

How to make a face shield using 3D printing

Notes for use

These instructions describe the production process for a simple face shield, using additive manufacturing for the frame and using standard, commercially available transparent film for the face shield.

The face shield is offered as a do-it-yourself solution as part of coronavirus prevention measures.

Introduction

After successfully downloading and unzipping the files from the DMG website, you will have various files available:

Netfabb project files for immediate use

with the 3D printing system DMG 3Demax

Frame_DMG_FaceShield_complete.fabbproject

Frame_DMG_FaceShield_left_parts.fabbproject

Frame_DMG_FaceShield_right_parts.fabbproject

Generic STL files for corresponding printing systems

or for the creation of your own Netfabb projects

DMG_FaceShield_front_left.stl

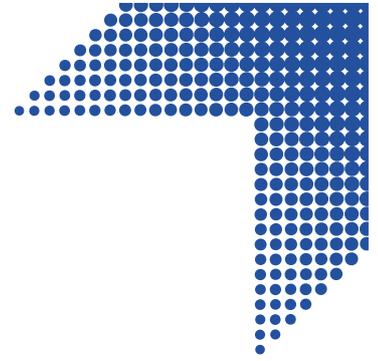
DMG_FaceShield_front_right.stl

DMG_FaceShield_earpiece_left.stl

DMG_FaceShield_earpiece_right.stl

Cutting template for protective film

Cutting_Template_protectivefilm.pdf

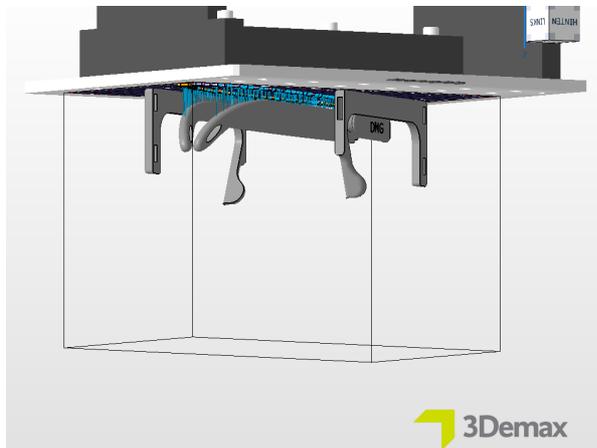


Instructions

Open the Netfabb application and select the desired project file.

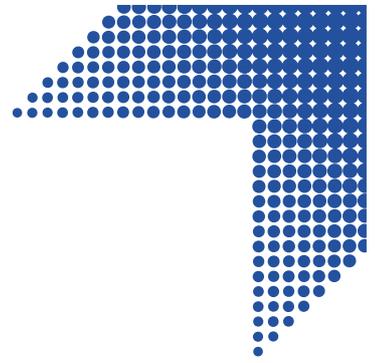
The project file "**Frame_DMG_FaceShield_complete.fabbproject**" allows you to print all components for a face shield frame with one print job.

One print job for all parts

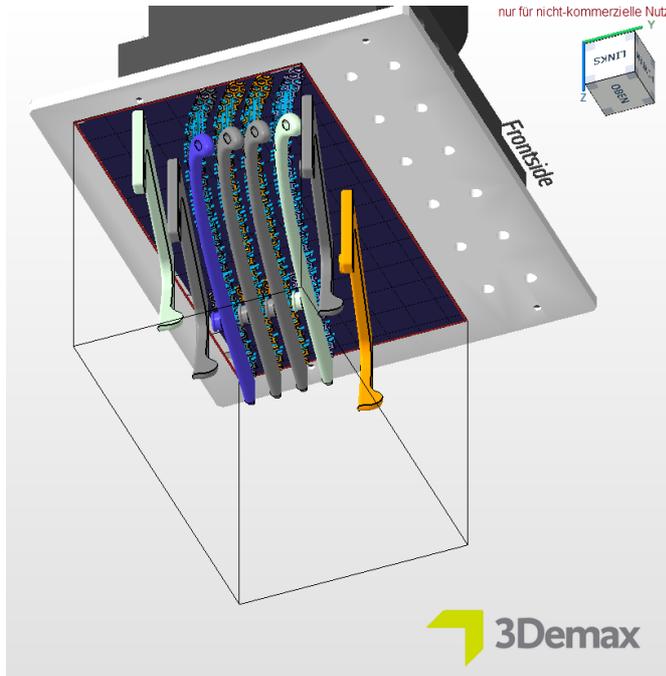


The project files "**Frame_DMG_FaceShield_left_parts.fabbproject**" and "**Frame_DMG_FaceShield_right_parts.fabbproject**" allow you to print 4 parts of each individual component (right and left).

