Health and Safety
Executive

Occupational health in construction

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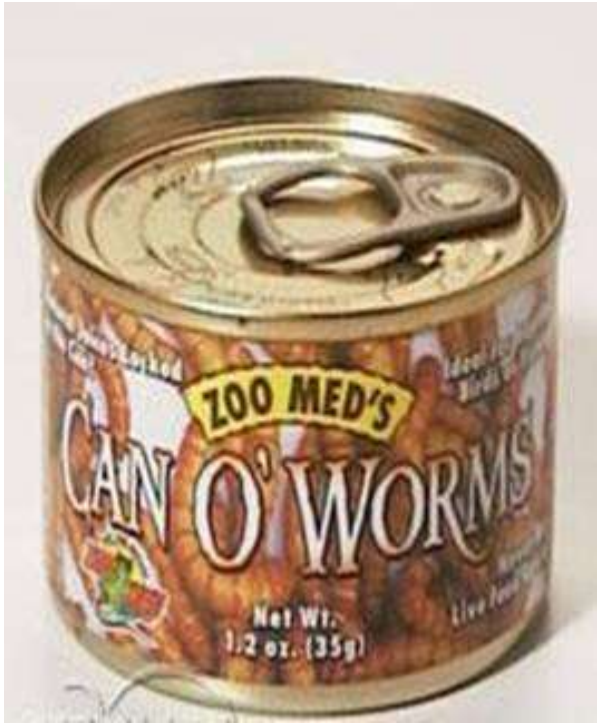
HM Principal Inspector of Health and Safety



What is **OCCUPATIONAL** health?

What is occupational health?

Occupational

Lifestyle Issues

Why is it important?

Key points

- **Deaths** – for every worker killed on site, approximately 100 die from ill health due to past exposures – particularly asbestos (5,000 deaths) and silica (600 deaths)
- Est 12000 lung disease deaths linked to work expsoures
- 1.4 million people suffering work related illness
- **Ill health** – working days lost (1.9 million) is nearly 3 X that of safety (0.4 million)
- **MSD** – is the biggest cause (65%) of self-reported illness in the construction industry

http://www.hse.gov.uk/statistics/index.htm

Construction health hazards

Asbestos	Noise	**Vibration**
Stone Dust	**Wood Dust**	Solvents
Chemicals	Ionising Rad	Manual handling
Repetitive work	Isocyanates	Lead
Cement	Stress	Diesel Fumes
Carbon Monoxide	Leptospirosis	Welfare

What is asbestos?

- Fibrous mineral
- Collective term for a number of naturally occurring minerals, crystallised to form long thin fibres
- Chemically inert (not chemically reactive)
- Heat resistant
- Used in over 3,000 products, including fire proofing materials, cement, brake pads, plastics, paper products and textiles.

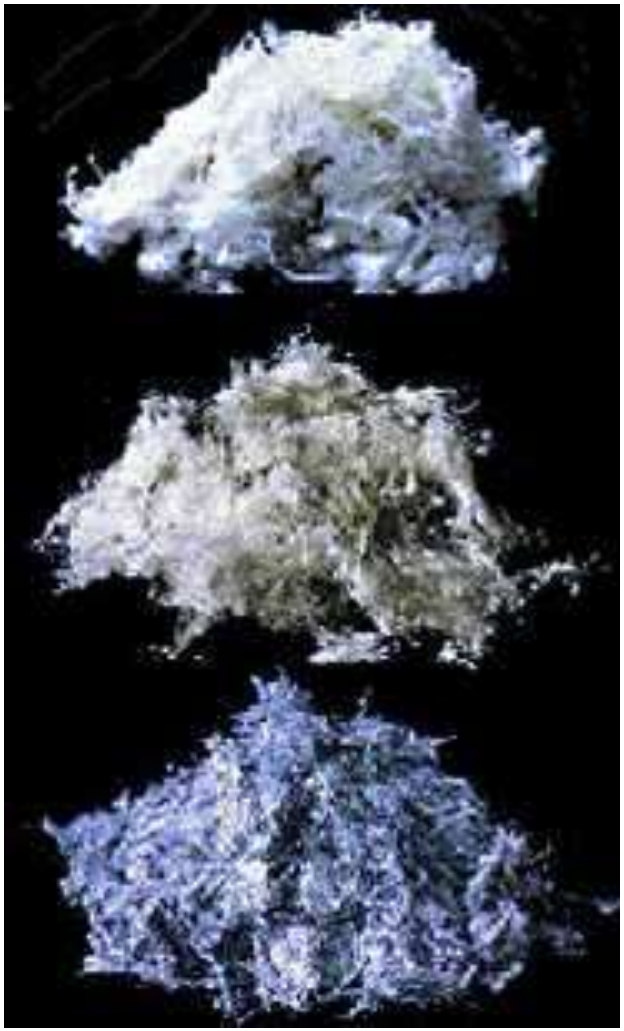
The three most common types;

Chrysotile (white asbestos) use banned in 1999

Amosite (brown asbestos) use banned in 1985

Crocidolite (blue asbestos) use banned in 1985

All are carcinogenic including white asbestos



You are at most risk when?

