

[Air Pollution \(/blog/category/air-pollution/\)](/blog/category/air-pollution/)

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Is Washing Masks Effective After Virus Exposure?

📅 2020-03-18 (<https://smartairfilters.com/en/blog/washing-masks-effective-virus/>) 👤 Paddy Robertson
(<https://smartairfilters.com/en/blog/author/paddy/>) 📁 Coronavirus
(<https://smartairfilters.com/en/blog/category/coronavirus/>), Masks
(<https://smartairfilters.com/en/blog/category/masks/>)



With the shortage of masks (<https://time.com/5785223/medical-masks-coronavirus-covid-19/>), during the coronavirus outbreak, many people are wondering if washing masks is an effective way of cleaning them, to let you re-use them.

What about washing them? Was there a test done for washing and how?

^ 0 v

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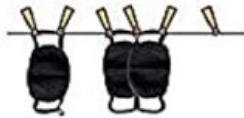
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2020-03-09 1:13 am

There are companies that claim to have washable anti-pollution masks. This company in India claims their mask is washable and can capture air pollution, bacteria, and “germs.”

WASHABLE MASK

Medilink Anti Pollution mask for Protection against air pollution, bacteria, smoke, germs, diseases, infection (many times washable mask and reusable mask) (Set of 6 black Masks) by Medilink



10 Days Returnable

Available from these sellers.

Select delivery location

Color name: Medilink Black Mask set of 6



- 8 in One Protection: Protect yourself from allergies, dust, breathing diseases, ischemic

Yet one thing that seems to be lacking is any actual data on this question—until now.

The Test: Washing Masks with Soap & Water

Smart Air tested this by washing a dirty 3M N95 mask our engineer Paddy had been using during the coronavirus outbreak.

Step 1: Use a Met One GT-521 (<https://metone.com/products/gt-521s-handheld-particle-counter/>) laser particle counter to test what percentage of tiny 0.3 micron particles the mask filters.

Read more: Here's why these 0.3 micron particles (<https://smartairfilters.com/en/blog/what-is-pm0-3-why-important/>). are they key for mask effectiveness.

Step 2: Wash in soap and water. Smart Air used Walch hand soap, which claims to remove 99.9% of bacteria, although it doesn't say how effective it is at removing viruses.

Step 3: After drying overnight, test mask particle capture again.

