your head passing it on your ears.



3. Lower rubber band

Tie the lower rubber band on you head passing it behind your ears.



4. Mask put on

Squeeze the stud on your nose to avoid the air to come out. Get sure that the mask sticks to the face.

MATERIALI



Certified Filament

- The filament mustn't irritate the worker with the contact on his/her skin and this quality must be certified.
- Used for the inner layer of the mask.

Other Materials

- Cotton yarn to stitch;
- Rubber band;
- Aluminium or copper foil.



Flexible TPU

- Commonly used for the printing of flexible stuff.
- Used for the outer layer of the mask and for some components.

Filter Materials

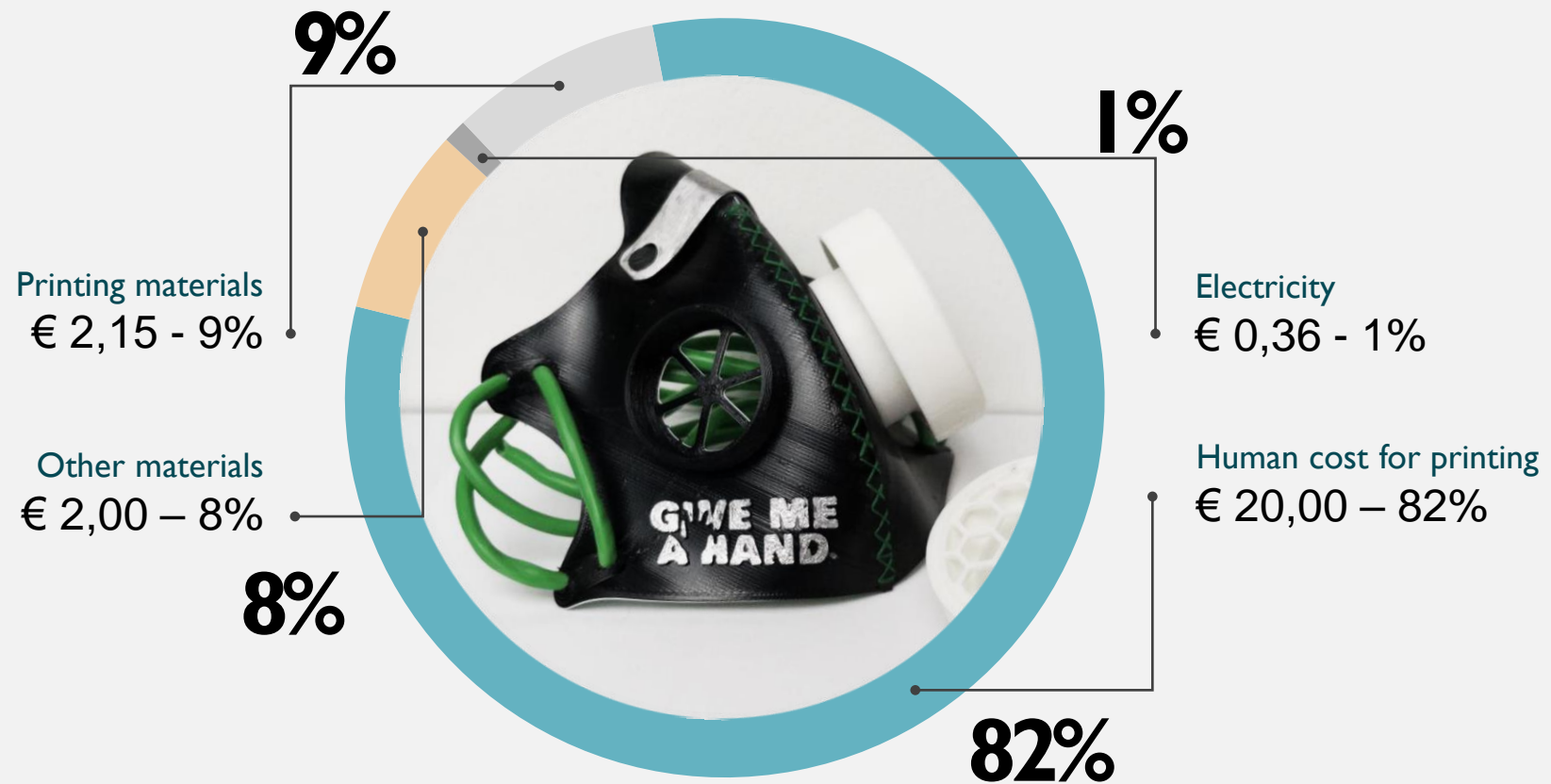
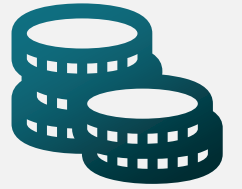
- Certified TNT (tessuto non tessuto).