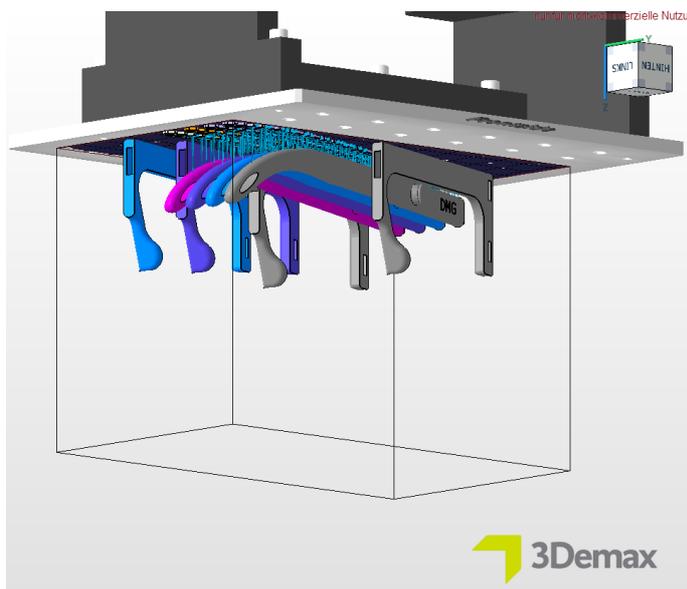
You can produce a total of four complete face shield frames with two print jobs.

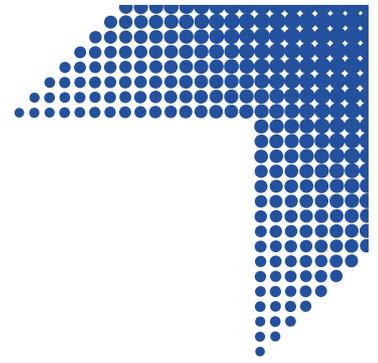


Print job 1 for 4 parts left



Print job 2 for 4 parts right





Material selection

The following materials can be used to make the face shields:

LuxaPrint Ortho Plus / LuxaPrint Ortho / LuxaPrint Tray

The choice of material is subject to personal preferences and immediate availability on site. It is also important to ensure that the respective print parameters for each material are available in the material library and that therefore the corresponding layer thicknesses are defined.

Further steps

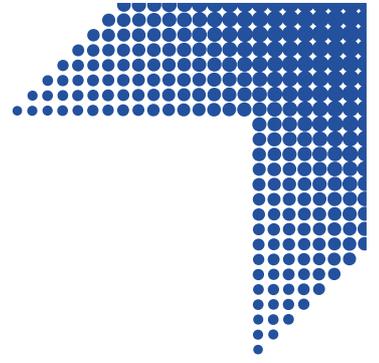
Create the print job using Netfabb. Transfer the print job to the 3Demax printer as usual via your network or USB stick.

After transfer is complete, start the print job as normal. Please make sure that the material tray is filled with the correct printing material.

After printing, the printed parts must be removed from the building plate, cleaned and post-cured according to the instructions for the material. Please follow the processing steps indicated in the instructions for use of the material chosen.

- Clean using 3Dewash or clean manually with isopropanol (two cleaning processes)
- Light-cure using 3Decure / Otoflash (2 x 2000 flashes) / Heraflash (2 x 180 seconds)

Remove the support structures present and smooth the surface with a suitable tool if required.

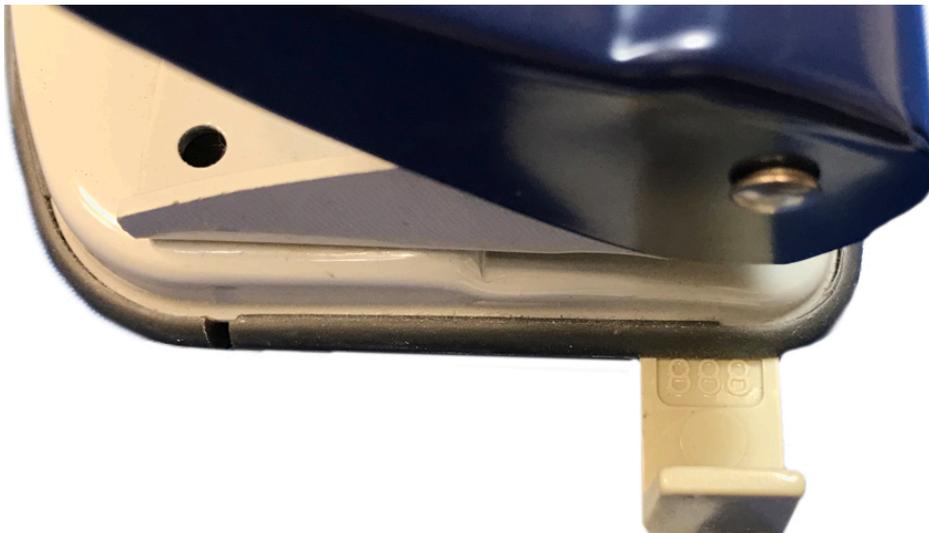


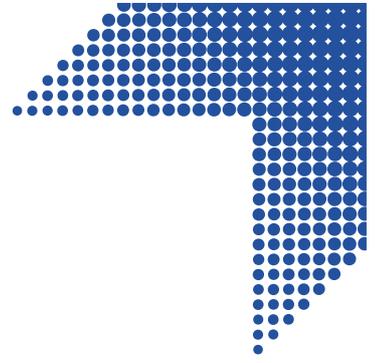
Final steps

Join the individual parts using super glue.

