Mask Filtration Background

What makes filter masks so effective is that there is no direct path through the fibers that make up the filtration material. Therefore the airflow and the particles it carries must turn and weave their way through the tortuous path of the filter media. Large particle greater than around 0.6 um in diameter are usually captured when the particle can't make the turn around a fiber due to its inertia and it impacts on a fiber. The random movement of very small particles (around 0.1 microns in diameter), because they are too small to be carried away in the airflow, cause them to accidentally come into contact with fibers and get trapped. Therefore it is not the largest or the smallest particles that are the hardest to trap but the particles that are greater than 0.1 micron and less than 0.6 micron. These particles are large enough to be picked up by the airflow yet small enough to travel with the airflow around most fibers. Particles of 0.3 microns are therefore considered to be the most difficult particles to trap and the object test size for the most stringent requirements for NIOSH certification of an N95 Respirator.

There are therefore three (3) testing protocols that evaluate filtering masks for filtering efficiency. The Bacterial Filtration Efficiency (BFE) test for filtering masks challenges them with bacteria that are 3 microns in size (and around the size for most bacteria) to see what percentage of large particles they trap. All of our masks trap at least 99% of large particles. The Particle Filtration Efficiency (PFE) test for filtering masks challenges them with small latex particles that are 0.1 micron in diameter. Here as well, all of our masks trap at least 99% of these small particles. These test results were performed by Nelson Laboratories, an independent test laboratory. The NIOSH (N95) test challenges the masks with NaCl that are 0.3 micron, the most difficult to trap. To receive N95 Certification, a mask must filter 95% of these particles and even N95 masks can only assure that less than 5% of these particles can pass through the filter media. We also have a line of N95 masks that offer this level of protection against these difficult to trap particles.

All of these filtration specifications are completely dependent on there being no leak around the mask. SoftSeal masks were specifically designed to provide a 360 degree seal with the face. Because one size of mask cannot not effectively seal to the faces of all users, SoftSeal masks come in multiple sizes to fit children to large adults. The SEAL to the face is the most critical element in protecting the lungs.

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