“Nanofiber masks can be sterilized multiple times without filter performance deterioration, unlike N95 masks “ phys.org 17 June 2020

Comparison of N95 and Nanofiber Facemask

Amidst the current social backdrop, a research team led by Professor Ick Soo Kim of Shinshu University's Institute for Fiber Engineering (IFES) with Ph.D. students Sana Ullah and Azeem Ullah and Professor Cha Hyung Joon of POSTECH studied the effectiveness of sterilizing N95 masks.

They looked at commercially available melt-blown nonwoven fabric N95 masks and Nanofiber masks with Nanofiber filtration.

They examined the filtration efficiency, comfort of the wearer, and filter shape change after washing and disinfecting

Nanofiber VS Melt-blown filters

With the global spread of coronavirus infections, personal protective equipment, especially face masks, are receiving attention from HR departments.

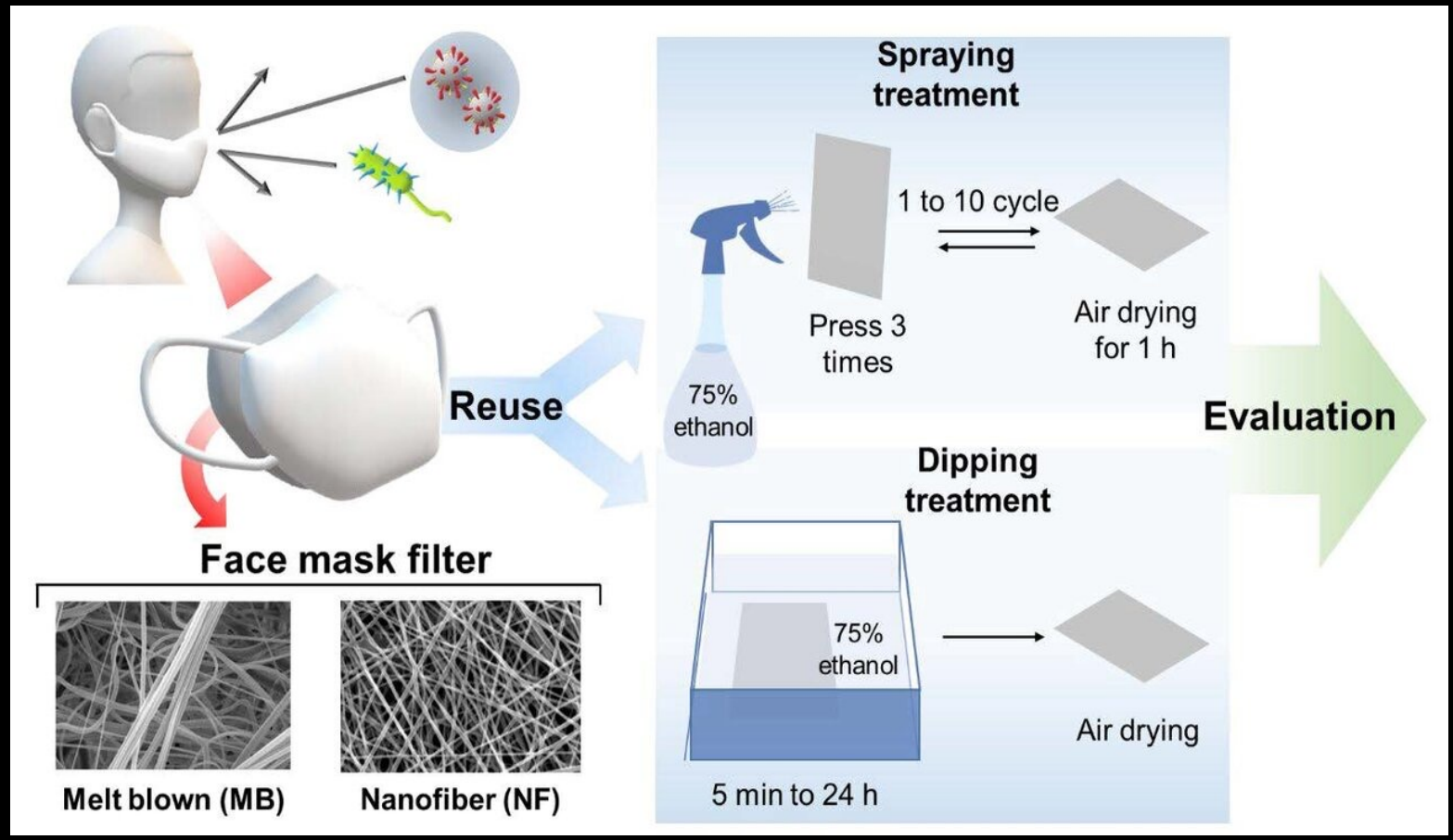
Masks are essential items for the primary protection of the respiratory tract from viruses and bacteria that are transmitted through the air as droplets and as mandates are lifted by Government, the burden now shifts to the private sector and to protecting employees against infectious agents.

