



THE UNIVERSITY *of* EDINBURGH

Asbestos Awareness Training 2017

Welcome



Murray Provan



THE UNIVERSITY of EDINBURGH



Asbestos Awareness Course

Housekeeping
(toilets / tea break)

Fire Alarm
(muster point)

Mobile Phones
(off / silent)

Format
(questions)



HSE 2016/17 Statistics

137 people were killed due to workplace accidents

19 In Scotland

30 in construction in UK;

construction remains a high risk industry.

Although it accounts for only about **5%** of the employees in Britain it still accounts for **nearly 25%** of fatal injuries to employees and over **10%** of reported major injuries.

What about asbestos?

- What do we know about Work-related asbestos disease?
- **Around 4000 deaths in total per year currently, and still increasing – possibly peak in 2020**
- Diseases take many years to develop following exposure to asbestos
- Current deaths are a result of past exposures
- **legacy industries...BUT...**

Did you know?

That every week on average **20** tradesman, including **8** joiners, **6** electricians and **4** plumbers die from asbestos-related disease.

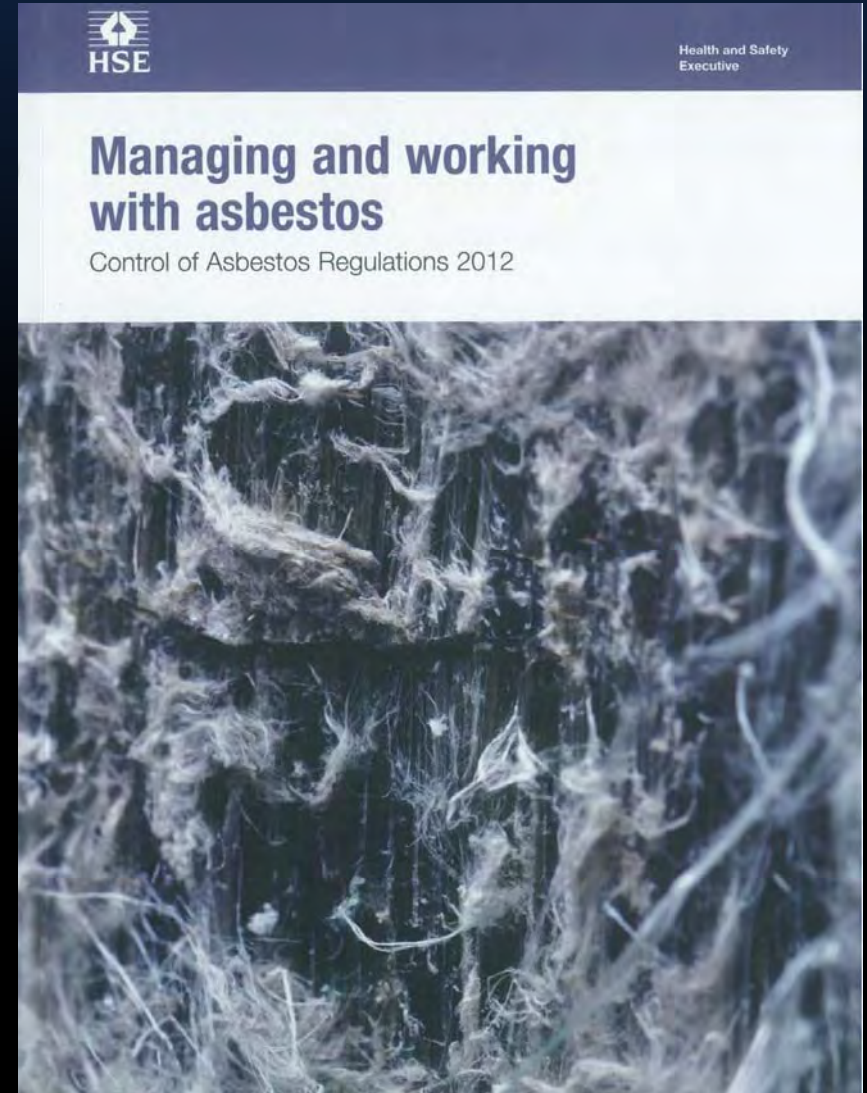
Asbestos Awareness

Asbestos awareness training is required to be given to employees whose work could foreseeably expose them to asbestos

The Control of Asbestos Regulations 2012

- Where asbestos comes from
- Types of asbestos
- Properties of asbestos
- Effects on health
- The presence of asbestos in buildings
- The risks
- Avoiding the risk
- Emergency Procedures

Test Paper



So who is at risk?

- It is recognised that almost all workers within the construction industry will come across asbestos as part of their work activities.
- *Not just demolition / refurbishment contractors!*
- This includes;
 - Electricians
 - Plumbers / Gas Fitters
 - Painters / Decorators
 - Joiners / Shop Fitters
 - Plasterers
 - Roofers
 - General Site Personnel
 - Site Management
 - Site Visitors

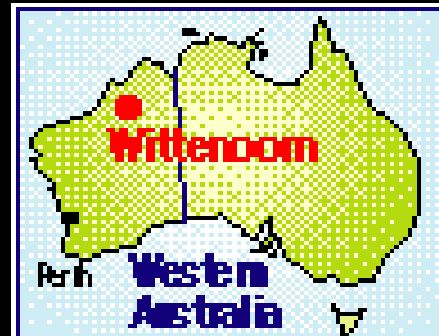
➤ **YOU**

What is Asbestos

- Asbestos is a naturally occurring rock which is/has been mined
- Asbestos is a generic term for a group of fibrous mineral silicates
- Formed over millions of years crystallised under the influence of igneous activity

Asbestos Origins

- Commercially mined in
- Canada, Russia, China,
- South Africa



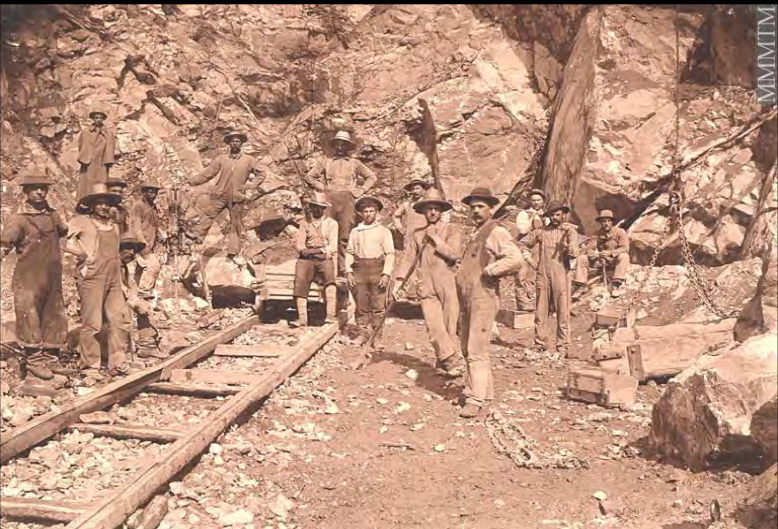
- Australia
- White Asbestos can be found in the UK



