

## Protection against asbestos fibres at work

### Introduction

This Technical Bulletin summarises the main health effects of exposure to asbestos fibres, the key health and safety legislation (to August 2010) that concerns asbestos, identifies the places where asbestos may be present in buildings and suggests the 3M Personal Protective Equipment (PPE) that may be suitable for certain work. This bulletin provides general guidance only and is aimed primarily at general trades people, e.g. builders, plumbers and electricians, as there is an understanding that it is these people who are most likely to be harmed by exposure to asbestos.

### What is Asbestos?

Asbestos is the name given to a group of six different naturally occurring minerals, which are divided into two groups:

- Serpentine – Chrysotiles (White Asbestos)
- Amphiboles – Amosite (Brown Asbestos), Crocidolite (Blue Asbestos), Anthophyllite, Tremolite and Actinolite.

Asbestos differs from other minerals as it is in the form of long thin fibres, these fibres are very strong and are resistant to heat and chemicals. Asbestos fibres are very stable in the environment and are not broken down over time.

### What are the Health Effects?

Asbestos is hazardous to health when its airborne fibres are inhaled. Intact asbestos in good condition does not generally pose a hazard unless it is disturbed. Once inhaled, fine asbestos fibres may settle in the lung and can lead to fatal respiratory disease and cancers. The main health effects are:

#### Asbestosis

Asbestosis is caused by long term exposure to relatively high concentrations of asbestos fibres. Scar tissue forms in the lungs and they begin to lose their ability to transfer oxygen to the blood. Asbestosis will become less prevalent as fewer workers are now exposed to the concentrations formally seen in poorly controlled removal work and the manufacture of asbestos containing materials

#### Mesothelioma

Mesothelioma is a cancer of the pleura, the lining of the lung. It takes several years to develop from the first exposure to asbestos fibres.

### Lung Cancer

Lung cancer caused by the inhalation of asbestos fibres is similar to that caused by smoking tobacco. The risk of contracting lung cancer as a result of exposure to asbestos is far greater for workers who smoke.

There is some uncertainty around the dose of asbestos fibres required to cause mesothelioma and lung cancer. However, deaths from mesothelioma have resulted from relatively low exposure. The effects of exposure to asbestos will not be felt immediately but may be severe in later life. Approximately 4000 people die of asbestos related cancers each year. This figure is expected to rise before it starts to decline with the number of deaths expected to peak sometime before 2015.

### Use of asbestos in buildings

New installation of asbestos is not permitted in the UK. However, it is found in many buildings constructed or refurbished during the twentieth century. Usage of blue asbestos stopped in 1970 and brown stopped around 1980. White asbestos continued to be used until 1999. White asbestos was used in asbestos cement building products. These can be found in many buildings and include corrugated or flat sheeting used for walls and roofs, downpipes, gutters and tiles. Asbestos insulation boards contain a higher percentage of asbestos than cement sheets. They contain white or brown asbestos and were used for insulation and fire protection.

Asbestos was also used as boiler and pipe lagging and as a sprayed on coating. Work with these materials is generally only carried out by an HSE licensed contractor.

### Asbestos Legislation

The main pieces of legislation which cover the control of asbestos are:

#### Health & Safety at Work 1974

Requires an employer to conduct a risk assessment to ensure their employees and other people who set foot on their workplace, are protected from health and safety risks.

## Construction (Design & Management)

### Regulations 2007

The CDM Regulations place duties on the client to appoint a planning supervisor (to coordinate and manage health and safety during the design and early stages of preparation) and a principal contractor (to co-ordinate health and safety issues during the construction work). The client should pass any information about asbestos to the planning supervisor and the principal contractor early enough for any work to be properly planned and any potential risks to be effectively managed. The principal contractor should ensure that the risks from asbestos (etc.) are effectively managed during the construction work. This includes ensuring that any such work is properly planned (in a plan of work), is carried out by competent people and monitored to ensure that the work is carried out as in the plan of work.

### Control of Asbestos Regulations 2006

Requires employers to prevent and control exposure of employees to asbestos to levels as low as reasonably practicable. The Duty to Manage Regulation creates a legal duty to manage asbestos in non-domestic properties. The duty holder must:

- Take reasonable steps to assess their buildings to be able to identify materials that might contain asbestos. If they are not sure whether asbestos is present, they should assume it is present unless they have strong evidence to suggest that asbestos is not present.
- Make a written record of the location and condition of materials which contain asbestos, to keep this record up-to-date and to make these records available to all who may come into contact with these materials.
- Assess the likelihood of whether employees may get exposed to asbestos.
- If asbestos is in bad condition, to repair or remove this using licensed removers.
- Monitor the condition of Asbestos Containing Materials (ACM's) and review the records on a regular basis.

