

Optimized HEPA-filtered Air Mask

VTIP 19-082: “Air Mask”

THE CHALLENGE

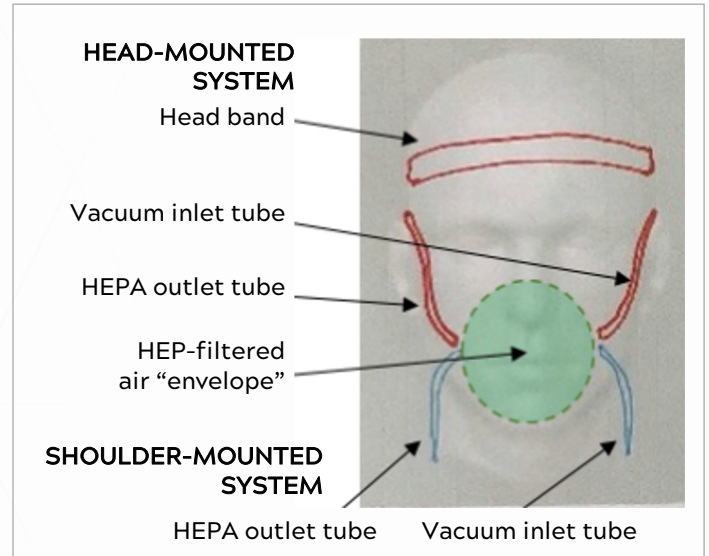
The basic design of protective masks and respirators has not changed for more than 50 years. Conventional masks can be uncomfortable and poorly fitted. Discomfort often leads to wearers removing masks and poor fitting can result in particle leakage into the breathing zone and loss of protection. In both cases, the wearer is at risk, making more comfortable and reliable alternatives much needed.

OUR SOLUTION

Researchers at Virginia Tech have developed a novel air mask that is a more comfortable and effective alternative to filter-based masks. It can be used to provide personal respiratory protection against exposures to nano- to micro-scale particles in air. Furthermore, the mask does not contact the face or nose and would be less likely to be affected by facial features.

Particle Reduction (compared with N95 mask):

- < 0.3 micron particle reduction: 86%
- < 0.5 microns particle reduction: 86%
- < 1 micron particle reduction: 90%
- < 3 micron particle reduction: 96%
- < 5 micron particle reduction: 97%
- < 10 micron particle reduction: 93%



Front view of air mask diagram.



Photograph of proof-of-concept testing.



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