



**Face Shield Design, Assembly, and User Instructions**

For 3-piece handmade disposable face shield capable of extended use.

**Follow these precautions prior to making face shields**

- Don't make these if you are sick or think you may be getting sick.
- Don't let others who may be sick into the making area.
- Disinfect the work environment before beginning.
- Practice good hand hygiene before and during the making process.
- If donating, check with recipients about cleaning, packaging, and delivery.



*Face shield on 7" display mount*

**Materials List**

Material	Specifications	Item #	Cost	Source	Use specifications	Notes
Clear PVC Film	0.005" Thick x 20" Wide x 25 Feet Long	87875K91	\$11.75 Roll	Mcmaster-Carr <a href="https://www.mcmaster.com">https://www.mcmaster.com</a>	Cut into 12"x9" pieces with 2 corners on the 12" edge cut at 2" from the corner.	Cuts easily with scissors or rotary cutter.
Light Duty Blended EPDM Foam Strip with Adhesive Back	1" Wide, 1" Thick, 25 Feet Long	8694K54	26.44 Each	Mcmaster-Carr <a href="https://www.mcmaster.com">https://www.mcmaster.com</a>	Cut into 12" strips.	Cut with scissors prior to removing adhesive tape cover strip. Adhesive is very strong so do not remove until ready to adhere to shield.
Knit Elastic White	0.75" Wide	varies	\$1-\$2/yard depending on source	Fabric store or other	Cut into upstretched 14" pieces.	14" fits and holds shield on small circumference head and also stretches to comfortably fit larger heads.

## Preparation

1. Cut PVC into 12" wide x 9" high rectangle. The 12" edge will be adhered to the foam strip.
2. Cut a 2" triangle from the corners of one 12" edge. This edge with cut corners is the bottom of the shield. The 12" straight edge is the top where the foam will be attached (See Photo 2).
3. Cut 1" x 1" foam strip into 12" pieces. Cut with scissors before removing adhesive cover strip (See Photo 4).
4. Cut elastic strap into 14" unstretched pieces (See Photo 6).

## Assembly

1. Remove adhesive cover from a foam strip. Don't touch it or let it touch anything. It will stick.
2. Place each end of an elastic strap on the adhesive side of the foam strip. Each end of the elastic should be approximately 1/2" from the end of the foam and there should be approximately 1/4" adhesive at the top and bottom of the elastic. Ensure that the strap is flat and not twisted when stuck to the foam.
3. Place foam and elastic assembly onto top edge of the PVC shield. The foam should be centered on the top 12" edge (without the cut corners) with only a few millimeters of the shield overlapping the foam. The elastic will be between the foam and the shield. The foam and the shield may have a natural tendency to curve. If so, assemble so that they curve in the same direction toward the face.
4. For extra durability, the PVC, elastic, and foam can be stapled together. However, preliminary testing indicates a staple is likely not necessary. Staple where the elastic is sandwiched between the shield and the foam. Compress the foam enough to fit into the stapler so that the staple is inserted and the legs of the staple fold down so they do not create a poking hazard. The staple should penetrate the shield and go through the elastic and into the foam. A common office stapler will span and staple the three layers (See Photos 7 and 8 for detail with and without staple).

## Fit and Tips

This face shield design should cover the entire front (that extends to the chin or below) and sides of the face. It should provide enough clearance for eye glasses, protective eyewear, face masks, and N95 respirators (See Photos 9 and 10). In general, as users move the foam band of the shield up on the forehead, the shield will tend to move away from the face and as it is moved down on the forehead, the shield will tend to move towards the face.

The adhesive on the foam is extremely tacky so be sure you are ready to assemble the pieces before remove the adhesive cover strip.

The PVC may have high static charge from the roll so try to cut and assemble in an area with minimal dust, pet hair, or other material that is easily attracted to charged materials.

## Use Precautions and Care for Extended Use

Consult the CDC before using

Users of this or other handmade face shields should consult the CDC for guidance on strategies for:

Strategies for Optimizing the Supply of Eye Protection from CDC

<https://www.cdc.gov/coronavirus/2019-ncov/hcp/ppe-strategy/eye-protection.html>

Users should

- Remove and reprocess face shield if it becomes visibly soiled or difficult to see through.
- Dedicate face shield to one user and reprocess whenever it is visibly soiled or removed (e.g., when leaving the isolation area) prior to putting it back on.
- Take care not to touch their face shield. If they touch or adjust, they must immediately perform hand hygiene.
- Leave patient care area if they need to remove their eye protection.

