

## The Bottom Line(s)

You can easily get >90% filtration efficiency with available ‘disposable’ masks with good fit. In some situations, a 60% filter with good fit may be very comfortable and good enough. Wear a good mask indoors if you’re with non-household members.

### 1. Good masks (good filter and good fit) make a much greater reduction in infection risk than increasing ventilation indoors.

“Strategies to minimize SARS-CoV-2 transmission in classroom settings: Combined impacts of ventilation and mask effective filtration efficiency” (preprint)

<https://www.medrxiv.org/content/10.1101/2020.12.31.20249101v1.full>

### 2. Better-than-Amazon places to shop online for KF94 (and some KN95) and one ‘exercise’ mask:

- <https://behealthyusa.net> for BOTN, Bluna FaceFit et al; sometimes has mix-and-match specials. Baseline prices ca \$3.50 (\$35 for 10) but they run specials and coupons, eg “ONLY4OYOU” (or is it “ONLY40YOU”?) gets one-time per customer 40% off. Prices posted include shipping
- <https://bonafidemasks.com/face-masks/>  
Best source for Powecom, ear loop or headband styles. Free domestic shipping.
- <https://kollekteusa.com/search?q=MH+Care> MH Care w/ adjustable ear loops, \$20.84/10
- <http://masklab.us> (for fewer than 4 boxes) Masklab.hk (if buying 5+ boxes or seeking the newest styles). If you don’t get Level 3, FFP2 (or FFP3), contact their customer service. Some old stock is still being released. Prices lower, but shipping higher, at masklab.hk website, cheaper if you are ordering ≥5 boxes to order from there (eg group order).
- Korean ILWOUL HYGIENIC Face Mask: ca 67% PFE but very low pressure differential (very breathable). Good for crowded hiking trails. <https://www.everydaybeautylib.com> one mask is \$1.50, basic shipping is \$5.00. <https://www.yesmask.net/product/mu-120/> if you want 20 of them, price is \$22, free shipping.

### 3. Good summary article, includes introduction to Aaron Collins:

“HOW TO BE SURE YOUR FACE MASK ISN’T A COUNTERFEIT

Fake N95 and KN95 masks are (unfortunately) a thing. How to know you’re getting the real deal—and the highest level of protection”

<https://www.bestproducts.com/fitness/health/a35550972/avoid-counterfeit-masks-kf94-n95-kn95/> Masks to trust is a good list of brands, but beware of the potential shifting of Amazon

sellers. Amazon links LG Airwasher seller has changed from Bellacos to Share Premium aka “5 Star TV and Audio” (?), Dr Puri site linked seems to be hacked by another seller (question

answer posted By dodams [SELLER](#) on February 27, 2021)

### 4. Aaron Collins and tests of various masks available for general public use:

Who is he, what are his qualifications? [https://youtu.be/4JFed\\_ofCwM](https://youtu.be/4JFed_ofCwM) Dec 15th, 2020

[00:00](#) Intro

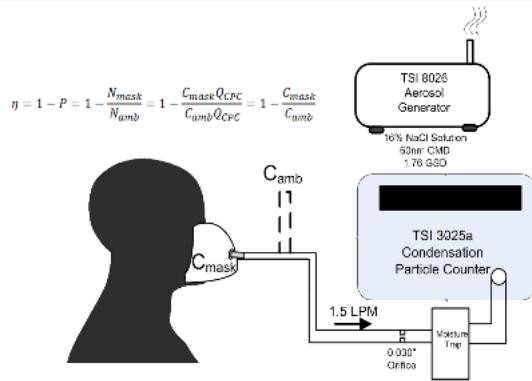
[01:05](#) Who is this nerd? (He worked in developing Condensation Particle Counters (CPC’s) obtained this equipment at public auction pre-pandemic as hobby,

[04:05](#) Apparatus: TSI-3025a CPC w/ TSI 8026 aerosol generator using 16% NaCl solution, 20-second average concentration measurements as fitted. Generates COMPARISONS one mask to another, on the same face (his)

[08:13](#) NIOSH N95 Comparison

[12:00](#) "Quality Factor" defined

[14:10](#) Reviews [14:14](#) 3M 8210 NIOSH N95 (Review) [15:18](#) Respokare NIOSH N95 (Review) [16:46](#) Deme Tech NIOSH N95 (Review) [17:54](#) XAM-MED N95 (Review) [19:35](#) Yiwu Kaoshidun (Review) [21:08](#) Top picks KN95



Dec 25 video

[01:55](#) Korean Ministry of Food and drug Safety (MFDS) testing protocol for population-style masks

[10:00](#) A.C.'s Test Aerosol vs. NIOSH vs COVID. His test aerosol is 'on the small side' still gives mask-to-mask comparison. See table of penetration vs particle size at different flow rates showing that the particles in the 40-60nm size get through most and bump most at high flow rates, i.e. his aerosol likely giving 'worst-case scenario' conditions.

