Health and Safety
Executive

Construction Dusts:

Much more than a Nuisance!

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“It’s only dust you know!”

What is Construction Dust?

- A general term used to describe what is found on a construction site.
- 3 main types
  - Silica
  - Wood
  - Low toxicity

Respirable Crystalline Silica (RCS)

Crystalline silica concentrations in common materials

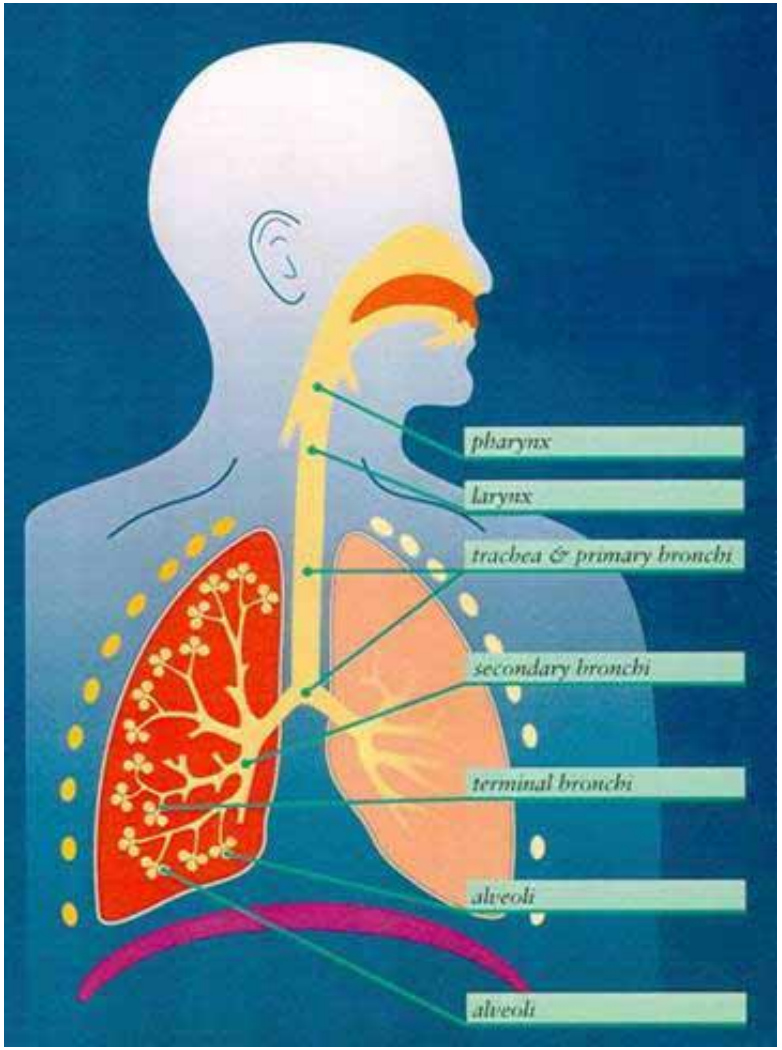
plastic composites	up to 90%
sandstone, gritstone, quartzite, flint	more than 70%
concrete, mortar	25% to 70%
shale	40% to 60%
china stone	up to 50%
tile	30 to 45%
slate	up to 40%
granite	up to 30%
brick	up to 30%
ironstone	up to 15%
basalt, dolerite	up to 5%

How can it harm me?

Airways:

- Inhalable
- Respirable

- Different dusts affect the airways in different ways



How can it harm me?

Construction dust can cause serious lung diseases:

- **Lung Cancer**
- ***Chronic Obstructive Pulmonary Disease*** (COPD)
- **Pneumoconiosis** (including silicosis)
- **Asthma**: Occupational and Work Aggravated
- Reduced lung function

How can it harm me?

