ASBESTOS AWARENESS
AND
ASBESTOS CONTAINING
MATERIALS
IN BUILDINGS

PRESENTED BY

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THE USE OF ASBESTOS – a brief history

- 1884 UK patent issued for asbestos construction boards:
- 1895 The discovery in France of asbestos related disease:
- 1926 The first diagnosed death from asbestosis:
- 1931 The first Asbestos Industry Regulations introduced:
- 1945 The use of asbestos increases......due to WWII:
- 1969 The introduction of occupational exposure levels/limits:
- 1985 The Prohibition Regulations banning ‘blue’ and ‘brown’
- 1987 CAWR introduced, covering mostly ‘asbestos workers’:
- 1998 CAWR amended to cover the construction industry:
- 1999 The Prohibition Regulations banning ‘white’:
- 2002 CAWR updated and introducing ‘Duty to Manage’:
- 2004 ‘The duty to Manage Regulation 4’ is enforced’
- 2006/2012 The Control of Asbestos Regulations are introduced

Although a total ban now exists within the United Kingdom and many other countries, asbestos is still used extensively throughout the developed world.

Because of the demand for this fibre to be used in different materials for many different uses, asbestos is still mined in many countries these include; Russia, China and India.

In total about 6 million tonnes of asbestos, mainly Chrysotile; were imported into the UK since the turn of the century. Imports reached a peak of around 172,500 tonnes in the 1960s and 1970s. This gives us some indication to the scale of the problem of managing the asbestos containing materials within buildings throughout the UK.
WHAT IS ASBESTOS?

**ASBESTOS** is the name given to a wide ranging group of naturally occurring minerals that are contained within the earth’s surface as ‘rock’.

These minerals appear as masses of strong, flexible fibres or sharp brittle fibres that can be separated into ‘miniscule’ thin threads and strands that then can be woven or combined with other materials to improve their performance in various uses within buildings etc.

Some uses include ancient woven fabrics, suits for fire protection, brake shoes, and unusual uses such as air filters in hospital ventilators, and even cigarette tips and military gas masks.

There are two main groups of the mineral which are mined they are both classified as asbestos but each one is quite different:
**AMPHIBOLES** – Composed of an iron based silicate structure these have a ‘hydroxyl’ layer on the inside, which makes them hydrophobic, meaning they are not easily wetted with water. The fibres are shaped like a sharp needle like structure.

**SERPENTINE** – Composed of a magnesium based silicate structure these have a ‘hydroxyl’ layer on the outside which makes them hydrophilic making them easier to be wetted with water. These fibres are a soft ‘curly’ snake like structure.

**ASBESTOS BY DEFINITION:**
*There are three main types of asbestos which are generally known by the terms:*

‘Blue asbestos’

‘Brown asbestos’

‘White asbestos’
There are actually six different types of asbestos fibres which are legislated for in UK legislation those being:

**ACTINOLITE** (*rarely used type of fibre*)

**GRUNERITE** (*aka Amosite, known as brown asbestos*)

**ANTHOPHYLLITE** (*rarely used type of fibre*)

**CROCIDOLITE** (*known as blue asbestos*)

**TREMOLITE** (*rarely used type of fibre*)

**CHRYSOTILE** (*known as white asbestos*)

*The above list describes the correct terminology for the different types of asbestos fibre; each different type of fibre cannot be identified by colour alone, because of the many factors which would affect the original mineral colour, i.e., dirt, the base colour of the materials the asbestos was mixed with, coloured surface coatings, etc. To determine the type of asbestos it is necessary to carry out ‘bulk sample’ analysis on a small section taken from each material.*
WHY DID WE USE IT?

Asbestos Containing Materials (ACM’s) contain asbestos and they have:

**Good electrical insulation properties;**
Generally, white asbestos has a high electrical resistance and has been used as an insulator in distribution boards and in electrical plant and equipment.

**High mechanical strength;**
The tensile strength of asbestos fibres is comparable to that of steel, also giving additional strength and bonding ability to materials such as cement and boards.

**Chemical resistance;**
Blue and brown asbestos are particularly chemically and corrosive resistant. Because of the acid resistance nature of blue asbestos, it has been used in battery boxes and high corrosive environments.

**Good thermal/sound insulation properties;**
Most asbestos minerals are stable up to about 600°C, making it particularly useful as a fire resistant material, and also widely used as a thermal protective barrier when added to other materials.
WHAT ARE THE HEALTH EFFECTS OF EXPOSURE TO ASBESTOS?

