Protection against silica – European guidance for labour inspectors

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CHEMEX Working Group

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Background to Guidance for National Labour Inspectors (NLIs) on RCS

- **SLIC** increased its focus on **long latency health issues**, the first selected being RCS.

- Sub-working group established under **SLIC CHEMEX WG** in 2014.

- Decided to develop practical guidelines on RCS exposures in the **construction industry**.

- **SLIC Plenary** approved guidance in May 2016 and launched in October in The Hague.
In Europe, for every work related death by accident, at least 20 people die of work related long latency diseases.

- 87% of occupational deaths are related to cancers, lung function and heart disease.
- Together with asbestos, RCS is one of the substances with the highest respiratory health risks to construction workers.
- Death due to RCS exposure is generally preceded by a long period of disabling disease.
Guidance for National Labour Inspectors on addressing risks from worker exposure to respirable crystalline silica (RCS) on construction sites

Senior Labour Inspectors’ Committee (SLIC)
Date of Issue: October 2016
Purpose of RCS Guidance

- Aims to increase NLI confidence in addressing & regulating RCS exposures on construction sites
- Construction sector selected as it is EU wide, has potential for high risk RCS exposures and is not part of NEPSI social dialogue agreement
Format of RCS Guidance

- **Part 1** provides information on
  - What is RCS?
  - Health Risks
  - Legal Framework (no detail)
  - Risk Assessment,
  - Hierarchy of Control,
  - Engineering Controls,
  - PPE including RPE,
  - Health Surveillance,
  - Welfare and Housekeeping
  - Training/Instruction

- **Part 2** - 14 single-page task sheets, on common tasks with RCS exposure risks
Crystalline silica (CS) is a form of Silica (SiO₂) found widely in stone, rocks, sands and clays.

Many construction products contain CS – see table.

Cutting, breaking, drilling etc. of silica based products releases crystalline silica dust.

The dust contains respirable particles, and these can penetrate deep into the lungs to do damage.

RCS particles are invisible to the naked eye, in normal lighting.

<table>
<thead>
<tr>
<th>Crystalline Silica concentrations in common materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silica containing composites, e.g. manufactured stone</td>
</tr>
<tr>
<td>Sandstone, gritstone, quartzite, flint</td>
</tr>
<tr>
<td>Concrete, mortar</td>
</tr>
<tr>
<td>Shale</td>
</tr>
<tr>
<td>China stone</td>
</tr>
<tr>
<td>Tile</td>
</tr>
<tr>
<td>Slate</td>
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<tr>
<td>Granite</td>
</tr>
<tr>
<td>Brick</td>
</tr>
<tr>
<td>Ironstone</td>
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<tr>
<td>Basalt, dolerite</td>
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</tbody>
</table>
General rules/tips:

When work is being carried out with silica-containing material:

- A visible dust cloud contains more RCS than the Occupational Exposure Limit and is dangerous to the health of those exposed to it.

- When cutting, sanding, drilling or grinding takes place, even without visible dust clouds the concentration of RCS may be too high.

- When inspectors see dust clouds they should take action.
Inhaling RCS can lead to serious health effects – **Silicosis** & **Chronic Obstructive Pulmonary Disease (COPD)**

**Silicosis** can develop at or below some member state Occupational Exposure Limit Values (OELVs)

Exposed workers are at increased risk of developing **lung cancer** – it is a group 1 Carcinogen (IARC)

Other health effects include **tuberculosis, kidney disease and cardiovascular disease**
What are the risks of silicosis?

Lifetime risk from 0.1 mg/m³ for 45 years = 30 in 100

Source: US OSHA
The main focus of this guidance is on the control of exposure; keeping in mind the health risks and current discussions at EU level, exposure should always be kept as low as possible.

(*Directive 2004/37/EC (= Carcinogens or Mutagens Directive CMD) will also apply – binding exposure limit for RCS in Annex III)

However, in keeping with a December 2012 opinion (Doc. 2011/12 ) agreed by the EU tripartite (government-employer-union) Advisory Committee on Safety and Health at Work, this guidance document, refers to a benchmark of 0.1 mg/m³ over a 8 hr time weighted average.
# Employer Risk Assessment

<table>
<thead>
<tr>
<th>Inspector Should Consider the following  (full version on page 10 of the guide)</th>
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</thead>
<tbody>
<tr>
<td><strong>Elimination or substitution</strong></td>
</tr>
<tr>
<td><strong>Task</strong></td>
</tr>
<tr>
<td><strong>Location</strong></td>
</tr>
<tr>
<td><strong>Duration</strong></td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
</tr>
<tr>
<td><strong>People</strong></td>
</tr>
<tr>
<td><strong>Controls</strong></td>
</tr>
<tr>
<td><strong>Other OSH issues</strong></td>
</tr>
</tbody>
</table>
Hierarchy of Controls