Working on properties built before 2000.

Asbestos containing materials were not identified before the job was started (no survey).

Asbestos information not passed to people doing the work.

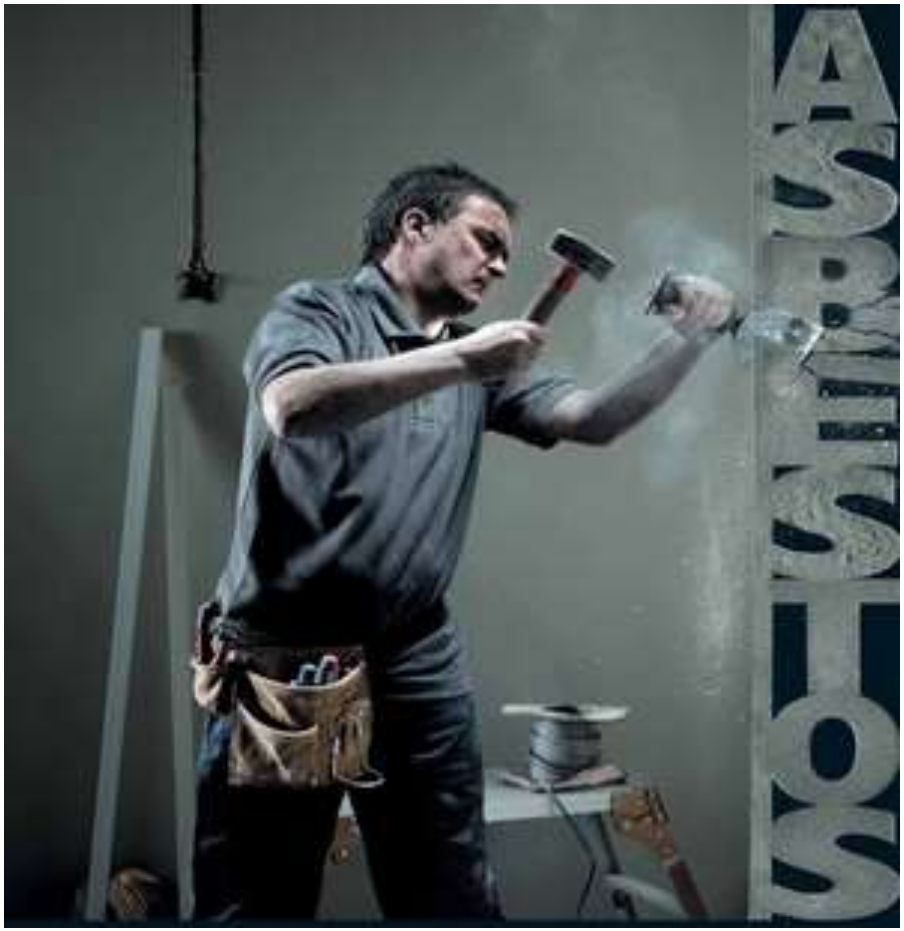
You don't know how to recognise and work safely with asbestos.

You know how to work safely with asbestos but you put yourself at risk by not following proper precautions, perhaps to save time or because no one else is following proper procedures.

Who is currently at risk?

- Heating and ventilation engineers
- Roofing contractors
- Fire and burglar alarm installers
- General maintenance staff
- Electricians
- Plumbers
- Carpenters and joiners
- Plasterers
- Gas fitters
- Cable layers
- Demolition workers
- Painters and decorators
- Building surveyors
- Labourers

TENANTS



Control of Asbestos Regulations 2012 CAR

Regulation 4 – Duty to Manage

Regulation 5 - Identification of the presence of asbestos

‘An employer shall not undertake work in demolition, maintenance, or any other work which exposes or is liable to expose his employees to asbestos in respect of any premises unless either’ —

(a) he has carried out a suitable and sufficient assessment as to whether asbestos, what type of asbestos, contained in what material and in what condition is present or is liable to be present in those premises; or

(b) if there is doubt as to whether asbestos is present in those premises he—

(i) assumes that asbestos is present, and that it is not chrysotile alone, and

(ii) observes the applicable provisions of these Regulations.