Asbestos is the single greatest cause of work related deaths in Great Britain. There is no cure for the main asbestos-related diseases, however, *asbestos is only a risk to health if asbestos fibres are released in to the air and breathed in.*

The fibres are long, fine, sharp and needle like and when inhaled can lodge deep down into the airspaces of the lung or the tissue of the chest/lung lining resulting in three main fatal diseases.

*It is statistically impossible to predict how many fibres inhaled into the body it would take to cause an asbestos disease, however what is clear is that the more exposure and the greater exposure you are subjected to occupationally, could result in an increased risk of contracting any of the diseases.*
The three main types of diseases attributed to occupational exposure to asbestos are:

**MESOTHELIOMA:** this is a malignant cancer of the lining around the pleural layer of the lungs. Once diagnosed it is always fatal.

**LUNG CANCER:** this disease once contracted is almost always fatal (*the risk is always higher (up to 53 times) for those who are heavy smokers and have had heavy exposure to asbestos*).

**ASBESTOSIS:** this is a scarring of the lung air spaces caused by the natural defence system of the lung, this results in a build up of scar tissue to protect the damaged areas of the air spaces. The affect of the scar tissue leads to hardening of the lung and shortness of breath. (*It is very disabling and can also be fatal*).

Occupation exposure to asbestos can also cause **PLEURAL DISEASES** which are **non-cancerous** including a disease known as **PLEURAL PLAQUES**.
WHAT ARE THE HEALTH EFFECTS OF EXPOSURE TO ASBESTOS? (continued)

Although pleural plaques generally do not impair lung function, they are a clear marker of previous asbestos exposure and can cause considerable concern to people that may be at risk of getting other asbestos diseases.

**MESOTHELIOMA** is responsible for the majority of deaths from exposure to asbestos. Virtually all mesothelioma cases are associated with occupational exposure to asbestos fibres.

The number of people who die from **LUNG CANCER** attributable to asbestos exposure is unclear, but best estimates are that there are around one or two asbestos-related lung cancers for each mesothelioma diagnosed.

Fewer employees die from **ASBESTOSIS** annually, and current theories state that the rates are on the decline. *In total, the number of people dying as a result of past exposure to asbestos is at a rate of around 5000 each year.*
Approximately (75%) of those dying now were exposed to asbestos between the 1950s and the 1970s, when asbestos was less well-regulated than today and very widely used in industry.

Many of those currently suffering from asbestos-related diseases will have been exposed to the fibres because of working in industries that used asbestos as a raw material, in docks when asbestos was imported, or by installing asbestos insulation in ships, railway carriages, industrial plant, factories and buildings etc.

In 1995, research carried out by Professor Julian Peto and HSE epidemiologists indicated that at least 25% of those people currently dying from asbestos diseases have worked in construction and maintenance operations.

As the other high risk activities have now all ceased, the maintenance sector now constitutes the highest occupational group at risk.
WHERE WERE, ACM’s USED WITHIN YOUR BUILDINGS?

Below is a table which shows typical ACM’s and their general asbestos fibre content. The table is in order of risk of fibre release if the material was disturbed.

<table>
<thead>
<tr>
<th>TYPE OF ASBESTOS CONTAINING MATERIAL</th>
<th>ASBESTOS CONTENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loose Fill Insulation</td>
<td>100%</td>
</tr>
<tr>
<td>Sprayed Coating</td>
<td>Up to 85%</td>
</tr>
<tr>
<td>Thermal Insulation (Lagging)</td>
<td>Up to 85%</td>
</tr>
<tr>
<td>Asbestos Insulation Board</td>
<td>15-40%</td>
</tr>
<tr>
<td>Textiles</td>
<td>Up to 100%</td>
</tr>
<tr>
<td>Paper, Felt &amp; Cardboard</td>
<td>Up to 100%</td>
</tr>
<tr>
<td>Asbestos Cement</td>
<td>10-15%</td>
</tr>
<tr>
<td>Vinyl Floor Tiles</td>
<td>Up to 25%</td>
</tr>
<tr>
<td>Textured Coating</td>
<td>3-5%</td>
</tr>
<tr>
<td>Composite Products</td>
<td>10-15%</td>
</tr>
<tr>
<td>Plastics</td>
<td>Up to 10%</td>
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</tbody>
</table>
Figure 1. Asbestos building
Typical locations for the most common asbestos-containing materials:

**ROOF AND EXTERIOR WALLS**
1. Roof sheets, slates and tiles
2. Guttering and drainpipes
3. Soffit boards
4. Panel beneath window
5. Roofing felt and coating to metal wall cladding

