

Cement Sustainability Initiative (CSI)

Health Management Handbook

Addressing occupational exposures
in the cement industry



Recommended good practices for the management
of health risks from occupational exposure to dust,
respirable crystalline silica and noise



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1. Basic principles

The objectives of this document and the consequent actions that will be taken by Cement Sustainability Initiative (CSI) members shall be compliant with all applicable legal requirements on health, safety, privacy and discrimination and will also obey competition laws and regulations. Consequently, any recommendation or good practices suggested that are specifically not allowed by locally enforced legal schemes shall not be performed.

The document drafting process has been open, transparent and non-discriminatory. Internal and external stakeholders have been consulted during the development of this document.

- The ultimate objective of this document is to protect employees by fostering appropriate health management practices.
- Good health management practices are grounded on two complementary pillars: proactive assessment and mitigation of the risk of exposure to identified agents in the workplace and careful implementation of a correct protocol for health surveillance.
- Only trained and experienced professionals should perform both exposure measurements and medical surveillance, providing appropriate elements of guidance to perform the risk assessment, which remains a clear responsibility of line management.
- This entire document is intended as a compilation of recommendations and good practices in the framework of a proactive approach to occupational health beyond locally enforced legislation.
- It is recommended that CSI member companies implement the good practices described in this document across all activities under their management control as soon as practicable and seek to have them implemented in all activities within five years.
- When a CSI member acquires management control of another company, the good practices described in this document are expected to be implemented within five years from the acquisition.
- While members should start implementing this document upon issuance, reporting requirements for agreed key performance indicators will become mandatory only after inclusion in the CSI Charter.
- The recommendations in this document are basically intended for CSI member company employees, while fostering the extension to contractors as much as feasible and as allowed by locally enforced legislation.

2. Scope

Promoting the health and enhancing the well-being of workers is as vital as protecting their safety. In this respect, the CSI strives to share good practices, creating tools and providing recommendation to foster the prevention of occupational illnesses by assessing the risks of exposure at the workplace, implementing suitable medical surveillance for employees and, more generally, improving working conditions by mitigating risks. These combined elements shape the good practices of health management adopted by CSI member companies.

The scope of this document covers all business sectors related to the building materials part of member companies. The reporting responsibilities relating to the degree of management control are as follows :

- The CSI member with a controlling position in a company (greater than 50% shareholding) is required to report for 100% of that company ; CSI members with minority positions should not double report that company.
- In a 50/50 joint venture where both parent companies are members of the CSI, only the company with health and safety management responsibility should report the related figures for 100% of that company in order to avoid double reporting.
- In a 50/50 joint venture where only one parent company is a CSI member, but does not have management responsibility, that CSI member is not obliged to report data for that company.
- If the controlling shareholder is not a CSI member, then the CSI member(s) in minority position(s) is (are) not obliged to report data for that company.
- In cases where management/technical agreements effectively give management control to a minority shareholder, then the reporting provisions of the controlling position apply as outlined above.



3. Understanding hazards and management tools

Like in any industrial process, workers may be exposed to physical, chemical and biological agents or materials representing health risks. In the cement sector, dust, dust containing respirable crystalline silica and noise are three recurring risk exposures. While it is the responsibility of individual companies to address potential health risks, CSI values a common approach to the management of occupational exposure to dust and noise.

Materials and processes in the sector (cement, aggregates, ready-mix concrete and others) may generate airborne dust. Significant exposure to dust may cause chronic obstructive pulmonary disease (COPD). In the limited cases in which airborne dust may contain a significant amount of respirable crystalline silica (RCS), exposure may lead to pneumoconiosis and silicosis, a nodular progressive fibrosis caused by the deposit of fine respirable particles of crystalline silica in the lungs.

Machines and processes in industrial facilities may generate noisy working environments. Significant exposure to noise may induce progressive hearing loss. The risk increases with the intensity of noise, the length of exposure intervals and the total exposure time. High-peak impulse noise (e.g. air shocks, blasting) may cause acute and permanent hearing damage.

This document provides useful information to understand the basic pillars of health management:



4. Dust, respirable crystalline silica and noise

4.1. Identification of critical areas



All CSI member company workplaces and premises that are considered to be potentially at risk for exposure to dust or noise should be identified against reference levels for dust, respirable crystalline silica levels or noise. Each CSI member company defines the reference levels individually based on the best internationally or nationally recognized references. These areas are designated as “dusty areas” or “noisy areas” respectively.

