

Fit testing for tight-fitting respirators

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The purpose of this safety alert is to highlight the importance of fit testing for tight-fitting respirators for workers who need to use them, and to reinforce this requirement under the Work Health and Safety Regulation 2011.

Background

Tight-fitting respirators (often referred to as masks) rely on having a good seal with the wearer's face. These are available as both non-powered and powered respirators and breathing apparatus (BA) with either a half mask or a full-face mask. Their performance, irrespective of whether they are non-powered (negative pressure), powered or constant-flow airline BA relies heavily on the quality of fit of the respirator to the wearer's face. Section 44 of the [Work Health and Safety Regulation 2011](#) places obligations on a person conducting a business or undertaking PCBU to ensure personal protective equipment (PPE) (including respirators) is a suitable size, fit and reasonably comfortable for the worker who is to use or wear it.

Contributing factors

People's faces vary significantly in shape and size so it is unlikely that one particular model or size of respirator will fit everyone. Inadequate fit will significantly reduce the protection provided to the wearer and can result in immediate and/or long-term health effects.

Fit testing (using a validated protocol) is required to ensure tight-fitting respirators are a suitable fit. It involves checking that a specific model and size of tight-fitting respirator matches the wearer's facial features and seals adequately to the wearer's face and is an essential step in the respirator selection process. It will also help to identify unsuitable respirators (which should not be used).

Tight-fitting powered or constant-flow airline BA respirators under positive pressure still require fit testing as studies have shown that during heavy exertion, inward leakage is possible. Powered or constant-flow airline BA respirators which incorporate loose-fitting hoods or helmets do not require fit testing.

Workers must pass a respirator fit test before they first start wearing a tight-fitting respirator. It is not necessary to undertake a fit-test when you are simply replacing a respirator with the exact same make and model you have already been successfully fit-tested to (this goes for both disposable and reusable respirators).

Note:

A fit-check does not replace the need for a fit-test. Fit-checking is a quick check to ensure the respirator, which has already been fit-tested, has been properly positioned on the face and there is a good seal between the respirator and face. Each time a tight-fitting respirator is put on, the wearer should carry out a fit check, following the manufacturer's instructions.

Action required

Key points

There are two basic types of respiratory protective equipment (RPE) fit testing – qualitative and quantitative:

1. Qualitative fit testing is a pass/fail test that relies on the wearer's ability to taste or smell a test agent. This type of test is only suitable to test half-face disposable and reusable respirators but is not suitable for full-face respirators. Although this type of test is based on subjective detection and response by the wearer of the RPE, it is important that it is administered by a fit tester competent in using this method.

Note:

Where the test subject is unable to detect either of the saccharin or Bittrex test agents, quantitative fit testing must be used.

2. Quantitative fit testing (QNFT) provides a numerical measure of how well a facepiece seals against a wearer's face and this is called a fit factor. These tests give an objective measure of face fit. QNFT methods are suitable for disposable and reusable half masks and full-face masks. Examples of QNFT methods are:
 - a. ambient particle counting
 - b. controlled negative pressure (CNP).

Where it is not possible to achieve a suitable fit using tight-fitting respirators, RPE that does not rely on a tight-fitting face seal should be used, such as a loose-fitting respirator hood or helmet.

Who can conduct fit testing?

You should take steps to ensure that person who carries out the fit test is appropriately trained, qualified, and experienced, and has, at a minimum, the following competencies:

- knowledge of the respirators used for the fit test
- knowledge of the fit-test method
- ability to set up all applicable equipment and monitor its function
- ability to carry out the test and evaluate the results
- ability to identify likely causes of fit-test failure.

Fit testing can be carried out in a range of settings, including mobile testing units, specialist facilities or in-house using the appropriate equipment.

Fit testing frequency

In addition to testing before a make/model of respirator is used for the first time, fit testing should be repeated:

- at least annually
- whenever there is a change to the circumstances of the wearer that could alter the fit of the RPE, for example:
 - weight loss or gain
 - substantial dental work
 - any facial changes (e.g. scars, moles, effects of ageing) in the area where the respirator seals to the face
 - facial piercings
 - introduction or change in other head-worn PPE.

Fit testing protocols

There are a number of validated protocols including:

- ISO 16975-3, INDG-479 (UK)
- ANSI Z.88.10 (US)
- OSHA 1910.134 (US).

The most commonly used protocol in Australia would be the OSHA 1910.134 (US). Whatever protocol is selected, the specific requirements of that protocol must be followed which is the responsibility of the competent fit tester to achieve a reliable outcome.

Facial hair

PCBUs must ensure workers who undergo fit-testing, or are required to wear tight-fitting respirators during work, are:

- clean-shaven; or
- have no facial hair in the area where the respirator seals to the face.

Workplace Health and Safety Queensland does not accept or recognise any fit test, regardless of the outcome, which:

- occurred whilst the wearer had facial hair in the area where the respirator seals to the face; or
- which incorporates the use of beard covering techniques (including the Singh Thattha technique which involves the use of an exercise resistance band wrapped around a wearers chin/beard and tied up on top of the head to create a smoother surface over the beard or facial hair, aiming for a better sealing surface area).

All international standards, including AS/NZS 1715:2009, ISO 16975-3, OSHA 1910.134 and others, clearly state that there should be no facial hair on a wearers' face underneath a tight-fitting respirator sealing surface area. Facial hair prevents an adequate seal from being achieved, and the level of protection is neither reliable nor predictable.

Further information

- [Respiratory protective equipment \(RPE\)](#)
- [Fit testing requirements for tight-fitting respirators brochure](#) (PDF, 0.86 MB)
- [RESP-FIT resources](#)
- [Respiratory Protection for Healthcare Experts webinar](#)

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