Guide to using the 3M Qualitative Fit Test Kits

3M

Purpose of the guide

The purpose of this training pack is to provide practical information on how to use the 3M Qualitative Fit Test Kit. It should be used in conjunction with the user instructions and training video supplied with every kit.

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Section 1: Getting Started

1. Equipment and materials you will need

- 3M™ Fit Test Kit FT10 (sweet) or FT30 (bitter) – see Note 1.
- Set of alternative nebulisers and solutions FT11 & 12 (sweet) or FT31 & 31(bitter)- Optional - see Note 1
- Training CD on how to use the kit (inside every kit) - see Note 2
- Training CD on how to correctly fit 3M tight fitting respirators - Optional - see Note 2

Note 1: The choice of bitter or sweet is a matter of individual preference. We suggest you get bottles of both so that you have an alternative in case someone cannot taste one of them. It is very unusual for someone to be unable to taste either. If this occurs the person will need to be fit tested by another method (e.g. Quantitative Testing – see Appendix 1 para 6.2). For more information on spares and consumables for the Fit Test Kits see Section 3.

Note 2: For a free copy of these CDs call the 3M Health and Safety Helpline and ask for CHTRNCD. This CD contains both videos - how to use the 3M fit test kit and and how to correctly fit the 3M respirators.

3M Health and Safety Helpline - 0870 60 800 60 (UK) 1-800 320 500 (Ireland)

2. Preparation and practice

What to do first:

2.1 Read the user instructions contained inside the fit test kit

2.2 Read this document

2.3 Learn how to fit the respirators you will be testing in accordance with the manufacturer's instructions. There are often differences in the fitting procedure for different models of respirator.

You must be confident you can demonstrate the correct fitting procedure. Study the printed user instructions that come with each 3M respirator and **watch the relevant fitting video**.

KEYPOINT:
Lack of knowledge on how to fit a respirator and lack of care taken during the fitting procedure are two of the most common reasons why people fail a fit test the first time but then go on to pass at the second attempt.

Familiarise yourself with other features of the 3M respirators you will be testing such as how to fit and remove replaceable filters, or carry out important pre-use or after-use checks. Support material is available to aid your understanding of our products via our helpline.

Technical data sheets are available from the Helpline to aid your understanding of our products.

2.4 Practice fit testing first on a colleague
Practice a few times before conducting your first actual fit test.

2.5 Read HSE supporting material
Study the HSE Information Document 282/28 on Fit Testing. This can be downloaded from the HSE website at www.hse.gov.uk (type HSE 282/28 in the search box).

2.6 Create a 'Crib sheet' or 'Memory Jogger'
This will help you remember all the steps involved in the test. See our example on page 12.

3. Equipment and Facilities

You will need the following on the day of the test:

- Fit Test Kit (and alternative tasting solutions)
- Record sheets (see suggested record card Appendix 2)
- Clock or watch with second hand
- Typed copy of 'Rainbow' passage in a large font for easy readability (see page 14)
- Jug of water and glasses – preferably from a dispenser to avoid the fit test aerosol contaminating the water and glasses
- Spare nebulisers (if possible, as these can get blocked)
- Nebuliser 'pin' kit (to clear any obstruction if it gets blocked)
- Samples of respirator to be tested
- Selection of alternative models in case of failures
- Table (big enough to lay out the Fit Test Kit)
- Room with good ventilation to conduct fit test & separate area/room for those waiting to be tested
- Room should be located near a toilet to allow hand/face washing post fit-test

Section 2: Suggested Protocol

4. Pre test-day preparation

4.1 Communicate to persons to be Fit Tested:

(i) Time slots
We suggest each person has a specific 30 minute time slot for each respirator being tested.

TIP: It's best to fit test people individually so that they are not distracted by other people in the room. Each test takes 20-40 minutes depending on whether the person passes first time. Time slots help avoid people waiting around.

(ii) Arriving on time
Ask them to arrive on-time and be cleanly shaven

(iii) Eating and drinking beforehand
They should not eat or drink anything other than water within 30 minutes of their allocated time-slot.

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.

