

Medical Face Mask Material Requirements by Performance Level

ASTM Minimal Barrier Standard	LEVEL 1	LEVEL 2	LEVEL 3
Bacterial filtration efficiency (BFE%)	≥95	≥98	≥98
Differential pressure, mm H ₂ O/cm ²	<4.0	<5.0	<5.0
Sub-micron particulate filtration efficiency at 0.1 micron, (PFE %)	≥95%	≥98%	≥98%
Fluid resistance to penetration by synthetic blood, minimum pressure in mm Hg for pass result	80	120	160
Flame spread	Class 1	Class 1	Class 1

Choosing the right level of protection is dependent on the surrounding environmental risk potentials

Important Information Regarding Surgical and N95 Protective Masks

Is an N95 approved respirator or face mask required to protect you from airborne pathogens? Are surgical masks “useless”? Good question since there is so much conflicting information out there! The short answer is that N95 or higher rated masks provide the maximum protection at filtering out airborne pathogens. N95 has a bacterial filtration efficiency (BFE %) of 99%. A few masks rated N99 have a BFE % of 99.9%. What about respirators / masks that do not meet those standards? Lower rated respirators / masks are generally grouped into one of three categories. ASTM Levels 1, 2, or 3. If you look at the chart above, you will see that ASTM level 2 and level 3 have a BFE of 98%. Whereas ASTM level 1 still has a BFA of 95%.

So, why such a difference in ratings? The primary feature where there is a significant difference in performance between these categories is in Fluid Resistance. This measure is determined by launching synthetic blood at a specified velocity and measuring the resistance to penetration. The higher the number, the better the mask is rated for Fluid Resistance.

What if I find a surgical mask without any ASTM rating? Many surgical mask manufacturers simply do not have the resources to send their mask for NIOSH or ASTM testing (it is by no means free). However, as a general rule of thumb most all 3 ply surgical masks contain the same components as an ASTM level 1 rated mask, meaning they have a BFE of up to 95%. Even 2 ply surgical masks generally provide a BFE of 80% - 90%, which is certainly better than nothing. In fact, logic would dictate that if two 2 ply surgical masks were worn doubled up, you would be wearing at least the equivalent of a 3 or 4 ply mask. Even mask that are rated as just “dust masks” can be double, or even triple layered to boost effectiveness.



ULTRA SPEC 3 ply Earloop Surgical Face Mask (BFE 95%)

What is the bottom line? For health care professionals performing a procedure that could involve expected exposure to blood or other bodily fluids, the higher fluid resistant masks would be preferred protection. However, for an average person wanting to protect themselves from airborne pathogens, a respirator / mask with an ASTM level as low as 1 still provides a bacterial filtration efficiency of 95%, which provides a very good measure of protection. And even non ASTM rated surgical masks can boast of a BFE of 95% in the three ply variety and up to 90% in the 2 ply variety. That is certainly better than a handkerchief, or nothing at all. Also, consider other ancillary benefits of wearing any mask. First, it prevents you from reflexively touching your nose or mouth. Lastly, if you are ill, it prevents transmission to others.