A preliminary assessment could be done by site managers checking the status of equipment and facilities and performing a precautionary identification of non-acceptable workplaces against the following non-quantitative basic evaluation schemes :

Dust	Noise
Visible airborne or settled dust, significant spills or leakage, unpaved yards, dusty open stockpiles, dusty loading/unloading operations.	Presence of high-noise equipment, difficulties in understanding people speaking, etc.

However, dust concentration and noise levels are to be measured using proper techniques and devices rather than evaluated through non-quantitative and therefore subjective assessments. In any case, this is the only means to assess airborne crystalline silica. It is also recommended that CSI member companies analyze settled dust in plants as a useful cross-check of airborne data.

Sampling and measuring devices must be calibrated and comply with any local or international standards and must be carried out by competent personnel and entities. Laboratories analyzing respirable crystalline silica content should be accredited. General recommendations may be taken from country or international legislation. In the absence of local legislation, CSI members define and adopt their own directives and procedures.

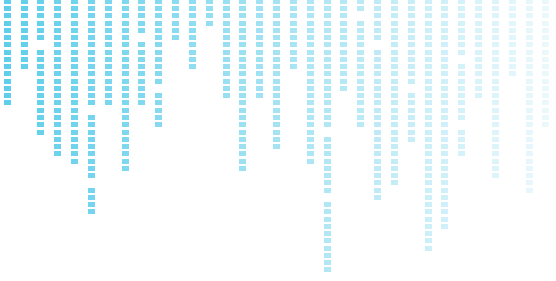
Critical areas, especially in closed buildings and confined spaces, are conveniently marked with permanent or, if applicable, temporary signage and must indicate which type of personal protective equipment (PPE) has to be worn.

4.2. Assessment of personal exposure

Identification of dusty and noisy areas in workplaces is not always sufficient to protect workers. Selected occupations or tasks should be periodically assessed for their personal exposure to dust, respirable crystalline silica or noise. The evaluation is site specific and should be performed under the responsibility of site managers. As an option, this duty could be delegated to an occupational health service. In all cases, each CSI member company individually defines relevant procedures and record keeping.

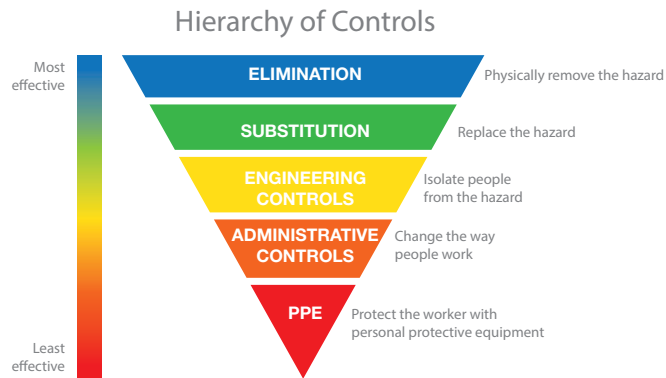


Dust	Noise
<p>Dust and crystalline silica monitoring should be performed through personal samplings to measure actual exposure levels, with sampling time up to full shift, adjusted depending on job variability and dust concentration in the work area.</p>	<p>Noise monitoring should be performed through the integration of sound pressure levels at the site and the duration of exposure in each relevant site facility. Before any of the measurements commence, exposure times have to be evaluated, preferably in consultation with the site occupational physician and after informing employee representatives.</p> <p>Direct exposure measurement through portable integrating sound dosimeters is feasible but can be misleading if not managed properly.</p>



4.3. Good prevention practices

CSI member companies should adopt the hierarchy of controls to reduce dust, respirable crystalline silica concentrations and noise levels as follows.



1. At source, through material selection and adequate technologies, such as :

Dust	Noise
Change of raw materials and their fineness, equipment emitting low dust levels, de-dusting systems, enclosed machinery, separated production and control rooms, etc.	Low-noise equipment, sound insulation of machinery, silencers on air intakes, segregation of multiple-machine facilities, etc.

2. At the workplace in general, through technical measures such as :

Dust	Noise
Reducing or mitigating dust generation or propagation (paving of roads and surfaces, road wetting, de-dusted air conditioning for vehicles and mobile equipment, automated production lines, etc.)	Sound absorbing panels, waffles, sound screens, automated production lines, etc.

When it is not technically or economically viable to reduce noise, dust or dust containing RCS below reference levels :

- Workers and people potentially exposed should be provided with suitable PPE, and/or
- Organizational measures such as a reduction of personnel exposure time should be undertaken to limit the exposure of workers in these areas.

