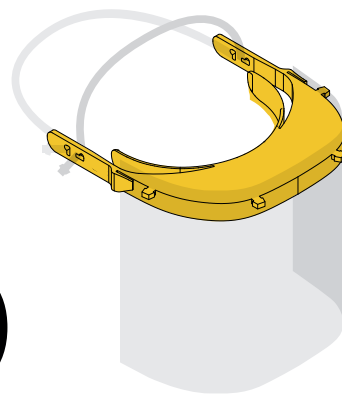




**VERS 04.2020**

**ENGLISH**



# **SHIELD 19**

## **OPEN SOURCE FACE SHIELD**

**FROM MILAN, ITALY, EUROPE, WORLD  
TO ANYONE WHO NEEDS IT**



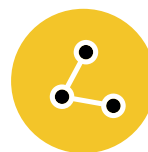
**DOWNLOAD**



**PRINT**



**ASSEMBLY**



**SHARE**

*An open source project to make in case of emergency and when it is difficult  
or impossible to obtain protective visors on the market*



*SHIELD19 is for healthcare workers operating in emergency situations in close contact with patients who may be in a critical condition. Apart from personal protection equipment for the airways, it may also prove necessary to shield themselves from the droplets when an infected person sneezes or coughs or from drops of sweat. SHIELD19 is designed for them.*



**FOR WHO**

# 2 STEPS TO PROTECT FROM COVID-19

## 3D PRINTING

1

The file to make a SHIELD19 contains one single element to be printed in PLA according to the parameters in *sheet 01*.

2

## THINGS THAT ARE EASY TO COME BY

Since it is an item of personal protection equipment (PPE) designed for emergencies, the material necessary to complete it (and which needs to be replaced frequently) must be easy to come by. *Sheets 3A-B-C* indicate what material to use and describe assembly procedures.

# SHIELD19

*An open source project to make in case of emergency and when it is difficult or impossible to obtain protective visors on the market.*

## DIAGRAM

### ELASTICS

*To fix the structure to your head you need two plastic elastic bands. Just one, the elastic band at the back, is enough, in case materials are scarce.*

### 3D PRINTED VISOR

*This is the main element of Shield19. It is a high resistance single piece designed to withstand prolonged continuous use. It is completed using materials which are easily available.*

**It is NOT a disposable visor.**

### TOP CLOSED

*The top is closed, requires more time to print, but ensures a greater degree of separation between the face of the operator and the external environment.*

### FASTENERS

*Quick fit system with a trapezoidal shape to ensure that the film stays in place.*

### PROTECTIVE SHIELD

*Acetate film A4 size, 180/200 micron, with 6 mm holes at standard intervals (8cm), which can be made using an office paper hole puncher.  
An A3 size sheet of acetate can be used vertically in order to obtain a longer shield (the lower part should be cut to fit).*

### P-SHAPED HOLES

*The holes can be used or elastics with a flat or round section. The vertical hole is for the rear elastic, the horizontal one can be used for the upper elastic.*

### END STOP

*In order to keep the protective film curved and facilitate rapid insertion and removal.*

# SPECIFICHE DI STAMPA

The structure is printed **upside down** in order to make the cover too in one single piece so as to ensure greater protection of the healthcare worker.  
In order to speed up production the parameters below for **perimeter and infill** can be modified.  
If more time is available, it is recommended to fill in the walls completely, increasing the number of concentric perimeters.

**DIMENSIONS** 18.5cm x 17.5cm

**MATERIAL** PLA (or material which is not compromised by contact with alcohol and disinfectants)

**QUANTITY OF MATERIAL** 12 metres of filament Ø1,75

**PERIMETERS** 1 (if more time is available perimeters=2)

**INFILL** 15%, pattern grid (linear with intersection at 90°)

**INCLINATION OF INFILL** pattern at 45° angle to the X axis

**LAYER HEIGHT** 0.2 mm

**TIME** about 3.30 hours

## NOTE

**PRODUCTION** Beware of the **retraction** at the end of the bars.

**RESISTENCE** When the printing is finished, check the resistance of the shield: by doing some stress tests it must be solid, otherwise discard it. It is not designed to be a disposable object.