**BOILER, VESSELS AND PIPEWORK**
6. Lagging on boiler pipework, calorifier, etc.
7. Damaged lagging and associated debris
8. Paper lining under non-asbestos pipe lagging
9. Gasket in pipe and vessel joints
10. Rope seal on boiler access hatch and between cast iron boiler sections
11. Paper lining inside steel boiler casing
12. Boiler flue

**CEILINGS**
13. Spray coating to ceiling, walls, beams/columns
14. Loose asbestos in ceiling/floor cavity
15. Tiles, slats, canopies and firebreaks above ceiling
16. Textured coatings and paints

**INTERIOR WALLS/WALLS**
17. Loose asbestos inside partition walls
18. Partition walls
19. Panel beneath window
20. Panel lining to lift shaft
21. Papier-mâché to vertical and horizontal beams
22. Panel behind electrical equipment
23. Panel on access hatch to service riser
24. Panel lining service riser and floor
25. Heater cupboard around domestic boiler
26. Panel behind/under heater
27. Panel on, or inside, fire door
28. Bath panel

**FLOORING MATERIALS**
29. Floor tiles, linoleum and paper backing, lining to suspended floor

**AIR HANDLING SYSTEMS**
30. Lagging
31. Gaskets
32. Anti-vibration gaiter

**DOMESTIC APPLIANCES**
33. Gaskets rope seals and panels in domestic boilers
34. "Capot" insulating blocks, panels, paper, string etc. in domestic heater
35. String seals on radiators

**OTHER**
36. Fire blanket
37. Water tank
38. Brake/clutch lining

Note: This diagram does not show all possible uses and locations of asbestos-containing materials. A detailed survey will be required to identify all asbestos-containing materials present in a building.
<table>
<thead>
<tr>
<th>LOOSE FILL INSULATION</th>
<th>SPRAYED COATINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>THERMAL INSULATION / LAGGING</td>
<td>ASBESTOS INSULATION BOARD</td>
</tr>
<tr>
<td>TEXTILES</td>
<td>ASBESTOS CEMENT</td>
</tr>
<tr>
<td>FLOOR TILES</td>
<td>FELT</td>
</tr>
<tr>
<td>-------------</td>
<td>------</td>
</tr>
<tr>
<td>TEXTURED COATING</td>
<td>BITUMEN SINK PAD</td>
</tr>
<tr>
<td>COMPOSTE TOILET CISTERN</td>
<td>BITUMEN FLOOR ADHESIVE</td>
</tr>
</tbody>
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Asbestos Awareness Notes 2017
WHAT TYPES OF BUILDINGS MAY CONTAIN ACM’s.......?

Any building built before 1999 may have ACM’s used within them either as structural elements of the building or installed into plant and machinery.

However, by using the following legislation as a guide, we can eliminate some of ACM’s likely to be found in buildings by the age of the property.

The Asbestos (Prohibitions) Regulations 1985 banned all use and imports of ‘blue’ and ‘brown’ asbestos, therefore we can rule out those products which may contain these types of asbestos fibre such as; thermal insulation products and fire resistant insulation boards. The Regulations were amended in 1992 to include some ACM’s which would contain ‘white’ asbestos such as bitumen and flooring products.

The Asbestos (Prohibitions) Regulations 1999
The importation, supply and use of ‘white’ asbestos was finally banned.
Employers, building owners and landlords are obliged by law to protect their employees, the building occupants or tenants from being exposed to asbestos whilst working, visiting or living on the premises.

Various legal acts of parliament, Regulations and codes of practice are now in place which should ensure that information, instruction and where applicable training, is given to anyone at risk from exposure to fibre release from ACM’s within their buildings, these may include:

- The Defective Premises Act 1972
- The Health and Safety at Work Act 1974
- The Management of Health & Safety at Work Regulations 1999
- The Control of Asbestos Regulations 2012
The Defective Premises Act 1972:
This places legal duties on landlords to take reasonable care to see that tenants and other people are safe from personal injury or disease caused by a defect in the state of the premises.

The Health and Safety at Work Act 1974:
A wide ranging act of parliament which places many legal duties to protect all aspects of health and safety risks at work covering the self employed, employees, any non direct employees and members of the public.

The Management of Health & Safety at Work Regulations 1999:
These Regulations place a legal duty on employers to risk assess all work activities, tools and equipment etc. Where there are five or more people employed, the risk assessment should be written, documented and be available to all workers who may be at risk.
LEGAL DUTIES SPECIFIC TO ASBESTOS?

The Control of Asbestos Regulations 2012
These Regulations are specific to asbestos and apply to both those who work with ACM’s and have ACM’s within or on their premises.

