Respirator Selection and Fit-testing Guide

1. Purpose

This document provides guidance on the appropriate selection and fit testing for the range of respirators that may be used in research, teaching and/or event activities conducted at the University of Newcastle.

2. Scope

This guideline applies to all staff, students, visitors (volunteers, contractors etc), for activities conducted by the University of Newcastle both on and off-campus where respiratory protection is required to reduce the level of exposure to a hazardous material. This guide is based on Australia & New Zealand 1715 Selection, use and maintenance of respiratory protective equipment. This document provides a brief overview, for comprehensive guidance, please refer to the standards.

3. Fit-testing

3.1 Do I need to be fit tested?

If you are required to wear a close-fitting respirator for your work, then YES!

This includes disposable respirators with a performance rating (P1/P2, N95), all reusable half-face (P2), full-face (P3) and Powered Air-Purifying Respirators (PAPR) where a face-fit is required.

It is not required for masks that are not close-fitting such as surgical masks, or respirators that are of the loose-fit hood type and operate under positive pressure.

The respirator will only provide the rated level of protection if it passes a fit test.

3.2 How often do I need to be fit tested?

At least on an annual basis, or where a change in fit is observed due to changes in facial structure.

3.3 On the day

If you have facial hair, you must be clean shaven to all areas where the respirator will make contact with your face (this will also be a requirement for use of the respirator day-to-day).

Make sure that the fit-testing provider is aware of the make and model of your respirator beforehand to ensure that they have the right attachments for their equipment. Note, you are

often required to **take your own mask for fit-testing**, so make sure you check the instructions prior to attending appointment

Refer to **Attachment 1** for facial hair requirements for the purpose of achieving adequate seal with respirators.

3.4 What is involved?

Fit testing is performed by one of two methods. 1) Qualitative, which involves a user response to sense stimuli such as smell, taste or cough reflex, and 2)Quantitative, which measures numerical leakage around the face seal and provide a fit factor their use. The university will opt for quantitative fit-testing of all respirators to avoid false negatives that rely on user senses.

4. Respirator Selection

Respirators should only be relied upon to reduce residual risk to an acceptable level (where controls are already in place), or where there is no other option to reduce exposure risk. Respirators rely heavily on the training and behaviour of users and should therefore be a last resort option.

Close fitting respirators (also known as tight fitting) are any type of respirator (masks) that are designed to provide protection to the user from exposure to aerosolised substances in the environment. The designation of close fitting is based on the requirement of the respirator to form a tight, effective seal in order to perform the rated level of protection.

As per AS/NZS 1715 there are 3 different classes of particulate filters, P1, P2 and P3.

The negative pressure particulate categories are based facepiece coverage. All particulate filtering facepieces that cover the nose and mouth area only can achieve only a P1 or P2 classification. A P3 classification can ONLY be achieved when worn with a full facepiece.

- **Class P1** particulate filters are used against mechanically generated particulates
- **Class P2** particulate filters are used for protection against mechanically and thermally generated particulates or both
- **Class P3** particulate filters are used for protection against highly toxic or highly irritant particulates **NOTE: In Australia, P3 is only applicable to full-face respirators and must achieve the corresponding fit factor. Half-face respirators with a P3 filter will be considered P2 protection level.**

Filter Type	Colour	Main area of application
A	Brown	Certain organic vapours (boiling point above 65ºC) from solvents such as those in paints and thinners
B	Grey	Acid gases such as chlorine and hydrogen sulfide (sulphide)
E	Yellow	Sulfur dioxide

ABE	Brown Grey Yellow	Suitable for both certain organic vapours/acid gases and sulfur dioxide e.g. solvents, chlorine and sulfur dioxide
K	Green	Ammonia gas
ABEK	Brown Grey Yellow Green	Suitable for both certain organic vapours/acid gases, sulfur dioxide and ammonia

NOTE: certain contaminants may have specific respiratory selection criteria outside this guide e.g. asbestos.

5. Respirator Use

As a part of daily work activities, you will need follow a documented process for the type of respirator that you wear and how to check that it is fitted correctly.

Steps for putting on and fit-check of a disposable respirator:

1. Remove glasses and hats. Tie back long hair so it does not become tangled in the straps of the mask
2. Place your chin into the bottom of the respirator first then hold the respirator onto your face
3. Pull over the bottom strap over your head and position around the back of the neck
4. Pull over the top strap and position at the back of your head.
5. Adjust the respirator on your face, ensuring the nose piece at the top is pinched in around the bridge of your nose.
6. Conduct a fit check: Check the seal of the mask by covering as much of the front of the mask as you can with your hands and gently blowing out. If you feel air leaks around the face seal, readjust the mask and repeat the process or check for defects in the mask. If you cannot stop leaks you may need to try a different size or style of mask.

Steps for putting on and fit-check of a reusable negative pressure respirator:

1. Fit respirator in accordance with specific instructions for the make and model
2. Perform a positive pressure test by blocking the exhalation valves and gently breathing out.
3. The respirator should remained bulged whilst the valve is blocked and no leaks should be observed around the edges of the face seal.
4. Next, block the filter cartridge(s) and gently inhale to perform a negative pressure test
5. The respirator should collapse slightly and no leaks should be observed around the edges of the face seal.

Follow these processes each time you need to put on your respirator for use.