(iv) Provision of respirators for the test
Make it clear if people should bring their own, or if you will provide identical models (sizes where appropriate) for the tests.

This applies if respirators have already been issued and fit testing is being carried out retrospectively.

If respirators have not already been issued, explain that one will be specified and provided at the time of the test.

(v) Sensitivity Test

TIP: If it is possible to do so, conduct the sensitivity test on a different day from the actual fit test.

This reduces the risk of a false failure caused by any solution from the sensitivity test that might remain in trace quantities on the hands, face or lips, being tasted during the actual fit test. If it is not practical to do this then be very careful to avoid cross contamination by asking the person to wash their hands, face and lips, especially after the sensitivity test and before starting the fit test.

4.2 Check the equipment you need

(i) Nebulisers:
Ensure they are washed and rinsed and that they work properly.

Saccharin can sometimes crystallise and block the nebuliser. If this happens the bulb becomes hard to squeeze and no aerosol comes out. Use the pins provided to unblock nebulisers. Spraying in front of a dark background makes it easier to see the fine mist emerging from the spout.

(ii) Test Solutions:
Check you have enough of each of the solutions.

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

TIP: Screw the cap firmly on the bottle to prevent saccharin solution leaking out and crystallising as a white powder around the cap. In particular, try and avoid getting any of the powder into the nebuliser or it may become blocked. If this occurs during a fit test then ideally have a spare one available to use. Otherwise you will have to halt the test, wash the nebuliser using the 'pin' provided to dislodge any blockages, and then start the test again from the beginning. Finally, avoid storing the solutions in a cold place as the saccharin can crystallise into a lump inside the bottle. If this occurs, you may have to leave the bottle in warm water for a while to dissolve the saccharin back into solution. The bitter solution is less prone to crystallising out of solution.

(iii) Respirators
Have enough samples of each respirator you are testing (together with different sizes when applicable). One for each person and a few spares should be enough.

5. On the day of the test

5.1 Assembling the hood

(i) The training video on how to use the Fit Test Kit shows a simple and easy way to fit the hood to the collar.

(ii) Make a 10cm 'gap' between the persons face and the inside of the hood by pulling apart the front and back of the hood at the top. You can clip together the two press-studs on the top corners of the hood to hold it in this shape.

5.2 Preparing the nebulisers – Practical tips

(i) Use the foam block provided in the kit with the round holes as a holder to stand the nebulisers upright and ready for use.

(ii) Don't pour in too much solution. A teaspoon is enough for several people. A quarter teaspoon is more than enough for one person.

(iii) Each nebuliser is marked 'Sensitivity Solution' or 'Fit Test Solution'. DO NOT put the wrong solution into the nebuliser or you risk using the wrong solution in the tests. (The two solutions have different concentrations and should not be mixed or confused with each other).

(iv) Check BOTH nebulisers are working by spraying against a dark background. You should see a fine mist coming from the spout.

(v) Wash your hands afterwards to reduce the risk of surface contamination.

(vi) REMEMBER to remove both plastic plugs when you use the nebuliser (or it won't work!).

5.3 What to tell the person being tested

(i) Purpose of the Test
Explain the purpose of the test and what you want them to do.

KEYPOINT:

(ii) Follow instructions given
Explain that the test is very rigorous and it is possible to taste very tiny amounts of the solution should they get inside the respirator. They should follow your instructions precisely and should not talk until asked to do so. They need to avoid laughing or doing anything different from the test protocol.

(iii) If they wear other Personal Protection Equipment
Explain that during the Fit Test they should wear whatever other PPE they would normally wear when using the respirator, such as safety eyewear or normal spectacles.

(iv) If they pass
Explain that if they pass, this result is specific to this particular respirator and they should not use another type or model unless they are fit tested on that one too.

(v) If they fail
Explain they can be tested on the same respirator a second time even though they failed at the first attempt. This is because failures are often a result of not taking enough care during fitting. If they fail twice, then they should not see this as a failure on their part. It is just an indication that the respirator tested has been shown not to fit them well enough and an alternative must now be tried in order to find a model that will provide them with an adequate fit.