Refurbishment & Demolition Survey

- This is needed before any refurbishment or demolition work is carried out.
- This is a fully intrusive survey which will involve destructive inspection, as necessary, to gain access to all areas where ACMs may be present.
- Be aware of no access areas described in the report which are areas that have not been surveyed. You must get them surveyed before working in these areas
- Keep a copy on site for easy reference and site inductions.
- Keep a copy of any clearance work completed after the survey so you have the most accurate information on where the asbestos is.

Management Survey

- Its purpose is to locate, as far as reasonably practicable, the presence and extent of any suspect Asbestos Containing Materials (ACMs).
- It is minimally intrusive and designed to be used by the occupier of the building to allow them to manage the condition of the asbestos and carry out routine maintenance work.
- When carrying out intrusive refurbishment work – it is not sufficient to rely on the results of a management survey.

Classes of ACMs

Three different classes of asbestos containing materials (ACMs)

Licensed

Notifiable Non-Licensed

Non-Licensed

Licensed Asbestos Materials

Asbestos Insulating Board

Sprayed asbestos coatings (limpet)

Asbestos Pipe Lagging

Loose fill asbestos insulation (flock)

You must not remove this type of material unless you have an asbestos licence

Licensed asbestos materials

AIB

Sprayed Coating

Pipe Lagging

Loose fill insulation

Licensed contractor

Asbestos enclosure with three stage airlock/baglock

Decontamination Unit

Notifiable non-licensed asbestos work

- Work to remove a single AIB board or carrying out repairs to AIB.
- Repairing Asbestos pipe lagging.
- Large scale removal of textured coatings.
- Removal of damaged Asbestos Cement.
- Work which will be likely to significantly damage Asbestos Cement.
- Must be removed using correct control measures
- Must be Cat 2 trained
- More information on HSE website and the Asbestos Essentials method sheets

Non-Licensed asbestos work

- Asbestos cement removal
- Small-scale removal of asbestos containing textured coatings
- Asbestos floor tiles
- Gaskets

- Must be removed under controlled conditions
- Must be CAT 2 trained
- More information on the HSE Website and the ‘Asbestos Essentials’ method sheets.

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Asbestos essentials

A task manual for building, maintenance and allied trades on non-licensed asbestos work

HSE

For Notifiable Non-Licensed work and Non-Licensed work with asbestos

This illustrated guide takes the contractor step by step through a safe means of working with less hazardous ACMs.

Asbestos Cement

Experience shows many builders and roofers believe that asbestos cement is harmless as it only contains white asbestos! THIS IS NOT TRUE.

REMEMBER Asbestos Cement is fragile – do not walk on it or on the bolts

Control of Asbestos Regulations 2012 CAR

Regulation 10 – training

This regulation requires mandatory training for anyone liable to be exposed to asbestos fibres at work. This includes maintenance workers and others who may come into contact with or who may disturb asbestos as well as those involved in asbestos removal work.

Asbestos awareness training for all employees who could foreseeably disturb the fabric of a building and expose themselves to asbestos.

Additional training for any employees who will carry out non-licensed asbestos work and notifiable non-licensed work.

Comprehensive training requirements for licensed asbestos workers.

When it goes wrong!

When it goes wrong!

When it goes wrong!

Asbestos Questions

Control of Vibration

Hand Arm Vibration Syndrome

Serious, debilitating, costly, incurable but preventable.

Vibration – Employers Duties

- Assess the vibration risk
- Identify exposure level
  - Introduce programme of controls to eliminate or reduce exposure
  - Provide health surveillance to those who continue to be exposed above the action level
- Provide information, Instruction & Training
- Consult employees and Union representatives
- Keep a record of the risk assessment and controls
- Provide Health Surveillance & keep records
- Review & update the RA regularly