- Few develop quickly – acute silicosis
- Most take a long time – years
- Regularly breathing small amounts adds up over the years
- By the time you notice it may be too late to do anything about it

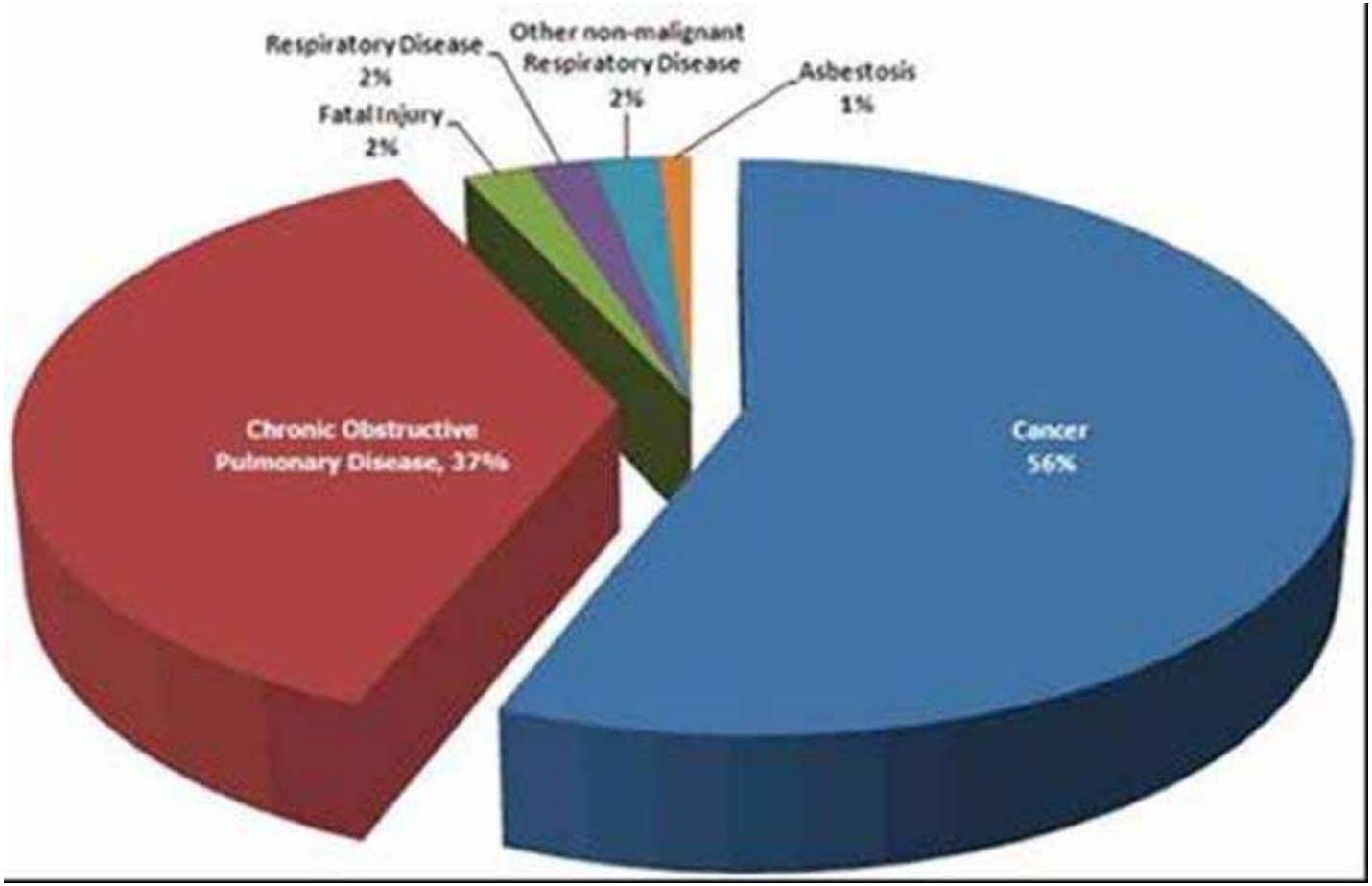
> **Important to control every single exposure**

How can it harm me?

