What is the difference between a P2 respirator and the surgical masks I have always used?

Surgical masks (even those that meet Australian Standard AS 4381) are made and worn to protect the patient/surgical field from contamination by the doctor or health care worker. They will intercept large droplets etc leaving the mouth. They do not form a tight fit on the face of the wearer or provide any significant respiratory protection against airborne transmitted particles.

Respirators that meet AS/NZS1716 are designed and tested to provide respiratory protection to the wearer. They are tested to ensure they can get facial fit on a wide variety of face sizes and achieve an acceptable filtration performance. Face fit is crucial to provide a barrier to the passage of particles into the lungs. All individual users of respirators should be fit tested to confirm that a particular respirator model can achieve an effective fit on their face.

What’s a P2 respirator?

A P2 is an AS/NZS1716 rated particle filter for use with mechanically and thermally generated particles - these are also the recommended type for use for infectious diseases. The USA’s equivalent rating for these respirators is called an N95.

What guidance do we have in selecting the correct respirator?

Two Australian Standards that pertain to respiratory protection. AS/NZS1715 is for the user and is called “Selection, use & maintenance of respiratory protective devices”. AS/NZS1716 provides the information required to test the performance of respirators. Requirements for respiratory protection for infectious diseases is given in the “Interim Infection Control Guidelines for Pandemic Influenza in Healthcare and Community Settings” (June 2006) from the Federal Department of Health & Ageing. To provide respiratory protection to health care workers in exposed situations, this recommends use of P2 respirators as the first level response. These align with the approach by the World Health Organisation, the USA’s CDC and other national health authorities.

How do particle filters work?

A bed of randomly oriented fibres is used to attract and trap particles as they flow into and through the filter material. Particle filters are tested against a test aerosol and must meet certain filtration performance. The filter classification achieved (e.g. P2) then indicates what level of protection and what applications the product is suited for. P2 filter are known to effectively capture particles in the sub micron range and so are suitable for very small particulates like bacteria or viruses (although these are normally associated into or onto larger droplets or aerosols).
Respirators and infectious diseases

<table>
<thead>
<tr>
<th>Microorganism (common name or disease)</th>
<th>Physical Size (μm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hepatitis virus (Hepatitis B)</td>
<td>0.042 – 0.047</td>
</tr>
<tr>
<td>Adenovirus (respiratory infections)</td>
<td>0.07 – 0.09</td>
</tr>
<tr>
<td>Filovirus (Ebola)</td>
<td>0.08 diameter 0.79-0.97 length</td>
</tr>
<tr>
<td>Orthomyxoviridae (Influenza A, B, &amp; C)</td>
<td>0.08-0.12</td>
</tr>
<tr>
<td>Coronaviridae (SARS –CoV)</td>
<td>0.10-0.12</td>
</tr>
</tbody>
</table>
| Variola Virus (Smallpox)               | 0.14 – 0.26 diameter  
                                         | 0.22-0.45 length  |
| Mycobacterium tuberculosis (TB)        | Droplet nuclei that contain the organism often cited as 1 – 5 μm in diameter, but may be smaller. |
| Bacillus anthracis spore (Anthrax infection) | 1.0 – 1.5 diameter |

**Are there situations where P2 masks must not be used?**

There are several applications where particle filters should NOT be used:

- When the ambient Oxygen level is not guaranteed to be > 19.5%.
- For capture of gases or vapours.
- For persons with beards or other facial hair that interferes with the faceseal.

**Why can't bearded people wear tight fitting half or full face respirators?**

Laboratory and workplace testing has shown that the presence of facial hair (including significant stubble) between the face and the mask-sealing surfaces acts to hold the mask off the face and allow air and contaminants to bypass the filters and enter into the breathing zone. A drastic reduction in the protection level of the respirator will occur. People in this situation can get respiratory protection by wearing an appropriate head covering connected to a Powered Air Purifying Respirator (PAPR) or a supplied airline system. With an appropriate headtop with an effective seal (e.g. under the chin or around the neck), suitable respiratory protection can be achieved.
Respirators and infectious diseases

How do you check if a respirator fits?

For tight fitting masks, the wearer should first be fit tested to show that he/she is able to get an effective faceseal when using that particular respirator (as recommended by AS/NZS1715). One way this can be done is using the 3M Fit Test Kit FT-10. Using a saccharin mist spray to test the performance of the faceseal gives the wearer an easily identifiable sweet taste if the faceseal is ineffective. This allows an adjustment of the face fit or highlights the need to use a different model of mask that better fits that individual’s facial contours. In addition, each time a mask is put on, the wearer should do a fit check to ensure an effective seal is achieved. Instructions for donning and fit checking are on the packaging.

How long will my P2 mask last?

There are three main considerations:

- If the mask is contaminated with infectious materials, it should be replaced after each use.
- For high particle exposures, the mask will load up with particles and become harder to breathe through. When the wearer notices this restriction and considers it is too high, change the mask – this situation is unlikely in the health care situation.
- If the filter is damaged in any way e.g. broken straps - replace it.

For more information please contact your 3M representative or
3M TechAssist Helpline on 1800 024 464 or techassist@mmm.com
3M Aust Customer Service 1300 363 565
Website www.3m.com/au/ohs

3M Occupational Health and Environmental Safety Division
3M Australia Pty Limited
ABN 90 000 100 096
950 Pacific Highway
Pymble NSW 2073