Exposure Values

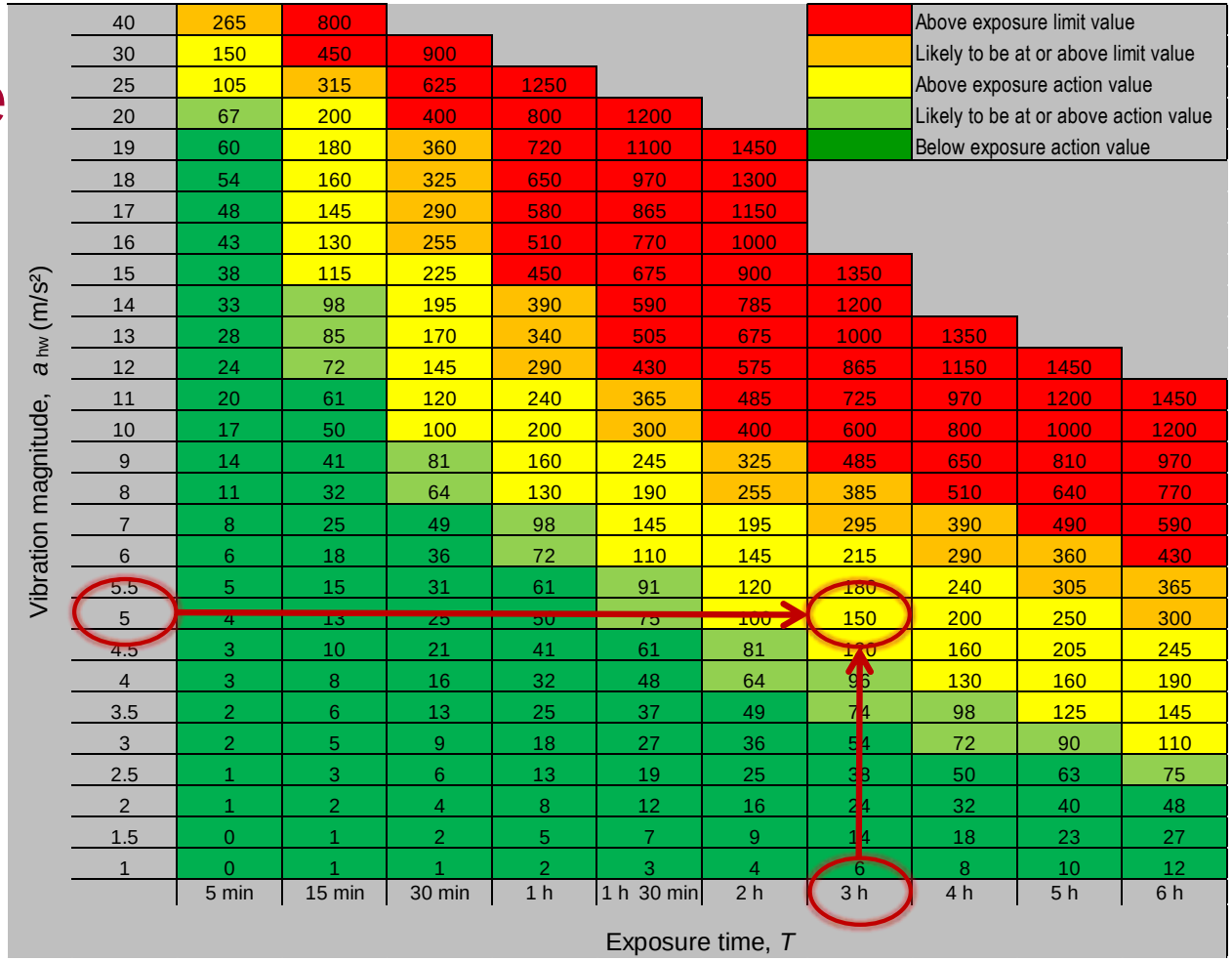
- Exposure Action Value 2.5m/s.The daily amount of vibration exposure above which employers are required to take action. Reduce to ALARP, health surveillance and information, instruction and training.

- Exposure Limit Value 5m/s. The maximum amount of vibration an employee may be exposed to on any single day. Not a target.

- As Low As Reasonably Practicable – remember.