**PARAMETERS** It is not recommended to change the parameters to obtain higher printing speed at the expense of the quality of the finished part.

## POST-PRODUCTION

**REMOVE** the "circles" of the first layer with a cutter. They are just an element to increase the adhesion to the plate of the object and if not removed they are annoying for the wearer of the visor.

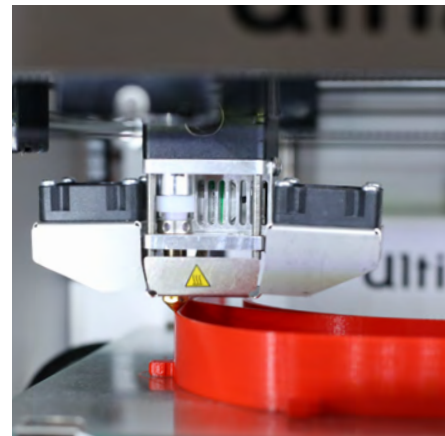
If necessary, **REMOVE** from any imperfections the internal band that rests on the head using sandpaper.

## TECH SHEET

### 3D PRINTED

#### DOWNLOAD FILE

[www.yatta.xyz/kit/shield19\\_eng.zip](http://www.yatta.xyz/kit/shield19_eng.zip)



#### TOOLS NEEDED

CUTTER

SANDPAPER



# VISOR

## TECH SHEET

### 3D PRINTED

This is a single piece and does not require any assembly.  
It has these main characteristics:

**A a flexible inner arch** to fit over the forehead to give stability to the structure which can also be used to block the hood of the protective suit, protecting the forehead of the operator from exposure;

**B two outer rods with holes** of variable dimensions to tie the elastics to go around the head of the operator;

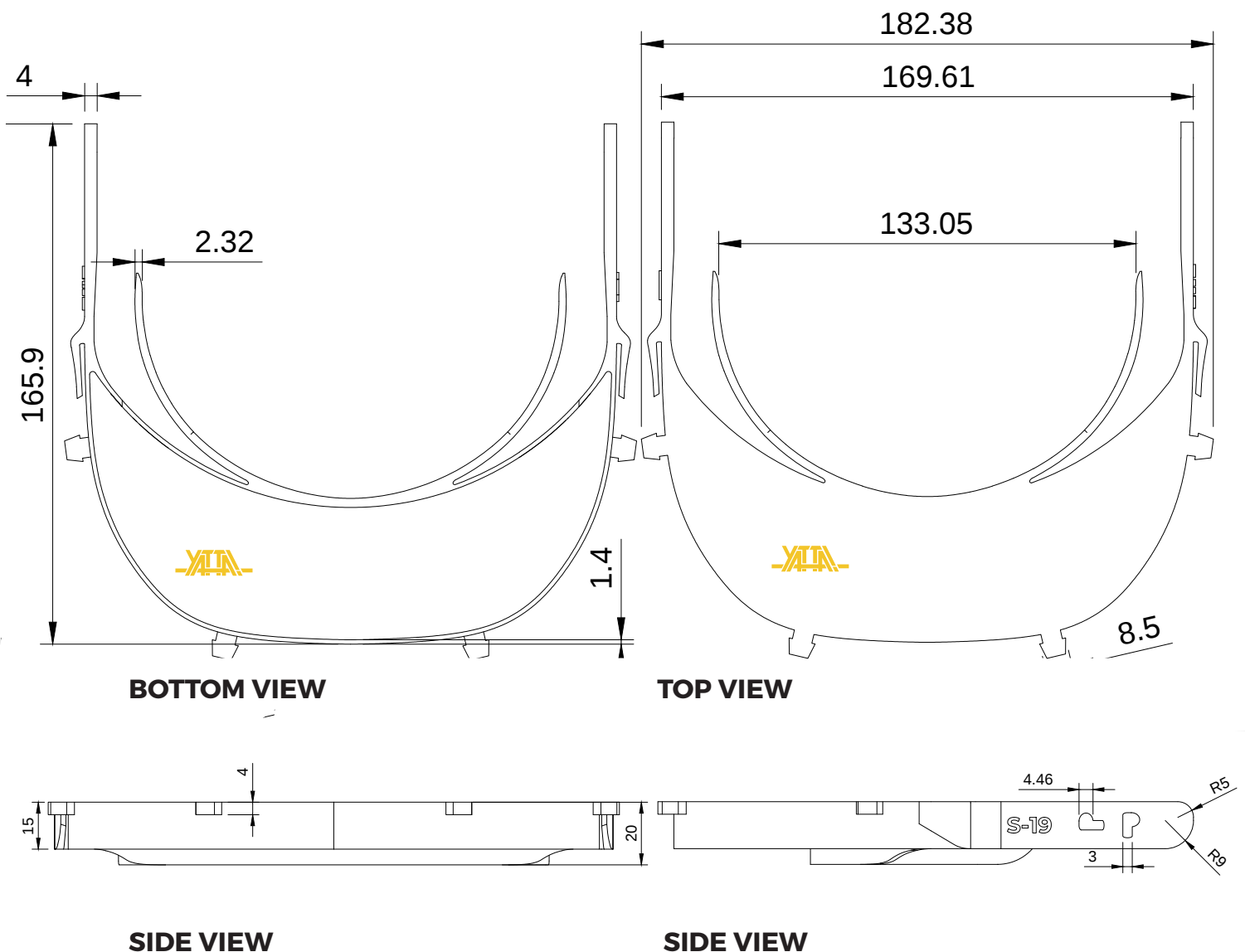
**C four hooks** at a standard distance to fix the protection shield without fear of release;