These regulations bring together all previous sets of regulations. They prohibit the supply and use of all forms of asbestos, including second-hand use of asbestos products such as asbestos cement sheets and asbestos boards and tiles. If, however, existing asbestos containing materials are in good condition they can be left in place. Their condition should be monitored and it should be managed to ensure it remains logged and undisturbed.

## Asbestos Exposure Limits

Personal exposure must be prevented or where that it is not reasonably practicable reduced to the lowest level that is reasonably practicable. The airborne exposure limit, set by the Control of Asbestos Regulations 2006, is 0.1 fibres/cm<sup>3</sup> for ALL types of asbestos. This is a maximum concentration of asbestos fibres in the air (averaged over any continuous 4 hour period) that must not be exceeded. In addition, short term exposures must be strictly controlled and must not exceed 0.6 fibres/cm<sup>3</sup> of air over a continuous 10 minute period using RPE (if exposure cannot be reduced by other control methods).

Asbestos Control Limits Asbestos Type	4 Hour Exposure Period (f/cm <sup>3</sup> )	10 Minute Exposure Period (f/cm <sup>3</sup> )
All types of asbestos	0.1	0.6

Table 1 – The Occupational Exposure Limits for Asbestos

In order to control exposure to as low as is reasonably practicable, the HSE generally expect that a powered full face respirator is worn for licensed work and an FFP3 respirator or a reusable respirator with P3 filters is worn for unlicensed work, in addition to other control measures.

### Non-licensed work

Most work with asbestos cement products, asbestos containing fabrics and decorative textured coatings is not required to be carried out under licence from the HSE. Short duration work with asbestos insulating board can also be undertaken without a licence. Short duration is defined as one person doing the work for less than one hour, or more people doing the work for a total of less than two hours, in any seven consecutive days. The total time spent by all workers must not exceed two hours. The working time includes setting up, carrying out the work and clearing up.

The HSE publication HSG210 is a useful guide for those carrying out unlicensed asbestos work. It contains 10 equipment and method sheets and 38 task sheets giving practical guidance around non-licensed work with asbestos. The equipment and method sheets include advice on asbestos containing materials, training, enclosures, vacuum cleaners, wetting techniques, personal protective equipment (PPE), cleaning and disposal. The task sheets feature non-licensed jobs regularly undertaken. They detail the required preparation, equipment, PPE, procedures, cleaning and disposal, personal decontamination, clearance and checking off. The PPE required is generally a Type 5 disposable coverall with a hood and boots without laces. For many tasks gloves and respiratory protective equipment are also required. Unlike licensed asbestos work where powered full face mask are generally worn, non-licensed work is typically carried out using disposable FFP3 or reusable half masks with an assigned protection factor of at least 20. The tasks requiring respiratory protective equipment are tabled on page 3.

## Non-licensed tasks requiring respiratory protective equipment

HSG210 Reference	Task	HSG210 Reference	Task
a1	Drilling holes in asbestos insulating board	a24	Removing a single asbestos insulation board panel, less than 1m <sup>2</sup> , fixed with nails or screws
a2	Removing a single (screwed-in) asbestos insulating board ceiling tile	a25	Cleaning light fittings attached to asbestos insulating board
a4	Removing a single asbestos insulation board panel, less than 1m <sup>2</sup> , fixed with nails or screws	a26	Drilling and boring through textured coatings
a5	Cleaning light fittings attached to asbestos insulating board	a27	Inserting and removing screws through textured coatings
a6	Repairing minor damage to asbestos insulating board	a28	Removing textured coating from a small area e.g. 1m <sup>2</sup>
a9	Drilling holes in asbestos cement and other highly bonded materials	a29	Cleaning up debris following collapse of a ceiling or wall covered with textured coating
a11	Removing asbestos cement debris	a30	Removing an asbestos containing 'Arc shield' from electrical switchgear
a12	Cleaning weathered asbestos cement roofing and cladding	a31	Removing a single asbestos containing gas or electric heater
a14	Removing asbestos cement sheets, gutters etc and dismantling a small structure	a32	Replacing an asbestos containing part in a 'period' domestic appliance
a15	Removing an asbestos cement or reinforced plastic product e.g. tank, duct or water cistern	a33	Replacing an asbestos containing fuse box or a single fuse assembly
a17	Removing asbestos paper linings	a35	Replacing an asbestos cement flue or duct
a18	Removing asbestos friction linings	a36	Removing an asbestos cement panel outside, beside or beneath a window
a20	Drilling holes in asbestos insulating board	a38	How to deal with fly-tipped asbestos waste
a23	Removing a single (screwed-in) asbestos insulating board ceiling tile		