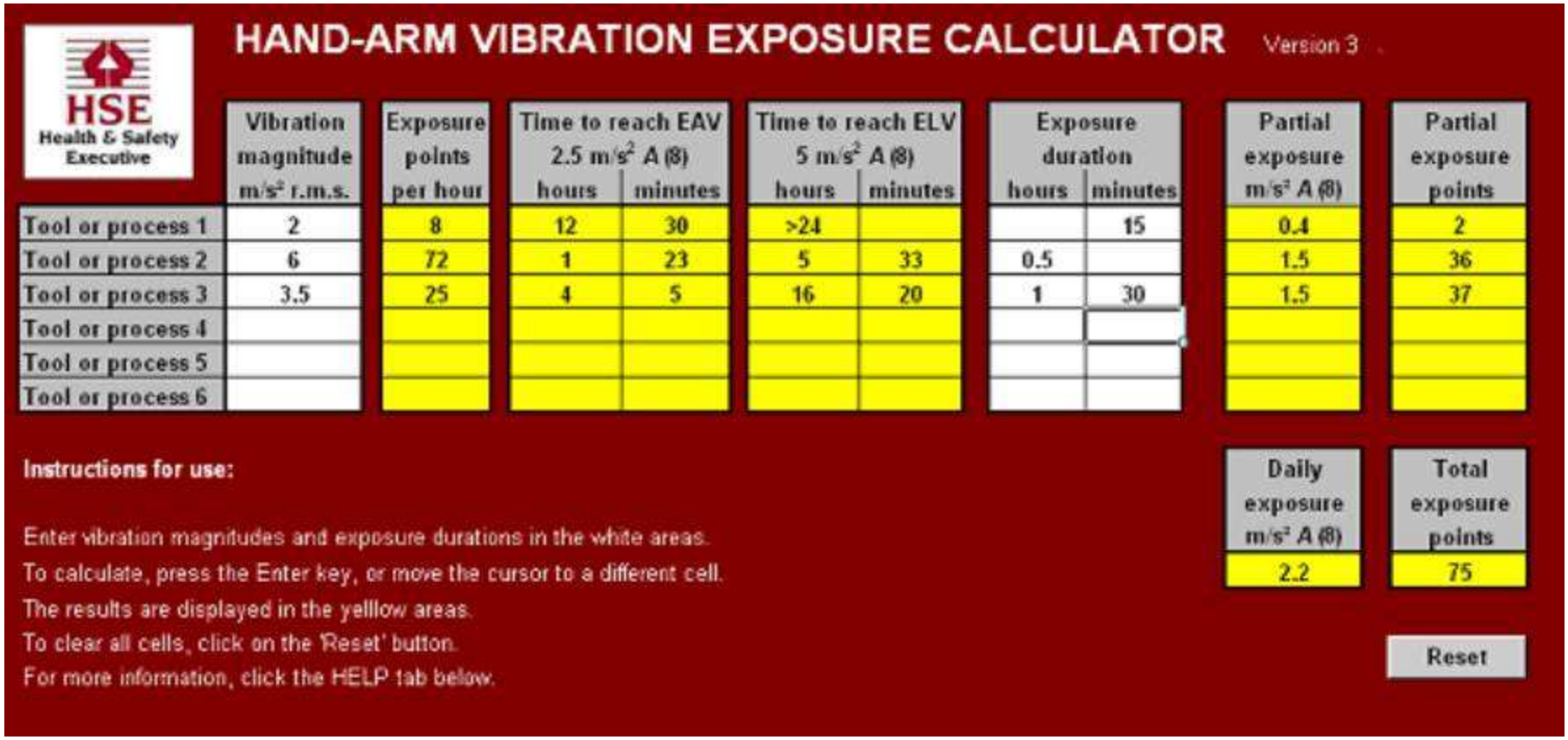
Tools for estimating exposure

- To encourage rapid exposure determination, and risk assessment



Vibration magnitude, a_{hw} (m/s²)	5 min	15 min	30 min	1 h	1 h 30 min	2 h	3 h	4 h	5 h	6 h
40	265	800								
30	150	450	900							
25	105	315	625	1250						
20	67	200	400	800	1200					
19	60	180	360	720	1100	1450				
18	54	160	325	650	970	1300				
17	48	145	290	580	865	1150				
16	43	130	255	510	770	1000				
15	38	115	225	450	675	900	1350			
14	33	98	195	390	590	785	1200			
13	28	85	170	340	505	675	1000	1350		
12	24	72	145	290	430	575	865	1150	1450	
11	20	61	120	240	365	485	725	970	1200	1450
10	17	50	100	200	300	400	600	800	1000	1200
9	14	41	81	160	245	325	485	650	810	970
8	11	32	64	130	190	255	385	510	640	770
7	8	25	49	98	145	195	295	390	490	590
6	6	18	36	72	110	145	215	290	360	430
5.5	5	15	31	61	91	120	180	240	305	365
5	4	13	25	50	75	100	150	200	250	300
4.5	3	10	21	41	61	81	120	160	205	245
4	3	8	16	32	48	64	96	130	160	190
3.5	2	6	13	25	37	49	74	98	125	145
3	2	5	9	18	27	36	54	72	90	110
2.5	1	3	6	13	19	25	38	50	63	75
2	1	2	4	8	12	16	24	32	40	48
1.5	0	1	2	5	7	9	14	18	23	27
1	0	1	1	2	3	4	6	8	10	12

HAV Calculator - www.hse.gov.uk/vibration



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HAND-ARM VIBRATION EXPOSURE CALCULATOR

Version 3

	Vibration magnitude m/s² r.m.s.	Exposure points per hour	Time to reach EAV 2.5 m/s² A(8) hours	Time to reach EAV 2.5 m/s² A(8) minutes	Time to reach ELV 5 m/s² A(8) hours	Time to reach ELV 5 m/s² A(8) minutes	Exposure duration hours	Exposure duration minutes	Partial exposure m/s² A(8)	Partial exposure points
Tool or process 1	2	8	12	30	>24			15	0.4	2
Tool or process 2	6	72	1	23	5	33	0.5		1.5	36
Tool or process 3	3.5	25	4	5	16	20	1	30	1.5	37
Tool or process 4										
Tool or process 5										
Tool or process 6										

Instructions for use:

Enter vibration magnitudes and exposure durations in the white areas.
To calculate, press the Enter key, or move the cursor to a different cell.
The results are displayed in the yelllow areas.
To clear all cells, click on the 'Reset' button.
For more information, click the HELP tab below.