**D a closed visor** to further limit the passage of liquids and droplets.

*To attached to:*

*\*Sheet 02B*

*\*Sheets 03A-B-C*



# PROTECTIVE SHIELD

The principle here is to use mainly material that is **easy to come by** and render the operator independent of any specific supply or proprietary system involving click fits or hooks.

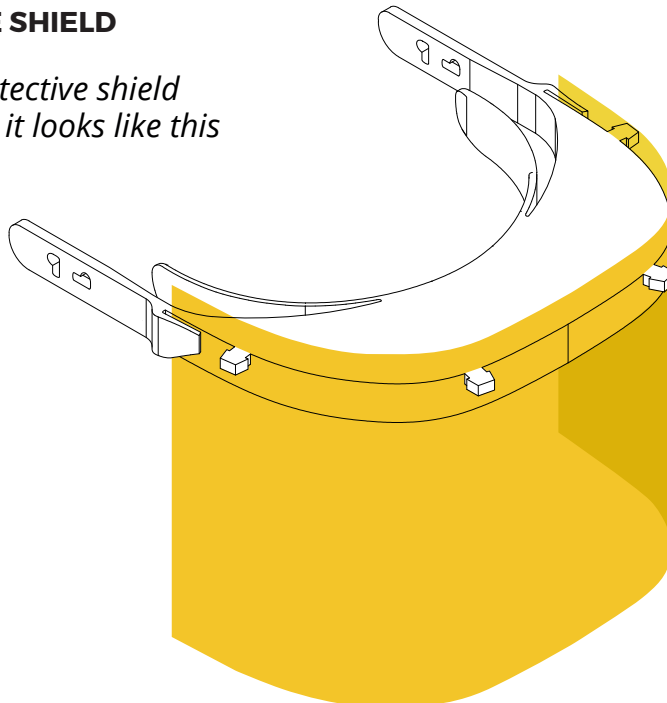
## SHEET OF ACETATE

A4 sheet used as protection of the front page in corporate documents, studies, reports.  
In order to be used on SHIELD19 4 holes at a standard distance of 8 cm must be made with an ordinary office paper puncher (see Template).

Ease of access of material under lockdown conditions: high.