(vi) Washing hands and face
Explain the importance of avoiding a false test result due to trace amounts of the solution getting into their mouth. This is why they will be asked to wash their hands, face and lips before the fit test stage begins and to keep these clean throughout.

6. During the test

6.1 During the Tests – Reminders & Practical Tips

(i) Breathing through the mouth
Remind the person to breathe through their mouth with their tongue slightly out. Remind them that they are trying to taste the solution, not smell it.

(ii) Regularly check the nebuliser
Frequently check that you can see the spray entering the hood. If the mist can't be seen then the nebuliser may have become blocked and you will need to take action (see para 4.2 (i).)

(iii) Ensure gap between Sensitivity and Fit Test
If doing the Sensitivity Test and Fit Test on the same day then ensure a good time gap between the two to give time to rid the taste from the person's mouth and to wash hands and lips to avoid cross contamination. 5 minutes should be enough. Ensure they have a drink of water to help clear any leftover taste.

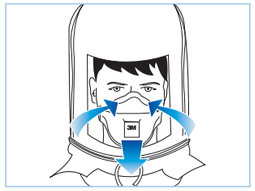
(iv) Alternative to Rainbow Passage
If preferred, it is acceptable for the person to count down from 100, or recite some other passage known to them, as long as they continue to talk out aloud for one minute.

6.2 The Sensitivity Test – Things to remember

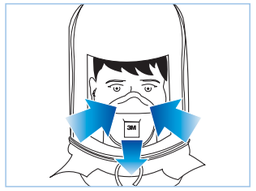
(i) This test is done without wearing the respirator.

(ii) The objective is to find out IF the person can taste the solution and HOW MANY squeezes of the nebuliser to use in the Fit Test which follows.

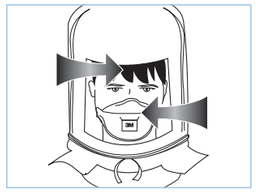
6.3 The Fit Test – 7 tests



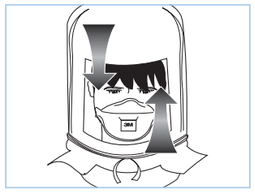
1. Breathe normally



2. Breathe deeply

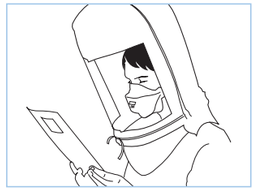


3. Head side to side

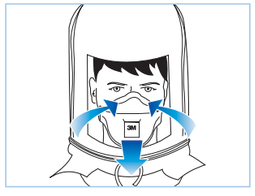


4. Head up and down

5. Bent over at waist



6. Talking



7. Breathe normally

7. End of a successful test

Before removing 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. Make this point to them afterwards.

8. What to do if someone fails a fit test?

8.1 When has someone failed a fit test?

(i) Remember, you can be tested twice on the same respirator.
You only fail if you fail twice on the same size and model of respirator.

8.2 How often do failures happen?

It is not unusual to find that some people have difficulty obtaining a reliable fit with their selected respirator. This is not surprising, as it is impossible to design a respirator that fits everybody. When this occurs, an alternative respirator of a different design or size, but with at least the same level of protection can be offered. The Face Fit Test is then repeated using this alternative model. Usually just one alternative model or size is needed to achieve a pass of the Fit Test second time around.

8.3 How to select an alternative respirator to use

3M has a range of different respirators. We are confident that there is an effective, comfortable alternative for anyone who does not pass the fit test on the 3M 1800 series model. Ensure the alternative respirator selected offers the same level of protection.

8.4 Who to contact in 3M about alternatives

See section 3 of this guide for further information and guidance on how to select an alternative and where to get information and samples.

8.5 Repeat Fit Testing

Arrange for Fit testing on an alternative model or size as soon as possible for anyone failing the Fit Test.

9. Post test check-list

9.1 Record Keeping

a. Record the tests results for each person. These should be kept for 5 years. An example of a record sheet is given in Appendix 2 but you could produce your own, using the HSE guidance document.

b. According to your policy, send a copy to the person and/or Department responsible for holding fit test records.

c. Inform the Safety Department of all those who passed (or failed - if a suitable respirator was not identified at the time of the test).

