

Medical face masks are made from spunbonded, non-woven polypropylene and worn to prevent the transmission of potentially infectious airborne organisms. They can be worn with eye protection, such as goggles or a face shield, to protect the wearer in situations where there is a risk of blood and body fluid splashes.



When selecting medical face masks it is important to consider the level of protection required. A good quality medical mask is made up of 3 layers (known as a 3-ply mask). They can also be made up of 4 layers and these are known as a 4-ply mask.

The three layers of a 3-ply mask are:

- an inner hydrophilic layer, which absorbs moisture from the wearer
- a middle meltblown filter layer
- an outer hydrophobic layer, which repels water

Below we have outlined the factors to consider when selecting a medical face mask, the characteristics of a good mask fit and points to consider when wearing a face mask.

## THINGS TO CONSIDER

The most important criteria to consider when selecting medical face masks are the bacterial filtration efficiency (BFE) and the fluid resistance. Another important factor to consider is the breathability of the mask – how easily can the wearer breathe while wearing the mask.

Bacterial filtration efficiency, fluid resistance and breathability, are discussed below using the Australian Standard, 4381:2015 Single use face masks for use in health care, as the benchmark for a face mask used in a healthcare setting. This Standard specifies the filtration efficiency, fluid resistance and breathability required, based on the level of risk that the wearer may be exposed to (refer Table 1 below).

Table 1 AS 4381:2015 Single use face masks for use in health care

Parameters	Level 1	Level 2	Level 3	Test Method
Bacterial Efficiency (BFE) %	≥ 95	≥ 98	≥ 98	ASTM F2101-14 or EN 14683:2014
Breathability (Delta P) mm H <sub>2</sub> O/cm <sup>2</sup>	< 4.0	< 5.0	< 5.0	EN 14683:2014
Fluid resistance (mm Hg)	80	120	160	ASTM F1862/F1862M-13 or ISO 22609

Level 1 – Use for general purpose where there is no risk of exposure to blood or body fluid splash

Level 2 – For use where minimal exposure to blood or body fluid splash may occur

Level 3 – For use where the risk of exposure to blood or body fluid splash is high

### Bacterial filtration efficiency (BFE)

This is a measure of how well the mask filters bacteria and is quoted in %

### Fluid resistance

This value is a measure of the masks ability to minimise fluids travelling through the mask material and is quoted in mm Hg. The greater the fluid resistance of a mask, the lower will be the potential exposure to blood and body fluids caused by splashes.

### Breathability

The breathability or Delta P value of a surgical face mask measures how easily the wearer can breathe while wearing the mask. The higher the Delta P value the more difficult the mask is to breathe through. People with breathing difficulties, such as asthma, may need to wear a mask with a lower Delta P value.

## FACE MASK FIT

The fit of a mask is another important consideration, as its filtering efficiency is only as good as its fit. The protection capability of a face mask with a high filtering efficiency may be compromised if the mask is loosely fitting with gaps around the edges. The greater the edge leakage of a face mask, the lower the actual “in use” Bacterial Filtration Efficiency is.

Face masks are available with ties or ear loops to secure the mask to the face. The mask should cover the nose and mouth of the wearer and be secured to minimise any gaps between the mask and the wearer's face. The nose wire should be fitted to the contour of the nose bridge.

## **POINTS TO CONSIDER WHEN WEARING A MEDICAL FACE MASK**

- Do not touch the mask while wearing
- Replace the mask when it becomes wet with a clean, dry one (masks become less efficient when they are wet)
- Face masks are a disposable item and must be discarded after a single use.
- Dispose of the mask as clinical waste as soon as the procedure is finished
- Decontaminate hands thoroughly after mask disposal
- A new mask should be worn for each patient

## **FINAL THOUGHTS**

Selecting medical face masks with the level of protection required depends on filtration efficiency, fluid resistance and breathability. To check the level of protection of these features, ask the supplier for a copy of the test results before purchasing.