

Guidance Notes

What is Asbestos?

Types of Asbestos

There are 6 regulated types of asbestos, they fall into 2 classes of asbestos minerals.

- AMPHIBOLE – Crocidolite (Blue)
Amosite (Brown)
Fibrous Anthophyllite
Fibrous Tremolite
Fibrous Actinolite

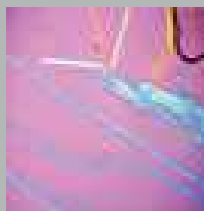


- SERPENTINE – Chrysotile (White)

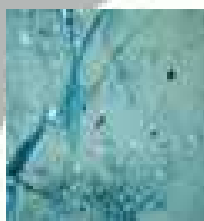
Estimated that 6,000,000 tonnes has been imported into UK.

What do they look like?

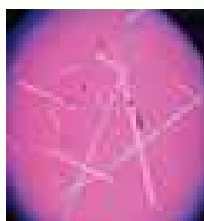
- **Chrysotile** – White, pale yellow or pale green
- Typically found in cement products, floor tiles and gaskets
- Soft, flexible, inelastic, curly
- Hydrophilic (Having an affinity for water; readily absorbing or dissolving in water.)
- Static charge on surface
- Low resistance to acids
- High tensile strength
- Accounts for 90% of asbestos used commercially



- **Crocidolite** – Blue asbestos
- Typically found in sprayed coatings (limpet), insulation and old textiles
- Flexible, elastic, small fibres
- Very good chemical stability
- Very high tensile strength
- Very high thermal stability
- Hydrophobic (Repelling, tending not to combine with, or incapable of dissolving in water)
- Accounts for 6% of asbestos used commercially



- **Amosite** – Brown, grey
- Needle like, easily split, glassy appearance, flexible, elastic
- Hydrophobic (Repelling, tending not to combine with, or incapable of dissolving in water)
- Moderate tensile strength
- Good resistance to acid
- Typically found in wall panels, ceiling tiles and pipe insulation
- Accounts for 3% of asbestos used commercially



History

What is Asbestos?

- From the Greek for “Not Quenchable”
- First used 3900BC in Finland for making cooking pots!
- Classical scholars mention the use of the material.
- Used in UK industry for 150 yrs.
- Health hazards known as early as 1898.
- Asbestos was finally banned from use in buildings in 1999.
- Covered by more UK Health and Safety legislation than any other material.

Myths

Myth of “safe” White Asbestos:

- All asbestos types (White, Brown and Blue) are acknowledged as dangerous and all have the same control limits (0.1 f/cm³)
- All asbestos types are Category I Carcinogens (an agent directly involved in causing cancer)



Health Effects

- The type of asbestos fibre is not important.
- It is impossible to tell the different types of asbestos apart, except by UKAS accredited lab microscopic analysis.
- This is why we take samples of asbestos.
- Asbestos that is bonded with other materials is less hazardous.
- Pure fibrous fluffy asbestos is more dangerous.
- The more friable the asbestos containing materials and the higher the asbestos content, the more dangerous.
- As asbestos ages the more friable it becomes.
- Estimated 5000 died last year from asbestos related diseases.
- Will increase to 10,000 per year in the next 10 years.
- The 3 major diseases, for which there is no cure, directly attributable to asbestos exposure are:

- **Asbestosis**
- **Lung Cancer**
- **Mesothelioma**

Annual UK Deaths

- Construction accidents (2004/2005 figures): **69**
- Road accidents (2007 figures): **2946**
- Asbestosis (2006 figures): **96**
- Mesothelioma (1968 figures): **153**
- Mesothelioma (2005 figures): **2037**
- Total including lung cancer around: **4000**
- Generally accepted ratio is 1 Lung Cancer deaths for each Mesothelioma death.