### PROTECTIVE SHIELD POSITION

*Once the protective shield is assembled it looks like this*



## TECH SHEET

### DIY

**TOOLS NEEDED**  
**\_PERFORATOR**

#### ● NEW HOLES

**A4**

### NOTE

*Alternatively and in case of lack of other protection it is possible to use transparent ring bags*





21 cm

29,7 cm

# TEMPLATE FOR A4 SHEET OF ACETATE

If you use an **A4 transparent sheet of acetate**, be sure to make four circular holes at a standard distance of 8 cm. If you do not have an office hole puncher, place the transparent sheet over this template and use a cutter or any other pointed object. You can also use an **A5 sheet**, but in this case you must make the holes along the short side.

8 cm

# ELASTICS

## TECH SHEET

### DIY

**TOOLS NEEDED**  
\_CUTTER/SCISSORS

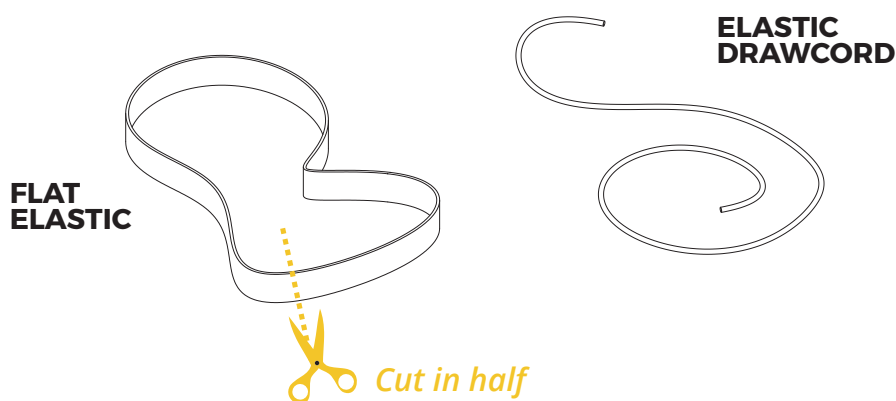
In order to secure the visor, you need two elastics or other material that will stretch a little, so you can secure the visor to the head of the operator.

The holes at the ends of the rods allow you to use ties with a round section or flat elastics.

In case of limited availability of the material, only put on the rear one. Better to opt for elastics with a diameter of 200 mm or 6-8 mm thickness because they are more resistant.

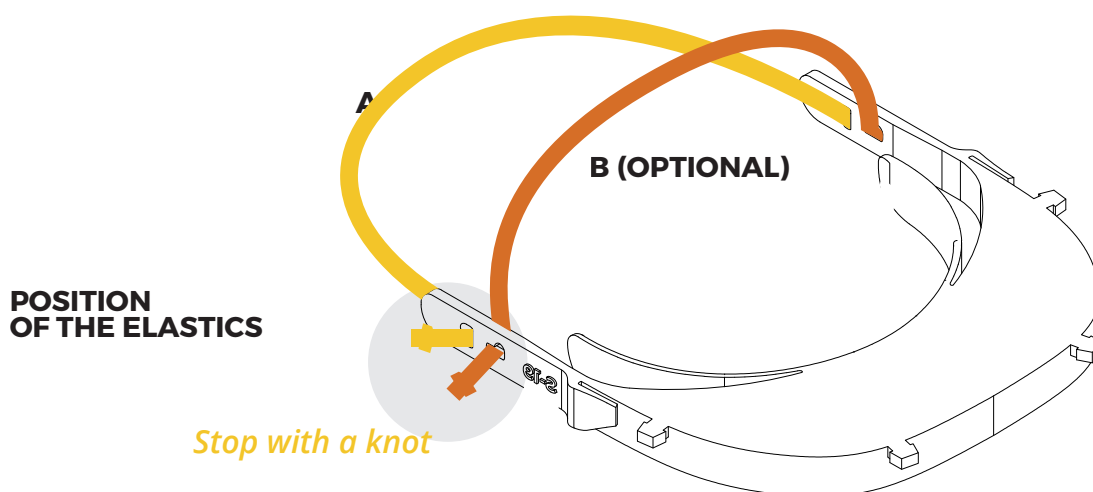
NB. Elastic cords or elastic fabrics may only be used as disposable ties because they cannot be sanitised.

Ease of access to material under lockdown conditions: high.