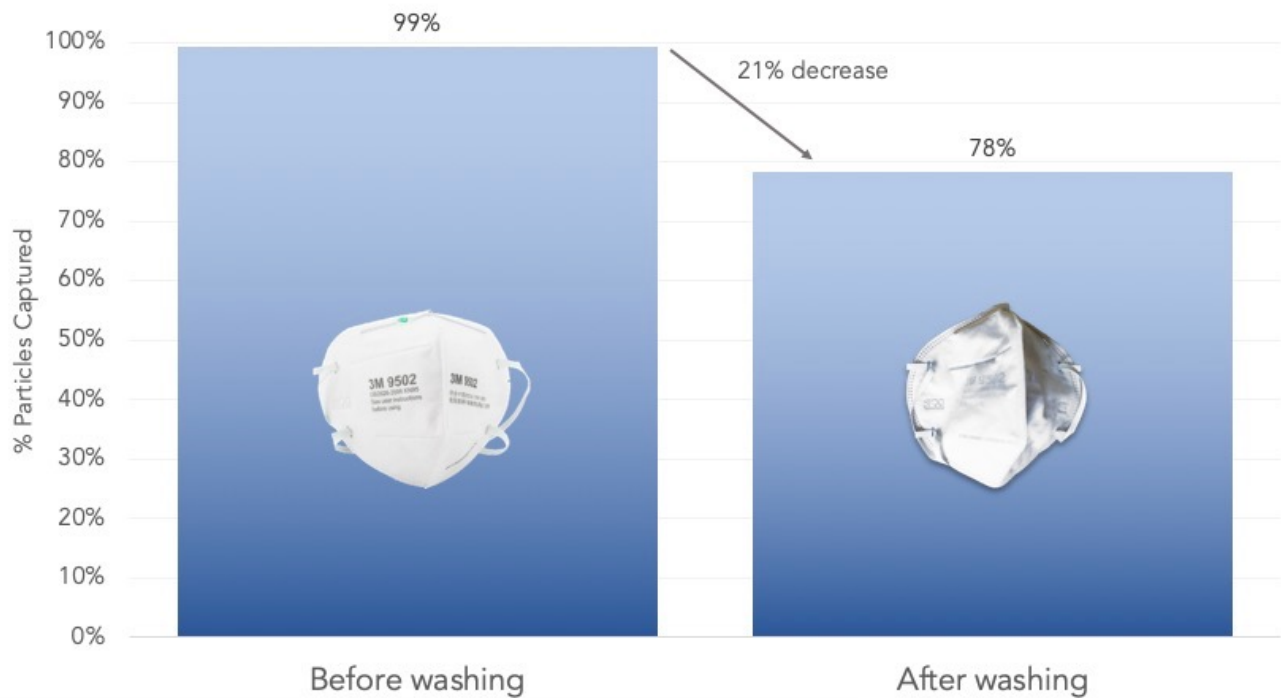


Testing Mask Filtration Effectiveness

Although the mask was used for over a week, it still very captured 99% of particles. This fits with previous Smart Air results where masks retained effectiveness nearly unaffected after being worn 11 days (<https://smartairfilters.com/en/blog/how-long-masks-last/>), 20 days, and even 30 days (<https://smartairfilters.com/en/blog/how-long-air-pollution-masks-last-lifespan-data/>).

However, washing the mask was much worse than natural “aging.” Washing decreased particle capture by 21%.

Washing Mask Decreases Effectiveness 21%



That is still better than the effectiveness of some surgical masks (<https://smartairfilters.com/en/blog/do-pollution-masks-work/>), but it's a large drop.

Why Is Washing Masks So Harmful?

The answer to this question lies in the fibers masks are made from. Many N95 and other pollution masks are made from a mat of randomly aligned, very thin fibers.



Manufacturers then give these sheets an electrostatic charge.

See More: 3M explains static charge in masks in this video.



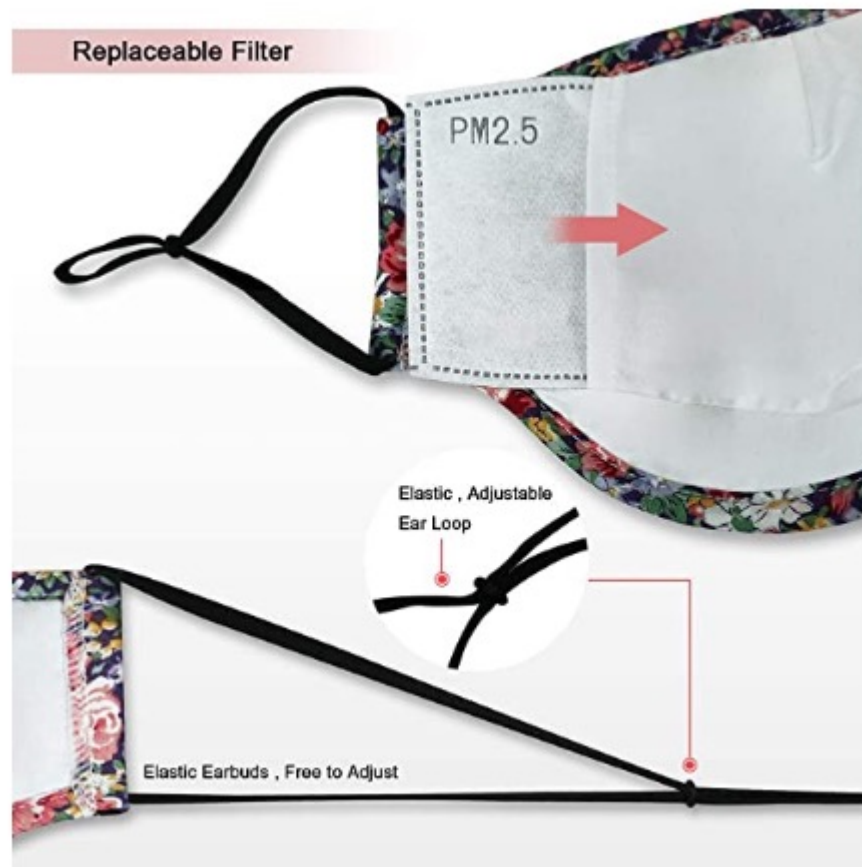
Washing removes that static electric charge, which decreases performance. Vigorous washing may also damage the fibers, making it easier for particles to pass through.