Statistics are scary:

- 500+ silica related deaths in 2004 – over **10 a week**
- Silica is the second most important cause of occupational lung cancer after asbestos
- Construction workers 2-3 times greater risk of COPD
- Research backs up link between construction work and lung disease
- Reduced quality of life and shorter working life

How can it harm me?



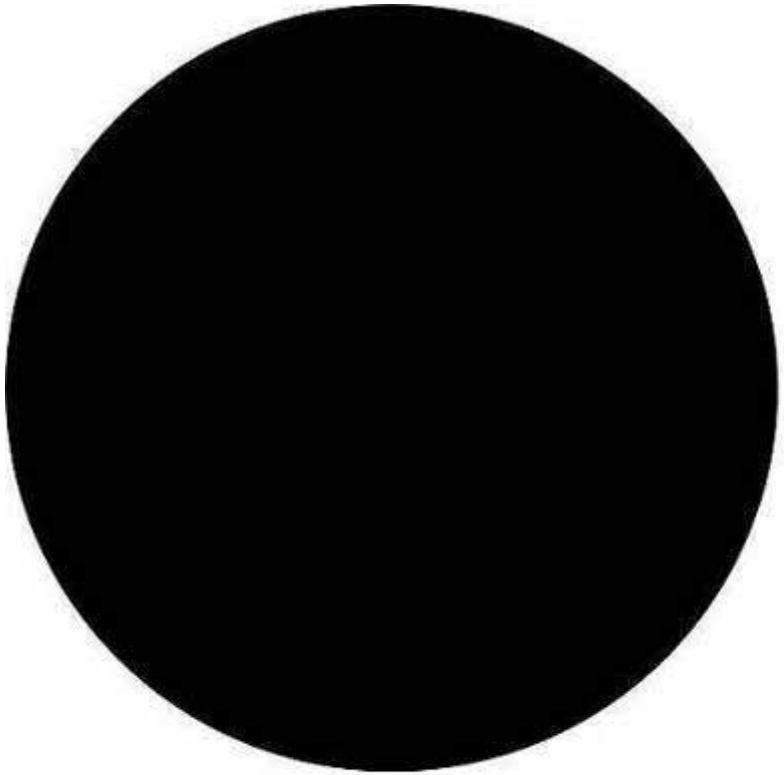
- Over 50% of new cancer case are in construction workers

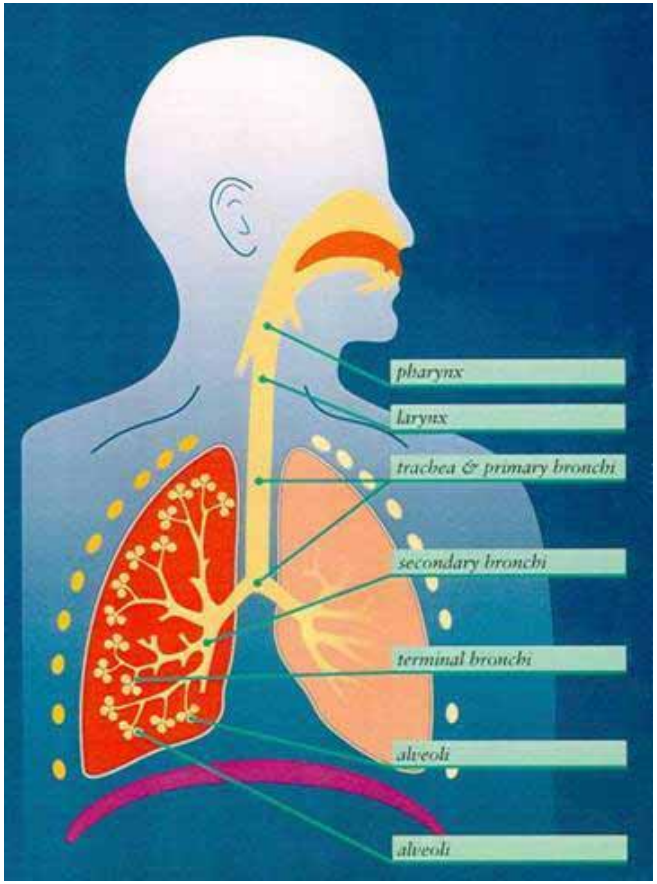
How much dust is a problem?