Raw data of his tests are available in the Google Drive Link

<https://docs.google.com/spreadsheets/d/1M0mdNLpTWEGcluK6hh5LjicFixwmOG853Ff45d30-L0/edit#gid=1976839763>

5. Emergency Use Authorization (EUA) [FDA Appendix A](#) list by manufacturer. Manufacturers and mask models approved for Emergency Use Authorization (compiled in March, and mainly addressing the question of what is a reliable KN95)
6. **"Registered with the FDA"** list of masks submitted for FDA testing, but does NOT constitute any endorsement or approval by the FDA unless annotated as EUA therein.

### 7. Other US Government postings

<https://www.cdc.gov/niosh/npptl/respirators/testing/NonNIOSHresults.html> There seems to be no way to search this data for the name of a manufacturer, nor for "KN94", nor for country of manufacturer. The few I looked at that were not specifying KN95 were Chinese. Search of the CDC website yields no entries with "KF94" (search engine will not find text in images) but there is ONE entry, Dr Puri, with 99% PFE results

<https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization#covidppe>

CDC Order: Wearing of face masks while on conveyances and at transportation hubs  
<https://www.cdc.gov/quarantine/masks/mask-travel-guidance.html>

Improve the Fit and Filtration of Your Mask to Reduce the Spread of COVID-19  
<https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/mask-fit-and-filtration.html>  
includes notation, “At least [60% of the KN95 masks evaluated by NIOSH](#) did not meet the requirements that they claim to meet.”

Counterfeit Respirators / Misrepresentation of NIOSH-Approval  
<https://www.cdc.gov/niosh/nppt/usernotices/counterfeitResp.html> Lots of illustrations of mask falsely marketed.

#### **8. Examples of sellers’ postings that got taken over by scammers:**

- [https://www.amazon.com/BOTN-Adjustable-Certified-Comfortable-individually/dp/B08NY2RNFF/ref=psdc\\_3753541\\_t1\\_B08N5B38LC#customerReviews](https://www.amazon.com/BOTN-Adjustable-Certified-Comfortable-individually/dp/B08NY2RNFF/ref=psdc_3753541_t1_B08N5B38LC#customerReviews)
- <https://nypost.com/article/where-to-buy-kf94-masks-to-protect-yourself-from-covid-19/>
  - Full of amazon links – use this as an exercise in identifying scammers.

#### **9. Mask Fit strategies with surgical masks**

- Badger Seal: (U Wisconsin-Madison) <https://making.engr.wisc.edu/mask-fitter/> Open source DIY- lots of info, links, videos, parts list et al.
- Fix the Mask <http://fixthemask.com> Silicon version sized for various noses. Testing data collected using NIOSH head models and human subjects.

#### **10. Shifting perspective on COVID transmission; Timeline**

- February, 2020. <https://www.cdc.gov/coronavirus/2019-ncov/hcp/respirator-use-faq.html> CDC says masks are not necessary for public use stating that person-to-person spread of viruses such as COVID-19 usually happens within six feet. Instead, CDC recommends everyday preventative actions including washing your hands, covering your mouth when you cough or sneeze, and avoiding touching your eyes and nose.
- It Is Time to Address Airborne Transmission of Coronavirus Disease 2019 (COVID-19) Published 06 July 2020.  
<https://academic.oup.com/cid/article/71/9/2311/5867798>
- COVID-19: Droplet or Airborne Transmission? Penn Medicine Epidemiologists Issue Statement. (02 August 2020)  
<https://www.pennmedicine.org/updates/blogs/penn-physician-blog/2020/august/airborne-droplet-debate-article> refuted ventilation as #1 prevention measure, noting “lack of infection spread in hospital settings with universal masking protocols”

