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## Are you fit enough? A practical guide to fit testing and competency

### Presentation Agenda

- Why and when to fit test
- Fit testing methods
- Hints and tips
- Dealing with failures
- Competence and the Fit2Fit Accreditation Scheme

Alan first established that most of the audience were aware of the need for face fit testing in the workplace and had adopted this practice.

### Why Fit Test?

COSHH 2002 Regulation 7(9) (and also the asbestos and lead regulations) states that PPE shall be “suitable for purpose”. The ACoP linked to this regulation says a respirator must provide an adequate seal to the wearer’s face. The best way to determine this is to do a face fit test.

### Types of RPE to be Fit Tested

**Tight-fit** disposables or reusable rubber half or full face masks, including Powered and Supplied Air versions, all work on the principle of negative pressure. The mask is fitted to the face, the wearer then breathes the air within the mask which creates a negative pressure – a partial vacuum - and the outside air rushes in to equalise that pressure via a filter. To be effective the mask must provide an adequate seal to the face as inward leakage of contaminated air will reduce protection.

Respirators that rely on a constant flow of compressed air through the headtop and have a **loose-fit** to the face, eg helmets and hoods, do not require fit testing.

### What is Fit Testing?

It is a means of assessing how well a respirator fits the face. It has to be an individual test because one model will never “fit all”. Several tests will be required if different models are being worn for different tasks.

There are two main methods used:

- **Qualitative Taste Test** - used with disposable or reusable half masks. This method tends to be used by those companies undertaking the fit testing in-house. Kits are around £120 and straightforward to use.

- **Quantitative Particle Counting Test using Portacount** - a device made by TSI which costs around £7/8,000. Some large companies will purchase these but they are generally purchased by external consultants.

A question put to the audience found that around 4-5 do in-house testing , 2-3 use consultants but no one had a Portacount machine.

### **Respirator Performance During a Fit Test - What to look for**

The test is to judge how much of the contaminant gets to the inside of the mask. For half masks, disposable or reusable, particles have to be reduced by a factor of at least 100 during the 7 minute test. So for every 100 particles outside, only one can be allowed in through leakage which is quite a tough test and twice the level of protection required to achieve the CE mark.

However, when wearing a FFP3 half mask fitted with a P3 filter, over the period of the working day you would expect a protection factor of 20 but you are looking for five times this rate over the 7 minute test.

### **Fit Test Methods**

#### **Qualitative Taste Test – A Particulate Test**

If using half masks with gas and paper filters you will need to change them for the purpose of the test.

The result is either a Pass or a Fail and is based on the response from the wearer and works on the principle of taste. Mist is delivered into the hood from a hand delivered nebuliser. If the person tastes the substance, which should have been captured by the filter, then we say it is an inadequate fit and therefore a fail.

The taste comes from two versions of a solution; one is a sweet saccharin solution and the other a bitter one which contains a substance similar to that painted on children's nails to stop them being bitten.

George asked whether it was inevitable that there will be some amount of leakage between the respirator and the skin and thus a fail. Alan responded that it is not about a 100% seal but an "adequate" seal and at very low levels there would be no taste. There is no such thing as 100% efficiency – something will always get through, even with self-contained breathing apparatus.

The test is in two parts. The first is a sensitivity test without the respirator to check whether the person can indeed taste the solution as not everyone is able to do so – especially the sweet one, in which case they would be tested with the bitter version. This part also establishes the person's threshold over three bands. If someone should need more than 30 squeezes of the solution then the test is not suitable for them.

A Member asked whether there would be a delay prior to the actual test to remove the taste. Alan confirmed there is usually a short break to clear the palate, clean the lips, drink water and, whilst waiting, to become familiar with the respirator and how it should be applied.

### **3M Fit Tests**

The 3M test kit consists of:

- Hood and collar
- Sensitivity nebuliser and solution
- Fit test nebuliser and solution
- Spare jet and cleaning pin
- Instruction book

The actual fit test uses a stronger version of the sensitivity solution.

### **Quantitative Particle Counting Test**

Tubing comes out of the respirator going down to the machine. The tubing is in two parts, one part stops outside the respirator and the other reaches in to the breathing zone. The machine takes samples from outside and inside and counts the particles in the air. In clean air conditioned buildings it is necessary to increase the particles for the machine to operate. The machine then compares the ratio between the two. The HSE sets the fit factor ratings for each device: 100 for half masks and 2,000 for full face masks.