Asbestos Mining

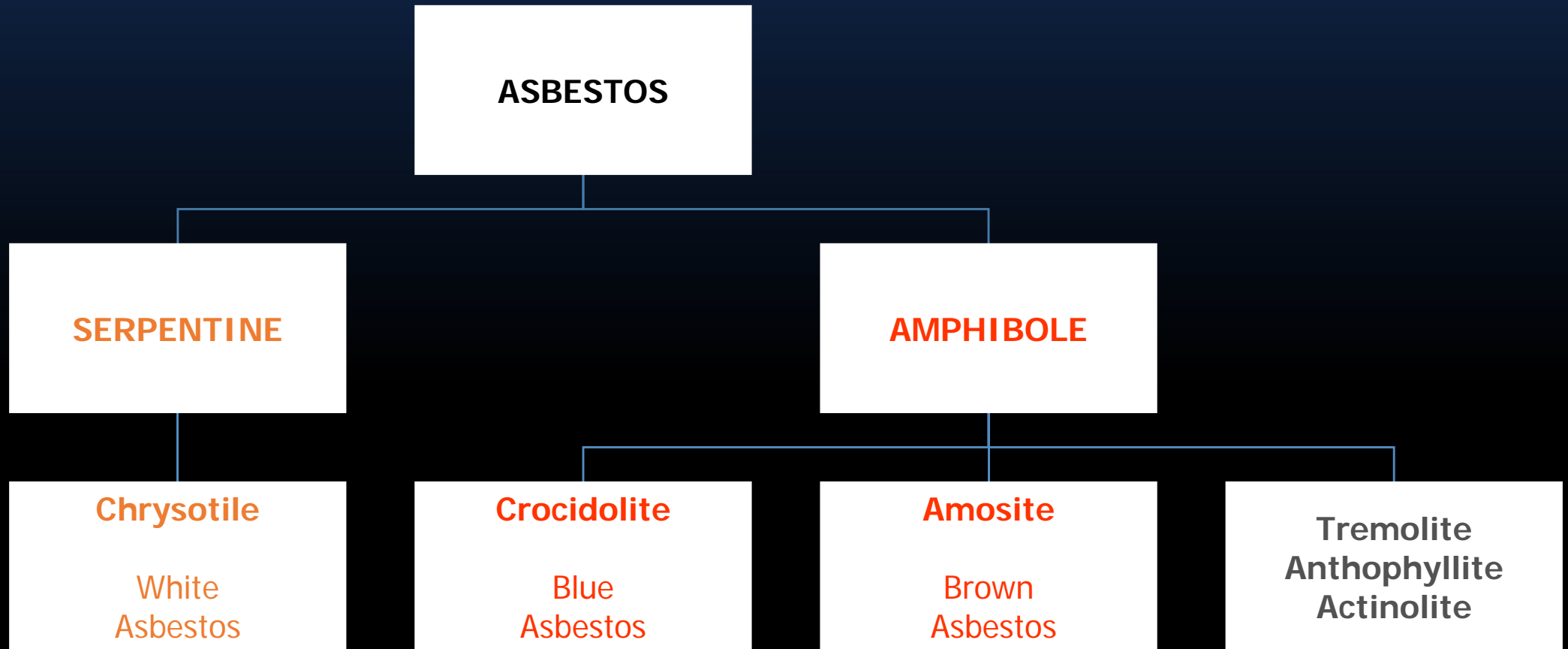


- From 1910-1999 it is estimated that over 6,000,000 tonnes of raw natural asbestos was imported into the UK
- It was cheap, had a variety of uses and therefore very common in Government Funded buildings. (remember this !)





Asbestos Family Tree



Warning !

The type of asbestos can not be confirmed by its surface colour

This is due to its microscopic nature, it will take on the colour of the bonding sealing material

Brief History Of Asbestos

- Used to strengthen clay pottery by Finnish potters around 2000BC
- Ancient Romans made clothing from asbestos
- Industrially used in Shipbuilding and train manufacture

Construction industry used in building materials and Products

First death from Mesothelioma linked to Asbestos 1906

- 1974 Asbestos Imports peak around 170,000 tonnes/year)
- 1980 Voluntary import ban on Blue and Brown Asbestos
- 1983 Main Asbestos Regulations Introduced - CAWR & Licensed work
- 1999 Total Ban (6.1 Million Tonnes imported since 1900!) - why is this important?
- 2004 Duty to Manage came into force

“White Asbestos”

Chrysotile

Bundles of fibres
“wavy”

Hardness about
same as fingernail

High tensile strength
can be spun and
woven



Characteristics

- Chrysotile (“White”)
- Prohibited since 1999
- Not totally resistant to acids and alkali
- Decomposition temperature (400c – 700c)
- Fibres are hydrophilic (water loving)

Common Usage:

Asbestos Cement, Insulation, Vinyl Flooring, Roofing Felts, Oven Gloves, Fire Blankets and Curtains.

Testing:

Moved from kg/ per m³ to water absorption test.

“Brown Asbestos”

Amosite

- Straight, needle like fibres. Often used for thermal insulation.



Characteristics

- Amosite (“Brown”)
- Prohibited since 1985
- Highly resistant to acids and alkali
- Decomposition temperature (600c – 700c)
- Fibres are hydrophobic (water hating)
- Excellent as sound and heating insulation

Common Usage:

Pipe Lagging, Insulation Boards and Sprayed Coatings.

“Blue” Asbestos

Crocidolite

Sprayed coating
“fluffy” and very
friable



Characteristics

- Crocidolite (“Blue”)
- Prohibited since 1985
- Resistant to acids and alkali
- Decomposition temperature (400c – 600c)
- Excellent as sound and heating insulation
- Tensile strength greater than Chrysotile and similar to steel

Common Usage:

Ropes, Lagging, Sprayed Coatings and Cements.

Asbestos Products



Asbestos Fibres are added
to make an Asbestos
Containing Material (ACM)



What makes it so useful?

- Good thermal insulator
- Good electrical insulator
- Fire / heat resistant
- Very stable at high temperatures
- High tensile strength
- Long Flexible Fibres
- Chemically inert
- Easily Bonded
- Resistant to strong acid/alkali
- Water repellant,
- Lighter than silk,
- Stronger than steel,
- Does not degrade over time
- 3000+ Building Products..



Versatile

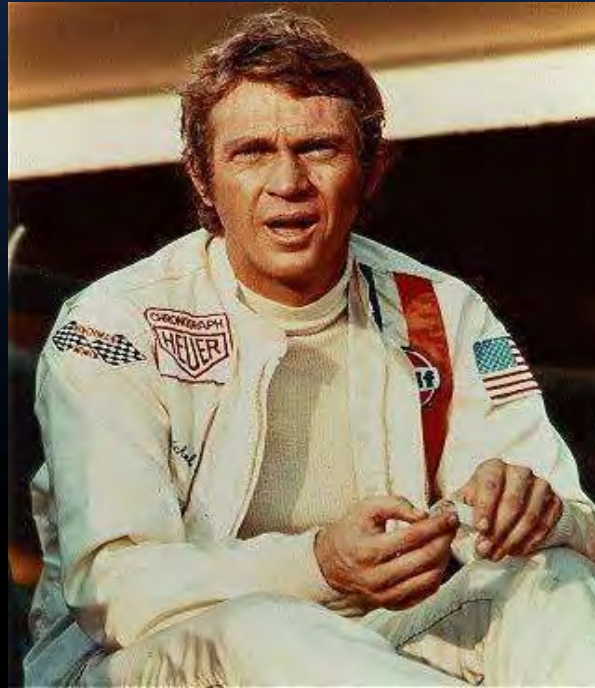
- Hollywood "Snow"
- Talcum Powder
- Crayola Crayons
- Ironing Board plates / covers
- Kent Cigarettes
- Czechoslovakian Budweiser
- Gordon's Gin



What types of asbestos are dangerous?