PLA – Polilactic Acid

- Commonly used for the printing of rigid stuff.
- Used for the making of filter holders and some other components.

COSTS FOR A SINGLE MASK



OPEN SOURCE AVAILABLE FILES

Open-Source logic

Facing the current emergency we decided to spend our time realizing a project that is open to everyone.

The design and the instructions are freely available online in five languages.

We are trying to support the health workers fighting coronavirus making our modeling and printing skills available.

We hope this project could be improved over time, in a totally open source logic.

Give Me A Hand

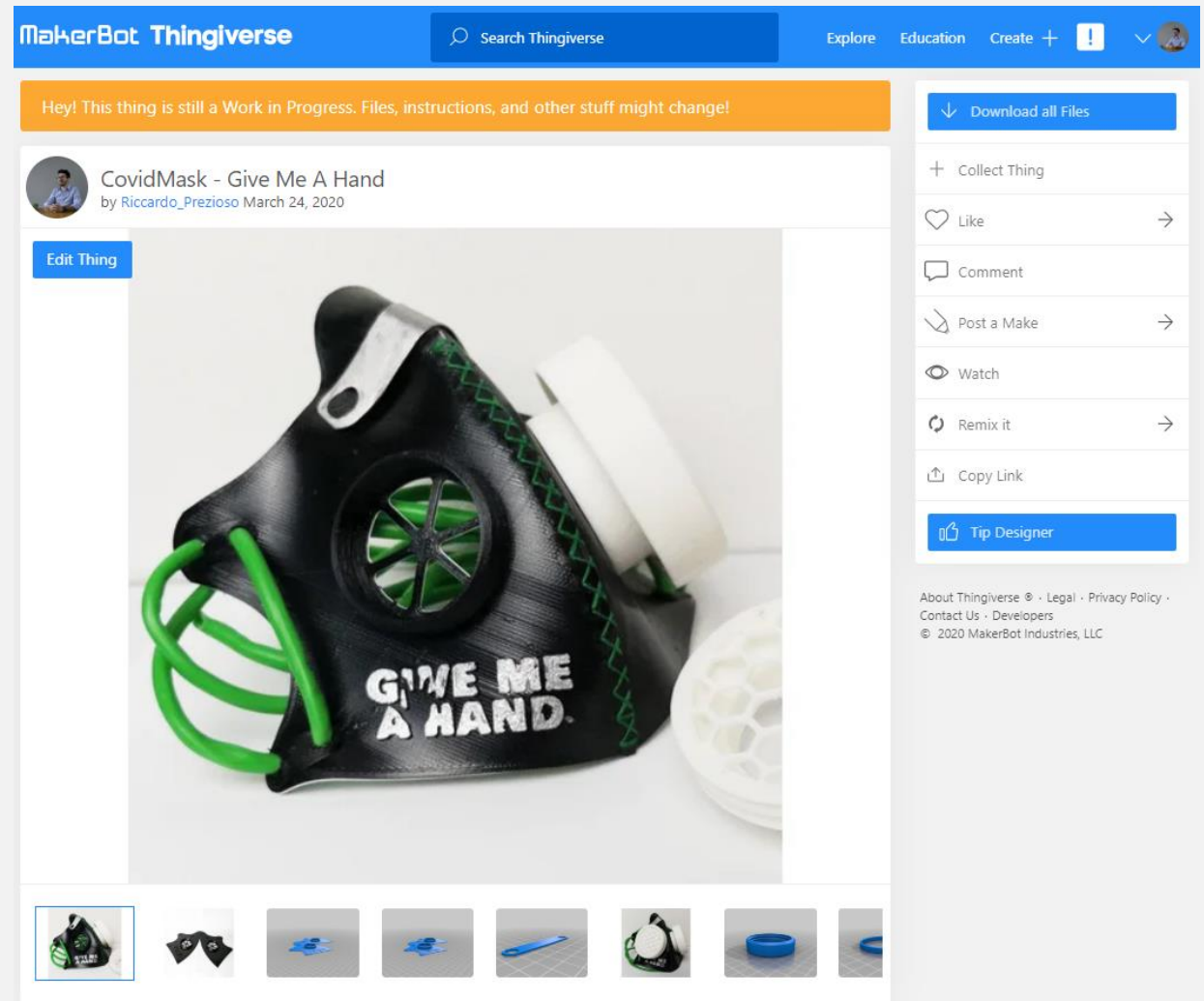
<https://www.givemeahandfoundation.org/>

Thingiverse by MakerBot

<https://www.thingiverse.com/thing:4237777>

GitHub

<https://github.com/RiccardoPrezioso/Give-Me-A-Hand>



THANKS



William Amighetti

Presidente – Give Me A Hand



amighetti.william@gmail.com



+39 339 4887436