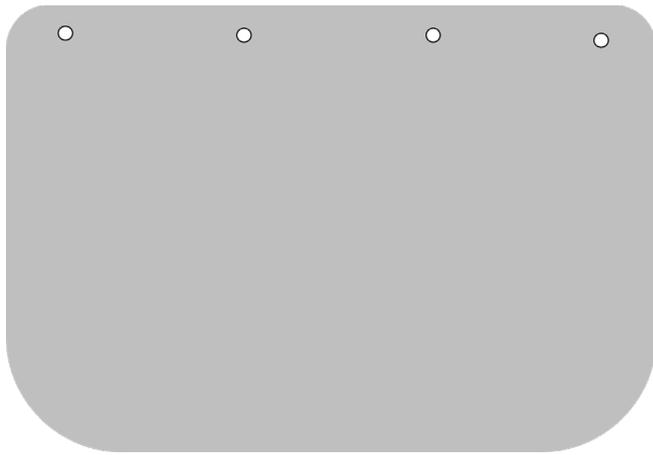


Punch holes in the protective film using a standard office punch set at the 888 position. (transparent film with a thickness of approx. 0.3 mm from a stationery store, e.g. document cover or overhead transparency)



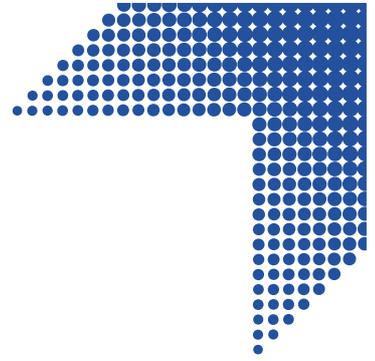


Round off the corners of the film with scissors if needed (see [Cutting_Template_protectivefilm.pdf](#)). Trim or smooth the cut edges of the protective film if necessary.



Attach the protective film to the attachment points on the frame.



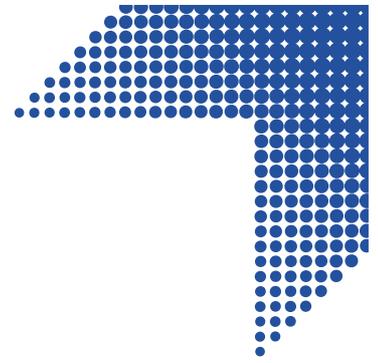


Note:

The attachment points at the front of the frame do not necessarily have to be used. Depending on the stability of the protective film, attachment to the frame earpieces may be sufficient.

Attachment to the earpieces alone provides a greater distance between nose and protective film, and therefore a lower tendency for fogging.





Instructions for STL files

Import the following STL files into the printer software (nesting/slicing software) and place them according to the printer manufacturer's instructions for printing:

Front part left: DMG_FaceShield_front_left.stl

Front part right: DMG_FaceShield_front_right.stl

Ear piece left: DMG_FaceShield_earpiece_left.stl

Ear piece right: DMG_FaceShield_earpiece_right.stl

Follow the printer manufacturer's instructions and the processing instructions for the material used when fabricating the printed objects.

Once the individual parts have been correctly printed, join the components together using a suitable adhesive (according to the specifications for the printing material).

Prepare the protective film as previously described and then attach this to the frame.

Notes for use

Please note the following instructions and the disclaimer. The print files for the face shield are only supplied subject to the stated conditions, to which you hereby indicate your consent:

1. 'Helping people help themselves'

In line with its aim of "helping people help themselves", DMG provides the 3D print files for the face shields, plus the manufacturing instructions, free of charge for interested users on its website. **The user accepts sole responsibility for printing and for checking durability and usability; users are also solely responsible for their utilization of the finished face shield! In downloading the data supplied by DMG, the user consents to and accepts**



the terms of use, warranty exemptions and disclaimers of liability specified here.

The user alone decides the purposes for which he/she will use the face shield; the user is aware that the face shield does not constitute the only possibility for protection during medical procedures and that he/she is solely and personally responsible for making the relevant provisions for the respective implementation of the face shield.

2. The face shield is not a medical device

DMG would like to emphasize that it provides no guidance and directions regarding the

**assembly,
utilization,
fitting,
durability,
cleaning and**

effectiveness of the use of the face shield; nor is DMG able to offer any guarantees in regards to the successful usage of the face shield.

In particular, no guarantee and/or liability will be accepted for any harm incurred in connection with usage of the face shield!

No assertions can be offered on disinfection and the effectiveness thereof owing to the absence of empirical data.

3. Tip from DMG

To prevent further infections and cross-contamination, appropriate hygienic precautions should be observed and enacted when cleaning and disposing of manufactured products and their components.