

Respiratory Protection Questions and Answers

Is the use of respiratory equipment likely to involve COSHH regulations?

Yes. The Control Of Substances Hazardous to Health Regulations were brought in to meet the requirements of EC Directive 80/110/EEC.

The aim of COSHH is to strictly control the use of substances which may be used in or formed during the manufacturing process, found in the materials used, or during maintenance (i.e. Painting and Cleaning) or they may be natural.

So what do I have to do, comply with COSHH?

We cannot answer this question completely since the COSHH handbook (available at all good book shops) is quite a large volume and hence it is not possible to put all the information in to this guide.

However we can outline some of the salient points for you. As an employer it is your duty to ensure that you have a comprehensive risk assessment done with a written report. It may be that you do not have the ability to perform this assessment yourself, since it requires such action as measuring the contaminant in the air.

There are commercial Health and Safety Consultants who can perform this assessment for you. Once the risks are known the regulations require the introduction of control measures and the maintenance of these measures. You are also required to monitor the effectiveness of these measures on the health of your staff.

What is fit testing?

It is a method for checking that a tight fitting facepiece matches the person's facial features and seals adequately to the wearer's face. It will also help to ensure that incorrectly fitting facepieces are not selected for use.

What is the reason for fit testing?

The performance of tight-fitting facepieces depends on achieving a good contact between wearer's skin and the face seal of the facepiece. Inadequate fit will significantly reduce the protection provided to the wearer. A fit test is not substitute for correct and careful day-to-day fitting of the facepiece.

I know what I'm exposing my staff to because that information is on the containers that my materials come in. Isn't that good enough for this assessment?

The regulations state that an employer must not carry out any work that is liable to risk the health of employees without first having an assessment done.

I've had an assessment done and it shows that one of the chemicals I use is three times over the OEL. What does OEL stand for and what should I do?

OEL stands for Occupational Exposure Limit. The OEL is the 'Safety' line decided upon by the Health and Safety Executive.

If the levels of concentration are below the OEL then no action is needed. However since one of your chemicals is over the OEL then it is time for action.

For example: Xylene is present at a concentration of 300ppm. The OEL is 100ppm:

$$\frac{300}{100} = 3$$

Therefore a half mask with an A1 gas filter, which has an Assigned Protection Factor (APF) of 10 is appropriate.

What does the Assigned Protection Factor of a disposable dust mask mean?

It is the level of protection that a wearer can reasonably expect. The factor can be used to multiple the OEL to determine the maximum concentration that



DIN Filter Penetration Testing

can be worked in when wearing a particular type of mask.

How do I know when a dust is fine or very fine?

There are set definitions of the different sizes of particles. Particles that are bigger than 5 micrometers (millionths of a metre) are classed as dusts, between 2 and 5 micrometers are classed as fine particles and anything less than 2 micrometers are very fine.

What colour band will appear on a filter that offers protection against organic vapours?

A brown band.

I know what the contaminant is and there is no practical way of reducing the exposure, so all I have to do is buy masks. What's the secret to selecting the correct mask?

There are several things that should be considered when selecting respiratory protection.

The first thing that should be considered is the suitability of a mask to the contaminant and the nature of the contaminant as it is experienced. For example there is no point using a dust mask to protect against acidic vapours. You should also bear in mind whether

you want disposable masks or reusable respirators.

The advantage of disposable masks is that there are no requirements to keep records under current legislation where as reusable respirators may be more cost effective over time and have the added advantage that the same mask can be multi functional by changing the filter cartridge.

What do you mean by 'Combination Mask'?

A combination mask should be used when it is necessary to protect yourself against more than one contaminant or form of contaminant at the same time.

How long will the disposable mask last?

Maximum of eight hours, it is a one shift only item designed to be correctly disposed of after this period. It may not last this long in heavy concentrations of hazard.

What are the six types of respiratory hazard?

Dust, Mist, Fume, Vapour, Gas and Oxygen Deficiency/Enrichment.

Respiratory Protection Questions and Answers

What mask and filter for working with Asbestos?

The correct grade of filter for Asbestos is P3, for people working with Asbestos we would always recommend the Olympus® Full Face Respirator fitted with a P3 DIN Canister Cartridge.

In addition a Quantitative Face Fit Test must be carried out to ensure adequate protection. Asbestos removal will usually need to be carried out by specially trained and licensed organisations.

What mask and filter for wood dust?

For soft wood dust always use a P3, for hard wood dust use a P2/P3 depending on the concentration.

What is the shelf and working life of respiratory cartridges?

All Olympus® cartridges have a shelf life of three years from the date of manufacture. The 'use by date' is stamped onto each cartridge for easy checking.

The life in the field is a lot harder to assess due to the variety and concentrations of contaminants that may be experienced. The cartridges should be replaced as soon as the wearer can smell or taste the contaminant.

What type of filter can a pre filter be fitted to ?

They can only be fitted to gas vapours filters.

Are there any general guidelines concerning the use of respiratory equipment?

Rule number one is always read the instructions, it may seem obvious but it is vital that the instructions are read and understood.

You should not use respiratory equipment in an atmosphere of less than 17% oxygen. (This will have been measured during the survey).

What is fume?

When solid materials are intensely heated, such as in welding, the material is vapourised and condenses as very fine particles; therefore creating a fine dust.

What mask and filter for working with MDF?

This depends on how the MDF is being worked. Any use of machine tools will create vapours as the glues and fungicides are heated, in this case a twin half mask fitted with AB1 filters and P2 pre-filters should be used.

If hand tools are being used then a disposable dust mask to FFP2 requirement should be used.

