

DtM-v3.0 COVID-19 Face Shield

DESIGN SUMMARY

Version: 1.2, last updated 3/26.2020 @ 10:30am Pacific

~~Version: 1.1, last updated 3/25.2020 @ 5:30pm Pacific~~

~~Version: 1.0, last updated 3/25.2020 @ 1:00pm Pacific~~

PRODUCT POINT-OF-VIEW

Healthcare workers responding to COVID-19 who face PPE supply gaps while waiting for domestic face shield production to catch up with demand NEED a transparent face shield that:

- limits aerosol and splatter exposure from in front and above, while providing top ventilation
- reduces aerosol and splatter exposure on N95 and other face masks
- is re-usable for a single user (can survive multiple daily washes; transparent visor can be replaced from readily sourced materials when worn out)
- is easy to fabricate within a few days of design approval (ie no complex supply chains or production bottlenecks)
- is comfortable to wear and easy to don and doff (as it will be taken on and off dozens of times in a twelve-hour shift)
- provides protection to broader area of face compared to standard safety goggles or glasses

BILL OF MATERIALS

- 3d-printed headband in PLA, roughly 50g/1.75oz per part. Outer envelope of 3d-printed headband is 191mm wide, 148.5mm long, and 52.5mm tall. Print time is roughly 3h15m per part on a Prusa i3 MK2S and a Lulzbot Taz 6 at 30% infill, no supports.
 - Acceptable alternate 3d printing materials include PETG, ABS, ASA, Nylon
- Elastic for the headband: could be 7"x1/8" rubber bands, 13" strip of 3/4" wide buttonhole elastic, coflex/coban tape
- A standard US letter-sized transparency or report-cover for the shield, 2-8mil (0.002-0.008", 0.05-0.2mm) thickness
 - Acceptable alternative materials include clear PETG, PMMA or mylar in the same thicknesses cut to 8.5" x 11" (215.9mm x 279.4mm). Dimensions for a US-style three-hole-binder punch: three 6-8mm diameter holes with each center spaced 108mm apart. Do NOT cut PVC
- Options:
 - Add a folded paper towel or medical stretch foam to the inner headband to improve comfort, dispose as necessary
 - Before hole-punching, add tape (duct tape, medical cloth tape, etc) to reinforce the holes at top of the transparency sheet during repeat use and washings. Remove and replace tape between patients as necessary.

INSTRUCTIONS FOR ASSEMBLY

1. Punch holes in standard US letter-sized transparency with a standard US three-hole-punch
2. Attach transparency to headband using the three forward mounting pegs
3. Attach elastic to headband with cleats near temples, adjust to fit. Some users may find 7" rubber band too tight, consider chaining elastic bands as necessary.
4. To clean, wipe the headband and transparent visor with a standard cleaning product. Discard and replace the transparent visor as appropriate, after excessive wear or fogging. DO NOT submerge or soak 3D-printed headband in cleaning solution as the headband may absorb the solution and leak it out onto the wearer's forehead over time.

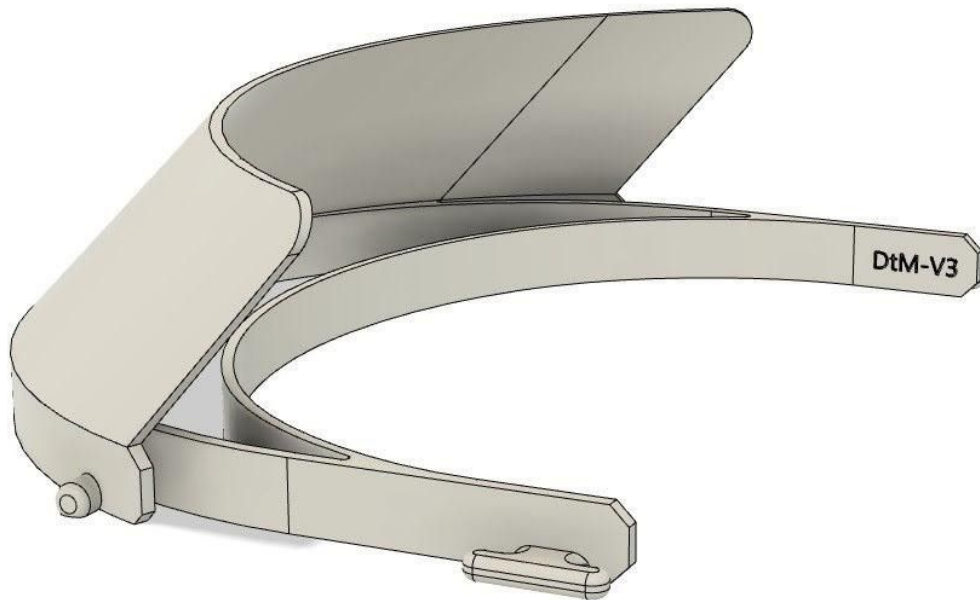
INSTRUCTIONS FOR CLEANING

1. Follow recommendations given by CDC in Strategies for Optimizing the Supply of Eye Protection
- Selected Options for Reprocessing Eye Protection

