Exposure to Silica and Construction Dusts

OUTSOURCE SAFETY

Presented by

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Introduction

- Dust exposure, is it a real problem?
  - Last year in construction alone;
    - 500,000 days lost to safety related issues
    - 1,500,00 days lost to health related issues
  - It's the Health & Safety at Work Act
  - Enforcement, 35% of HSE time on construction will be focused on sites of <15 people this year
    - "70% of fatal accident occur on small sites"
    - "Health is not being properly managed"
  - Statistics: 500 people each year die from silica related cancers and 7,000 develop occupational asthma

Role of HSE Fee For Intervention (FFI)

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- Around 9 Health & Safety Executive inspectors in the South West
- Inspector can arrive unannounced and have the right to inspect the premises and activities at any time of the day or night
- Health/Wellbeing is becoming a priority – Lungs, HAVS, Muskoskeletal, Stress, Occupational Cancers
- Very active – can hold you personally liable – fine ££££
- FFI – Was introduced in 2012 to help the HSE ensure that businesses that break H&S laws should pay for the HSE's time.
- FFI is currently £129 per hour once a breach has been identified.

<u>STATISTICS - 2015/2016</u>

Income from FFI £14.7 m. Cost of recovery £17.5 m.

HSE Prosecutions – 90% Conviction Rate – 11,403 Notices

Prosecutions

Prosecution of Company Directors

2014/2015 - 15 prosecutions

2015/2016 – 46 prosecutions – 34 of 46 Found Guilty

– 12 of 34 Given custodial sentences

- Income from FFI £14.7 m. Cost of recovery £17.5 m.
- HSE Prosecutions – 90% Conviction Rate – 11,403 Notices
- Increase in Personal Prosecutions

Sentencing Guidelines

- New guidelines in force from February 2016;
- Enormous increase in probable levels of fine;
- Magistrates Court limit raised from £5k/£20k to unlimited.

Large organisation
Turnover more than £50 million

Offence category	Starting point	Category range
A	£7,500,000	£4,800,000 – £20,000,000
B	£5,000,000	£3,000,000 – £12,500,000

Medium organisation
Turnover £10 million to £50 million

Offence category	Starting point	Category range
A	£3,000,000	£1,800,000 – £7,500,000
B	£2,000,000	£1,200,000 – £5,000,000

Small organisation
Turnover £2 million to £10 million

Offence category	Starting point	Category range
A	£800,000	£540,000 – £2,800,000
B	£540,000	£350,000 – £2,000,000

Micro organisation
Turnover up to £2 million

Offence category	Starting point	Category range
A	£450,000	£270,000 – £800,000
B	£300,000	£180,000 – £540,000

Exposure to dust

- **Are you at risk?**
  - Construction dust is not just a nuisance, it can cause serious damage to your lungs. These effects can be life changing and even fatal.
  - You are most at risk if you regularly do any of the following jobs without the right controls:
    - Using a cut-off saw on kerbs, blocks, paving slabs, roof tiles and other concrete products
    - Chasing, scabbling or grinding concrete
    - Drilling or coring for long periods, particularly indoors
    - Abrasive pressure blasting
    - Cutting and sanding wood with power tools
    - Sanding plasterboard jointing
    - Dry sweeping
    - Internal demolition and soft stripping.

Generals dusts, what are the dangers?

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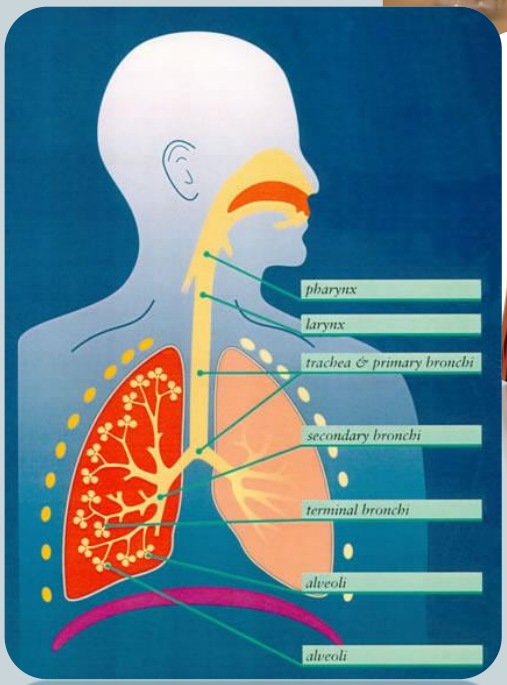
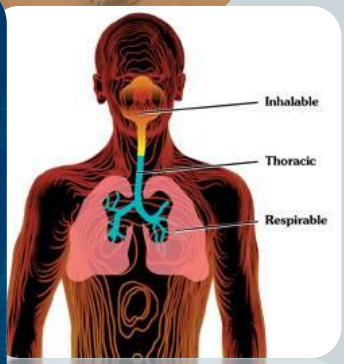
- Inhalable dusts and respirable dusts
  - Nuisance dusts from site
  - Dusts which you create:
    - Wood dusts
    - MDF dusts
    - Plaster dusts
    - Cement dust
    - Block and brick
  - The physics of dust inhalation
  - Your natural defences
  - The long term effects

