

HS926 Protocol: Face Fit Test

For respirators

Never Stand Still

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Related documents:	HS659 Personal Protective Equipment Guideline

1. Purpose

A face fit test is used to assess the adequacy of a respirator fit on an individual's face. This is a qualitative pass/fail test relying on the individual's response to the test agent.

This test is needed for negative pressure respirators (half and full face piece air purifying respirators) or positive pressure tight-fitting respirators. Air-purifying respirators do not need to be fit tested.

The test should be carried out on all workers who are required to use a tight-fitting respirator as identified in the risk management form for their work. The individual will need a repeat test if they

- change to using another type of respirator
- loss or gain of significant weight;
- undergo any substantial dental work or
- develop facial imperfections (scars, moles, etc) around the face seal area

2. Scope

Applies to all UNSW workers who are required to wear disposable or half-face respirators.

3. Definitions

No terms have been defined

4. Protocol statement

Follow this protocol for carrying out face fit testing.

4.1 Test equipment

3M Qualitative Fit Test

- Hood
- Collar
- Nebulizer # 1 (Sensitivity)
- Nebulizer # 2 (Fit test)
- Nebulizer inserts x 2
- Sensitivity Solution (sweet)

- Fit test solution (sweet)
- Sensitivity solution (bitter)
- Fit test solution (bitter)

Other items needed to perform the test

- Test report form (and pen)
- A watch/clock
- Water
- Chair
- Private room with good ventilation near to a toilet
- Spare information sheets to provide to the test subject

A test takes about 30 minutes per person.

Provide the Face Fit Test Information Sheet (at end of this document) to the test subject in advance so that they are familiar with the procedure and know what to expect.

4.2 Preparing the Equipment

- Attach the hood to the collar. Tighten draw string and tie a knot
- Pour approx. 1 teaspoon of the 'Sensitivity Test Solution' into the nebuliser labelled 'Sensitivity Test Solution'.
- Pour the same amount (1 teaspoon) of the 'Fit Test Solution' into the nebuliser labelled 'Fit Test Solution'.
- Immediately re-cap the bottles.

On average one teaspoon should be enough to test 10 people. Each test solution bottle should be able to test about 150 people.

Have blank test report forms available to complete during the test.

Check that the nebuliser isn't blocked (saccharin can sometimes crystallise). Spraying in front of a dark background makes it easier to see the fine mist emerging from the spout. Use the pins provided to unblock nebulisers.

4.3 Sensitivity Test

This test is to assure that the subject can detect the sweet taste of the test solution at very low levels. The sensitivity test solution is a very dilute version of the Fit Test Solution.

Check that the subject has not eaten, drunk (except water) or chewed gum for 30 minutes before the test. If a smoker, check when they had their last cigarette.

- Put the hood and collar assembly on the test subject without a respirator.
- Position the hood assembly forward so that there is about 6 inches between the test subject's face and the hood window.
- Instruct the test subject to breathe through his/her mouth with their tongue slightly extended.
- Using the 'Sensitivity Test Solution' remove both plugs from the openings, keep the nebuliser upright and inject the aerosol into the hood.
- Inject 10 squeezes of the bulb allowing the bulb to fully collapse and expand.
- Ask the test subject if they can taste the solution.
- If tasted note the number of squeezes as 10 and proceed to the Fit Test
- If not tasted, inject a further 10 doses into the hood, repeat with 10 more if necessary
- Note whether 10, 20 or 30 doses produced a taste response

- If no taste is detected after 30 doses end the sensitivity test. Try the bitter taste test agent instead and follow the steps above.
- Remove the test hood and allow the test subject a few minutes to clear the taste from their mouth. It may be helpful to allow them to have a drink of water. If possible ask them to wash their hands, face and lips to remove any trace amounts of the sensitivity solution.

4.4 Fit Test

Explain to the subject that if at any time they taste the test agent during the test, then they must indicate this immediately.

