IBERDROLA
Engineering & Construction

SP ENERGY NETWORKS

Control of Personal Exposure to Crystalline Silica

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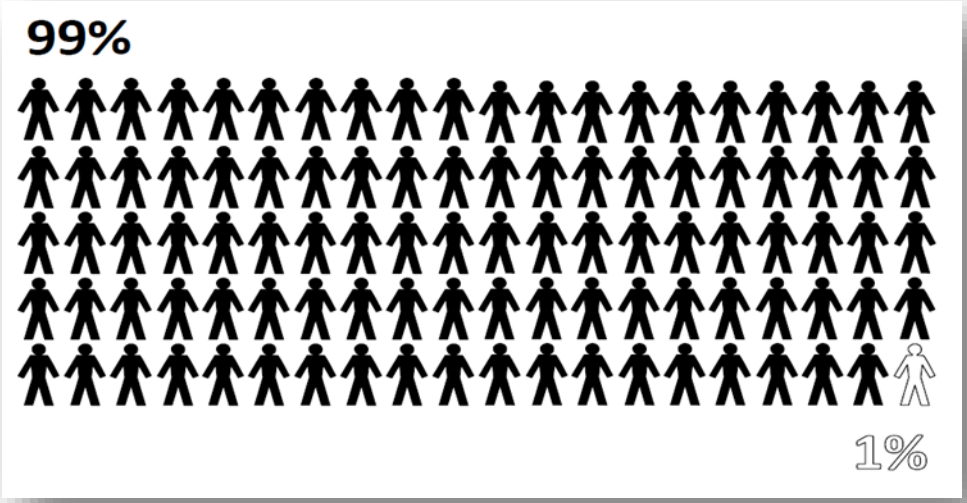
Introduction

- Why be concerned about exposure to Crystalline Silica?
- Breathe Freely campaign
- Health effects from exposure to Crystalline Silica
- Practical Control Measures
- Summary

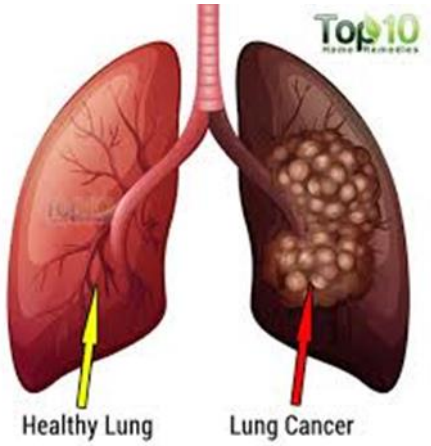
Why be concerned about Crystalline Silica exposures

- Exposure to Crystalline Silica has occurred for centuries, and the health effects from such exposures known for almost as long. So why the interest now?

- 13,000 deaths as a result to health conditions contracted as a result of exposure to hazardous substances in the workplace.



A significant proportion of these deaths are attributable to past asbestos exposure, however another significant proportion will be as a result of cancer,



Lung cancer is a notable one, caused not only as a result of exposure to asbestos, but also Crystalline Silica among others

- It is known that the Construction Industry has an increased risk of it's workers being exposed to hazardous dust due to the nature of the work.

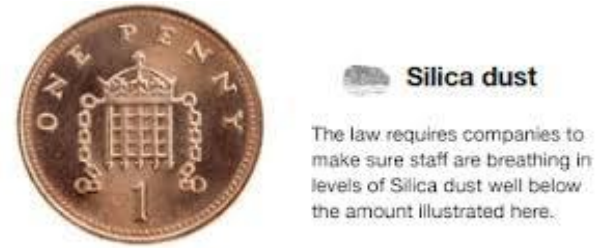
- The BOHS, in collaboration with the HSE and large construction companies are trying to raise awareness on the wider issues of the causes of occupational lung disease.