- Depends upon
  - Amount of dust
  - Size of the dust particles
  - Type of dust

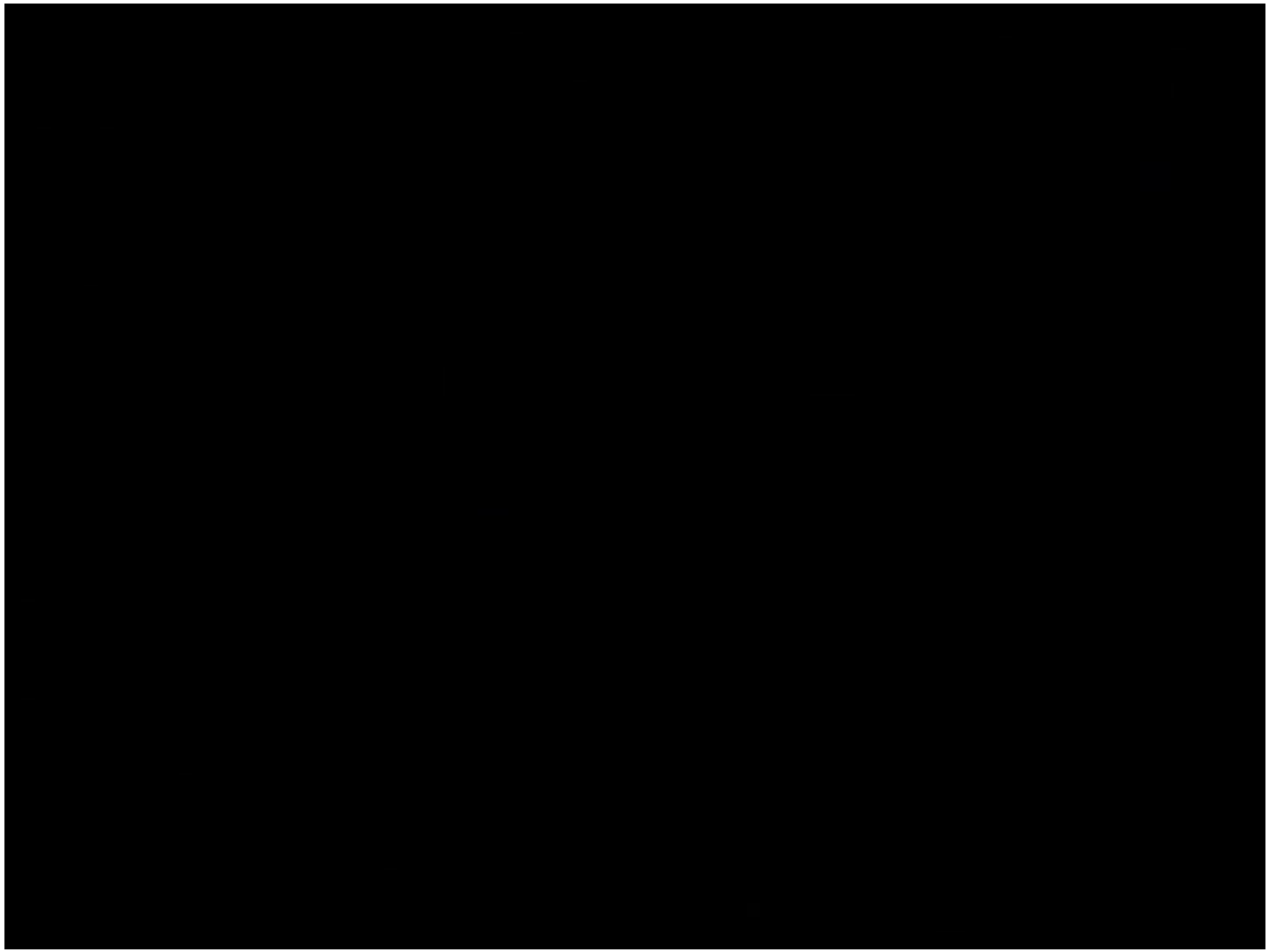
How much dust is a problem?

