



Respiratory Protection Product Guide

Respiratory Protective Equipment (RPE) has been used far longer than most people realise. One of the earliest recorded uses dates back to ancient Rome, when lead miners fastened pig's bladders across their noses and mouths to protect against the dust. More recently, late nineteenth century photographs of fire fighters show many of them displaying full beards. It was believed that shoving the beard into the mouth minimised smoke inhalation ...

Today RPE is still used extensively in all types of workplace situations when all other means of minimising respiratory hazards have been applied.

Correct selection of RPE is critical. Equally critical is correct fitting and use of the RPE.

Selection & Use of RPE



When should RPE be used?

RPE should only be selected as the last resort. All other measures to control the hazard should be considered first e.g. substitution, elimination, separation and engineering controls. RPE should be used when the level of a hazard exceeds the exposure limits laid down by the HSE or to provide relief from nuisance levels.

Assigned Protection Factors & Standards for RPE types

Type of Respirator	Description	Standard	APF Range
Filtering facepieces for particulates	Provides protection against dust/mists/fumes. Normally intended for 1 day's use	EN149: 2001	4-20
Filtering facepieces for nuisance gas/vapour	Provides protection against dusts/mists/fumes. Also protection against nuisance level gas/vapour	EN149: 2001	4-20
Half masks (dust)	Provides protection against a variety of contaminants dependant on Filter(s)	EN140 Facepiece En143 Particulate Filter, EN405 low maintenance	- 4-20
Half mask (gas/vapour)		EN140 Facepiece EN141 Gas/vapour Filter, EN405 low maintenance	- 4-10
Full face masks (dust)	Provides protection against a variety of contaminants dependant on Filter(s) and protection for the face/eyes	EN136 Facepiece En143 Particulate Filter	- 4-40
Full face masks (gas/vapour)		EN136 Facepiece EN141 Gas/vapour Filter	- 4-20
Powered Respirators	Provides clean air to the headpiece by drawing air through a filter. Protection can be tailored to a variety of hazards.	EN146, EN12941, EN12942	5-40
Airline hood or helmet	Provides clean air to the wearer's headpiece from an external source of breathable quality air. Can also provide eye/head protection.	EN270, EN1835, EN139	5-40
Self contained open circuit breathing apparatus	The top level of protection. For tasks where there is an immediate danger to life or health	EN1146, EN137	Up to 2000



What type of RPE do I need?

RPE is divided into two broad categories; filtering respirators and supplied air equipment. To make a correct selection the following factors must be considered.

Contaminant

- Q. Is it a gas or a particulate?
- Q. How many contaminants are present?
- Q. What is the concentration of contaminant(s)?
- Q. Has it got a Workplace Exposure Limit (WEL)?
- Q. If the contaminant is a gas, does it have good warning properties i.e. can you taste or smell it at levels below the WEL?

WELs are defined by HSE and published in EH40 document. Workplace monitoring is required to measure the respiratory hazard level. This is then compared to the WEL to determine the required protection level, otherwise known as the **Assigned Protection Factor (APF)**

BS4275, published in 1997, introduced APF's to replace Nominal Protection Factors (NPF's). NPF's were determined in laboratory testing of RPE. Research, however, showed that NPF's were rarely achieved in actual workplace situations. APF's, therefore, give a more realistic indicator of a respirator's actual performance level.

Example: Ferrous Foundry Particulate

- A. Measured Respiratory Hazard Level = 48mg/M²
- B. Workplace Exposure Limit (WEL) = 4mg/M²
- C. Divide A by B i.e. 48/4 = 12

The actual Respiratory Hazard Level is 12 times WEL. Assuming all other control measures have been considered you should select a respirator with an APF greater than 12. Furthermore, you must consider whether the respirator is suitable for the wearer.



Working Environment

- Q. Is it a confined space?
- Q. If this is the case, is there sufficient oxygen in the atmosphere?
- Q. Does the activity require protection for extended periods?
- Q. What is the concentration of hazard in the atmosphere?

Training & Fit testing

Once the respirator has been correctly selected it is essential to train the wearer in the correct fitting, use and maintenance of the equipment.

Training in the proper use and care of respirators has been a mandatory requirement in COSHH since 1988. Checking that a tight fitting respirator seals properly is part of the legislation. The 4th revision of COSHH in 2002 has now extended this further by incorporating Face Fit Testing as a mandatory requirement. The requirement for Face Fit Testing is described in the ACoP (Approved Codes of Practice) and supports the CLAW (Control of Lead at Work) and CAW (Control of Asbestos at Work).



Fit Testing

Under this legislation fit testing must be carried out on:

- The appropriate selected device
- On all tight fitting face pieces (if fit testing has not been previously been carried out)

Face Fit Testing is only required to be carried out once, or if:

- The employee shows substantial weight gain or loss.
- The employee has undergone severe dental treatment.
- The employee has had scarring which may affect the seal.

Although under current legislation face fit testing is only required once, training in the proper use and care should be carried out biannually.

Under this legislation fit testing is not required when:

- The device being used is a loose fitting device. i.e. Powered Air Respirator.
- If the device is being used to protect against a substance carrying a WEL (with the exception of suspected carcinogens and respiratory sensitizers) and monitoring has shown that the exposure falls below the WEL and the respirator is being used for comfort only. In this instance face fit testing is not required, provided it is clearly stated in the risk assessment.

Methods of face fit testing

- Quantitative
- Qualitative

Both methods of fit testing are dependent on the employee being clean-shaven and any other obstacles that may prevent the wearer attaining a good seal. A number of test exercises should be performed during the test in an endeavour to simulate the working environment. On completion of the test, the employer should complete a record of the result and should retain the record for 5 years under the ACoP; however, some would suggest that 40 years would be more appropriate. A copy should be made available to the employee, as the record is transferable to a new employer.

Quantitative face fit testing

Quantitative fit testing is mandatory for all Full Face Piece Respirators, Air Fed Respirators and tight fitting powered respirators (in non-powered mode). It can also be used for 1/2 mask respirators and disposable respirators apart from FFPI; however, this is not a mandatory requirement. Quantitative fit testing devices are objective and provide a numerical result. This test would be considered the more expensive option.

Qualitative face fit testing

Qualitative face fit test kits are designed to test the seal of 1/2 mask respirators and filtering facepiece respirators. The test result will only provide a pass or fail. If the test is for carbon filters such as the type used to protect against organic, inorganic vapours, acid gases, ammonia etc, the test agent will provide a smell. If the filter is designed to protect against particulate, the test agent will provide a taste.

The advantages of Qualitative Face Fit Testing are:

- Ease of use
- Inexpensive

The disadvantages of Qualitative Face Fit Testing are:

- Unable to be used on all devices
- Relies on the response of the wearer