The N95 little “secret” you cannot clean it!

N95 masks are currently difficult to obtain, so there is an urgent need for a safe method of prolonging their usability through disinfection and reuse with minimal loss of performance and integrity. Particulate filtration and air permeability are key factors in determining performance while cleaning and disinfecting N95 certified masks. This is crucial in preventing infections. However, research shows that after prolonged use and just one washing filtration reduces over 62% and renders the mask useless.

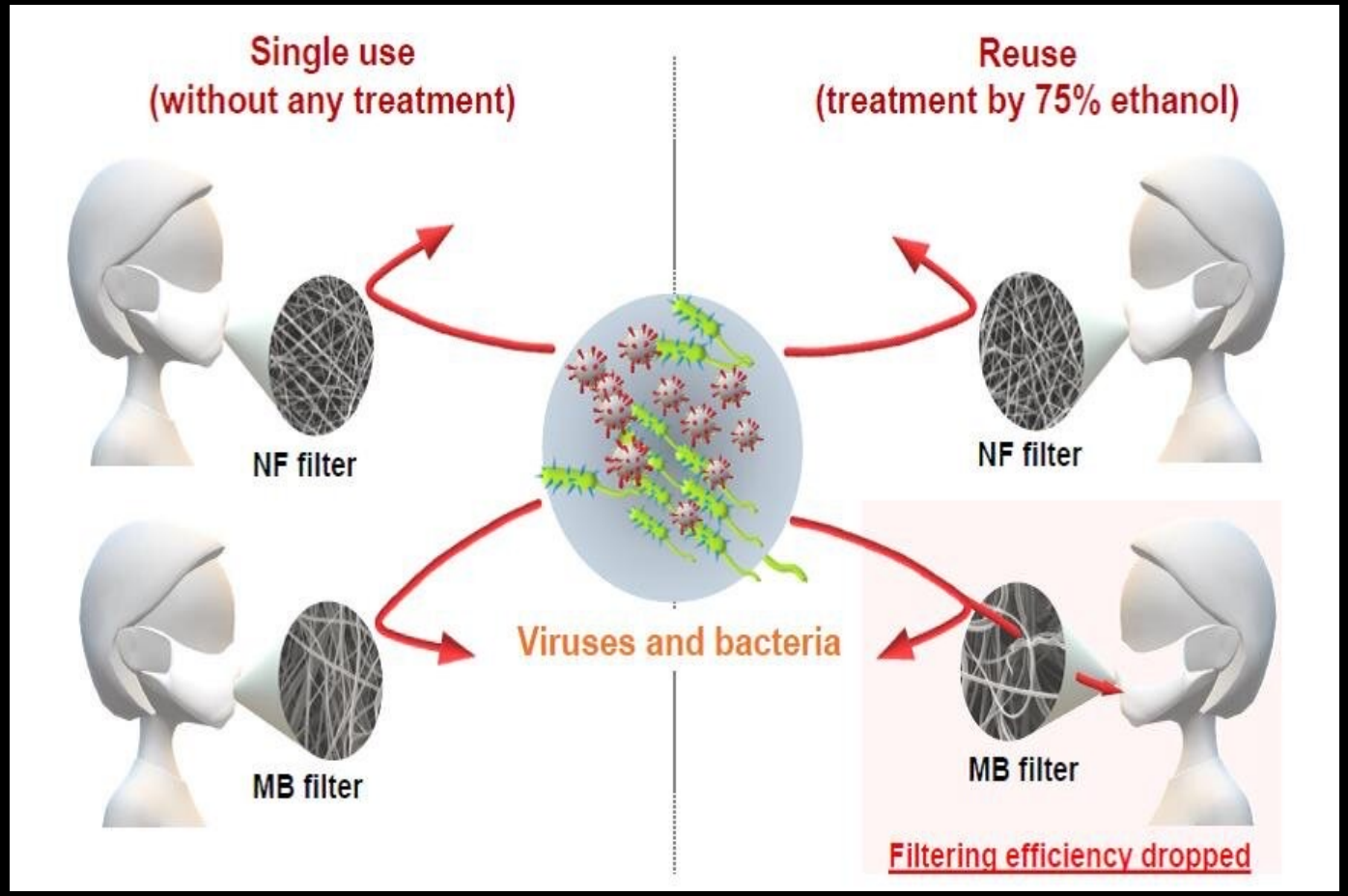
Methodology of cleaning and N95 and Nanofiber face masks