Bottom line: Washing masks with soap and water decreases particle capture effectiveness. Washing is not a solution for extending mask lifespan.

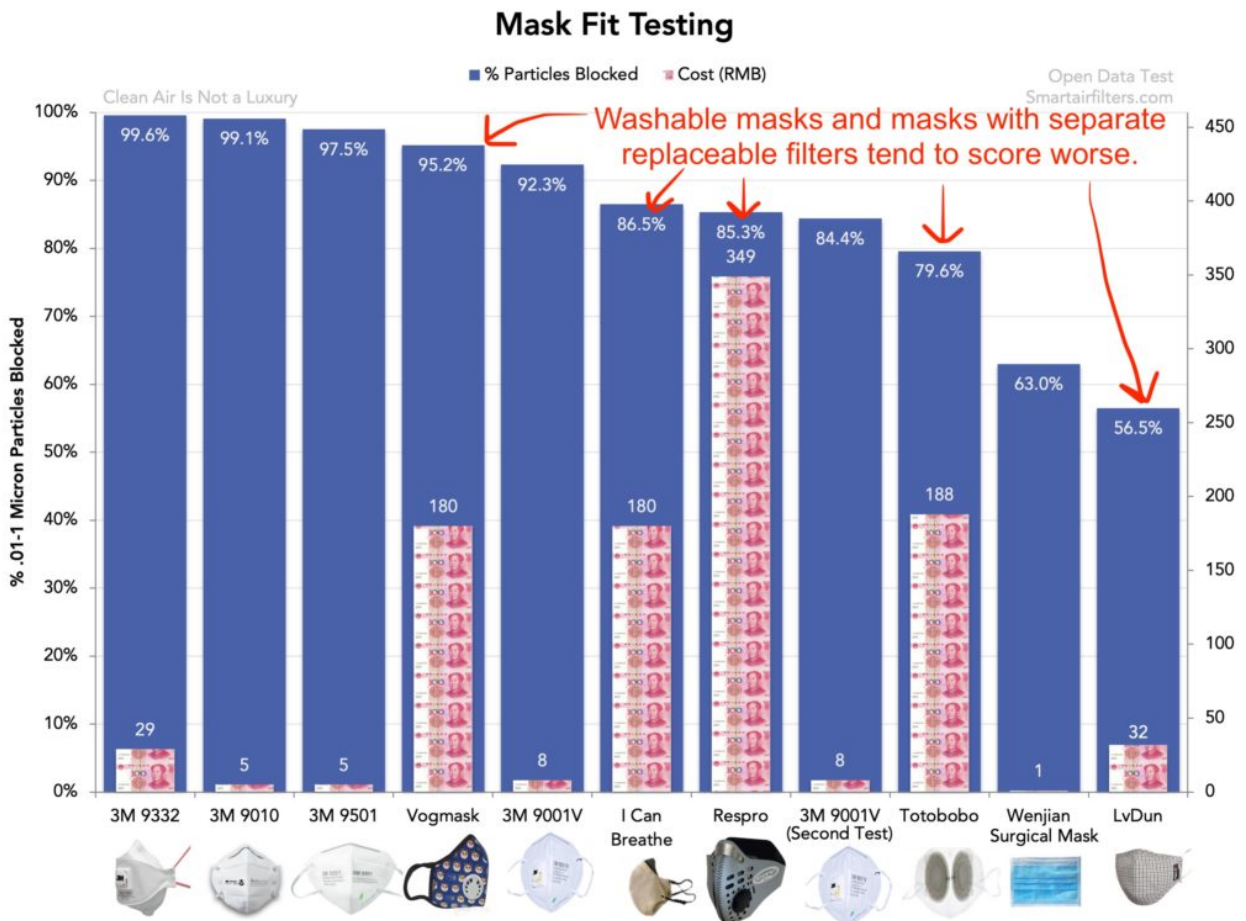
Why Do Some Companies Claim to Have Washable Masks?