Note: No-one should continue to use a respirator at work if they failed the Fit Test and an alternative has not yet been identified and tested on them successfully.

9.2 Cleaning the Test Kit after use

a. Nebulisers:
Thoroughly clean and rinse them after use & ideally dry them with kitchen or paper towels or similar.

b. Hoods:
The hoods may be cleaned from time to time with a cloth dampened with very mild soapy water, then rinsed with clean water. A cloth dampened with water containing a small amount of mild disinfectant can be used as an additional measure. Kitchen roll or paper towels can be used to dry the inside of the hood afterwards & remove any wipe marks, especially on the inside & outside of the clear visor.

(iii) Packing away the Test Kits:
Do not pour unused solution back into the bottles, it should be discarded. Ensure the caps are firmly screwed back on the bottles to prevent leakage and crystallisation, especially of saccharin, around the neck.

Section 3: Information and support

10. Information about alternative 3M respirators

10.1 Selection criteria

You must ensure that any alternative respirator offered provides at least the same level of protection as the model it is substituting. 3M offers a wide range of types of respirator offering differing levels of protection and can provide you with assistance in the selection of suitable alternatives.

10.2 Alternative Disposable (Maintenance Free) Respirators

3M has a full range of different styles for each level of protection (FFP1, FFP2 and FFP3) under the European Standard EN149:2001. Samples are available on request.

10.3 Alternative half mask respirators

3M has a range of these types of respirators and filters for protection against particulate, gas and vapour hazards

10.4 Other types of respirator

3M offers a range of battery powered and compressed air supplied respirators. Except where these utilise tight fitting facepieces, these types do not require face fit testing. However, they may be a useful alternative for a person who has had difficulty in passing a face fit test with tight fitting type respirators. Ask 3M for more information about these.

10.5 Contact 3M

Please call the 3M Health and Safety Helpline on **0870 60 800 60 (UK)** or **1-800 320 500 (Ireland)** for details of suggested alternative products, free-of-charge samples, literature and information on where these products can be obtained and details of the 3M representative in your area who will also be able to discuss your needs and help you further.

11. Where to obtain 3M™ Qualitative Fit Test Kits

11.1 Fit Test Kits and Spares

3M offers two qualitative fit test kits FT-10 (sweet) and FT-30 (bitter). Each kit contains a hood and collar assembly, two nebulisers, one bottle of sensitivity solution, one bottle of fit test solution, detailed User Instructions and CD-Rom), spare atomiser heads for the nebuliser and a pin for unblocking blocked nebulisers. Spare Parts are available for these as follows:

FT11 - Sensitivity Solution 55ml bottle (sweet)
FT12 - Fit Test Solution 55ml bottle (sweet)
FT31 - Sensitivity Solution 55ml bottle (bitter)
FT32 - Fit Test Solution 55ml bottle (bitter)
FT13 - Nebuliser (1/box)
FT14 - Hoods (2/box)
FT15 - Collar (1 collar/box)
CHTRNCD - Video

11.2 Where to obtain kits and spares

Contact 3M for details of your local supplier

Memory Jogger

Sensitivity Test

Use sensitivity solution and matching atomiser
Remind person to breathe through mouth with tongue at front.
Say ... "Tell me immediately when you can taste it"

1-10 Squeezes	If not tasted, repeat
11-20 Squeezes	If not tasted, repeat
21–30 Squeezes	STOP if not tasted

NOTE down which range the taste was detected = 10, 20 or 30

Fit Test

Change exercise every 60 seconds
Top up with atomiser every 30 seconds
Repeat again ... "Tell me immediately when you can taste it"

Start	10, 20 or 30 squeezes
During test	Half = 5, 10 or 15 extra squeezes every 30 seconds
Exercises (7)	Breathe normally Breathe more deeply Head side to side Up and down Bending over Talking Breathe normally
Finish	Ask person to break face seal with finger and take a breath through the mouth (Explain what this shows)

Don't Forget To Record The Results!

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.

TIP:
Alternative to the 'Rainbow Passage' - Can also count backwards from 100 as long as it's out loud and lasts 1 minute.