The methods of disinfection test involved directly spraying 75% ethanol on the mask filter air drying and soaking the masks in 75% ethanol solution for 5 minutes to 24 hours and leaving it to air dry naturally.



THE RESULTS ARE IN!

Filtration efficiency of both filters (melt-blown filter and the nanofiber filter) was 95% or more before use, which indicates that the respiratory organs of the wearer can be effectively protected. The tests also clarified that the inside of the filter can be effectively sterilized by spraying ethanol 3 times or more or immersing it in an ethanol solution for more than 5 minutes**. However, when the mask was reused after the ethanol disinfection, the filtration efficiency of the melt-blown filter decreased to 64% HOWEVER the nanofiber filter did not deteriorate in filter performance even after 10 or more uses**.



Melt Blown
”MB”

Melt-blown filters work on the principle of electrostatic charge for the removal of particulate matter, as in the result of ethanol spraying or dipping the electrostatic charge on the surface of melt-blown filter was lost, so efficiency of melt- blown filter was significantly decreased.

Nano Fiber
”NF”

Nanofiber is INDEPENDENT of static charge and fully DEPENDANT on pore diameter, pore distribution and morphology of nanofibers. As a result of ethanol spraying morphology of nanofibers was NOT affected , thus maintaining filtration of 95%

Nanofiber out-performs Melt-blown in every measurement

- Nanofiber filter has higher heat emission and carbon dioxide emission performance than the melt-blown filter
- Nanofiber exhibits excellent breathability.
- Nanofiber had lower cytotoxicity than the melt- blown filter when a safety experiment using human skin and vascular cells was performed.

After disinfecting

- The nanofiber filter has air permeability even after being washed.
- The melt-blown filter has its mesh structure changed by ethanol sterilization and its performance is deteriorated. Credit: © 2020 American Chemical
- Both mask filters have similar filtering performance at the time of first use, but after disinfecting and reusing, the nanofiber filter does not exhibit performance deterioration.
- Nanofiber masks can be easily sterilized with ethanol at home and reused multiple times.

"This research is an experimental verification of the biological safety of nanofiber masks and the maintenance of filtration efficiency after washing, which has recently become a problem and nanofiber masks will serve as a means of prevention in the second and third wave of coronavirus infections “

Both mask filters have similar filtering performance at the time of first use, but after disinfecting and reusing, the nanofiber filter does not exhibit performance deterioration. nanofiber masks can be easily sterilized with ethanol at home and reused multiple times.

And the best news…..
Our filtration 99.9%BFE which is better than an N95!!!

The “Secret Sauce” is what you CANNOT SEE…..

Microscopic images of our proprietary nanofiber that you cannot see with the naked eye. The larger shapes are the fabric you can see.