Daily exposure m/s² A(8)	Total exposure points
2.2	75

Reset

Continuous Exposure Monitoring

- NOT a requirement of the regulations.
- Useful to confirm ‘trigger time’ estimates.
- Must NOT be used to transfer responsibilities to the tool user.

HAVS – Using the Hierarchy of Control

- **Eliminate – don't do it!**
- **Substitution – find a safer way to do it**
- **Engineering controls – source safer tools or equipment (or make adaptations)**
- **Administrative controls – job rotation, time limiting**
- **Use of suitable PPE**

Mechanisation removes the risk

- Machine-mounted pick replaces hand-operated breakers

Demolition without noise or vibration

- Use hydraulic crushers instead of demolition hammers

Pile cropping

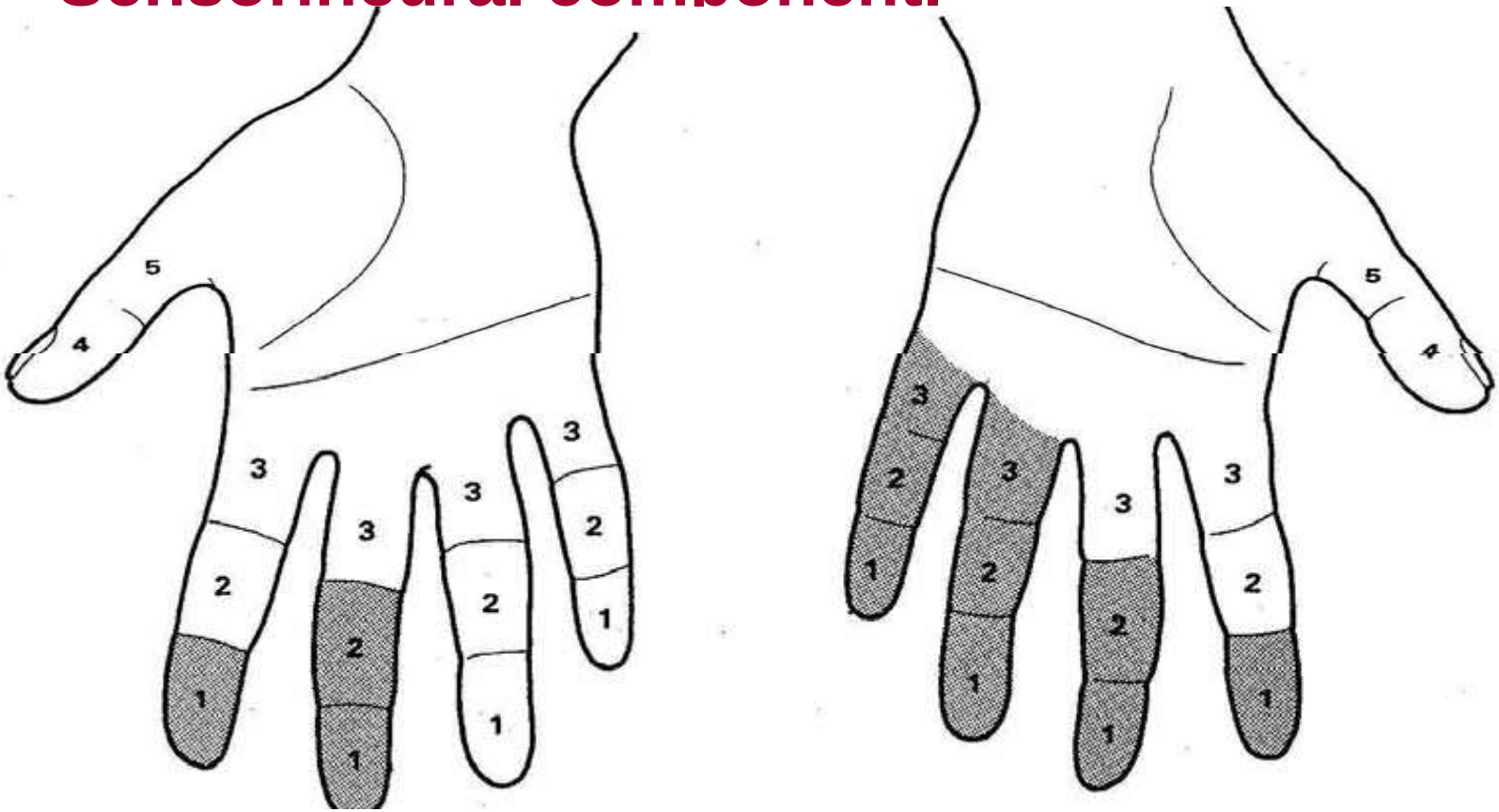
- In construction the biggest reduction in exposure can often be achieved at the design stage