- ALL types of asbestos are classified as Category 1
- Cancer
causing

Famous Asbestos Death

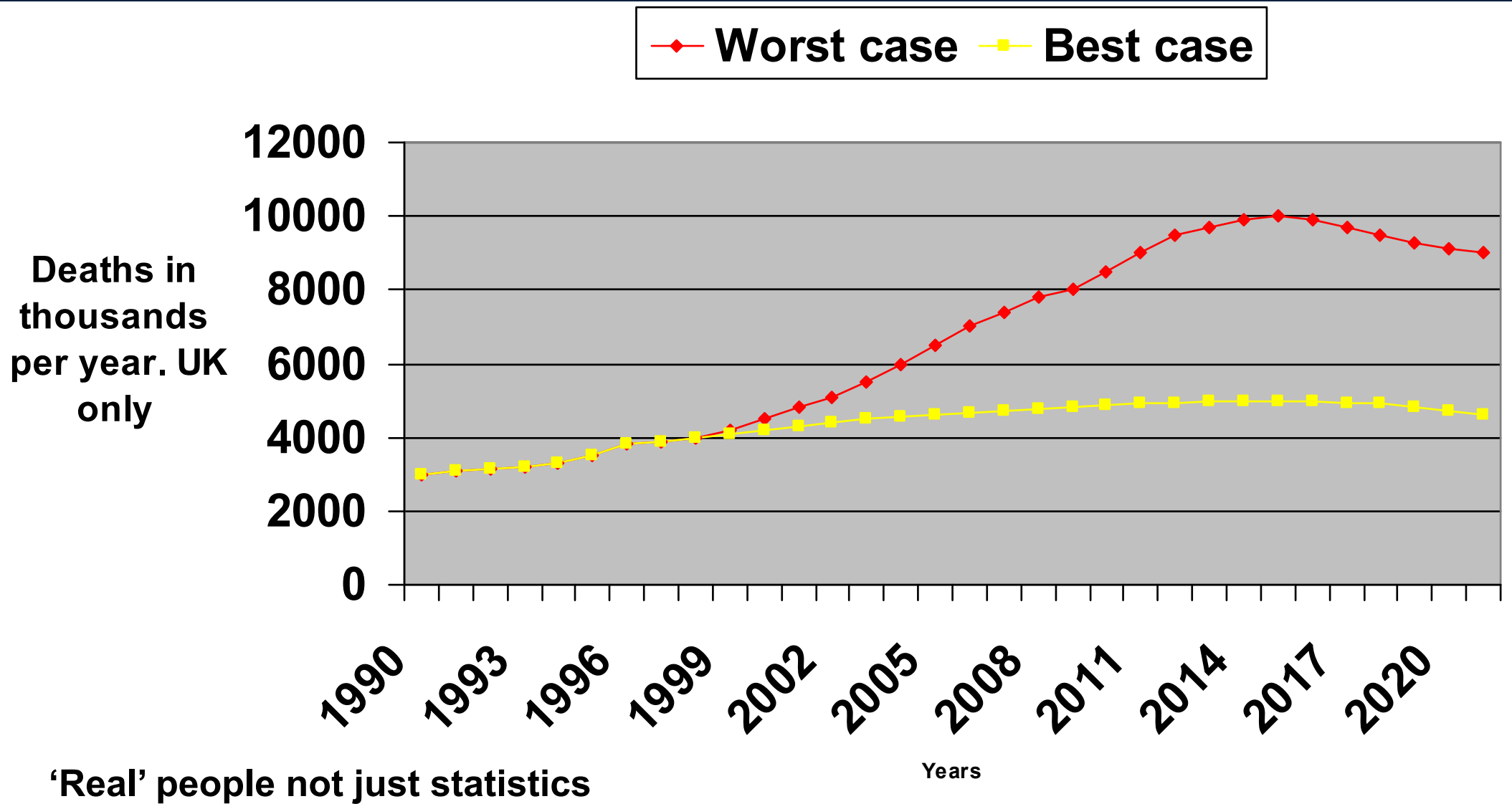


Steve McQueen – WHY ?

Died: Friday 7th November 1980,

Cause: Mesothelioma - Asbestos Exposure

UK Asbestos exposure Deaths



- There is a general background level of Asbestos fibres in the air we breathe
- Many Asbestos Fibres are released from a material when damaged (Greater force = More fibres)
- Fibres are microscopic and invisible to the naked eye.
- They are virtually weightless and can float in the air for hours and even days



Asbestos Fibres in the Air

Worker Empties Asbestos Into Hopper

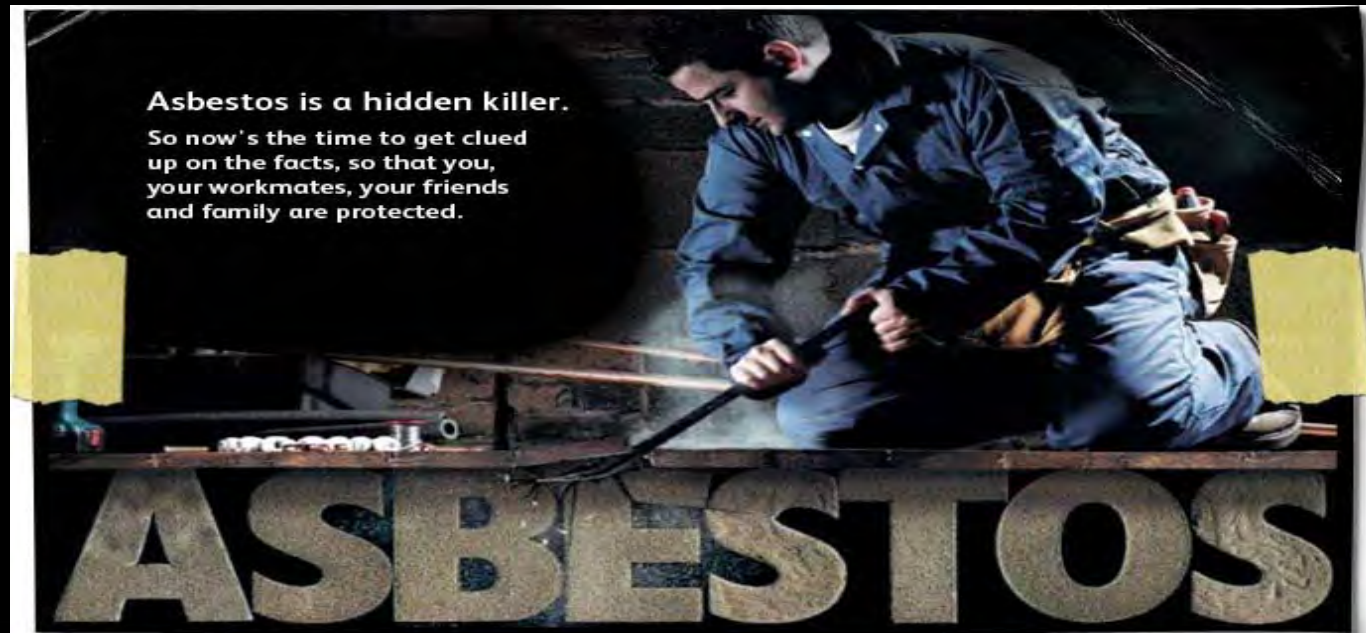


Types of activities likely to increase exposure

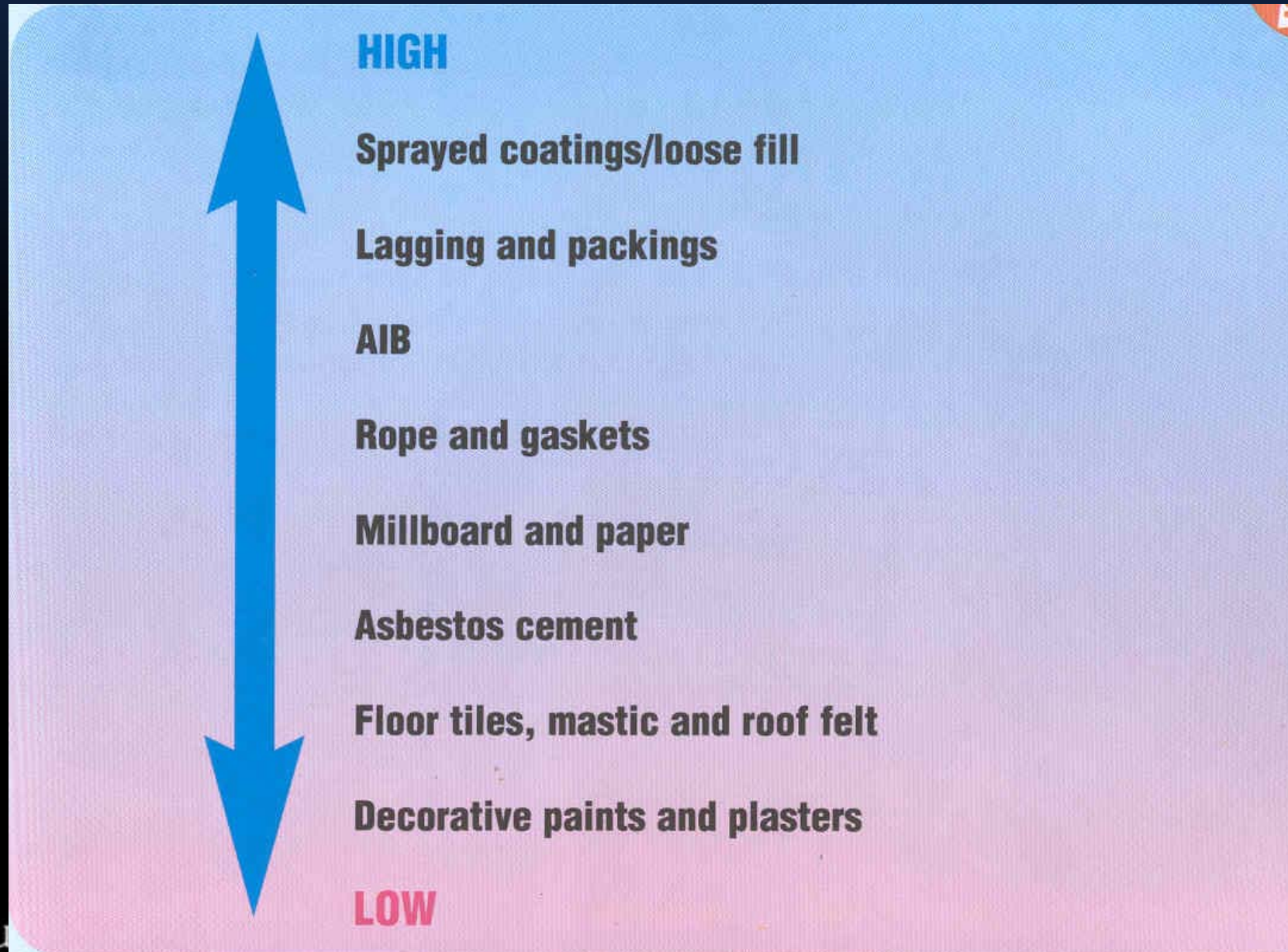
- Cutting (esp. with power saw)
- Drilling
- Hammering
- Disturbing, investigative work?**
- Sanding
- Stripping
- Removing



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Levels of Concern – WHY ?