Companies might not know that washing mask filter media can drastically reduce effectiveness. Or maybe the masks claiming to be washable aren't actually N95 standard masks, but just cotton masks that can be washed with potentially less damage to the fibers.

Another common so-called "washable" masks is made up of a washable cotton mask and a non-washable N95 filter.



Yet this filter still can't be washed. What's more, masks with replaceable filters tend to score worse on fit tests (<https://www.ncbi.nlm.nih.gov/pubmed/20359769>) than 3M N95 masks. That pattern is clear in mask fit tests (<http://www.myhealthbeijing.com/children/my-personal-fit-testing-heres-the-best-pollution-mask-for-me/>), run by Beijing-based doctor Richard Saint Cyr.



Is Washing Masks with Alcohol Effective?

Perhaps another solution for washing masks is alcohol. If soap and water require rubbing, maybe alcohol will do less harm because it can disinfect without rubbing.

A group of researchers at the National Institute for Occupational Safety and Health tested N95 masks (<https://www.ncbi.nlm.nih.gov/pubmed/10957816>) before and after dipping them in rubbing alcohol. After drying overnight, the masks captured 37% less particulate on average.

Disinfecting Masks in Rubbing Alcohol Drops Effectiveness

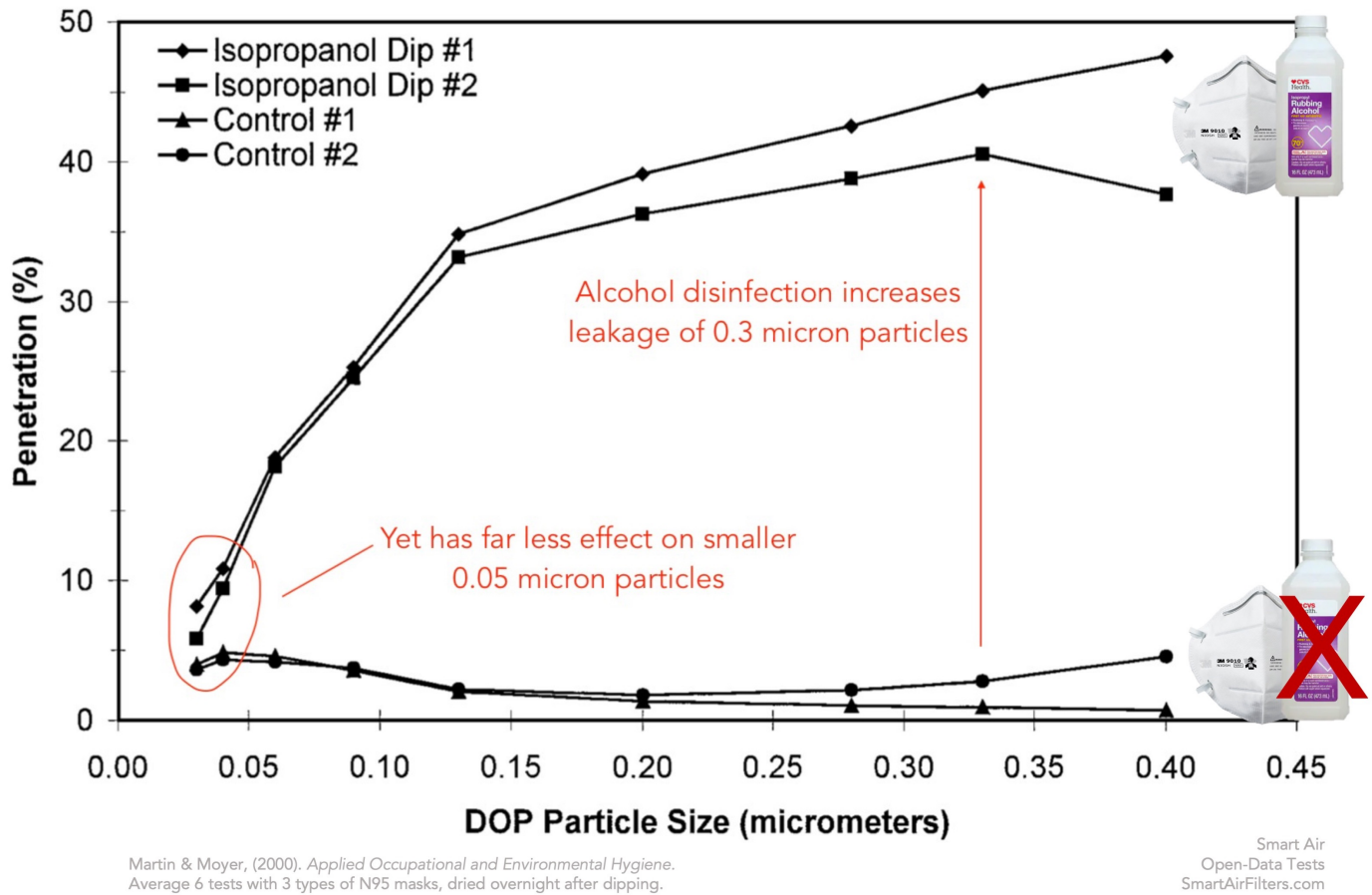


Martin & Moyer, (2000). *Applied Occupational and Environmental Hygiene*.
Average 6 tests with 3 types of N95 masks, dried overnight after dipping.

Open-Data Tests
SmartAirFilters.com