HAVS – Health Surveillance

- HSE suggests a 5 tiered approach to health surveillance
  - Tier 1 – initial screening questionnaire
  - Tier 2 – annual screening questionnaire
  - Tier 3 – HAVS health assessment by qualified person
  - Tier 4 – formal diagnosis by doctor (OH)
  - Tier 5 – optional – includes tests

Health Surveillance

- Vascular component
- Sensorineural component.



Summary : What do you need to do to control HAV at work?

- **Assess** risks to develop an action plan
- **Reduce** risks for all employees
- **Investigate** and **implement** good practice and industry standards for control
- **Prioritise** higher risk cases with a programme of control measures
- **Health surveillance** to detect symptoms of HAVS and feedback to control measures

Vibrating Questions

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Construction Dust:

Much more than a nuisance!

What is Construction Dust?

- Generic term for dust 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%

Wood Dust

- Hardwood
- Softwood
- MDF

‘Low Toxicity’ Dust

- Gypsum
- Marble
- Limestone

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 much dust is a problem?

Depends upon:

-Amount of dust

-Size of the dust particles

-Type of dust

Managing the Risk

- Assess the risk (COSHH)
- Plan the work
- Water suppression
- On-tool extraction
- RPE

Silica Tasks: Wall Chasing

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

Silica Tasks: Sweeping

- Eliminate or minimise:
  - Control other tasks!

- Control
  - Remove larger bits
  - Rake
  - M or H extraction with vacuum attachments etc
  - APF 20 mask depending on what else happening

Wood Tasks: Cutting

- Control
  - On-tool extraction (M or H class unit)
  - Mask APF10/20 as well for longer cutting periods (15-30 minutes) /more enclosed space

Low Toxicity: Grinding/Cutting

- Eliminate or minimise:
  - Fully skim?