### NOTE

*Stretch lanyards or stretch fabrics are to be used only as disposable.*



# SOFT ELEMENT

A soft element to apply with double-sided tape on the internal arch so it rests more comfortably on the forehead of the operator. This element can also be removed and replaced when the visor is sanitised.

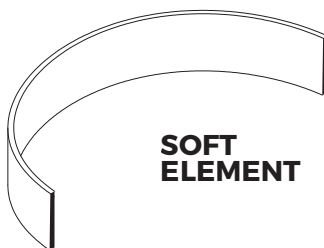
Ease of access to material under lockdown conditions:  
medium-low

## TECH SHEET

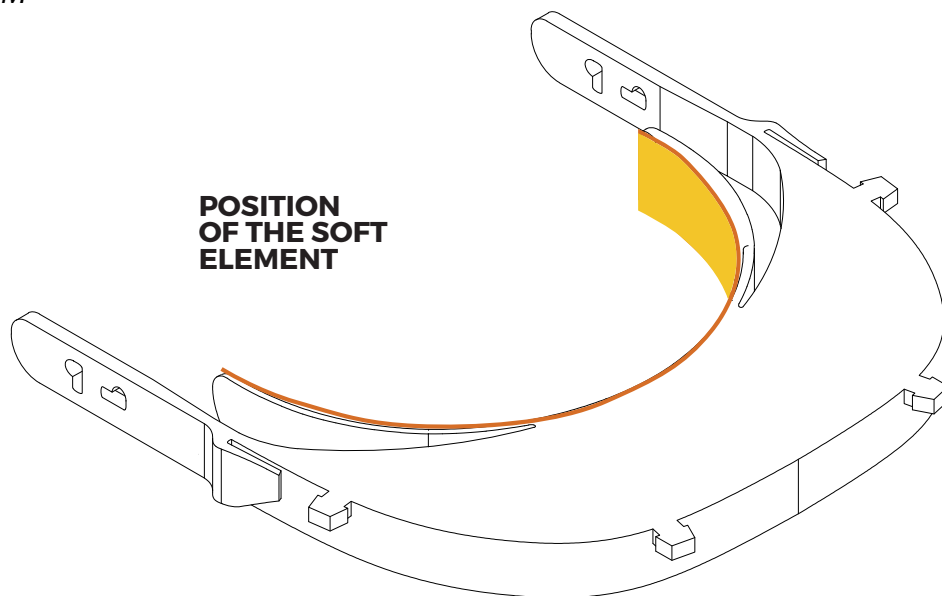
DIY

OPTIONAL

TOOLS NEEDED  
\_DOUBLE-SIDE TAPE



TEMPLATE FOR SOFT ELEMENT  
LENGTH ABOUT 21 CM



LINK PROGETTO [www.yatta.xyz/kit/shield19\\_eng](http://www.yatta.xyz/kit/shield19_eng)

DOWNLOAD KIT [www.yatta.xyz/kit/shield19\\_eng.zip](http://www.yatta.xyz/kit/shield19_eng.zip)

Our sincere thanks  
to all the healthcare workers and volunteers  
who gave us feedback to improve Shield19.  
The best of luck.

INFO [hello@yatta.xyz](mailto:hello@yatta.xyz) // 347.8819923

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3D PROJECT Cecilia Faraone and Marco Lanza and Brignetti Longoni Design Studio  
GRAPHICS Chiara Ettari  
ENGLISH TRANSLATION Marie Weston  
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# PLEASE SHARE





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**SHIELD19** is a project of solidarity to the community to which we belong. Since the launch of the project, YATTA! has created and coordinated a network of printers (mainly in the Lombardy region) **working 7 days a week**. Each member has contributed to deliver a total of more than **1450** visors to health workers, law enforcement agencies, ambulances, civil protection workers and public offices.

## PRINTERS

Special thanks to all the printers in the network. Without them it would not have been possible to do all this quickly.

### MILAN

YATTA! / Project G / FabioMyStudio / Luca Marconetti / Francesco Nicoletta / Gabriele Fabbri / Andrea Piniferi / Marco B. / Federico Gargano / WeMake

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