

A decorative graphic on the left side of the slide consisting of swirling, translucent smoke or vapor in shades of yellow, orange, red, and blue.

Respiratory --- Chemical Hazards

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Introduction

Avoidable work-related respiratory conditions account for around **3 million deaths** world-wide and 12,000 deaths in the UK every single year.

In the healthcare environment, staff are regularly exposed to numerous respiratory risks such as airborne pathogens like influenza and multi-drug resistant tuberculosis, or exposure to hazardous chemicals like formaldehyde and peracetic acid. When air ventilation and hazard extraction is not possible, **Respiratory Protective Equipment (RPE)** is used as the last line of defense in protecting workers from potential respiratory hazards.

In this eBook we will explore some of the important aspects of RPE and respiratory infection control - vital for keeping employees and patients safe and for organisations to fully comply with HSE regulations.

Legal Requirements

The Health and Safety at Work Act 1974 and the Management of Health and Safety at Work Regulations 1999 require organisations to provide and maintain a safe working environment for their workers.

In the UK, it is a legal requirement that all staff required to wear Respiratory Protective Equipment at work be Fit Tested, provided appropriate training and have access to the correct apparatus that is adequate for the hazard and suitable for the person.

Failing to comply with HSE and COSHH guidelines could lead to serious fines, employee ill-health or even death.

Education

Understanding Respiratory Protective Equipment, how it should be used and what type is appropriate for a given situation are all fundamental in keeping you and your workforce safe from harm.

But to do this, workers, managers and CEOs all need to be made aware of the fundamental regulations surrounding RPE and the potentially fatal dangers of getting it wrong.

It is our mission to ensure every person who needs RPE in the workplace is aware of the potential dangers and has access to adequate and suitable equipment.





Full Support provide a number of different awareness, training and education courses, seminars and webinars to meet a variety of needs.

Passionate about health & safety at work and raising awareness for respiratory issues, our Fit2Fit accredited experts have trained over **100,000** people across the UK so far, equipping people with the necessary skills to be competent, confident and compliant in the safe use of RPE.

Utilising a combination of face-to-face, webinar, theory and practical training; whatever your RPE education needs, we're here to help.

Get in touch to find out more



Auditing

RPE is widely used in hospitals to protect frontline staff from respiratory pathogens, but there are many work activities that may result in harmful substances contaminating the air, in the form of dusts, mists, vapours, chemicals, gasses and fumes.

With no two organisations facing the same combination of respiratory hazards in the workplace, it can be difficult to identify all of the hazards and implement the required responses to be compliant and ensure your workforce is safe.

Full Support offer an Auditing service to ensure that your hospital is fully compliant to its legal RPE responsibilities and that you are offering the correct type and level of respiratory protection to your staff to keep them safe.

Our comprehensive Audits involve a thorough 6 stage process, including:

1. Meeting

A meeting with one of our experts to assess your specific needs.

2. Hazard review

An in-depth review of your work place(s) to identify potential respiratory hazards and RPE requirements.

3. Staff review

A detailed assessment of who is at risk and what equipment would be appropriate to them.

4. Policy review

A systematic evaluation of any existing policies/guidelines your organisation has in place.

5. Report and recommendations

A full technical report using our innovative RPE Auditing tool.

6. Follow up

Six and twelve-month follow up webinar sessions for implementation review, evaluation and Q&A support.

Get in touch to find out more



Filter Selection

A wide range of filters are available for reusable respirators to protect the wearer against different hazards.

The most common kind of filter used in hospitals is the particulate (P) filter, which offers protection against particulate matter such as airborne pathogens, dusts, mists, sprays, aerosols and fumes. P3 filters offer the highest level of particulate protection and are essential in the healthcare setting.

However, particulate filters do not offer protection against every kind of hazard.

Staff in a number of different departments may require non-particulate respiratory protection from time to time including - Endoscopy, Pathology, Mortuary, Research labs, Estates & Facilities.

Overleaf you will find a breakdown of the different filters available.