- Ask the subject to don their respirator and perform a positive and negative user seal check as per the instructions provided on the respirator package.
- The subject should wear any applicable safety equipment (e.g. safety glasses) that they may wear in normal working conditions that could interfere with the respirator fit.
- The test subject should put on the hood as before.
- Using the 'Fit Test Solution' nebuliser inject the same number of squeezes as was required in the Sensitivity Test (i.e. 10, 20 or 30)
- In order to maintain an adequate concentration of aerosol during the test inject one half of the number of squeezes (i.e. 5, 10 or 15) every 30 seconds for the duration of the test.
- After the initial injection of aerosol, ask the subject to perform the following test exercises for 60 seconds each:
 - a. Normal breathing
 - b. Deep breathing
 - c. Turning head side to side, inhale at each side
 - d. Moving head up and down, inhale in the up position
 - e. Talking – use the rainbow passage (appendix 1) or ask them to count backward from 100 or to tell you about their research project
 - f. Bending over from the waist or jog on the spot
 - g. Normal breathing.

Periodically check the nebulizer to make sure that it is not clogged. If clogging is found, clean the nebuliser and retest.

4.5 Test pass

If the entire test is completed without the subject detecting the agent, the test is a pass and the respirator fit has been demonstrated.

The subject can continue to wear this respirator; however they will need a repeat test if they meet any of the requirements in section 1.

Before taking off the hood ask the person to put their hand inside the hood and then, with one finger, break the seal of the respirator on their face. Ask them to take a breath through their mouth. They will probably grimace in surprise at the sudden taste of the strong solution inside the hood. This is a very good way of building people's confidence in the respirator, because they will realise that if it can be this effective at keeping out an apparently high concentration of test agent for so long, then it will be able to protect them in the workplace, provided they have been careful to fit it correctly each time.

4.6 Test failure

The test is terminated if at any time the subject tastes the agent, because this indicates an inadequate fit.

Step 1

- Wait at least 15 minutes and perform the sensitivity test again.
- Readjust on the face, tighten the strap, try a different size
- A second failure will indicate the need for a different type of respirator.
- Only 2 tests are allowed to be carried out on the same make, model and size of respirator.

Step 2

- Arrange a re-test with a different make/model/size of respirator.

Step 3

- If they still fail, a battery powered or compressed air supplied respirators (except where they are tight fitting) may be a useful alternative for a person who has had difficulty in passing a face fit test as these respirators do not require face fit testing.

Beard, stubble, thick sideburns, long hair or moustache in the region where a face mask is intended to seal to the face will cause leakage. In addition, deep cuts or scars, wrinkles, moles, warts etc. can affect the seal of masks to the face. If these cannot be avoided consider the use of loose-fitting respirators which do not rely on a tight seal in this region.

4.7 Cleaning

- Dismantle the nebulisers, discard un-used test solution – do not pour solutions back into bottles.
- Rinse the nebulisers with warm water to prevent clogging and shake dry.
- Wipe inside of the hood with a damp cloth to remove any deposited test solution.

5. Roles and responsibilities

HS staff – Carry out face fit test and report back to the workers and their supervisor.

Supervisors – identify all workers who require a face fit test and direct them to get a face fit test.

Worker – Have a face fit test carried out where required or wear alternative respiratory protection. Notify their supervisor if there are any changes as outlined in section 1 that may require a re-test.

6. Acknowledgements

<http://multimedia.3m.com/mws/mediawebserver?66666UuZjcFSLXTtmxMX5xf6EVuQEcuZgVs6EVs6E666666-->

<http://www.hse.gov.uk/pubns/priced/hsg53.pdf>

Rainbow passage

When the sunlight strikes raindrops in the air, they act like a prism and form a rainbow. The rainbow is a division of white light into many beautiful colours. These take the shape of a long round arch, with its path high above, and its two ends apparently beyond the horizon. There is, according to legend, a boiling pot of gold at one end. People look, but no one ever finds it. When a man looks for something beyond reach, his friends say he is looking for the pot of gold at the end of the rainbow

FACE FIT TEST INFORMATION SHEET



Introduction

Respirators filter out fine particles so it's very important that you get a good, tight seal when wearing one. Otherwise, particles that should be filtered through the respirator can get into your airway through gaps around the respirator's edge. A face fit test is carried out to check this seal and thus evidence that you are getting the protection you need.