- Dust comes in different sizes

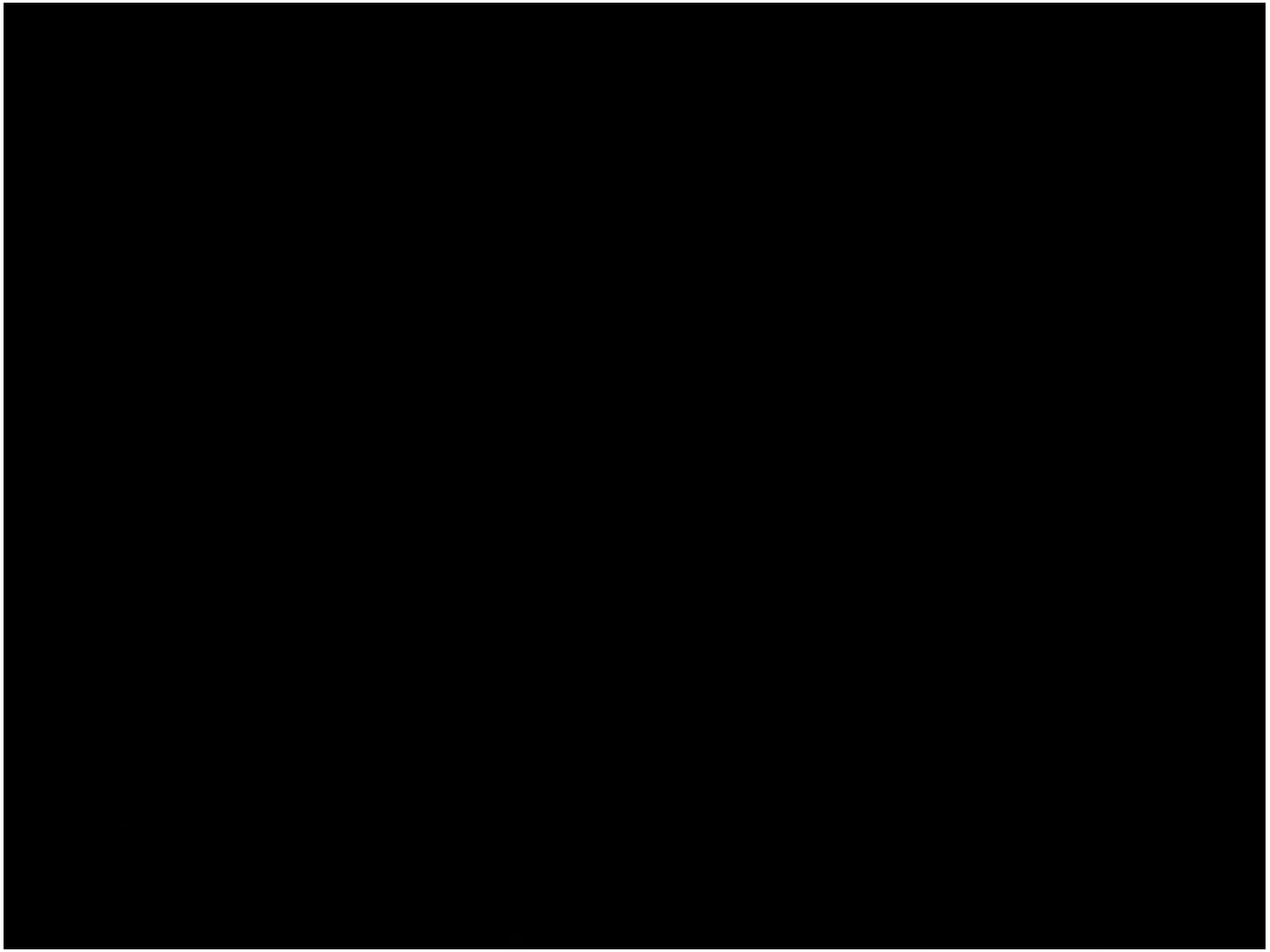




Respirable dust



Respirable dust ..