- Science Brief: SARS-CoV-2 and Potential Airborne Transmission (05 October 2020) <https://www.cdc.gov/coronavirus/2019-ncov/more/scientific-brief-sars-cov-2.html> “...most infections are spread through close contact, not airborne transmission.” One mention of ‘mask’ on that page.
- Science Brief: Community Use of Cloth Masks to Control the Spread of SARS-CoV-2. (20 Nov 2020) <https://www.cdc.gov/coronavirus/2019-ncov/more/masking-science-sars-cov2.html> “Masks are primarily intended to reduce the emission of virus-laden droplets... Masks also help reduce inhalation of these droplets by the wearer.” 66 mentions of ‘mask’ on that page.
- Strategies to minimize SARS-CoV-2 transmission in classroom settings: Combined impacts of ventilation and mask effective filtration efficiency. (preprint posted January 2021, not peer-reviewed) <https://www.medrxiv.org/content/10.1101/2020.12.31.20249101v1.full>
- CDC Order: Wearing of face masks while on conveyances and at transportation hubs February 2021 <https://www.cdc.gov/quarantine/masks/mask-travel-guidance.html>
- Improve the Fit and Filtration of Your Mask to Reduce the Spread of COVID-19 <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/mask-fit-and-filtration.html> (February 2021) includes notation, “At least 60% of the KN95 masks evaluated by NIOSH did not meet the requirements that they claim to meet.”
- Counterfeit Respirators / Misrepresentation of NIOSH-Approval <https://www.cdc.gov/niosh/npptl/usernotices/counterfeitResp.html> (Update Feb 26, 2021) Lots of illustrations of mask falsely marketed.

## 11. Other Articles

Effectiveness of surgical, KF94, and N95 respirator masks in blocking SARS-CoV-2: a controlled comparison in 7 patients <https://pubmed.ncbi.nlm.nih.gov/32845196/>

Alpine Ski Resorts are requiring FFP2 masks, even on ski lifts. Examples: [https://www.skiamade.com/corona\\_en](https://www.skiamade.com/corona_en) and <https://www.austria.info/en/service-and-facts/coronavirus-information/ski-winter-holidays>

Why 0.3 microns is a good test aerosol for mask standards

"Maximum Penetrating Particle Size" (MPPS) concept explained.

<https://breathesafeair.com/respirator-filtration-mechanisms-mpps/>

In short, if it works well on 0.3 micron aerosols, it will work well on 1 nm particles.

Barriers to new manufacturers of N95 masks getting into hospital-chain supply  
<https://www.baltimoresun.com/featured/sns-coronavirus-mask-warehouse-n95-nurses-reuse-masks-20210302-zbiqkuo7vffnawyzdw5xpjx2i-story.html>

### 12. Still want to do home-made?

- Facebook group: Masks for Performers
- <https://makermask.org/>
- Test details on various materials: Long KD, Woodburn EV, Berg IC, Chen V, Scott WS (October 13, 2020) Measurement of filtration efficiencies of healthcare and consumer materials using modified respirator fit tester setup. PLoS ONE 15(10):e0240499 <https://doi.org/10.1371/journal.pone.0240499>  
Contains link to .docx of their materials tested. Testing done prior to July 2020.

### 13. Information on reusable masks:

- Vogmask (KF94 certified) <https://www.vogmask.com/pages/technical> However, Vogmasks PFE in these other tests was 40-60% due to fit leakage: <https://nirvanabeing.com/wp-content/uploads/2019/11/UW-Air-Pollution-Data-Round-1.pdf> (unclear what year); Vogmask material tested at 95% PFE by smartairfilters.com.
- Cambridge Mask – valved mask, with valve cover included at no extra charge. <https://info.cambridgemask.com/hc/en-us/articles/360049009451-Does-the-PRO-Mask-meets-FFP2-standard-of-protection-> (technical) and <https://info.cambridgemask.com/hc/en-us/articles/360049007371-How-long-can-the-mask-be-used-for-> (duration of use)

How long might viable virus persist on a used ‘reusable’ mask?

- Cotton layer (eg Cambridge Mask) Handle a cotton mask as potentially contaminated until it has dried for 24h. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7706414/> “SARS-CoV-2 remained viable ... throughout a dehydration period of 1 h...No significant loss of infectivity on cotton fabric was noted, indicating SARS-CoV-2 persistence.” <https://www.nature.com/articles/s41598-020-80098-3> “[W]hen applied to 100% cotton fabric, the virus underwent rapid degradation and became undetectable by TCID<sub>50</sub> assay within 24 h.”
- Microfiber = plastic. (eg Vogmask) Persistence on plastics is estimated as 1-2 days.