Asbestos removal workers:
For those employees who work with ACM’s these Regulations enforce upon their employer a legal duty to put in place a vast array of legal requirements.

These requirements should ensure that that employees engaged in the removal or repair of ACM’s are given the highest levels of protection in all aspects of training, personal protective equipment and dust suppression techniques to ensure the risks to their health are minimised or even eliminated whilst at work.
Construction and maintenance workers:

The Regulations have included since 1998, legal duties relating to the protection of all people who are liable to be exposed to asbestos whether through direct or incidental exposure.

So for anyone with responsibility for any premises and building maintenance management there are now a number of clear implications which apply during routine maintenance work, and refurbishment projects.

The two specific Regulations relating to the protection of construction and maintenance workers are:

**Regulation 11**- where employers must; PREVENT the exposure of their employees to asbestos so far as is reasonably practicable, and

**Regulation 16**- where employers must; PREVENT or REDUCE the spread of asbestos contamination from any workplace under their control.
The Duty to Manage asbestos in non-domestic premises (*Regulation 4*)

Introduced in 2002 and enforceable from 21st May 2004, a new ‘Duty to Manage Asbestos’ within non-domestic buildings is now in place.

The ‘Duty to Manage’ brings a role – the term: **“The Duty Holder”**

**Who is the Duty Holder?**

- Main duty is on the employer in occupation of the non-domestic premises if they are in control of maintenance activities.

- The duty is also applicable to those who have responsibilities to maintain or repair premises by virtue of contract or tenancy to enable an employer to comply with the duty.

- Although the duty *does not apply* to the domestic premises, it *does apply* to those responsible for common parts in domestic rented housing sector.
What does the Duty holder have to do?

► Find out if and where ACM’s are present, how much there is and in what condition.

► Presume any unknown materials contain asbestos unless there is strong evidence that they do not.

► Compile and keep a record of any identified ACMs or presumed ACMs.

► Assess the risks of exposure from the ACMs.

► Prepare and implement a detailed written plan on how to control and manage the risk of exposure.

► Review and monitor any management plans at regular intervals to ensure that measures are effective and working.

► Inform all who need to know of the location and condition of ACMs within their buildings.
Identification of the presence of asbestos (Regulation 5)

This regulation requires employers to identify the presence of asbestos and its type and condition before any building, maintenance, demolition or other works, liable to disturb asbestos, begins. It also sets out the requirements to arrange a survey if existing information on the presence of asbestos in the premises is incomplete or appears unreliable.

Types of Asbestos Surveys;

Management Survey – Standard survey to locate ACM’s as far as reasonably practicable. Involves minor intrusive works.

Refurbishment and Demolition Survey Needed before any Refurbishment or Demolition works carried out. This type of Survey is fully intrusive and involves destructive inspections as necessary to gain access to all areas.
PRE-WORK ASSESSMENT

BEFORE YOU START WORK

Ask the Client/Employer for the section of the asbestos register which relates to the area in which you propose to work.

Is the asbestos register available for inspection?
- Yes: Does the register show any asbestos materials in or near the work area?
  - Yes: STOP WORK & REFER TO CLIENT/EMPLOYER
  - No: An inspection of the work area must be carried out before beginning work with findings confirmed in writing. Liaise with Client
    - Yes: STOP WORK & REFER TO CLIENT/EMPLOYER
    - No: Does the proposed work make contact with the material OR could dust from the material be released accidentally?
      - Yes: STOP WORK & REFER TO CLIENT/EMPLOYER
      - No: CONFIRM YOUR DECISIONS WITH THE CLIENT / EMPLOYER BEFORE STARTING WORK

If you suspect any asbestos during your work avoid it or stop immediately and refer to your employer or client.
EMERGENCY PROCEDURE

POSSIBLE RELEASE OF ASBESTOS FIBRES ON SITE

STOP WORK IMMEDIATELY

- Prevent anyone from entering the area & remove any personnel from the affected area to an area away from others, preferably outside. Barrier area off with warning signs if possible.

- All employees in the affected area should be checked for any signs of dust or debris on themselves or clothing.

- If necessary, and if practicable, remove clothing or remove the top layer of clothing & place in plastic bag. Put on a pair of disposable overalls if available, alternatively wipe down any contaminated clothing with wet wipes or a damp rag.

- Notify Employer or Client

- Bulk samples from release/fall and swab samples from clothes to be taken for identification by a competent person.

- Wait outside property for further advice. Be conscious of your movements i.e. do not sit in a vehicle, stay away from others until advice is sought.

- Client or Employer to contact specialist for advice

- Depending on results, Client / Employer to arrange for clean up. If confirmed as asbestos record the incident on personnel file.