As guidance, the following links provide references to technical solutions to reduce occupational exposure.



Dust	Noise
<p>European Network on Silica (NePSi), <i>Good Practice Guide on Workers Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it</i> http://www.nepsi.eu/agreement-good-practice-guide/good-practice-guide.aspx</p> <p>World Health Organization (WHO), <i>Hazard prevention and control in the work environment: Airborne dust</i> http://www.who.int/occupational_health/publications/airdust/en/</p>	<p>United States Occupational Health & Safety Administration (OSHA), <i>OSHA Technical Manual (OTM)</i>, Section III: Chapter 5 [Updated 15/08/2013] https://www.osha.gov/dts/osta/otm/new_noise/index.html</p> <p>Health and Safety Executive (HSE), United Kingdom, extensive index of noise control case studies http://www.hse.gov.uk/noise/casestudies/index.htm</p> <p>World Health Organization (WHO), noise control with multiple examples of designs of various noise controls: <i>Occupational exposure to noise: evaluation, prevention and control</i> http://www.who.int/occupational_health/publications/occupnoise/en/ <i>Engineering noise control</i> http://www.who.int/occupational_health/publications/noise10.pdf</p>

4.4. Personal protective equipment

All employees working in dusty or noisy areas, regardless of the length of exposure, must be trained on the correct use of respiratory masks, hearing protection devices and other relevant personal protective equipment (PPE). Initial training is followed by periodic refresher courses and/or toolbox talks to ensure a good understanding of fitting and use practices. The use should be checked by appropriate means.



Equally, all sub-contractors, third parties and visitors to dusty or noisy areas, regardless of the length of exposure, must be trained on or introduced to the use of respiratory masks, hearing protection devices and other relevant PPE by management personnel supervising or accompanying them into the dusty or noisy areas.

Dust	Noise
<p>Respiratory protective equipment (RPE) must meet national or international standards as defined by each member company.</p> <p>Surgical-type masks are not suitable for the purpose and are not allowed under any conditions. Moreover, it is recommended to not use masks of a quality inferior to the FFP2 category defined by European Standard EN 149:2001 or equivalent.</p> <p>No respiratory masks offer protection from dust concentrations higher than 30 times the most commonly adopted occupational exposure threshold.¹ Therefore, no employees will be admitted to work in such an environment until dusty operations are stopped and airborne dust is left to settle for a suitable amount of time.</p>	<p>Hearing protection devices must meet national or international standards as defined by each member company.</p> <p>The selection and use of hearing protection must attenuate the noise to a level below the noise action level as defined by each country's legislation.</p> <p>It is recommended that protection devices provide a minimum attenuation of 25 dB SNR (decibel signal to noise ratio).</p>

A face fit test for respiratory masks and a comfort check for hearing protections are strongly recommended.

Storage conditions, functioning and maintenance of PPE are relevant to ensure adequate protection over time. All PPE should be kept in a clean, dry and a closed compartment when not in use.

¹ As an example, the American Conference of Governmental Industrial Hygienists (ACGIH) suggests a threshold of 10 mg/m³ for total inhalable dusts

5. Health surveillance protocols

5.1. General considerations

Health surveillance is intended as an element of the health management system, aiming in particular at anticipating occupational health risks well before any symptoms or illness conditions are detected.

The aim of this chapter is to describe recommended occupational health surveillance protocols for potentially exposed workers. The surveillance should be in accordance with established occupational medical methods and based on scientific knowledge. Moreover, in line with International Labour Organization (ILO) convention 161 on Occupational Health Services, health surveillance should be carried out at appropriate intervals and take risks into account.



Normally, occupational health services are responsible for advising the employer, the employees and their representatives in the company on the:

- Categories of workers subjected to health screening;
- Requirements for establishing and maintaining a safe and healthy work environment that will facilitate optimal health in relation to work;
- Adaptation of work to the capabilities of workers in consideration of their health status;
- Reassessment of workers' ability to perform the required tasks linked to a job following ill-health or injury;
- Reassignment of a worker to another job that best fits the worker's capabilities and health status.

In addition to the expertise brought by occupational health services, CSI member companies should be proactive in ensuring that an effective health management system is in place at every site. CSI members may require occupational health services to provide local knowledge and expertise to assist in the implementation of their health initiatives.

It is recommended that CSI members carry out a baseline health examination of new employees to confirm their fitness for duty. This could also be used to establish any possible health surveillance program in the future, if there are no restrictions in local legislation.