Where is the hidden killer?

**DANGER
ASBESTOS**



- Any building constructed or refurbished before 2000 may contain asbestos

Asbestos in Buildings

Sprayed Coatings (*Limpet Asbestos*)

- Applied Raw (almost 90% pure asbestos) by spraying
- Commonly either Blue or Brown asbestos used
- Application ceased around 1974-75
- Very friable and susceptible to damage
- Fire Protection: Steelwork and fire-curtains
- Prevent Condensation: Ceilings (car parks)
- Acoustic insulation (cinemas, theatres)
- Application results in high level of contamination – (over spray)
- Decontamination/Removal difficult & expensive

Asbestos Sprayed Coatings



Ceiling Fixings Placed on Sprayed Asbestos (not from University Site!)



Asbestos in Buildings



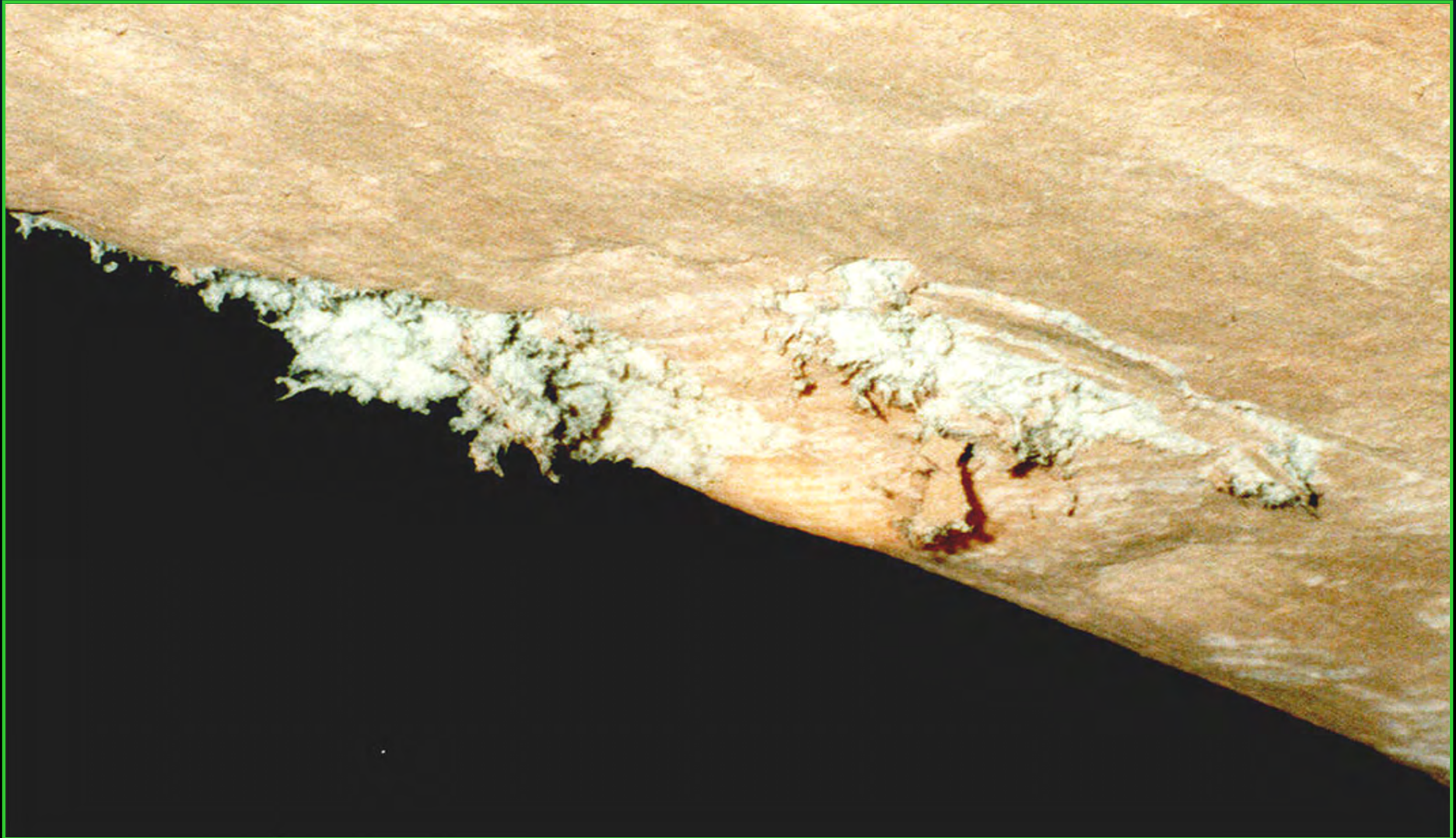
Asbestos in Buildings



Asbestos Insulation Debris in Ceiling Void – suspended ceiling tiles !!!



Damaged Sprayed Asbestos



Sprayed Asbestos (Encapsulated)



Asbestos in Buildings

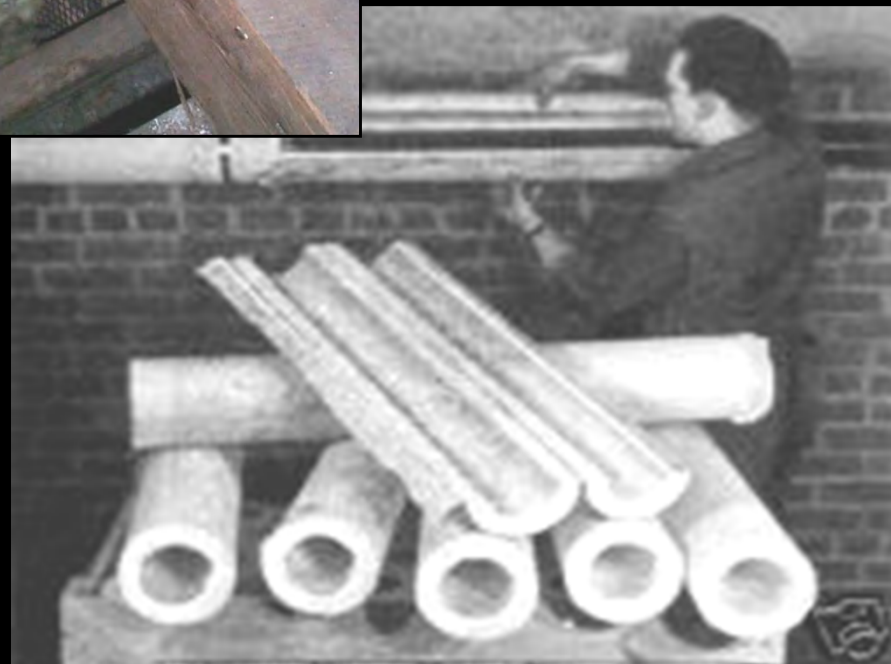
- **Lagging (thermal insulation)**

- Boiler & Pipe Insulation
- Can be almost 100% asbestos (mixture of types)
- Loosely bonded and friable (susceptible to damage)
- Numerous forms
 - Hard-setting (*'monkey dung'*-oldest form)
 - Sectional
 - Rope /yarns and blankets

Pipe Insulation



Pipe Insulation



Boiler & Tank Insulation



Pipe Insulation in a Ceiling Void



Insulation Residue & Debris



Asbestos Building Materials

- **Insulating boards (AIB)**
 - Typical asbestos content (20-40%)
 - Water absorbency test (>30% of its weight)
 - Usually contain Amosite or a mixture of types
 - Manufactured semi-compressed
 - Mainly used for partition walls & ceiling tiles
 - Provides fire protection