Protocol for removing and reprocessing face shields

1. While wearing gloves, carefully wipe the *inside*, followed by the *outside* of the face shield using a clean cloth saturated with neutral detergent solution or cleaner wipe.
2. Carefully wipe the *outside* of the face shield using a wipe or clean cloth saturated with EPA-registered hospital disinfectant solution.
3. Wipe the outside of face shield or goggles with clean water or alcohol to remove residue.
4. Fully dry (air dry or use clean absorbent towels).
5. Remove gloves and perform hand hygiene.

## Limitations

Face shields assembled according to these instructions are intended to be used as part of crisis and contingency strategies, not at times when commercially manufactured facemasks are available.

These instructions describe and illustrate how to assemble a face shield similar to those commercially manufactured and sold to protect users in healthcare and similar situations from exposure to large airborne droplets. This face shield design has not been tested nor is there any evidence that it protects users from these exposures.

This face shield was not designed to be protective against impact like those designed to be tested to meet or exceed standards established by the American National Standards Institute (ANSI Z87.1-2015).

## Photos



Photo 1. Roll of PVC measuring 20" wide, 0.005" thick, and 25' long.

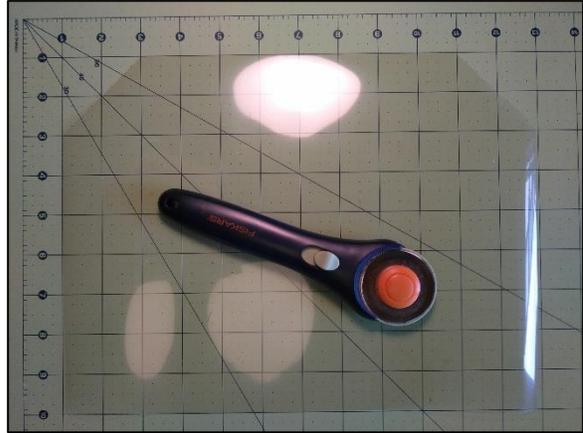


Photo 2. PVC cut into face shield. Measures 12" wide x 9" high with corners cut at 2".



Photo 3. Roll of foam measuring 1" wide, 1" thick, and 25' long with adhesive backing on one side.



Photo 4. Sections of 12" cut foam with adhesive cover still attached.



Photo 5. Elastic strap measuring 3/4" wide x 36" long to be cut into 14" pieces.



Photo 6. Example of 14" piece of elastic strap.



Photo 7. Detail of elastic attachment point without staple.



Photo 8. Detail of elastic attachment point and staple. Note that elastic is sandwiched between the foam and PVC with the staple inserted through top of PVC.

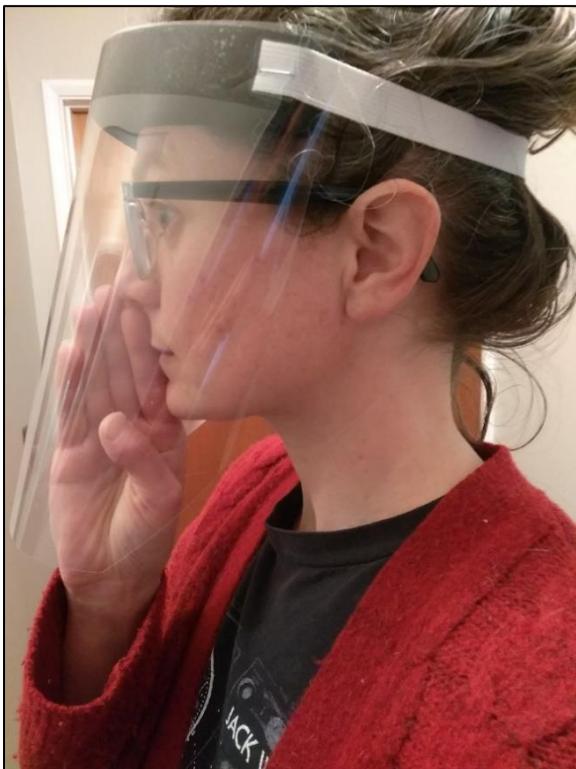


Photo 9. Face shield fitted on user with glasses.



Photo 10. Face shield fitted on user without glasses.