Link to current CAD and STL files for 3D printing:

https://drive.google.com/drive/folders/1ek1mNVNVhsNzNVN9hRwf_Qq_5meSHNII

DtM-v3.0 Face Shield CAD VIEW



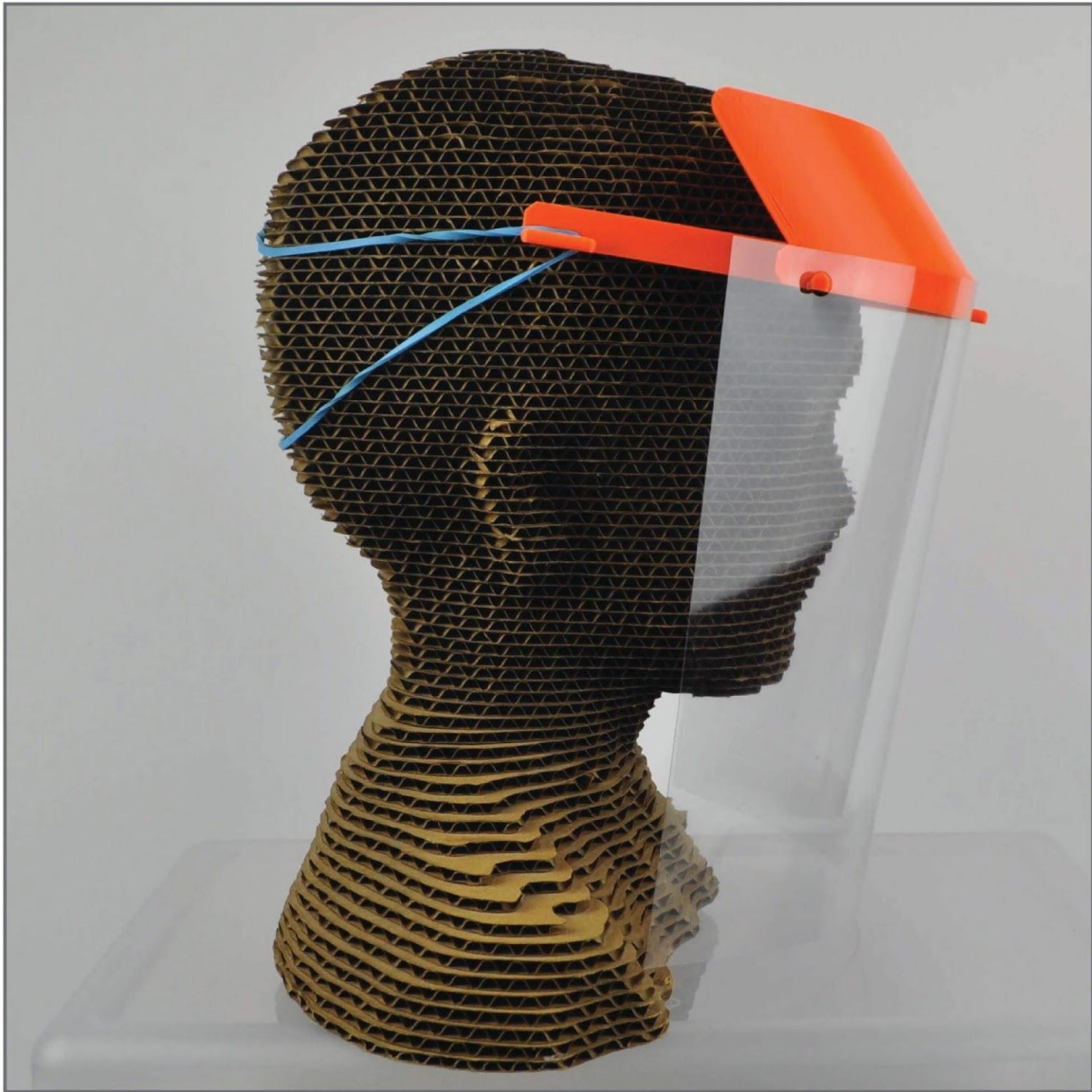
DtM-v3.0 Face Shield DESIGN REFERENCE VIEWS



DtM-v3.0 Face Shield SIDE VIEW, Buttonhole Elastic



DtM-v3.0 Face Shield FRONT VIEW



DtM-v3.0 Face Shield SIDE VIEW, 7" Rubber Band

DtM-v3.0 Face Shield DESIGN REFERENCE VIEWS, AS WORN



DtM-v3.0 Face Shield SIDE VIEW, Buttonhole Elastic AS WORN



DtM-v3.0 Face Shield TOP VIEW AS WORN