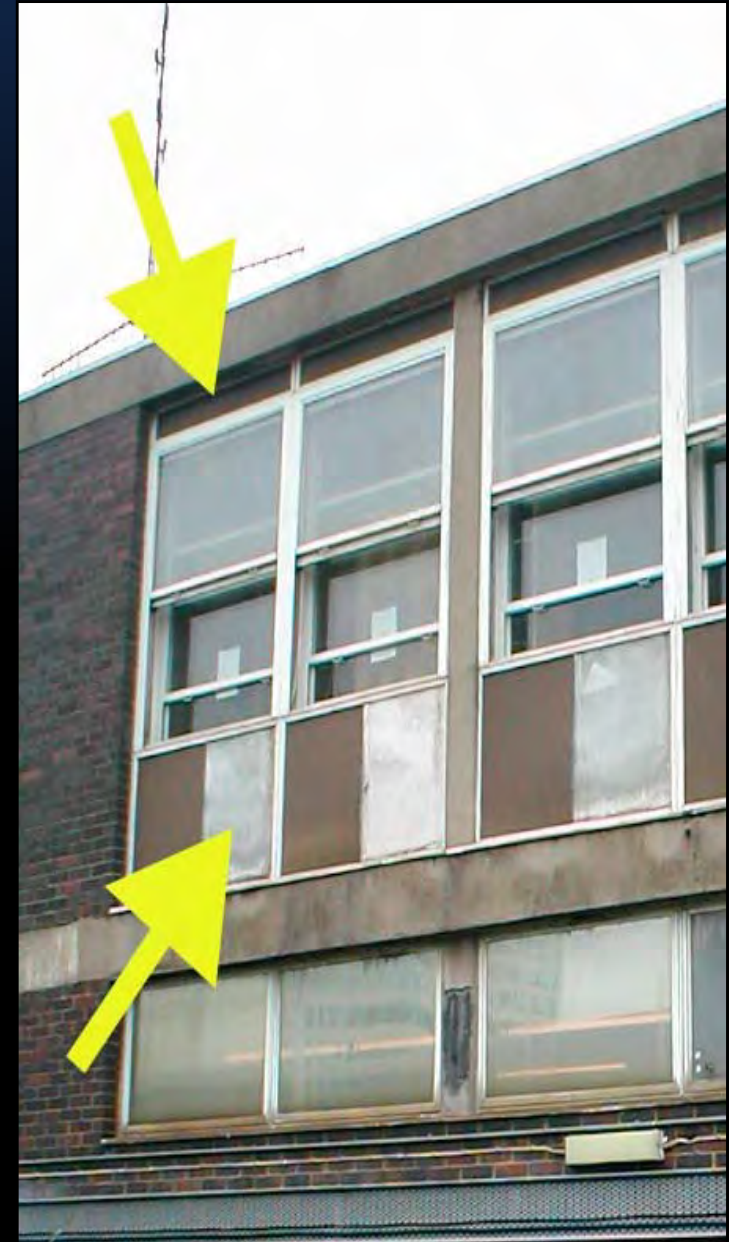
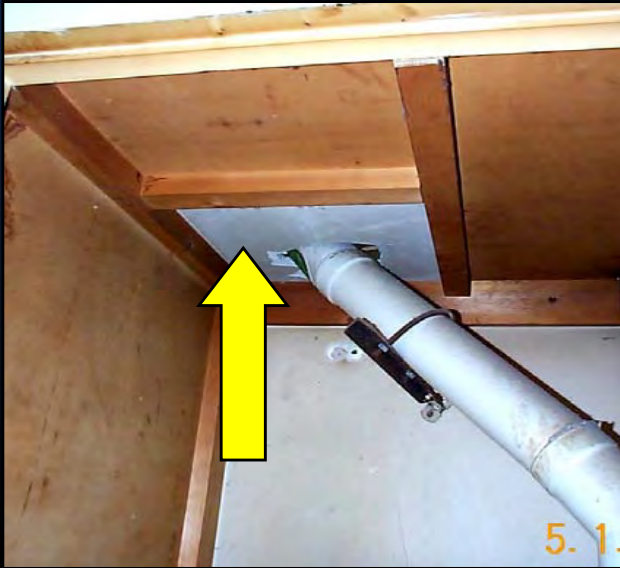
Asbestos Insulating Board



Asbestos Insulating Board



Asbestos Insulating Board



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Asbestos Building Materials

- **Other Materials**

- Ropes, gaskets, yarns and cloth flash pads
- Millboard, paper and paper products
- Bitumen felts and coated metal (Galbestos)
- Flooring materials-floor tiles & linoleum
- Textured Decorative Coatings (e.g. ARTEX) and paints
- Friction material - brake pads and clutch plates
- Mastics, sealants, putties and adhesives
- Reinforced plastics (cisterns, toilet seats)

Other Asbestos Materials



Asbestos Building Materials

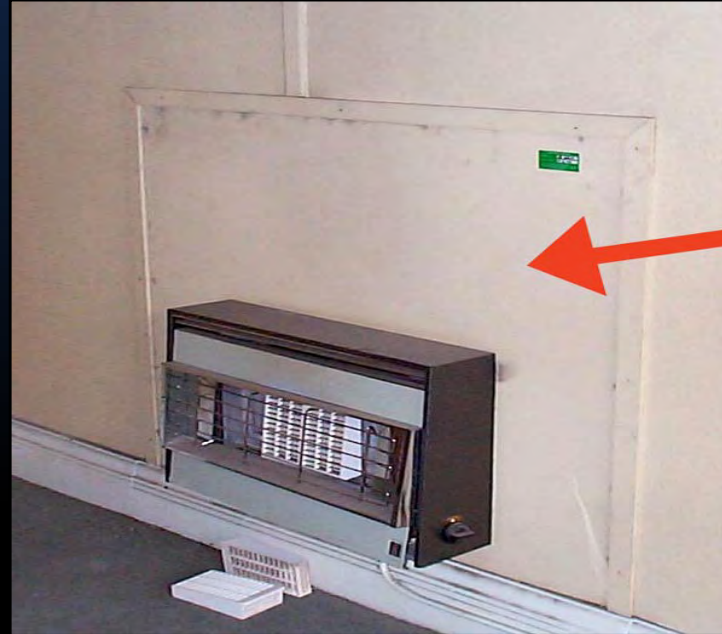
- **Asbestos Cement Products**

- Asbestos content (5-15%) - Usually Chrysotile mixed with Portland cement or calcium silicate
- Used as a binding agent to add strength & durability
- Very hard & brittle material
- Rainwater furniture, slates, shuttering
- Flue pipes, water pipes

Asbestos Cement Pipes



Asbestos Cement Products



Asbestos Cement Sheets



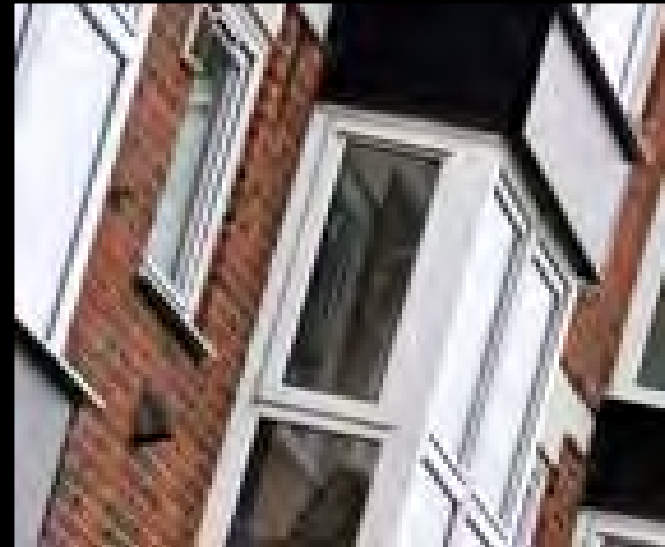
Asbestos Cement Roofing

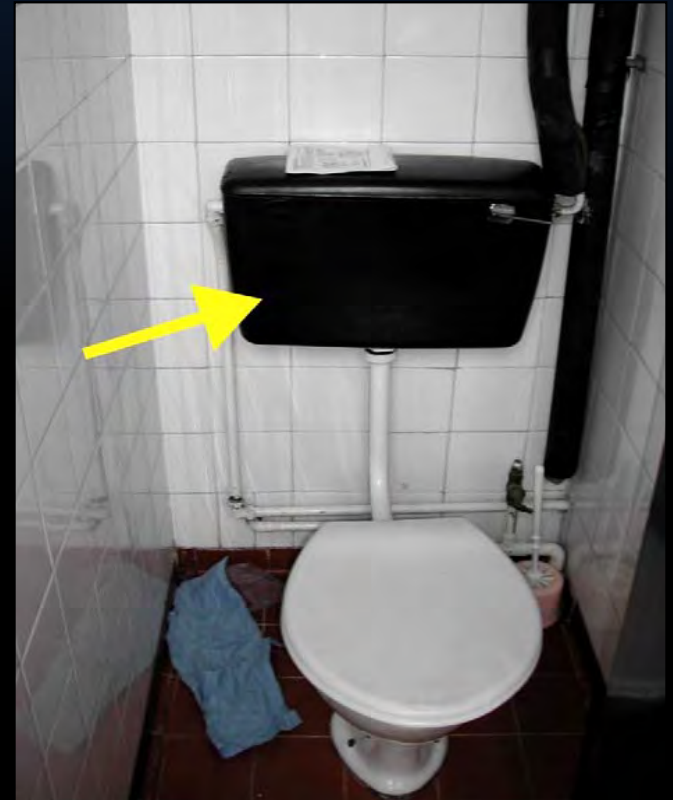


Always remember
with asbestos
cement roofs and
fragile roof lights,
there are additional
immediate risks!