To be fair, this test exaggerates the harm. That's because the test above was for particle sizes that are the most likely to be affected by alcohol treatment. Many masks capture particles in the range around 0.3 microns using fibers with static charge. Dipping in alcohol removes this charge (<https://search.proquest.com/docview/236317922>).

However, when the researchers looked at even smaller particles, they found out alcohol sterilization did much less harm.



Read more: [This is why \(https://smartairfilters.com/en/blog/can-hepa-filters-capture-nanoparticles/\)](https://smartairfilters.com/en/blog/can-hepa-filters-capture-nanoparticles/) the graph above makes no intuitive sense but is real.

Looking for an effective way of cleaning your mask from viruses?

Coming soon: Check out this method of killing viruses without affecting mask performance!

Get the latest clean air tips!

Get updates on masks, air purifiers and air quality delivered straight to your inbox.

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CORONAVIRUS & MASKS LIVESTREAM

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(/redirect/?r=<https://www.facebook.com/smartairfilters/videos/1097078063991680/>).

Paddy Robertson (<https://smartairfilters.com/en/blog/author/paddy/>)

Paddy is the CEO of Smart Air, running operations from Beijing. He's has a Masters in aeronautical engineering from Bristol University, UK having specialised in aerodynamics. An advocate for open data, free information and transparent business, he spends his spare time promoting honest business and social enterprise.