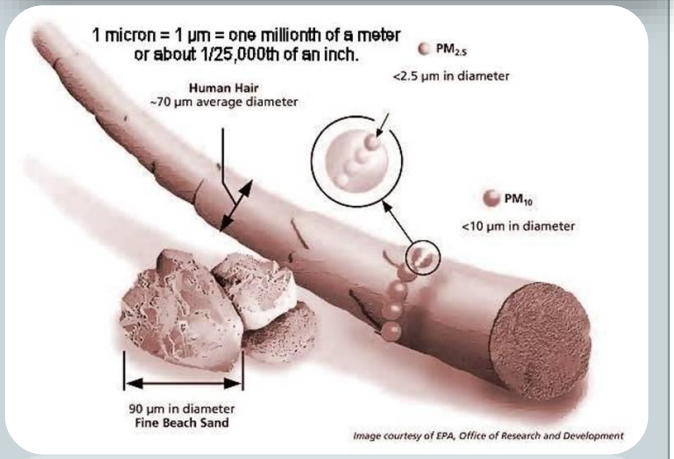




Silica dust dangers

- Silica
  - Natural substance
  - Exposure comes from cutting, sanding carving etc.
  - RCS: Respirable Crystalline Silica
  - Ill heath (second only to asbestos):
    - Silicosis
    - Chronic Obstructive Pulmonary Disorder (COPD in construction 2-3 x average)
    - Lung cancer (700 pa, 7% 5yr survival rate)
  - Video: silica dust exposure

Approximate RCS content of different materials	
Sandstone	70–90%
Concrete, mortar	25–70%
Tile	30–45%
Granite	20–45%, typically 30%
Slate	20–40%
Brick	Up to 30%
Limestone	2%
Marble	2%



Video - Silica

How much silica dust is a problem?

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- Measured in mg/m3
  - Bag of sugar = 1kg / 1,000 grams / 1 million mg
  - Teaspoon of sugar = 5 grams / 5,000 mg

Dust	Inhalable	Respirable
RCS	_____	0.1 mgm^3
Wood	5 mgm^3	As inhalable
Lower Toxicity	10 mgm^3	4 mgm^3

Based on an 8 hour average

Control of dust exposure

- Manage the risks:
  - Planning
    - Consider the workspace
    - Consider the exposure period
    - Consider the frequency of exposure
  - Controlling
    - Eliminate the risk
      - Design it out (eliminate)
      - Changes materials (substitute)
      - Change the tool / work method
      - Control at source
        - Water suppression or on-tool extraction (don’t forget neighbouring trades!)

Control of dust exposure - Masks

- When the previous options cannot reasonably be used…
  - Masks (RPE) are the final option and last line of defence
    - Drawbacks:
      - Fit
      - Performance (selection)
      - Human factors
        - Use, storage, replacement,
        - abuse, misunderstanding
    - Selection
      - FFP ratings APF ratings
      - Face fit testing

Choosing a dust mask

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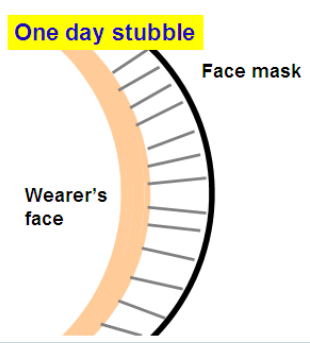
- For silica it must be FFP3!
- Lead must also be FFP3!
- General coarse dusts from woodwork, grinding, general nuisance FFP1
- Most dusts will be FFP2

Assigned protection factors for RPE types

Type of Respirator	Description	APF Range
Filtering facepieces for particulates	Provides protection against dust/mists/fumes. normally intended for 1 day's use.	4-20
Filtering facepieces for gas/vapour	Provides protection against gas/vapour.	4-10
Half masks (dust)	Provides protection against a variety of contaminants dependant on the filter.	4-20
Half masks (gas/vapour)		4-10
Full face masks (dust)	Provides protection against respiratory hazards (dependant on filter) and protection for the face/eye.	4-40
Full face mask (gas/vapour)		4-20
Powered Respirators	Provides clean air to the headpiece by pulling air through a filter. Protection can be tailored to a variety of hazards.	5-40
Airline hood or helmet	Provides clean air to the wearer's headpiece from an external source. Can also provide eye/head protection.	5-40
Self contained open circuit breathing apparatus	The top level of protection. For tasks where there is an immediate danger to life or health.	Up to 2000



Summary

- These exposures are long term, so are the health risks
- You may not feel any adverse effects
- You might have 10 or 20 years of exposure before the damage becomes noticeable
- You may know someone who is still alright
- None of this means you are safe
- Every exposure has an effect, no matter how small
- Huge benefits come from small changes in practice
- You are the one who controls the exposure of yourself and of those around you

RPE Face Fit testing

It is not sufficient to simply provide an employee with a respirator. It is also the employer's responsibility to ensure the chosen respirator/mask has the potential to adequately seal to the wearer's face.

- **HSE Operational Circular OC 282/28**
  - Fit testing of respiratory protective equipment facepieces.
  - Where respiratory protective equipment (RPE) is used as a control measure it is vital that the selected RPE is adequate and suitable;
  - RPE must reduce exposure to as low as reasonably practicable, and in any case to an acceptable level (e.g. below any applicable Workplace Exposure Limits or Control Limits EH40).
  - To ensure that the selected RPE has the potential to provide adequate protection for individual wearers, the ACoPs supporting COSHH, Control of Asbestos Regs, Legionella regs that tight-fitting RPE must be fit tested as part of the selection process.
  - This will help to ensure that inadequately fitting facepieces are not selected for use.
  - Ill-fitting facepieces can create inward leakages of airborne contaminants.

- FFT's Qualitative or Quantitative:
  - Qualitative – only suitable for half masks
    - Uses an aerosol of either a bitter tasting substance (Bitrex) or a sweet substance (Saccharine) to challenge the face seal whilst the wearer undertakes exercises (in a hood to contain the test substance).
  - Quantitative - suitable for half and full face masks
    - More exact method - Uses Portacount particle counting device.
    - Device counts the particles inside the candidate's respirator and compares the levels to the ambient atmosphere.