- Elimination: Physically remove the hazard
- Substitution: Replace the hazard
- Engineering Controls: Isolate people from the hazard
- Administrative Controls: Change the way people work
- PPE: Protect the worker with Personal Protective Equipment

Visualisation by NIOSH
https://www.cdc.gov/niosh/topics/hierarchy/
Perceived as impossible or difficult to achieve in the construction industry….But:

- Risks can be eliminated for ‘other’ workers by ‘segregating RCS work area’ from other areas on site.
- Using ‘right size’ building products –designing out dust-creating cutting
- Using ‘block splitters’
- Using ‘no’ or ‘low’ quartz content materials
- Substitution important for abrasive blasters
Engineering Controls

- **Water Suppression**
  - Water directed to tool cutting point during cutting etc.
  - Minimum flow rate of **0.5 l/min**
  - Look for lack of correct pressure, blocked spray jets, inadequate supply of water or damping areas only before working

- **On-Tool Extraction**
  - Type of LEV system
  - Captor hood most important
  - Extraction unit (industrial vacuum) should be fitted with **Medium (M)** or **High Filtration (H)**
Administrative controls

- Adopting **safe work practices**
- Providing appropriate **training, information and instruction**
- **Supervision** to ensure correct controls in place
- **Limiting** co-worker exposure and **rotating** workers
PPE: Respiratory protection

Where RPE is required:

- **CE marked** disposable **FFP3**, **half mask with P3 filter** or **powered helmets** for those with beards, etc.
- **Fit test** required in some Member States
- **Facial hair** lowers effectiveness of RPE and should be taken into account
- **Workers** must be **trained** and **supervised** on correct use, maintenance and storage.
- **Abrasive blasting** – airline blasting helmet for large stone cleaning projects
Health Surveillance (HS)

- **HS** should be introduced **when risk to health from RCS exposure**

- **HS Aim:** to detect ill health at early stage, provides data to improve controls & support workers

- May include **questionnaires, lung function test, chest x-rays**

- **Results** must be explained to worker, acted on when necessary and used for risk assessment
Welfare and Housekeeping

- **Changing & storage facilities**
  - In line with National Requirements

- **Uncontaminated areas for eating and drinking**
  - Workers should not eat, drink or smoke in contaminated areas

- **Washing facilities**
  - Warm water, mild skin cleansers, soft paper towels for drying
  - Pre-work creams to aid cleaning
  - Provision of showers where heavy contamination expected

- **Cleaning**
  - Vacuum cleaners with at least M filter or wet cleaning methods. Do not use dry brushing or compressed air.
Information and Training

- Should include
  - **Hazards** of RCS and health effects
  - Good practice **case studies**
  - Types of **products** containing silica
  - Types of **activities** leading to high exposures
  - Elimination or control **measures**
  - **Care and use of PPE and RPE**
  - Education on **health surveillance**

- **Toolbox talks**
  - **Refreshers** on regular basis
Part 2: Task Sheets
Sections of the task sheets

- **Photographs** – good and poor practice
- **General comment**
- **Recommended controls** for RCS dust
- **Designing out** risks
- **Maintenance** of control equipment and RPE
- **Possible actions** by National Labour Inspectors
Possible actions by inspectors

- Actual enforcement can vary between countries, table states when action is appropriate

<table>
<thead>
<tr>
<th>Possible Actions by National Labour Inspector</th>
<th>High Health Risk - Consider immediate action when all controls missing/ineffective e.g. Stop work, use of Notices, use of administrative fines etc.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Medium Health Risk - Consider action in situations where one control is missing/ineffective e.g. use of Notices requiring action</td>
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<tr>
<td></td>
<td>Low Health Risk - No action required where all controls are present and effective</td>
</tr>
</tbody>
</table>
# Useful resources

<table>
<thead>
<tr>
<th>NEPSI:</th>
<th><a href="http://www.nepsi.eu/">http://www.nepsi.eu/</a></th>
</tr>
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<tbody>
<tr>
<td>IOSH no time to lose</td>
<td><a href="http://www.notimetolose.org.uk/">http://www.notimetolose.org.uk/</a></td>
</tr>
</tbody>
</table>
Thank you for your attention - any Questions or Views?

Your Views
Where is the Inspector Guidance and related Introductory Powerpoint

EU Site - CIRCA-BC

- https://circabc.europa.eu/w/browse/a77d1b2d-8fca-47ec-ac9f-71d86ba4e87e

(Click on Guides, then ‘Guidance for NLI addressing risks from worker exposure to respirable crystalline silica (RCS) on construction sites’, where both documents are listed)

EU-OHSA

- Link to updated Guidance to follow shortly.