# 3D Printed 5P71 (P95) / 5N11 (N95) Respirator

Overview and Instructions

The respirator consists of a mask, a filter housing, a 3.75” strip of weather stripping, and elastic bands with adjusters. A nose clamp is included that can be glued on if difficulty is encountered getting a seal.

The parts are shown in the diagram below. Note: weather stripping and elastic are not pictured.



**MATERIALS**: The mask is polyurethane (TPU) and the housing and nose clip are polylactic acid (PLA).

**CLINICAL USE STATUS:** PROTOTYPE / UNDER REVIEW FOR CLINICAL USE

* Submitted to NIH for testing and clinical review. https://3dprint.nih.gov/discover/3dpx-013645
* Note that the FDA is currently working with the NIH to evaluate clinical use cases for PPE
	+ For more information, see https://3dprint.nih.gov/collections/covid-19-response

**FITTING**:

* Check that the weather stripping is properly adhered to the inside of the nose area of the mask
* Familiarize yourself with the elastic adjuster
* Flip the top elastic over the front of the respirator (out of the way)
* Pull the bottom strap behind your head and fit the respirator onto your face
* Pull the top piece of elastic onto your head, above the ears
* Adjust the elastic until an adequate pressure is applied
	+ Remove the respirator to adjust the elastic if required
* Breathe in an out normally and see how the seal works with each exhale (also try talking)
* Exhale sharply and see if any air escapes by your nose; tighten the elastic if required
* If trouble with the fit around the nose is persistent, install the nose clamp per figure 1



*Figure 1, Right: Nose clamp install (OPTIONAL)*

* *The front of the nose clamp should be parallel to the front of the respirator*
* *The back of the nose clamp should be about 2mm from the back (face side) of the mask*
* *Use* ***superglue*** *or* ***superglue gel*** *(cyanoacrylate glue)*
* *Align the crease in the nose clamp with the crease in the mask and hold the surfaces together for 1-2 min*
* *Allow to dry until no fumes can be detected (2+ hrs.)*

**CLEANING AND SANITIZING**:

* With a sanitizing wipe, clean and sanitize the entire mask, and all accessible portions of the filter housing after each use and allow to air dry
	+ Take care around the weather stripping
* Double check that the weather stripping is still adhered well enough to survive the next shift

**DISINFECTING**:

* Clean and sanitize the respirator with a sanitizing wipe before disinfecting
* Remove and discard the weather stripping; wipe the area with the sanitizing wipe
* Remove the front cover of the filter housing with a 2.5mm Allen wrench
* Remove the filter and set aside, text down, on a disinfected surface
* Spray the entire respirator liberally with 70% isopropyl alcohol and let dry overnight
	+ Soaking is acceptable, but additional drying time may be necessary
* After drying, attach a new 3.75” long piece of 1/4” foam rubber weather stripping
* Install a new filter (text towards face mask), or insert the old filter if no new filters are available

**FILTERS**:

* The respirator fits 3M 5P71 filters (P95 rating) and 3M 5N11 filters (N95 rating)
	+ These filters are common add-ons for full face respirator units, adding particle protection to a cartridge designed for organic vapors, acid gas, etc.
	+ When disposable N95 respirators are not available, it still may be possible to find a source for the 5P71 and 5N11 filters. Amazon.com still had them as of April 2020.