Individual health data are confidential and must be managed in compliance with local legislation. Anonymized aggregated data may be analyzed by management and the results communicated as appropriate to employees and/or their representatives in charge of health and safety. The anonymized results may be the basis for the definition of corrective and preventive action plans in order to further reduce exposure levels based on the hierarchy of controls. The individual results may be the basis for any specific medical surveillance and treatment.

The following paragraphs provide general guidance on how to structure occupational health surveillance for employees potentially exposed to dust, respirable crystalline silica and noise. The elements described are recommended based on the assumption that they are not prohibited by local legislation.

5.2. Protocol for workers exposed to dust and respirable crystalline silica

Frequency of controls

Exposed employees showing no specific symptoms should undergo a medical check every three years. In operations with a high exposure level and operations that have other exposures that impose a strain on the lungs, more frequent check-ups must be considered.

It is crucial to encourage employees experiencing respiratory tract symptoms to contact the occupational health service so that a medical check can be carried out as required, and that this not be delayed until the scheduled check-up at the standard interval. In some cases, the changes leading to chronic obstructive pulmonary disease (COPD) can develop at such a rate that it will not be intercepted in a three-year control cycle.

Individuals starting to work at a production site should undergo a medical examination. It is also recommended that employees leaving their job undergo a medical check-up if a recent medical file is not available. In all cases, they should be given the results of previous examinations and be informed that if they experience any new respiratory tract symptoms they should seek medical advice in order to have a new examination.

Collection of medical history (anamnesis)

Occupational history, including earlier and existing exposure factors.

The collection of basic symptoms, possibly based on recognized and validated questionnaires, should consider COPD as a minimum.

Previous and existing pulmonary diseases and atopy (a genetic state of hypersensitivity to environmental allergens).

Familial pulmonary diseases and atopy.

Smoking habits; the notice of examination can include a separate paragraph to map smoking habits that the employee can fill out in advance.

Specific medical examinations, performed by or under the control of a competent physician

Spirometry with minimum FVC (forced vital capacity), FEV1 (forced expiratory volume in 1 second) and FEV% (FEV1/FVC ratio) must be carried out in line with the criteria of the ERS/ATS (European Respiratory Society/American Thoracic Society).

Percussion of the thorax and an inspection of the respiratory movements should be carried out, as well as a lung auscultation.

Use of X-ray by itself is an unhealthy exposure to radiation and should be restricted to cases where the occupational physician found an indication or to follow national legislation.

Actions following results

Where the spirometry indicates a significant worsening of the respiratory function, or a diagnosis of COPD or silicosis is made, if symptoms are displaying from the respiratory tract, an assessment will be made of whether the employee is in need of further examinations or treatment.

When an employee is diagnosed with silicosis, the need to investigate whether the joints or the kidneys are affected should also be considered.

If the pre-start examination indicates that a new employee already has a pulmonary disease, then the employee should be informed about the exposure situation in the facility and in some cases, based on an occupational medical evaluation, be advised to seek other work. How to follow-up will depend on local legislation and taking privacy principles into account.

In some cases, a change of job/workplace may be necessary. A record should document when an employee opposes this advice.



5.3. Protocol for workers exposed to noise

Frequency of controls

The first inspection to be carried out as soon as possible, but no later than six months after employment.

Follow-up inspections conducted after one year, then at intervals adapted to the risk of hearing loss; intervals to be decided according to the health status of employees and their exposure to noise, but should not happen at intervals longer than three years.

Collection of medical history (anamnesis)

Risk assessment with regard to noise exposure including results of noise measurements and working environment surveys.

Any other environmental factor that can affect hearing (former arm-to-arm electrical accidents, exposure to ototoxic chemicals such as xylene, styrene, n-hexane, toluene, etc.)

Use of hearing protection.

Mapping of earlier ear diseases, trauma, infections, perforated eardrum, troublesome earwax, operations, tympanic drainage, etc.

Former diseases like meningitis, mumps and measles.

Family history of hearing loss.

Past use of ototoxic medicines (gentamicin, furosemide, aspirin, cytostatic, etc.)

Symptoms related to hearing loss (tinnitus, speech perception) and indication of when hearing loss occurred.

Results from previous audiometric investigations and any examination by an ear, nose and throat specialist.

Any earlier diagnosed hearing loss already reported as an occupational disease.

Exposure to noise outside work (hobby, music, hunting, etc.)

Specific medical examinations, performed by or under the control of a competent physician

Audiometry, performed in accordance with guidelines from national labor inspection and operating instructions.