Here's what else you should know about:



N95 Masks vs. Surgical Masks: Which Is Better at Preventing The Coronavirus?
(<https://smartairfilters.com/en/blog/n95-mask-surgical-prevent-transmission-coronavirus/?rel=1>).



Can You

Clean or Wash HEPA filters? (<https://smartairfilters.com/en/blog/wash-clean-hepa/?rel=1>).



[What combination of air filters do I need to protect against everything?](https://smartairfilters.com/en/blog/what-combination-of-air-filters-do-i-need-to-protect-against-everything/?rel=1)
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Karen Busch



What about fabric interfacing or used dryer sheets to add as a filter?

2020-03-22 12:29 am

Ben



Thanks for this, very informative. Interesting to learn that masks are still effective after 30 days of usage. That's about how long I usually use mine. What about spraying alcohol onto the outer surface of an N95/99 mask with a perfume type spray? I have been doing this on clothes and products after going

shopping. I wonder if this would still remove the static charge, or if being sprayed rather than dunked would be less damaging? Probably the best solution though is to put your mask in direct sunlight after returning home when possible. I've been timing my shopping trips... Read more »

2020-03-21 12:05 pm

David R AuBuchon



I think the system ate some of my other comments. Sorry if this is duplicate, but would you guys consider testing filtration of some other home materials like folded toilet paper of a commonly available brand, baby wipes, maybe a moist paper towel, an intentionally weakened vacuum cleaner bag (i.e. soak in water), possibly a piece of reusable cloth shopping bag? Thanks.

2020-03-20 6:18 am ^

Liz - Smart Air



Hi David, we hear you, all of you!!! A batch of tests on more materials is coming up soon! Stay tuned!

2020-03-20 2:52 pm ^

David R AuBuchon



Awesome. Also consider testing like a folder up handkerchief as tons if DIY mask videos using this method are going around:

https://www.youtube.com/watch?v=wEQHuM_sDX4
(https://www.youtube.com/watch?v=wEQHuM_sDX4)

2020-03-21 1:34 pm

David R AuBuchon



And as if I'm not spamming your blog enough, try layers in series, such as a handkerchief, paper towel, and toilet paper sandwiched together. Intuitively that wouldn't help, but data trumps intuition.

2020-03-21 1:45 pm

Kelly



Helpful information. I had another idea: I read that the new Corona virus can live on surfaces for up to 3 days. (<https://abcnews.go.com/Health/covid19-days-surfaces-experiment-findings/story?id=69569397>) I already read your article that stated that 'disposable masks' stay good for at least 30 days. But with a virus,

of course you don't want to wear it for 30 days, have potentially more and more of the virus accumulate and increase the risk of getting it on your fingers for example. So my idea: buy 4 masks , alternate wearing them. After you wear mask 1 for example, you can put it in a closed... Read more »

2020-03-20 5:22 am ^

David R AuBuchon



I had the same thought. I think the concern there is other germs like bacteria building up. I wonder if enclosing masks in a bag full of ozone gas would do the trick.

2020-03-20 6:19 am

b q



Timely article! Last sentence though, it looks like it's missing a link to an article describing how to kill viruses?

2020-03-19 7:57 am ^

Liz - Smart Air



Hi bq, thanks for pointing that out! This article is coming soon! We are working on the last part of it now! Stay tuned!

2020-03-19 12:25 pm ^

b q



Ok, great. Can't wait!

2020-03-19 1:02 pm

◀ Comparison of Mask Standards, Ratings and Filtration Effectiveness
(<https://smartairfilters.com/en/blog/comparison-mask-standard-rating-effectiveness/>)

Smart Air is a social enterprise based in China, India, Mongolia and the Philippines that creates simple, no-nonsense air purifiers and provides free education to combat the impacts of air pollution. More about who the heck we are (</en/about/our-story/>)



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