- Control
  - On-tool extraction (L class unit+)
  - No mask needed

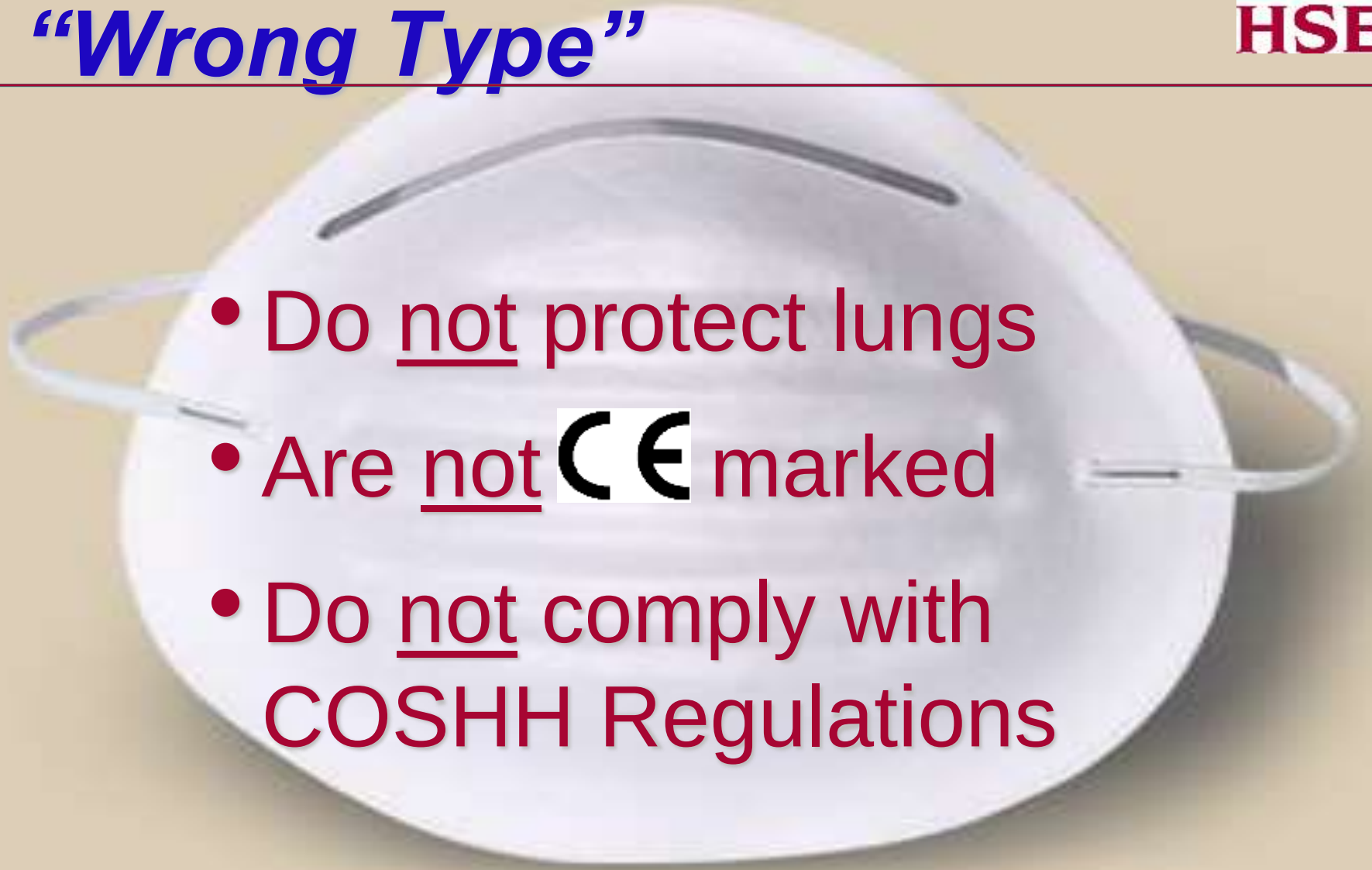
RPE

RPE is not the first line of defence!

Use when controls are not 100% effective which on construction sites is almost all of the time.

RPE supplements other control measures

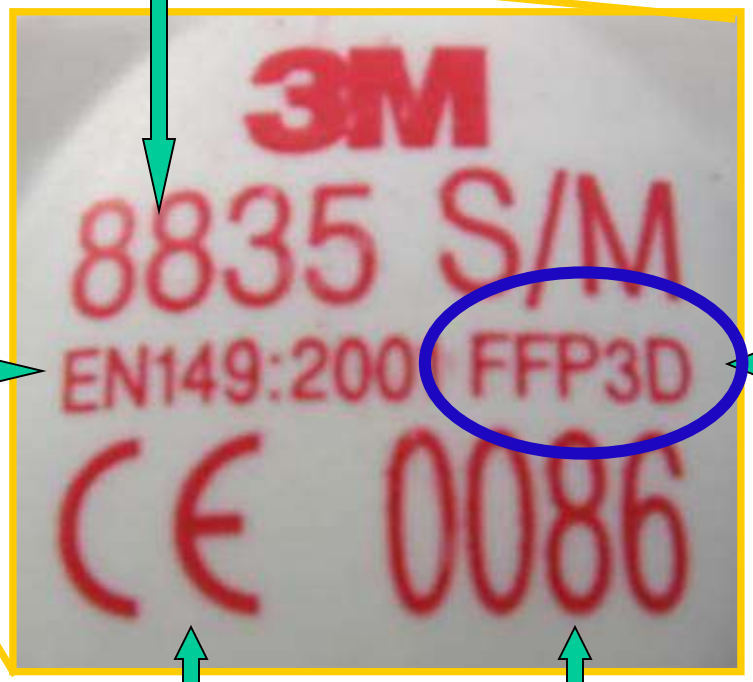
'Nuisance' Dust Masks: "Wrong Type"



- Do not protect lungs
- Are not CE marked
- Do not comply with COSHH Regulations

FFP3 - Disposable

Manufacturer product no.



European Standard

Class of Respirator: FFP3

Conformity mark & Notified Body

Must fit correctly

Fit testing required

Check that fit test providers are ‘FIT2FIT’

Key Points

- Dust is dangerous to your lungs
- ‘Safe’ levels of dust are very small. Many construction tasks quickly exceed them.
- The more dust you breathe in over the years the greater the risk. Control every exposure.
- All of this means that good controls are needed

Dusty Questions

Key Themes

- **‘Treat health like safety’**
  - Managing health risks is no different to managing safety risks
- **‘Ill health can be prevented’**
  - It is possible and practical to carry out construction work without causing ill health
- **‘Everyone has a role to play’**
  - Everyone must take ownership of their part of the process

Key Themes

- **‘Control the risk not the symptoms’**
  - Monitoring and health surveillance are not enough on their own. The first priority is to stop people being harmed
- **‘Manage risk, not lifestyle’**
  - Helping workers tackle lifestyle issues may be beneficial but is not a substitute for preventing work-related ill health.

Thank you

Any final questions?