6. Maintenance for reusable Respirators

6.1. Filters

There will be varying requirements for filter and cartridge replacement depending on the type of filter, manufacturer and frequency of use. Some models such as the Sundstrom SR100 have a prefilter pad that can be placed over the first filter in the stack to minimise nuisance dust loading on the more expensive particulate filter.

Refer to the manufacturer's instructions on frequency for recommended replacement.

6.2. Cleaning and maintenance

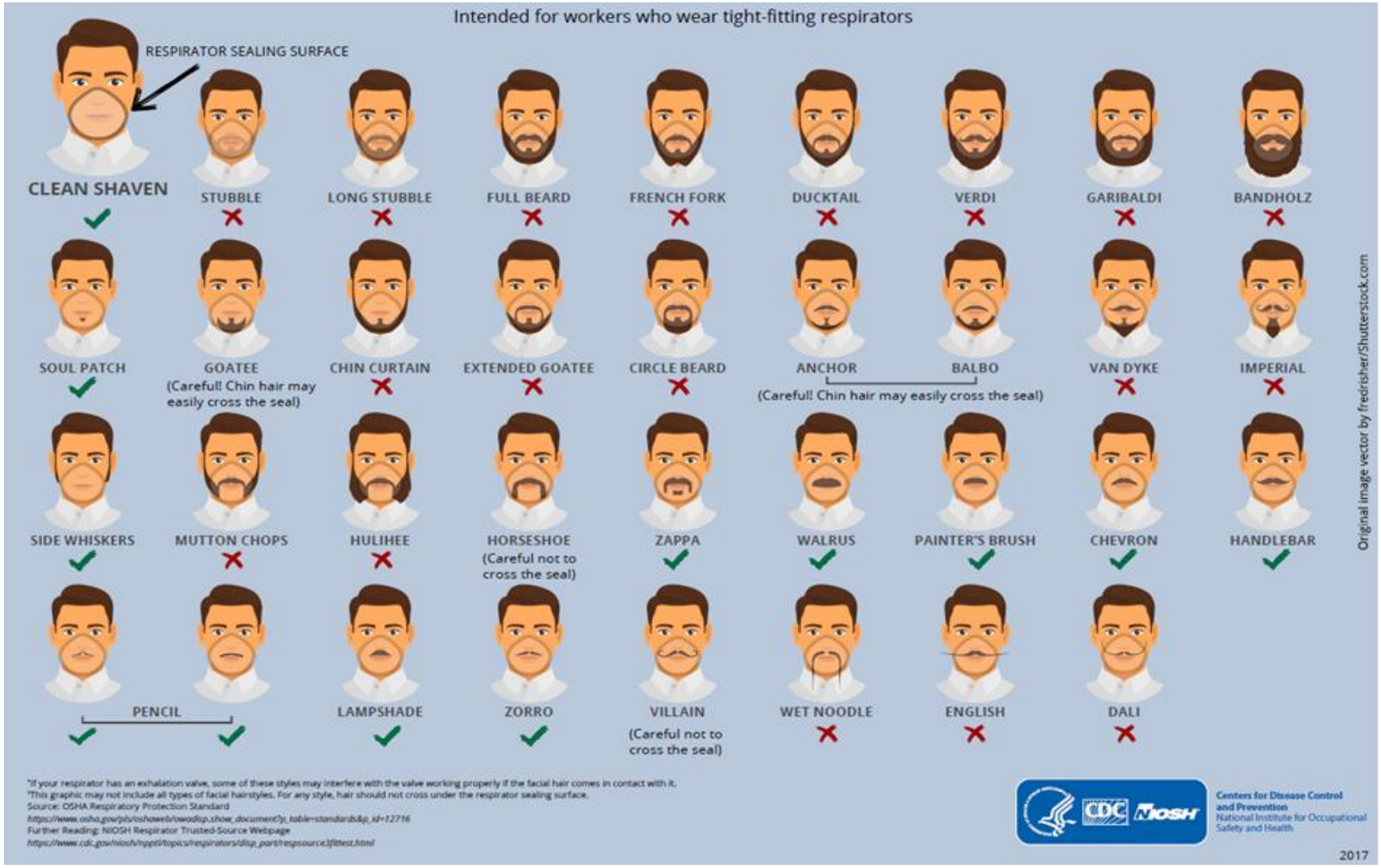
Follow the specific manufacturer's instructions for maintenance and cleaning. These instructions will vary based on design and frequency of use.

As a basic guide:

- Wipe the exterior surfaces with wet wipes after used to remove dust
- Wipe interior surfaces with alcohol wipes after use to prevent microbial growth and allow to air dry.
- Do not store the respirator in a container if it has any moisture, as mould will grow on porous surfaces.
- Replace pre-filters regularly if they are included on the device
- Check strap condition.
- Store in a dry location, and regularly inspect each component of the respirator
- Keep a log of filter replacement dates.

See respirator examples in **Attachment 2**

APPENDIX 1: FACIAL HAIRSTYLES FOR EFFECTIVE SEAL



Source: US Centre for Disease Control and Prevention / National Institute for Occupational Safety and Health

APPENDIX 2: RESPIRATOR EXAMPLES

P2 Half-face

FIT TEST REQUIRED

P1/P2 Disposable

FIT TEST REQUIRED

P3 Full-face

FIT TEST REQUIRED

Fitted PAPR

FIT TEST REQUIRED

Positive Pressure Hood or Loose-fit

FIT TEST NOT REQUIRED

Surgical Mask

FIT TEST NOT REQUIRED