Asbestos In Domestic Buildings





Asbestos In Domestic Buildings



Identification of Asbestos

- Cannot be identified by visual appearance alone
- Achieved by taking a sample and having it analysed in an accredited laboratory
- Only authorised people to take samples
 - Member of the H&S Management Team
 - One of our authorised framework surveyors
- Analysis will tell you what type of asbestos or non-asbestos

DR1



Sampling & Surveying

The university operates a framework of UKAS accredited survey companies. Only these companies are permitted to carry out asbestos surveys on campus.

HSG 264 Asbestos the survey guide 2012 – replaces MDHS 100

Management survey (old type 2)

Refurbishment / demolition survey (old type 3)

ONLY R&D for work area

Survey Report includes Description of Premises, Asbestos Register, Material Assessment, Photos & Plans

LABELLING

- Often ignored /or misunderstood
- Bottom of the control hierarchy
- Adequate message suitably positioned
- Reduce incidence of disturbance
- Warning and /or instructive
- Not always appropriate
i.e. In shops, schools, public areas?
- Can become dirty, be removed, covered over
- The University will **only** label asbestos which is vulnerable to damage and which is scheduled for removal. The **primary** control for checking for asbestos is the Shine system



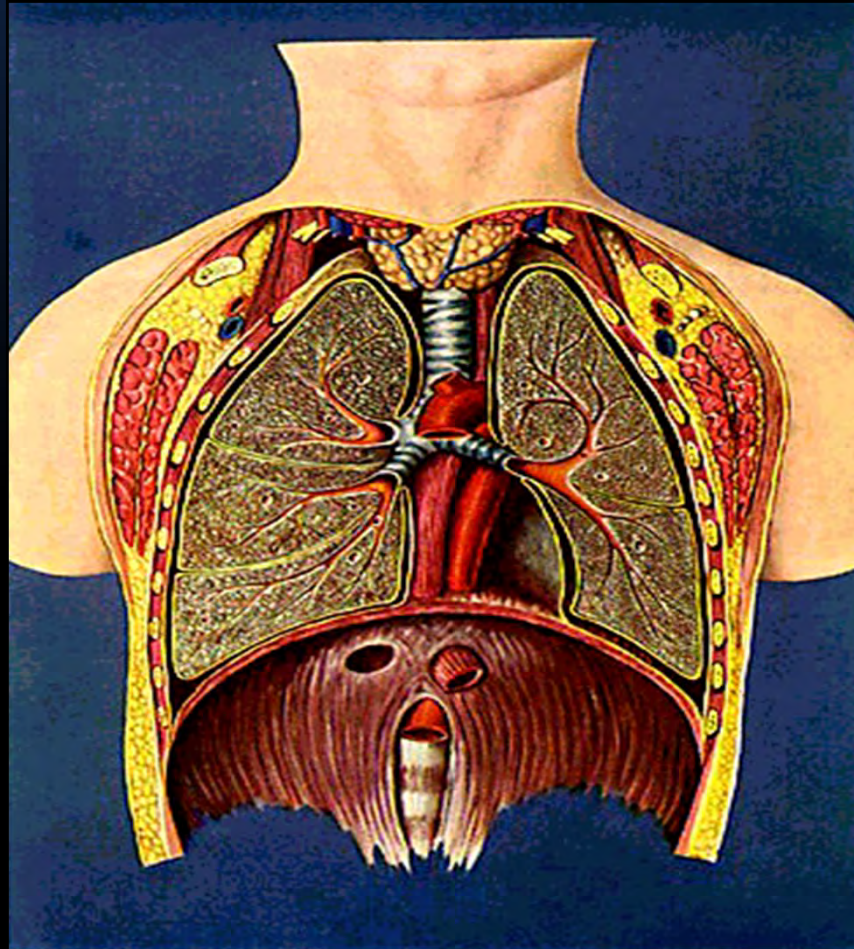
15 Minute Comfort Break



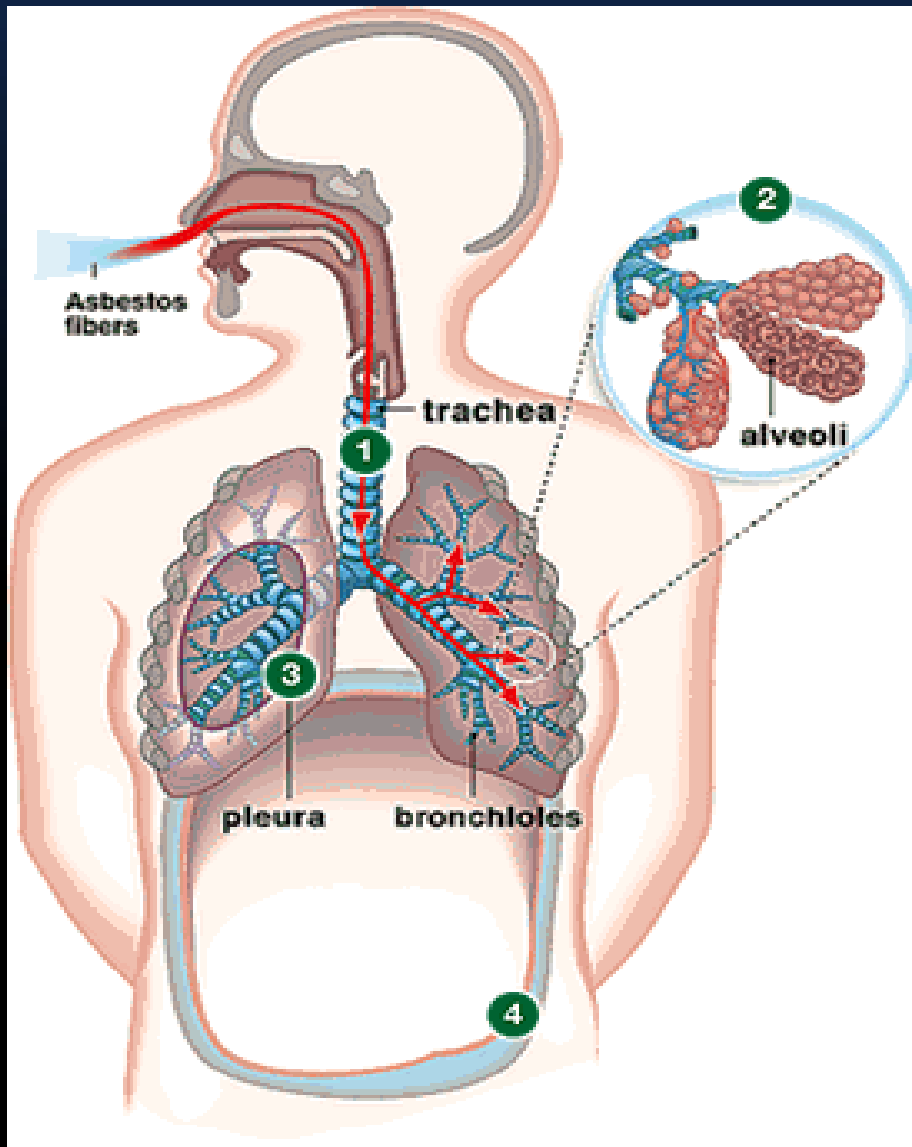
DVDs



Health Effects of Asbestos



Health Effects



Main Routes of entry:

Inhalation and Ingestion

Microscopic needle fibres

penetrate the bodies

defence

Lung lining one cell thick

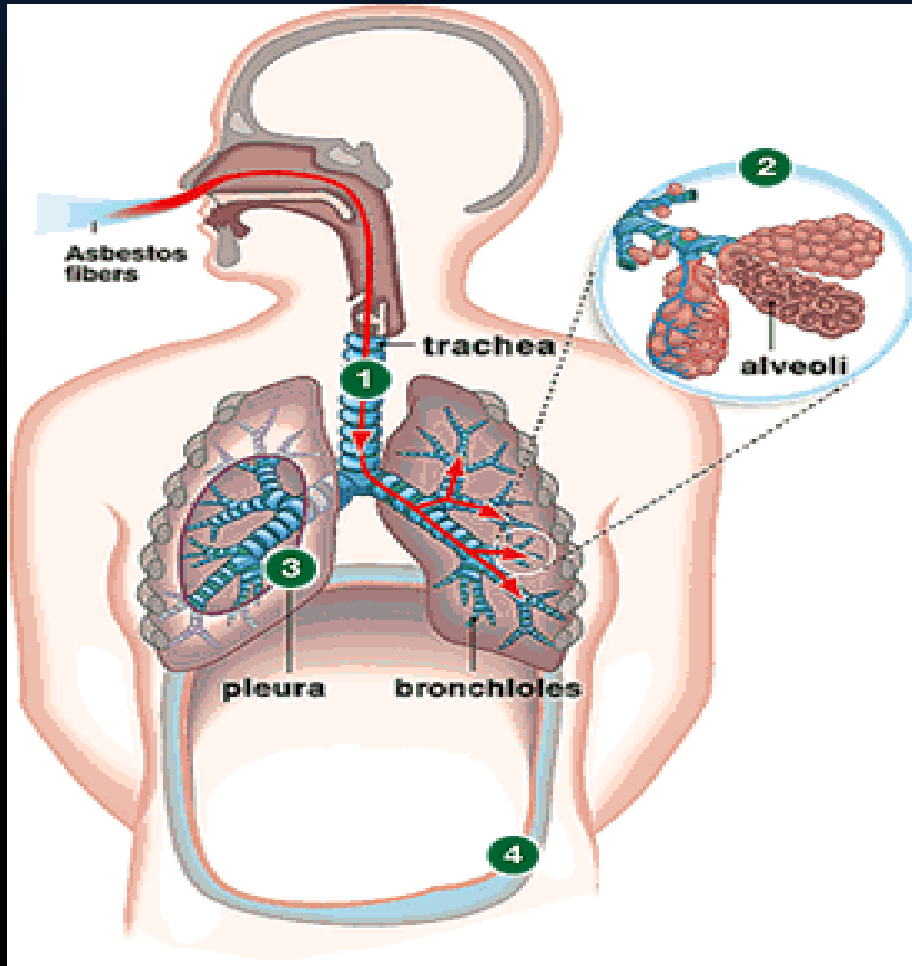
(very delicate),

Fibres can migrate to

surface and other parts of

the body

Respirable



- Fibres are:
 - less than 5000th of a mm long
 - about 3000th of a mm wide
- Such fibres, as airborne dust, are liable to penetrate the alveoli of the lungs.



What Types of Asbestos are Dangerous?

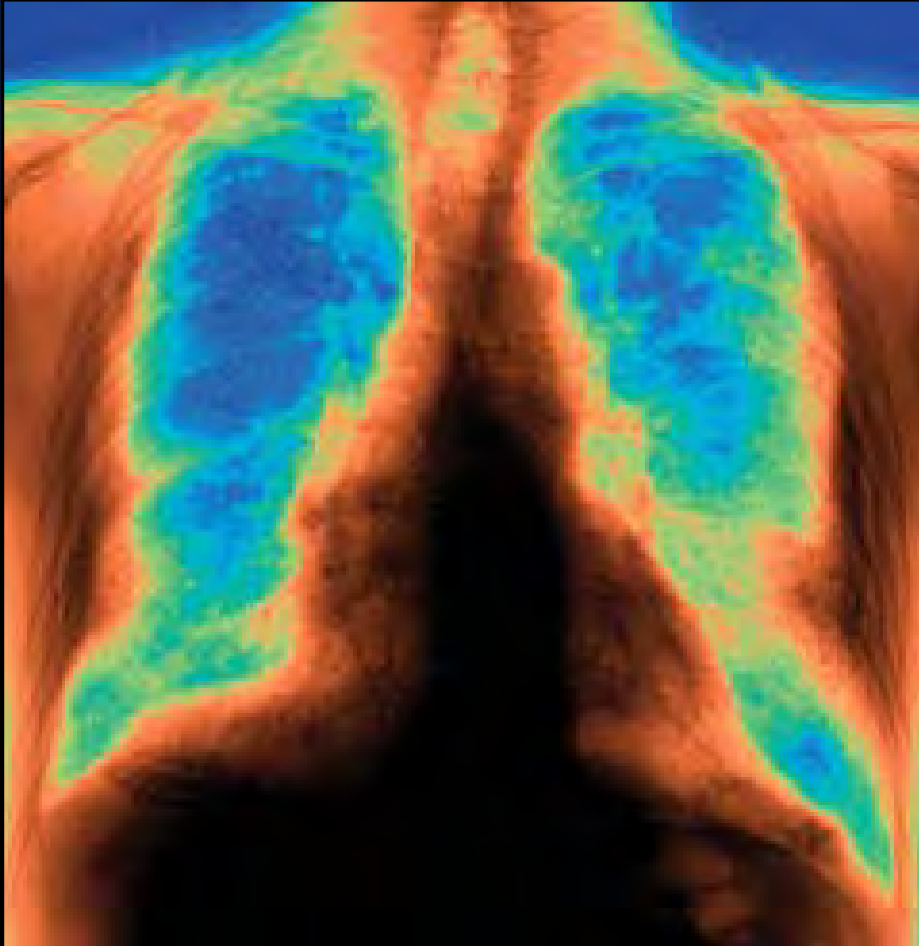
- All types are classified as Category Type 1 Carcinogens
- Amphiboles (Brown & Blue) are dangerous substances
- Serpentine (White) is considered *slightly* less dangerous by some but not all scientists. No SAFE level
- Default : Asbestos is carcinogenic

Latency Period

Asbestos related cancers can take years to develop

- In most cases it can take anywhere between 10-60 years
- As a result many workers may not become ill until after they have retired or left.
- They may not remember when or where they were exposed to asbestos
- Due to the nomadic nature of construction workers employment history it can be difficult to take court action

Health Effects - Lung Function



Scarring & physical damage;-

- Pleural Plaques
- Asbestosis

leading to;-

- Malignant Pleural Mesothelioma
- Lung Cancer
- Other Cancers

Asbestos Related Conditions

- **Pleural Plaques**

- *Benign partially calcified thickenings on the surface of the pleura*
- *Visible on X-rays*
- *No detrimental effects on Lung Function*
- *Sighted as a marker for significant asbestos exposure*

Asbestos Related Conditions

- **Asbestosis**

- *Fibrotic interstitial Lung Disease*
- *First signs are “crackles” & coughing*
- *Lung Function declines with advancement*
- *Irreversible and can progress even after exposure ceases*
- *Usually Results from very heavy long term exposure*
- *First seen in 1899*
- *Latency period of 10-25 years*

Asbestos Related Conditions

- **Lung Cancer**

- Dose related
- Cause and effect established in 1947
- Rate of Lung Cancer 7 times higher amongst workers exposed to Asbestos than general population
- Similar to cancer from smoking
- Smoking combined with asbestos exposure substantially increases risk of cancer (synergistic effect).

Asbestos & Smoking

Asbestos and lung cancer (Lung cancer death rates per 100 000 person years)			
Asbestos worker	Smoker	Death rate	Mortality rate
No	No	11.3	1
Yes	No	58.4	X 5
No	Yes	122.8	X 11
Yes	Yes	601.6	X 53

Asbestos Related Conditions

- **Mesothelioma**

- Cancer of the pleura-lining of the chest cavity and the peritoneum – lining of the abdomen
- Latency period of 25 – 40 years
- It is **incurable and always fatal**
- Average Life expectancy is 1 year after diagnosis (5-year 20% survival)
- Strongly linked with Exposure to Blue & Brown Asbestos
- Smoking does not increase the chance of disease

LUNGS

Healthy Lung



Mesothelioma



Preventing Disease

- Stop or reduce smoking
- Follow safe methods of work (method statement) and use RPE properly
- Think about !
 - Risk to families from contaminated work clothes or equipment
- Medical surveillance & Health records

Health Effects: SUMMARY

- We all breathe a small quantity of Asbestos fibres everyday
- Asbestos exposure can lead to:
 - Asbestosis
 - Mesothelioma
 - Lung Cancer
- Most cases of Disease are linked to long term exposure to asbestos fibres and dusts
- Exposure only results from breathing in the fibres
- The more fibres inhaled the greater the chance of developing an asbestos disease

Legislation

Health and Safety at Work etc Act 1974

The Control of Asbestos Regulations 2012

- A comprehensive guide to Managing Asbestos in premises HSG 227 (1st edition 2002)
- HSG 264 Asbestos the survey guide (2nd edition 2012)

The Control of Asbestos Regulations 2012

“duty to manage”

You are a ‘duty holder’ if:

- Anyone who is responsible for maintenance and repairs
- you own the building;
- you are responsible through a contract or tenancy agreement;
- you have control of the building but no formal contract or agreement; or
- in a multi-occupancy building, you are the owner and have taken responsibility for maintenance and repairs for the whole building

Health and Safety at Work etc Act 1974

Primary Legislation

Section 2 Duties

Section 3 Duties

Duty to Manage Asbestos

Main Requirements:

Identify or Presume Asbestos

Assess the Risk – (location / condition)

Make and keep an up-to-date record

Prepare an action plan that sets out how you are going to manage the risk from asbestos

Setting up a system for providing information on the location and condition of the acm

Review / monitor – is the management effective?