## Respiratory Protective Equipment

Personal Protective Equipment should only be used as a last resort, after other control measures have been evaluated, in order to reduce exposure to the lowest level reasonably practicable and in any event below the workplace exposure limit.

Respiratory Protective Equipment (RPE) must be suitable for the wearers and the work to be undertaken, the environment and the anticipated maximum exposure.

### Factors Affecting Performance of RPE

- **Face size and shape:** Facial features tend to vary with build, ethnic origin and sex. For tight fitting facepieces an effective seal between the face and respirator is essential – without it the respirator will not give adequate protection.
- **Facial Characteristics:** Facial hair (beards and side burns) and spectacles interfere with the seal and reduce the effectiveness of filtering respirators. Wearers of tight fitting facepieces must be cleanly shaven in the area of the face seal.
- **Work rate and the work environment:** Heat can build up which may cause the wearer to loosen the RPE. Sweat can also cause the face seal to slip.
- **Medical fitness:** Individuals with cardiovascular problems or asthma may find it difficult to draw air through a filtering respirator.
- **Visibility, Mobility and Communication:** Important issues to consider.
- **Compatibility with other forms of Personal Protective Equipment.**

### Face Fit Testing

The Control of Substances Hazardous to Health Regulations 2002 and the Control of Asbestos Regulations 2006 require that tight fitting RPE is face fit tested to ensure that any specific model can form an adequate seal to the wearer's face, essential if the wearer is to be protected.

## 3M™ Personal Protective Equipment

### Disposable Coverall

3M™ 4520	3M™ 4530	3M™ 4540+	3M™ 4565
Type 5,6	Type 5,6	Type 5,6	Type 4, 5, 6
Lightweight breathable fabric for comfort	Breathable fabric for comfort	Laminated fabric with breathable back panel	Laminated fabric with taped seams



### Powered Full Face Respirator

3M™ Powerflow XL

Full face powered respirator class TM3



### Disposable Respirators

3M™ 8833

FFP3

Cup-shaped for ease of fitting. Exhalation valve for comfort.



3M™ Aura™ 9332+

FFP3

Foldable for convenience. Exhalation valve for comfort.



3M™ 8835

FFP3D

Robust design with adjustable straps. Exhalation valve for comfort.



### Reusable Respirators

3M™ 6000 series half masks with 3M 6035 P3 R filters

Lightweight design for ease of use. Encapsulated replaceable filters.



3M™ 7500 series half masks with 3M 6035 P3 R filters

Soft silicone face piece for comfort. Fully maintainable for cost effective protection. Encapsulated replaceable filters.



### Further help

For further information on the correct selection of 3M PPE, fit testing, other respiratory protective equipment, hearing protection and safety eyewear call the 3M Health and Safety Helpline on **0870 60 800 60** or visit [www.3M.co.uk/construction](http://www.3M.co.uk/construction)

### Further reading

**Asbestos essentials - A task manual for building, maintenance and allied trades on non-licensed asbestos work (HSG210)**

Task sheets are freely available at [www.hse.gov.uk/asbestos](http://www.hse.gov.uk/asbestos)

**Working with materials containing asbestos - Control of Asbestos Regulations 2006, Approved Code of Practice and guidance (L143)**

**The management of asbestos in non-domestic premises (L127)**

**Asbestos - The licensed contractors' guide (HSG247)**

**Selection of suitable respiratory protective equipment for work with asbestos (INDG288)**

**Respiratory protective equipment at work - A practical guide (HSG53)**

All available from HSE Books [www.hsebooks.co.uk](http://www.hsebooks.co.uk)  
Tel: 01787 881165

**Fit testing of respiratory protective equipment facepieces (HSE 282/28)** Available from [www.hse.gov.uk/pubns/fittesting.pdf](http://www.hse.gov.uk/pubns/fittesting.pdf)



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