BREATHE FREELY

- Silicosis is a nodular fibrotic pnuemoconiosis, that causes scar tissue to develop on the lung, ultimately reducing lung function.
- There are three types of silicosis:
    1. **Acute:** can develop within a few weeks/ months of exposure,
    2. **Chronic**: Takes between 10 to 30 years of regular low level exposure. Often identified on the upper lung with the potential for extensive scarring.
    3. **Accelerated**: Tends to develop within 10 years of high-level exposure.
- Silicosis is a known pre-cursor to lung cancer.

Control of exposure to Crystalline Silica

- There a are a number of tasks that can generate exposure to dust containing a range of contaminants including Crystalline Silica



- The current Workplace Exposure Limit (WEL) for silica is down to 0.1mg/m³/ 8Hr TWA.
- To achieve this requires thought and a determination, identified through prior assessment of the hazard and risk.

Control options

- The basic principals for control should be the starting point for all environments:
    - Elimination / substitution…. Not always possible or practical!
    - Engineering controls
    - Adminstrative controls
    - PPE, Inc. RPE.

Control Cont.

- Dust suppression

- On tool extraction

Control Cont.

RPE:

- Some classic shots!

Beard Facts


Stroking of beard increases concentration, cognitive ability
Filters the air of toxins, pollution, and stray food
Natural bear-repellant wher camping or wandering in th woods
Science has shown that beards rarely sleep
Acts as a homing beacon attracting the jealousy and admiration of the beardless
Beards are almost completely nmune to sarcasm
Dramatically increases your wood-chopping capabilities
Quadruples handsomeness
Lets you instinctually know where the nearest mountain is
Fits on your face
DOGHOUSEDIARIES

How does dust hurt you?

Chronic Obstructive Pulmonary Disease

COPD, also called Chronic Obstructive Airways Disease (COAD), a blanket term for 'obstructive' lung conditions like bronchitis and emphysema. Reduces airflow out of the lungs. HSE estimates 15-20 per cent could be work-related.

Asthma

Another obstructive lung disease, linked to exposure to irritants or allergens ('sensitisers') at work. A reversible shortness of breath, between 15 and 20 per cent of all cases are work-related.

Extrinsic allergic alveolitis (EAA)

An allergic condition which affects workers exposed to biological dusts, causing conditions including farmers' lung and pigeon fanciers' lung.

Fibrosing alveolitis

Also known as pulmonary fibrosis, can be caused by some occupational dust exposures, for example work with cobalt or 'hard metals' in cutting tools. Related conditions, for example 'flock workers' lung' and 'popcorn lung' (Hazards 104), have been discovered recently.

Pneumoconiosis

A group of 'restrictive' lung diseases like silicosis, talcosis and asbestosis, where dust exposure causes debilitating lung scarring.

Cancers

Tumours, particularly of the lung and nose, are related to substances commonly encountered at work including asbestos, silica, chrome VI, nickel, cadmium and wood dust. These account for thousands of work-related deaths each year.

Heart disease

Dust-affected lungs put extra strain on the heart, which can lead to right-sided heart failure. Some occupational exposures, like hard metal dust, can cause potentially fatal conditions like cardiomyopathy. Very fine dust particles cause inflammation of the heart and a higher risk of heart attacks.

Other problems

Exposure levels half the level allowable for most workplace dusts overwhelm the body's first line of defence, the 'mucociliary clearance' that filters out dust in the upper respiratory tract. This can leave the worker more vulnerable to infections and more susceptible to occupational lung disease. Lots of other dust-related conditions occur, some specific to particular exposures; beryllium is linked to sarcoidosis, chrome dust to chrome ulcers.

summary

- Exposure to Crystalline Silica is not new, neither are the control methods available to limit exposure.

- To meet the WEL in a busy construction site takes a determination, best achieved not only from an assessment of hazard and risk, but through an understanding of the health effects:
- Silicosis is
    - Predominantly a chronic condition
    - It is disabling to the affected individual
    - It is not reversible and can be progressive
    - It can lead to cancer.