Filter types				
Colour code	Type	For use against	Class	Other information
White	P	Particles	1 2 3	European standard: EN 143
Brown	A	Organic gases and vapours, boiling point above 65 °C	1 2 3	European standard: EN 14387
Grey	B	Inorganic gases and vapours	1 2 3	European standard: EN 14387 Do not use against carbon monoxide
Yellow	E	SO ₂ and other acid gases	1 2 3	European standard: EN 14387
Green	K	Ammonia and its organic derivatives	1 2 3	European standard: EN 14387
Red & white	Hg P3	Mercury	–	European standard: EN 14387 Includes P3 particle filter Maximum use time 50 hours No class number
Blue & white	NO P3	Oxides of nitrogen	–	European standard: EN 14387 Includes P3 particle filter Single use only No class number
Brown	AX	Organic gases and vapours, boiling point at or below 65 °C	–	European standard: EN 14387 Single use only No class number
Violet	SX	Substance as specified by the manufacturer	–	European standard: EN 14387

Filters have colour coded labels to show which hazards they offer protection from.

For situations where a person requires protection from multiple respiratory hazards, combination filters can be equipped. These filters have multiple bands on their labels, as illustrated by the ABEK filter below.





E.g. Formaldehyde

A naturally occurring organic compound, formaldehyde can be combined with water to create **formalin**, a common chemical agent used in hospitals. Departments that may use formalin include:

- Theatres
- Pathology labs
- Mortuaries

Formaldehyde is a known carcinogen and poses a significant danger to health if inhaled in large quantities, so staff must be fully protected in the case of a chemical spill.

A half or full-face respirator with an A filter for organic gases and vapours would be required.

E.g. Peracetic Acid (PAA)

Peracetic Acid is a compound that is often used to disinfect equipment to minimise health care-acquired infections. Though its use will vary per hospital it can commonly be found being used in:

- The disinfection of medical devices
- Research labs
- General ward maintenance and barrier cleans

PAA is a known asthmagen and poses a significant danger to health if inhaled. Therefore staff must be fully protected in the case of a chemical spill.

Adequate ventilation or a half/full-face/powered air respirator with a B-P2 filter for Inorganic gases and vapours would be required.





E.g. Chloroform

A naturally occurring organic compound, chloroform is a powerful anesthetic, solvent and reagent found in many hospital departments, including:

- Research labs
- Operating theatres

Chloroform is a highly toxic phosgene and poses a significant danger to health if inhaled in large quantities. Staff must be fully protected in the case of a chemical spill.

A half or full-face respirator with an AX filter for Organic Vapours would be required.

Respiratory Protective Equipment

Once the risk has been assessed and the required filter type/level has been identified, adequate and suitable RPE can be selected.

If a tight-fitting respirator is required, the wearer MUST be Fit Tested on the chosen make/model of respirator, before use.

Adequate – a respirator and filter that offers sufficient protection for its wearer for the hazard type/degree it is worn for.

Suitable – a respirator that fits the wearer properly. If tight-fitting, a good seal needs to be achieved, which should be assessed via a Fit Test.

Single-Use

Single-Use Filtering Facepiece Respirators can be found in many hospitals, offering protection from airborne pathogens, such as influenza and multi-drug resistant tuberculosis.

Available in different sizes, shapes and valved/non-valved models; tight-fitting single-use respirators work by forming a seal around the users face so that contaminated air passes through the filtering facepiece when the wearer breathes in.

Care must be taken when doffing a single-use respirator, as the outside of the mask will be contaminated.

Always follow the manufacturer's instructions.





Half-Face

Depending on the filters applied, a reusable respirator can protect the user from a wide variety of hazards beyond airborne infections including hazardous gasses and vapours.

Half-face respirators usually also benefit from being reusable – meaning that the body of the respirator can be decontaminated and only the filters need to be changed.

Half-face respirators are ideal for staff in the healthcare environment working with chemicals or faced with a combination of respiratory hazards.

Full-Face

Providing higher levels of respiratory protection, as well as integrated eye shielding; full-face respirators are ideal for hazards where the utmost level of protection is required.

Like half-face models, full-face respirators may be equipped with different filter types for protection against a combination of respiratory hazards. Many full-face respirators also have the option of being combined with powered air units, fresh-air hoses, constant flow airlines or compressed air cylinders, depending on the wearer's requirements.