A fit test is needed for negative pressure respirators (half and full face piece air purifying respirators) or positive pressure tight-fitting respirators. Air-purifying respirators do not need to be fit tested.

If it is mandatory for you to wear a respirator then you must have a face fit test. If you wear a respirator by choice then the fit test is optional.

Surgical masks

These are mainly good for keeping healthcare providers from transmitting pathogens to patients and for blocking large drops, splashes and sprays of potentially-infectious fluids from reaching the wearer's nose or mouth. They are not appropriate for protection against airborne contaminants

Before the test

You should not eat, drink (except water) or chew gum for 30 minutes before the test. Also refrain from smoking for at least one hour prior to the fit test. This reduces the risk of food or drink consumed earlier leaving a residual taste in the mouth that could be confused with a fit test failure.

Any beard, stubble, thick sideburns, long hair or moustache in the region where a face mask is intended to seal to the face will cause leakage. If this facial hair cannot be eliminated, you should consider the use of loose-fitting respirators which do not rely on a tight seal in this region.

A respirator requires an extra effort to breathe through, which can put a strain on the body, especially over extended periods. You need to be aware of symptoms and signs indicating that you might not be healthy enough to wear a respirator. For example, shortness of breath, elevated heart rate, and dizziness could indicate an underlying medical condition. Also relevant are day-to-day coughs, colds and skin conditions. Some workers who have a fear of tight or enclosed spaces may also have difficulty wearing a respirator.

What to take with you

If you normally wear other protective equipment with your respirator that could interfere with the fit (e.g. safety glasses, hard hat etc.) then you should take these along to your test.

Take one of the respirator(s) that you normally wear. If you wear several different types take one of each type with you. You will need to be fit tested for each separately.

During the test

You will be exposed to a fine mist of either

- Water and sodium saccharin or
- Water, sodium chloride and denatonium benzoate. Denatonium benzoate is a very bitter chemical used to keep children from ingesting certain consumer products.

You will be asked to don your respirator and perform a pre-use fit check as per manufacturer's instructions.

PRE USE FIT TEST

Negative Pressure Test:

- Don the respirator according to the manufacturer's instructions.
- Cover and seal the filter cartridge(s) using the palm of your hand(s).
- Gently *inhale* through the respirator and hold your breath approximately 10 seconds.
- The respirator should collapse slightly. Check, feel and listen for leaks around the face piece.
- If it remains slightly collapsed and there are no leaks, it can be reasonably assumed that there is a good seal and the respirator is not leaking.

Positive Pressure Test:

- Cover the exhalation valve with the palm of your hand.
- Gently *exhale* but do not break the seal around the face piece.
- The respirator should expand slightly with a slight positive pressure increase in the face piece.
- If there are no leaks and no loss of pressure, it can be reasonably assumed that there is a good seal.

You will be asked to perform simple tasks like turning your head, deep breathing, reading a passage, bending, jogging on the spot. If you cannot do any of these the tester will find an alternative task.

After the test

You will be told whether the test was successful, meaning the respirator is a good fit and provides protection to you against the contaminant. The Fit Test Report will be provided to your supervisor to maintain on your personal records. You can continue to wear the respirator you were tested with.

If the respirator doesn't fit

If after a repeated test a good fit is still not found you will be asked to try alternative respirators (different size/style/brand/etc). You may need to return at another time to repeat the test to ensure there is no residue of the test solutions.

You should never wear a respirator that does not fit you as it does not provide you with adequate protection.

How often the test is carried out

You will need another fit test if you

- change to using another type of respirator
- lose or gain weight;
- undergo any substantial dental work or
- develop facial imperfections (scars, moles, etc.) around the face seal area