University Asbestos Management Plan 2017-2018

How we satisfy our duties under regulation 4 of the control of Asbestos Regulations 2012

Roles and Responsibilities

All university property has been surveyed and information is held on the Shine system. All of you have access. The information is regularly reviewed and updated.



Asbestos products are "special waste" and must be consigned under the relevant waste rules.

Dutyholders must prevent escape of the waste whilst it is in their control.

Other information may be found on the SEPA website and HSE's asbestos website.

Information to Employees



Asbestos training is a legal requirement

If you work on buildings built or refurbished before the year 2000, asbestos could be present. You will need awareness training so you know how to avoid the risks.

If you plan to disturb asbestos, eg. by drilling a hole in textured coating or removing an asbestos ceiling tile then, as well as awareness training, you will need job-specific, non-licensed asbestos training. This will give you the skills to:

- Use and fit a face-mask
- Use safe work methods
- Deal with asbestos waste
- Safely carry out non-licensed tasks – such as painting undamaged asbestos insulation board, cleaning light fittings attached to asbestos insulating board and cleaning guttering on an asbestos cement roof.

Visit www.ukata.org.uk or call 01246 824437
Other organisations also offer training.

HSE Infoline: 0845 345 0055
www.hse.gov.uk/hiddenkiller

*Calls to 0845 numbers can be charged at up to 5p per minute from a BT landline. Call charges from other phones or mobiles may vary.
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10/09 C5500

50% recycled
When you have finished with this leaflet please recycle it.

 Health and Safety Executive



Caution hidden killer

Each week approximately 20 tradesmen die from this hidden killer

Asbestos is a hidden killer. And it could be hidden in any building built or refurbished before the year 2000... including the one you're working in right now. Inside this pack you will find information on reducing the risks of asbestos plus a sticker for your toolbox.

Thousands of tradesmen are unknowingly working with asbestos. Are you one of them?

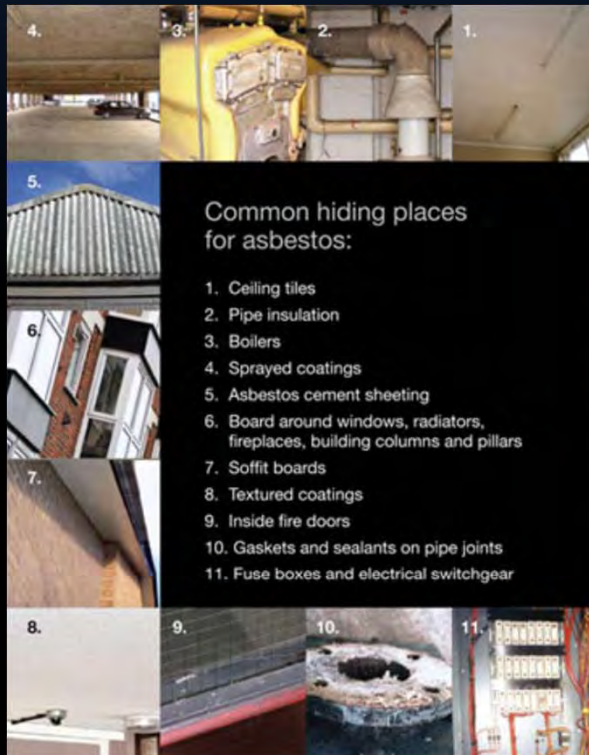
Avoid working with asbestos if you can. If you are not sure if there are asbestos materials where you are working, **stop and check**. People in charge of workplace buildings have a legal duty to provide you with up-to-date information on the location and condition of asbestos before you start work.

Each week approximately 8 joiners, 6 electricians and 4 plumbers die from asbestos-related diseases.

Call
0845 345 0055
or visit
www.hse.gov.uk/hiddenkiller
for more information.

 Health and Safety Executive

Information to Employees



Common hiding places for asbestos:

1. Ceiling tiles
2. Pipe insulation
3. Boilers
4. Sprayed coatings
5. Asbestos cement sheeting
6. Board around windows, radiators, fireplaces, building columns and pillars
7. Soffit boards
8. Textured coatings
9. Inside fire doors
10. Gaskets and sealants on pipe joints
11. Fuse boxes and electrical switchgear

Don't start work if:

- You are not sure if there is asbestos where you are working
- The asbestos materials are sprayed coatings, board or insulation and lagging on pipes and boilers – only licensed contractors should work on these
- You have not been trained to do non-licensed work with asbestos. Basic awareness training is not enough

You should only continue to work if:

- The work has been properly planned and the right precautions are in place (eg. you have the right equipment)
- The materials are asbestos cement, textured coatings and certain other materials which do not need a licence (listed in *Asbestos Essentials*)
- You have had training in asbestos work and know how to work with it safely

Each year
approximately
4000 die from asbestos.
That's more than
are killed on
the roads!

If you work with asbestos:

- Use hand tools – not power tools
- Keep materials damp – not too wet
- Wear a properly fitted, suitable mask (eg. disposable FFP3 type). An ordinary dust mask will not be effective
- Don't smoke, eat or drink in the work area
- Double-bag asbestos waste and label the bags properly
- Clean up as you go – use a special (Class H) vacuum cleaner, not a brush
- After work, wipe down your overalls with a damp rag or wear disposable overalls (Type 5)
- Always remove overalls before removing your mask
- Don't take overalls home to wash
- Wear boots without laces or disposable boot covers
- Put disposable clothing items in asbestos waste bags and dispose of them properly
- Don't carry asbestos into your car or home

Asbestos Essentials task sheets will show you how to do a range of non-licensed tasks safely. They are free to download at www.hse.gov.uk/asbestos/essentials



Health and Safety
Executive



Discovered or Damaged Suspect Material?

Step 1

- All work **must cease**
- Seal off the immediate area to ALL persons
- Contact the Health and Safety team immediately

Step 2

- Only the Health and Safety Management Team or Analytical Framework Consultant are authorised to take samples of suspect ACMs and to authorise work to proceed.

Step 3

- If the presence of asbestos, in a condition likely to lead to a health risk, is confirmed the area will remain out of bounds until the appropriate remedial work is undertaken i.e. encapsulation/ removal etc by University Framework Removal Contractors and Consultants.

Discovered or Damaged Known Material?

Step 1

- All work **must cease**
- Seal off the immediate area to ALL persons
- Contact the Health and Safety Team immediately

Step 2

- A list of those persons involved in the incident must be recorded.
- **No attempt to clean up dust, debris, or to remove any tools or equipment, is to be made.**

Step 3

- The Health and Safety Team will decide on any further actions required such as, extension of the cordoned area, air monitoring and remediation work.

Step 4

- The Health and Safety Team will undertake an investigation into the incident and record any actions and recommendations.

Asbestos essentials (not relevant for University)

- No University employee is permitted to work on any asbestos.
- All work is carried out by an Asbestos Contractor.

Asbestos Licensing

HSE issues and regulates Asbestos Licences

- Asbestos removal is a licenced industry. All asbestos work is carried out by a University approved licenced contractor.

Asbestos Removal Contractors

- HSE licence is required for work with most Asbestos
- Activities of contractors controlled by HSE
- Contractors have to give notification of works, and method statement
 - HSE carries out inspections of sites
 - Trade associations: ARCA

Refurbishment and Demolition Surveys

- Are a statutory requirement for all intrusive works.
- Survey commissioned by the Health and Safety Management team
- ACM clearly identified and condition noted
- **BASED ON SCOPE OF THE PROJECT/ACTIVITY**
NO MISSION CREEP!

Five Key Messages from Today

1. Asbestos is a natural mineral used within many construction materials (3,000 + !)
2. It is fibrous in nature, with fibres being harmful when inhaled.
3. 4000 plus people are dying every year due to asbestos exposure.
4. YOU are at risk.
5. By following Safe Systems of Work, disease is preventable!

Consequences of Failure

- People get hurt!
- Enforcement action
- Possible civil claims
- Worry, stress and anxiety...
- Damage to Reputation (yours and the Universities)

Any Questions!



Examination