Why can I not remove the filters from this mask (Filterjet/Maxijet /Tradesman2)?

The mask has been made to EN405 Standard - the mask has a maximum life of 28 days from opening its bag - it has been designed for the whole unit to be correctly disposed of after this period. The filters therefore are not removable.

I have been supplied with twin filter cartridges but I have a single filter mask, how can I fit them?

No only single filters must be fitted to single masks, and twin filters to twin masks in order to get adequate protection to EN standard.

What does ABEK on this filter cartridge stand for?

ABEK indicates the different chemical vapour and gases that it has been designed to protect against:-

A - Organic vapours and gases with a boiling point greater than 65°C

B - Inorganic vapours and gases

E - Sulphur dioxide and other acidic vapours and gases

K - Ammonia and Organic Ammonia Derivatives vapours and gases

The Standard Defines Assigned Protection Factors:

"Level of respiratory protection that can realistically be expected to be achieved in the workplace by 95% of adequately trained and supervised wearers using a properly functioning and correctly fitted respiratory protective device."

BS4275, A Guide to implementing an effective respiratory protective device program, shows the following table:

Assigned Protection Factor	1/2 or 1/4 Mask Plus Filter	1/2 Mask without Inhale Valve	Valved Filtering 1/2 Mask	Filtering 1/2 Mask	Full Face Mask Plus Filter	Powered Filtering: Helmets and Hoods
	EN140	N1827	EN405	EN149	EN136	EN12941
4	P1	FMP1	FF GasX +P1	FFP1	P1	-
10	P2 Gas X Gas X +P3	FMP2 FM Gas X FM Gas X+P3	FFGas X FF Gas X + P2 FM Gas X+P3	FFP2	P2	TH1 All Face-Pieces
20	P3	FMP3	-	FFP3	Gas X Gas X + P3	TH2 All Face-Pieces
40	-	-	-	-	P3	TH3 Semi-hood, Hood Blouse, Semi-Blouse

Whether or not a mask/filter/respirator is suitable can be determined by using the following calculation:

$$\text{Required protection factor (RPF)} = \frac{\text{Measured level of contamination}}{\text{Exposure limit for contaminate}}$$

For example:

$$\text{RPF} = \frac{250\text{mg}/\text{m}^3}{50\text{mg}/\text{m}^3}$$

$$\text{RPF} = 5$$

Therefore a respiratory device with an APF of 10 would be required (see shaded row above)

What mask and filter for painting/paint spraying?

More information is needed such as what type of paint and what is the paint? The information needed will include:

- Name of Hazard (proper chemical name) – can be found in 'Risk Assessment'; 'Product Label'; 'Safety Data Sheet'.
- What form is the Hazard encountered – can be found in 'Risk Assessment'; 'Product Label'; 'Safety Data Sheet'.
- What is the airborne concentration – only airborne contaminants can be inhaled – can be found in 'Risk Assessment'.
- How long will the workers be exposed to the hazard in 24 hours – can be found in 'Risk Assessment'.

How long will the disposable mask last?

A disposable dust mask is single shift piece of RPE, this means that when you put it on you start the shift and when you take it off, for a tea break for instance, the shift is over, the shift can last a maximum of 8 hours.

Their effective usage time depends on a number of factor levels of containment, breathing rate, heat, humidity and hygiene factors.

How long will this cartridge last?

This expectancy will vary from one work area to another and is influenced by a variety of factors: How often used.

How long is each period of use and hazard concentration levels.

In general change single particulate filters daily. Twin particulate filters every 2 days. Gas filter single every 2 days. Gas filter twin at least once a week.

Why can I not fit this filter to the supplied mask, it's too big to fit the hole?

Before answering this question find out whether the customer has purchased a single or twin mask. Single filters have a black left handed thread and twin filters a grey right-handed thread.

The reason for the question is because the customer has not unscrewed the threaded portion from the top of the filter.

Once this has been done by turning in the correct direction for the thread, the threaded portion should be inserted through the hole in the mask from the inside, the filter is then screwed onto this hand tight, care must be taken not to over tighten as this may distort the mask.

Can I use a half mask with organic filters for inorganic compounds?

No. The levels at which inorganic can be detected by smell or taste are much higher than the maximum exposure limit.

So it would be impossible to detect by taste/smell when break through had occurred. The safest solution would be to use an airfed system.

What respirator should I use to protect against vehicle exhaust fumes?

There is no easy answer to this as exhaust fumes contain amongst other hazards, oxides of carbon and nitrogen, these mixtures can not be filtered out the ideal solution would be a supplied air system or self contained breathing apparatus.

This solution more often than not is not practical. The only answer to this question is a compromise.

Use a twin half mask with filters for organic vapours, acid gas and air born particulates. i.e. an AEP2 filter cartridge.



Dust Mask Breathing Resistance Testing

How does "Oxygen Deficiency" occur?

Oxygen Deficiency occurs when the percentage of oxygen in the air falls below 19.5%. It can be caused by several things including fire or when chemicals displace oxygen from the air. Places of poor ventilation or in confined spaces are where this is likely to occur.

What is meant by IDLH?

This is the concentration considered immediately dangerous to life and health.

This valve represents a maximum hazard concentration from which a worker would escape within 30 minutes without any irreversible health effects.

What is "BS4275"?

The British Standard BS4275 is a "Guide to Implementing an effective respiratory protective device programme". If you only ever buy one standard, this is the one to buy!

It states that a respirator should be issued as part of a full respiratory protection programme that covers:-

1. Hazard Control

2. Risk Assessment
3. Selection of RPE
4. Fit Testing
5. Maintenance
6. Storage Procedures