Appendix 1:
Further information on Face Fit Testing

1. Legal framework

Checking that respirators with tight fitting face pieces seal adequately to the wearer's face has long been considered best practice as part of a Respiratory Protective Equipment (RPE) programme. With the introduction of the new Control of Substances Hazardous to Health Regulations (COSHH) and the supporting Approved Codes of Practice (ACOPs), fit testing is now a mandatory requirement. RPE is only deemed suitable if it is suitable for the job, the environment, the level of exposure and the wearer. One type and size of respirator will not fit everybody, so fit testing has been introduced to find the most suitable respirator for each individual.

2. What type of respirators require face fit testing?

The type of respirators that require a fit test are those which employ a tight fitting facepiece such as disposable respirators, half masks and full face masks, including those that form part of a powered or airfed respirator.

3. Who should be fit tested?

Fit testing should be carried out on:

(i) All existing wearers of these types of respirator if it has not already been done

(ii) People who are about to start wearing RPE in order to ensure that incorrectly fitting respirators are not selected for use.

4. How often should people be fit tested?

Currently, fit testing should be repeated at regular intervals or at appropriate times such as:

(i) If the RPE wearer significantly loses or gains weight, has major dental work or sustains a major facial injury.

(ii) If a different size or model of RPE is specified

HSE is currently consulting industry on the time frame of fit testing.

5. Who should conduct fit testing?

According to HSE guidelines, fit testing should be conducted by a 'competent person'. There is currently no recognised certification for a competent fit tester, therefore a certain skill set is suggested such as adequate knowledge in the selection of suitable RPE, ability to correctly fit the selected RPE and follow manufacturers guidelines, ability to recognise a poorly fitting facepiece, ability to identify poorly maintained facepieces, etc. For full details of suggested competencies, please refer to the HSE Document 282/28 which can be downloaded from www.hse.gov.uk (search for document 282/28).

The decision on who is a competent person to carry out fit testing is the responsibility of the employer. An industry fit tester qualification/accreditation scheme is currently being worked on.

6. Fit test methods – Quantitative and Qualitative

Two main methods of fit testing are available, Qualitative and Quantitative fit testing

6.1 Qualitative fit testing:

Qualitative fit testing provides a pass or fail result based on the wearer detecting a test agent. It provides a subjective measure of the quality of the seal of the facepiece to the wearers face. These tests are suitable for disposable respirators and half masks. The test agent can either be detected by taste or by smell.

The 3M Qualitative Test uses 'taste' to detect face seal leakage. A controlled concentration of aerosol is introduced into a hood fitted over the wearer. This test is suitable for all disposable respirators and half masks fitted with particulate or combination gas/vapour and particulate filters. 3M offer two test kits in this category, one using a sweet tasting substance (saccharin) and the others which uses a bitter tasting solution.

The 3M Kit can not be used with Full Face Mask respirators.

3M products that can be used with the 3M QLFT are:

- All 3M Disposable respirators (e.g 3M 8000 Series & 3M 9300 Series)
- 3M 4000 Series Respirators
- 3M 6000 Half Masks
- 3M 7500 Half Masks

3M 9300 Series

3M 8835 Series

3M 4000 Series

3M 7500 Series

6.2 Quantitative fit testing:

Quantitative fit tests give an objective measure of the quality of the seal between the wearer's face and the facepiece. A fit factor number is produced which indicates the quality of the face seal and leads to a Pass/Fail result. There are 3 main methods available on the market today. (1) Test Chamber, (2) Particle Counting Device (such as the TSI PortaCount) and (3) Controlled Negative Pressure Device.

This guide deals only with the 3M Qualitative Fit testing method.

Appendix 2:
3M Qualitative Fit Test – Record

Name

Company/Dept

Make/Model/Size of Respirator

Own facepiece/Pool or Test model used? Own ❑ Pool ❑ Test ❑

Fit test kit used? FT 10 (Sweet) ❑ FT 30 (Bitter) ❑

Test conducted by (Company and Fit tester)

Re-tests required Yes ❑ No ❑

If yes, reasons

Pass achieved Yes ❑ No ❑

Comments

Date

Signed

Occupational Health and Environmental Safety Group

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