The non-disposable masks have a space for the tube which sits between filter and mask and in some cases there are adapters available to facilitate the tubes but it would be necessary to puncture a hole in the disposable mask for the purpose of the test.

### **Fit Testing Exercises – Quantitative Test**

Some form of exercise is required whilst wearing the respirator. This is normally:

- ✚ Stepping up and down to get the breathing rate up
- ✚ One minute normal breathing
- ✚ One minute deeper breathing
- ✚ One minute slowly moving head from side to side to simulate the stresses a wearer might encounter
- ✚ One minute moving head up and down
- ✚ One minute talking out loud
- ✚ One minute bending forwards
- ✚ One minute normal breathing

A fit test takes 20-30 minutes for most people and half an hour is typical. So you need to allocate an hour's labour ie half an hour for the assessor and half an hour for the wearer.

A failure will be as a result of the wearer being able to taste the solution or the machine recording a number that is lower than the fit factor.

First examine the seal before the wearer takes off the respirator and ask them whether they were aware of any change to the fit at any point. If there is nothing obviously wrong then simply repeat the test and ensure that the nose clip especially is fitting correctly. If they fail a second time, and nothing is wrong with the test, try another model which may better suit the person's face.

## Preparation for Fit Testing

- ✚ Timeslots should be scheduled to allow some flexibility ie for repeating the test.
- ✚ People need to be briefed re shaving, eating, smoking, drinking.
- ✚ **Good ventilation** is necessary to remove the mist from the room prior to each test taking place so people are unable to detect it as they enter. If it is an air-conditioned room then there needs to be sufficient particulates in the air.
- ✚ **Privacy** is necessary to avoid embarrassment and ridicule from work colleagues.
- ✚ For the taste test it is important to have a **clean palate** so schedule tests half an hour before eating, drinking or smoking.
- ✚ The person also needs to be **clean shaven** to ensure a good seal.

A Member pointed out that some men in construction may start a shift so early in the morning that they have not shaved before leaving home and that they could be on jobs quite late in the day. Alan's response was that as a guide they should have shaved within the 8 hours prior to a shift starting but HSE guidance is that the individual should be clean shaven – certainly on the day they intend to wear a respirator and it may be necessary to enforce a clean shaven policy if issuing these devices. However, if it is not practical to enforce the policy – say if someone has facial hair for personal or religious/cultural reasons - then it would be necessary to use a powered respirator.

Do not expect one size or model of face mask to suit every face, so have some alternative models/sizes available in the event of failure.

## Fit Test Records

Records should be made of all tests. There is HSE guidance as to what to record, eg make and model of respirator, name of assessor etc.

## Who can do a Fit Test?

- A competent person
- HSE guidance lists 14 competencies

## How to Judge Competence

HSE working with British Safety Federation established an accreditation scheme called Fit2Fit. There is a large syllabus on the Fit2Fit website, a multiple choice examination and a practical assessment.

## Roles and Responsibilities

- The employer must ensure that, where staff are using tight-fitting respirators as a control measure, they are fit tested by competent staff.
- Fit testers must ensure fit testing protocol is adhered to and must possess competencies as listed in HSE 282/28.
- Employees must wear the model of respirator they were tested on.

Buying departments should buy the models most of the people will have to wear but stores need to be aware of the other types in use so they may keep sufficient stock. Note that a change of mask manufacturer will require a repeat of the fit testing process and purchasing departments need to be aware of this.

Re-testing will be required for factors which may affect the seal such as a significant gain or loss of weight, scarring, major dentistry, etc but there is no set time for general re-testing.

Fit testing is only a starting point to confirm that you can achieve an adequate fit with that form of protection. You will still need to do a Risk Assessment to determine the correct equipment for the risk and also to train employees in how to use and look after it, to be clean shaven when wearing it, to keep it on during all forms of exposure, and to notify you of any changes which might require re-testing.

3M do train people using their fit testing kits. There is also a more detailed half-day workshop, which is chargeable.

For further guidance go to:

[www.hse.gov.uk](http://www.hse.gov.uk) [www.fit2fit.org](http://www.fit2fit.org) (Steve Parton highlighted a really good video clip on the website.) [www.3m.co.uk/fittestrespirator](http://www.3m.co.uk/fittestrespirator).