

# PAPR Shield Assembly

## Material Recommendations:

### Lens

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#### Optically Clear Material:

Polycarbonate (PC)  
Polyethylene Terephthalate Glycol (PETG)

#### Thickness:

0.015 – 0.025"

### Cuff

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#### Elastomeric Material:

Neoprene (Thickness:  $\leq 0.015$ "; Hardness: Shore 30A or 40A; Elongation to failure:  $\geq 700\%$ )\*  
Latex Rubber (Thickness: 0.006 – 0.012"; Elongation to failure:  $\geq 800\%$ )\*

*\* these are not recommended for people with allergies to neoprene and/or latex*

### Flapper

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#### Opaque Material\*\*:

PETG  
PC  
Polyvinyl chloride (PVC)

#### Thickness:

0.0125 – 0.025"

*\*\* Material should be stiff but not brittle. Flappers help hold cuff material against the wearer's skin by the ears.*

### Arc

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#### Opaque Material:

PETG, PC, PVC, etc.

#### Thickness:

$\leq 0.0125$ "

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## Assembly Instructions:

Wash cuff materials thoroughly. Remove any protective liners from shield materials. Slow setting cyanoacrylate-based glues are recommended for assembly in clean environment with proper PPE.

- 1) Adhere the Arc to the front of the Lens. Note: Arc piece is decorative and is used to hide glue marks from the backside pieces.
  - a. Use an extra Lens to serve as a guide and position the Arc on the guide Lens so the edges line up, with the side to be glued facing up. Use the three holes on the top of the Lens to align the Lens with the guide Lens. 3D printed guide posts can be used to help align the two lenses.

- b. Apply thin, uniform layer of glue to the Arc. Avoid excess glue that could bleed beyond the Arc's boundaries when pressed against the Lens it is being glued to. Allow drying.
- 2) Adhere the elastomeric Cuff material to the back of the Lens.
  - a. Again, use an extra Lens as a guide and position the elastomeric Cuff material so the curved perimeters line up. The straight perimeter of the cuff should sit just below the holes in the Lens.
  - b. Apply thin, uniform layer of glue to the back side of the Lens. Glue should only be applied along the curved portion of the Lens' perimeter. The straight edge of the Cuff material will sit just below the holes in the Lens. Therefore, do not apply any glue to edges in-line with and above the holes in the Lens. A silicone brush can be used uniformly spread glue. Do not apply glue too close to the inner boundary created by the Arc since excess glue could bleed past.
  - c. While carefully handling the Lens with wet glue, line up the holes of the wet glue Lens with the holes on the guide Lens, and place the wet glue Lens onto the Cuff material. Gently apply pressure and wait for the glue to dry.
  - d. Look for ruffling of the elastomeric cuff material at the edges. These spots will require extra glue. Excess cuff material can be trimmed using scissors or a razor as needed.
- 3) Adhere the Flappers to the back of the Lens and Cuff material.
  - a. Apply thin, uniform layer of glue to the back side of the Flappers. Do not apply glue too close to the edge since excess glue could bleed past.
  - b. While carefully handling the Flapper with wet glue, line up the Flapper edges with the edges of the Lens and the front Arc and place the Flapper onto the Lens and Cuff material. Gently apply pressure and wait for the glue to dry.

**Disclaimer:** Although extensively tested, this design has not been officially approved by any recognized institution or organizations. NO WARRANTIES OF ANY KIND ARE OFFERED FOR THESE DEVICES AND ASSOCIATED EQUIPMENT DESIGNS AND SPECIFICATIONS, INCLUDING WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Assembled PAPR Shield (Front View)



Assembled PAPR Shield (Back View)