Asbestos fibres in air

- Exposure to asbestos in the work environment
- Fibres can remain airborne for up to 3 to 4 days after being released
- Invisible to the naked eye

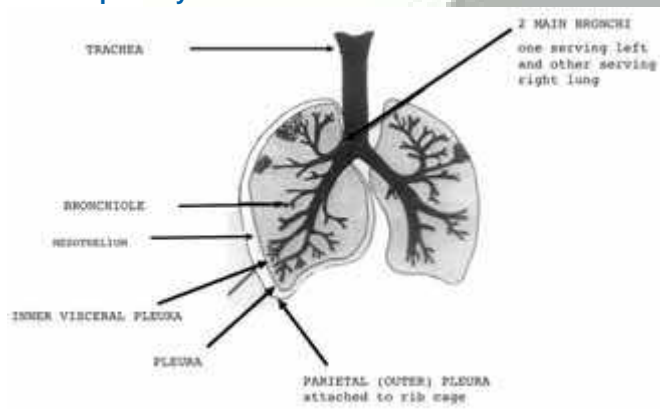


Guidance Notes

Routes of Entry

- Fibres enter the body through the nose and mouth.
- Fibres cannot be absorbed through your skin.
- Your body naturally gets rid of any fibres you might take in with food and water.
- Larger inhaled fibres will be removed by the body.
- Long, narrow fibres will pass deep into the lungs where they can cause disease.
- It is therefore very important to control exposure to fibres on every job.

The Respiratory Tract



Respirable Fibres

For a fibre to be respirable:

- < 3 Microns DIAMETER
- > 5 Microns LENGTH
- Overall Aspect ratio 3:1



IN OTHER WORDS NOT DUST BUT A LONG THIN AERODYNAMIC FIBRE

Hazard and Risk

- Hazard – The POTENTIAL of a substance to cause harm.
- Risk – The LIKELIHOOD (probability or chance) of that harm occurring.
- For all substances hazardous to health:

Risk = Hazard x Exposure

- The Hazard can be reduced and the Exposure can be controlled, thereby reducing the overall Risk.

Typical Exposures

- Exposures are measured in respirable airborne asbestos fibres per millilitres of air.
- There is no such thing as a safe level of asbestos.
- 200 of the shortest respirable fibres laid end to end measure only 1mm – they are invisible to the naked eye.
- The clearance indicator, which is a reasonably achievable level following asbestos removal is 0.01 fibres per f/cm³.
- The Control Limit – a level that no-one is allowed to inhale is 0.1 fibres per f/cm³.
- 0.1 fibres per f/cm³ is the same as 100000 fibres per cubic meter – the amount of air you could breathe in an hour!

Activity	Typical Exposures (f/ml)
Asbestos lagging, coating and insulating board (AIB)	
Drilling AIB overhead	5 – 10
Drilling vertical columns	2 – 5
Using jig saw on AIB	5 – 20
Hand sawing AIB	5 – 10
Repair/replace ceiling tiles	0.45
Asbestos cement	
Machine cutting	
- jig saw	2 - 10
- circular saw	10 - 20
- abrasive disc	15 - 25
- hand sawing	Up to 1
- machine drilling	Up to 1
Removal of asbestos cement sheeting	Up to 0.5

Asbestosis

- Normally 15 - 20yrs to develop from first exposure.
- Can be picked -up by X-ray in around four out of five cases.
- It is known as a one symptom disease: Breathlessness!
- Sufferers can live for many years.
- Sufferers have severely restricted respiratory problems.

Mesothelioma



- Very low levels of exposure can cause cancer to develop.
- It can take 20 to 50 years to show symptoms from first exposure.
- Is not smoke related.
- The cancer is UNTREATABLE, most people die between **3 to 18 months** of diagnosis

ESTIMATED 1,000,000 ASBESTOS RELATED DEATHS IN WESTERN EUROPE OVER NEXT 35 YEARS

Lung Cancer and Smoking

There is a significant increased risk of lung cancer due to the combined effects of **SMOKING** and working with **ASBESTOS**



Relative Risk of lung cancer from asbestos exposure	
Non-smoker/no asbestos exposure	x1
Non-smoker/asbestos exposure	x5
Smoker/no asbestos exposure	x11
Smoker exposed to asbestos	x52