Fit Testing

Tight-fitting RPE works by forming a seal between the respirator and the wearer's face. This ensures that when air is breathed in, it is forced through the filtering material of the respirator – capturing hazardous substances in the filter only letting clean air into your lungs.

However, the smallest of gaps caused by a respirator not fitting properly could let contaminated air in and endanger the wearer's health.

Face shape, size, facial hair, scarring and donning technique are all common reasons as to why a respirator might not perfectly fit and no single respirator model will fit every person's face.

To ensure a tight-fitting respirator fits and is suitable for an individual, they must be Fit Tested.

There are two predominant methods of Fit Testing – the Qualitative (taste) method and the Quantitative (particle counting) method.

The Qualitative Method

The Qualitative Fit Test method is a simple pass/fail **taste test** to assess whether or not a tight-fitting single-use or half-face respirator is suitable for an individual.

This method involves the tester intermittently spraying a strong-tasting aerosol solution at the subject's face while they undertake a series of exercises, designed to mimic common strains on the seal of their mask.

Relatively cheap and simple to set-up, the Qualitative method can be a cost-effective way of cascading testing across smaller organisations.





The Quantitative Method

The Quantitative Fit Test method is a more objective way of assessing the suitability of a respirator for an individual, by measuring the number of particles inside and outside the respirator.

The Quantitative Method, using a PortaCount™ machine, counts the number of particles inside and outside the respirator while the subject undertakes a series of exercises, designed to mimic common strains on the seal of their mask. The difference between the outside and inside readings indicate the *Fit Factor* - revealing how effective the respirator is fitting.

Accurate, detailed and suitable for all respirator types, the Quantitative method is ideal for Fit Testing large organisations accurately and quickly.

In addition to selling Qualitative Fit Test Kits and Quantitative PortaCount™ devices, Full Support offer a comprehensive Fit Testing service for both Qualitative and Quantitative Fit Testing, on-site or at our Northamptonshire based Fit Test Centre.

Get in touch to find out more



A person wearing a yellow protective suit and a respirator mask is shown. They are using a powered air purifying respirator (PAPR) system, which includes a black and white motor unit connected to the mask by a hose. The person is holding a black object, possibly a tool or a container. The background is blurred, showing industrial or laboratory equipment.

Powered Air Purifying Respirators

For some people, tight-fitting RPE is not an option.

People who have a beard, facial scarring, moles, have undergone recent dental work or wear a hijab may not be able to pass a Fit Test.

In many cases, if suitable RPE cannot be found, effected staff may need to be excused from their duties.

However, this need not be the case with the Full Support RPE Kit.



Get in touch to find out more

Unlike tight-fitting RPE, Full Support's RPE Kits do **not** require Fit Testing.

Instead of relying on a tight-fitting seal, loose-fitting respirators draw contaminated air in to a filter using a battery unit and force the cleaned air along a tube in to the wearer's hood/helmet.

Not needing to be Fit Tested makes these kits ideal for:

- Departments requiring infrequent respiratory protection
- Wards with a high level of worker turnover or bank staff
- Emergency chemical hazard protection



Record Keeping

In accordance with HSE and COSHH guidelines, documented evidence of Fit Test results must be kept on-site for at least 5 years and up to 40 years under Health Surveillance.

For large organisations, keeping thousands of up-to-date paper records and accessing them for assessing who needs re-testing can seem near impossible.

That's why Full Support has created **Vigilant Safety Solutions**® - the future of RPE monitoring, recording and compliance.

A new and innovative cloud-based RPE record keeping system, **Vigilant Safety Solutions**® empowers users to accurately monitor and record their use of RPE across multiples sites – ensuring confidence, competence and compliance to HSE legal regulations and safety standards.

Data Management Centre

Vigilant Safety Solutions® is an innovative and dynamic platform, ensuring organisational compliance with legal standards and internal policies.

Reporting Suite

Accessible via any internet-connected PC and a log-in, the Reporting Suite lets clients instantly monitor and report on their organisation's RPE records in real-time.

Field Application

Pre-installed onto Android tablets, the Field Application aspect is an essential tool for undertaking Qualitative and Quantitative Fit Testing, monitoring and recording.



[Click here to find out more](#)



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