How much dust is a problem?

- 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

How much dust is a problem?

- Warehouse = 10 mg/m3 +
- Begin to lose definition across a room

Plan

Identify your <u>High Risk Tasks</u>:

= amount of dust x duration of exposure

Will be influenced by:

- Type of material
- Energy of work equipment – e.g. cut off saw
- Where the work is taking place – e.g. enclosed space
- How long the task takes – e.g. all day soft strip demolition

Plan: Silica Dust

Concrete, Granite etc:

- Some Tasks ALWAYS produce very high levels:
  - Cut-off saws
  - Grinders
  - Chasers
  - Grit Blasting

Plan: Silica Dust

- Some tasks can in right conditions generate lots of dust
  - Pneumatic drilling / coring with poor ventilation
  - Internal structural demolition
  - Dry sweeping indoors

Act: Control at Source

- Water Suppression

Uncontrolled cutting

And water suppressed…..

Act: Water Suppression

Issues associated with water suppression use:

- Marking the cut line
- Slurry generation
- Wet clothing

Act: On-Tool Extraction

Act: On-Tool Extraction

Extraction Unit

Cyclonic

Compact

Act: On-Tool Extraction

- Different classifications:

Dust Class	Suitable for dusts with WEL	Degree of penetration
L (Light Hazard)	Greater than 1mg.m3	Less than 1%
M (Medium Hazard)	Greater / equal to 0.1mg.m3	Less than 0.1%
H (High Hazard)	Less than 0.1mg.m3 including carcinogenic dusts	Less than 0.005%

Act: On-Tool Extraction

- Industry figures for extraction benefits:
  - Up to +60% increase in life of tools
  - Up to +20% increase in life of consumables
  - Up to +60% quicker application speed
  - No need to clean up dust created: up to 15 kg/h

RPE Backup – Why?

- Controls are not 100% effective
- RPE is still needed for high risk tasks
  - Silica
  - Wood
  - High levels of low toxicity dust

Act: RPE

- Unless there are ***real*** problems doing so do not just rely on a mask for high risk tasks
- These can produce so much dust that the mask cannot give the amount of protection needed.
- A mask only protects the person wearing it.
- People make mistakes with masks

The main aim is to stop the dust getting into the air in the first place.

Particle Respirators

Disposable

Class	Class
FFP1	P1
FFP2	P2
FFP3	P3

Increasing level of protection (and breathing resistance)

Reusable

Adequacy

Manufacturer product no.

European Standard

Class of Respirator: FFP3

Conformity mark & Notified Body

Adequacy

- Nuisance Masks
  - Do not protect lungs
  - Are not CE marked
  - Do not comply with COSHH

- FFP1 / P1
  - Not acceptable (insufficient protection)

Suitability

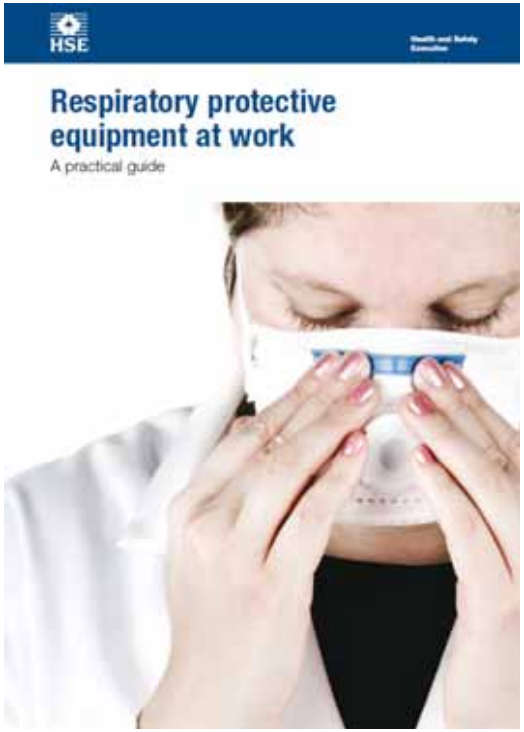
Fit Testing

- Fit should be demonstrated by fit testing
- Done by a competent person
  - E.g. Fit2Fit Accreditation Scheme for fit testers - supported by HSE www.fit2fit.org
- COSHH

RPE – ‘Adequate and Suitable’

- Adequate:
  - Right for the hazard and reduces exposure to the level required to protect the wearers health.

- Suitable:
  - Right for the wearer, task and environment so that the wearer can work freely and without additional risk



Silica Tasks: Cutting

- Control:
  - Water (or on-tool extraction)
  - Mask APF 20

Silica Tasks: Wall Chasing

- Control
  - On-tool extraction (M or H class)
  - Mask APF 20

Silica Tasks: Breaking Indoors

- Control for handheld breaker:
- ..or rotary drilling if it is main activity
  - On-tool extraction (M or H class unit)
  - Mask APF20

Act: Other Controls

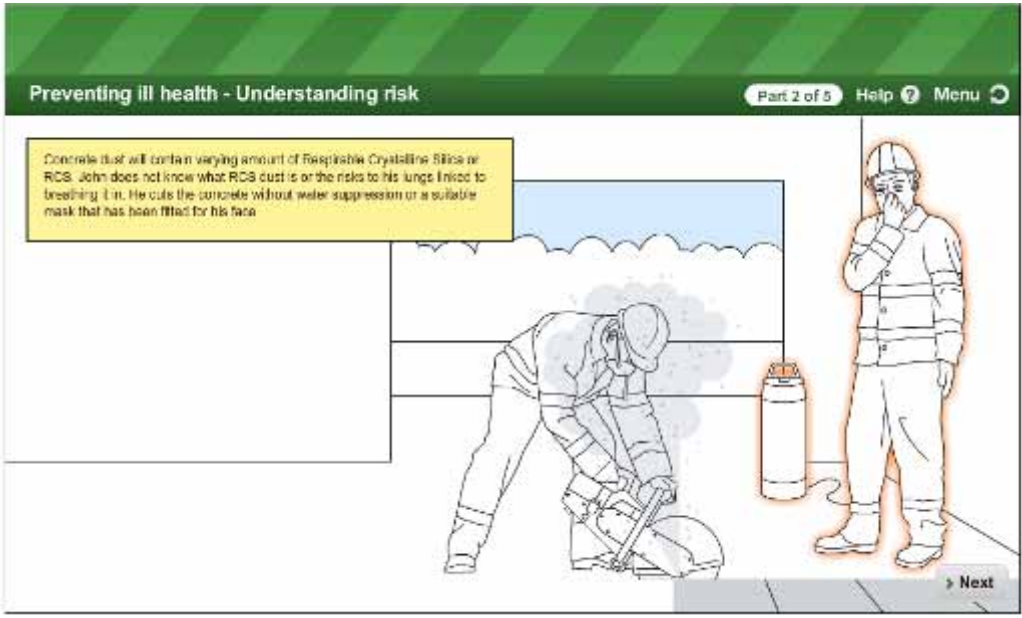
- Also Consider:
  - Segregation
  - Ventilation – long duration power tool tasks, internal demolition
  - Limiting people / duration

Check:

- **Clear** work procedures
- Ensure controls implemented
- Maintenance
- Supervision

Act: Workers

- Training
- Engagement - http://www.hse.gov.uk/construction/lwit/index.htm



Planned Action

HSE Action:

- Provision of information to Inspectors
- Remain priority topic
- Revision of Guidance and Website
- Support WWT SHAD’s

Questions?