Quality maintenance of the audiometry equipment and training of the audiometry operator according to ISO 8253-1:2010; audiometry investigation to take place as early as possible in the day, possibly with absence of exposure to noise higher than 80 dB(A) prior to the investigation.

Otoscopy, to exclude any earwax, middle ear fluid, eardrum calcification, perforation of the eardrum, cholesteatoma or other pathology.

Actions following results

Suggested check-list in case of detection of hearing loss:

- Is the employee exposed to higher noise levels than previously assumed?
- Is the quality of mapping and risk assessment for associated personnel good enough?
- Are current protection measures adequate and understood by employees?
- Is the labelling of noise zones effective?
- Do employees have access to appropriate protective equipment and do they use them properly when needed?
- Wherever necessary, is maximum stay time defined and understood by employees?

In some cases, a change of job/workplace may be necessary. A record should document when an employee opposes this advice.

6. Key performance indicators (KPIs)

The need for the standardization of procedures among different stakeholders and the measurement of the performance of current and future CSI members in the area of occupational health requires the introduction and use of a common reference system in the form of specific key performance indicators (KPIs). The selected KPIs can be used both for internal or external evaluation purposes to assess the level of accomplishment of different organizations or business units against CSI recommended good practices or the trend of their performance over time as regards the protection of the health of their employees.

The following KPIs are recommended as a general context for the protection of worker health from exposure to dust and noise among CSI members.

Percentage (%) of employees working on sites where the recommendations have been implemented, meaning the:	Occupational illness frequency rate (OIFR)
<ul style="list-style-type: none">a. Identification of critical areas for dust/crystalline silica and noise;b. Assessment of personal exposure for dust/crystalline silica and noise;c. Implementation of prevention measures, including PPE;d. Implementation of health surveillance protocols for dust/crystalline silica and noise.	OIFR is defined as the number of recognized occupational illnesses per million worked hours. The number of occupational illnesses includes the confirmed new cases related to dust, crystalline silica and noise for occupational illnesses communicated to the company during the reporting year.



7. Glossary

Lung cancer

There is sufficient information to conclude that the probability of lung cancer increases with silicosis. There is no indication that exposure to cement dust, or other dusts existing in a cement plant, represents a risk of lung cancer.

Medical practitioner

Medical practitioners are individuals who are accredited, licensed and/or registered as a health professional upon meeting the specified requirements. Medical practitioners diagnose physical and mental illnesses, disorders and injuries and prescribe medications and treatment to promote or restore good health.

Occupational health service

According to ILO Recommendation 112, occupational health services are services established in or near a place of employment for the purposes of:

- Protecting workers against any health hazard that may arise out of their work or the conditions in which it is carried on;
- Contributing towards the workers' physical and mental adjustment, in particular by the adaptation of the work to the workers and their assignment to jobs for which they are suited; and
- Contributing to the establishment and maintenance of the highest possible degree of physical well-being of the workers.

Furthermore, ILO Convention 161 defines occupational health services as services entrusted with essentially preventive functions and responsible for advising the employer, the workers and their representatives on:

- The requirements for establishing and maintaining a safe and healthy work environment that will facilitate optimal health in relation to work;
- The adaptation of work to the capabilities of workers in light of their health status.

Occupational hygienist

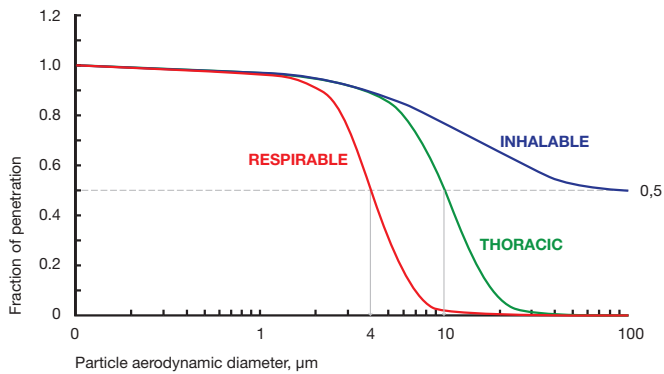
Occupational hygienists are experts in exposure risk assessments. They are qualified to identify, assess and control health hazards in the workplace. They understand how chemical, physical and biological agents may affect the health of the workforce and, in turn, the health of the business.

Occupational physician

Occupational physicians are specialists in the field of occupational medicine who focuses on the prevention, identification, management and treatment of health conditions and rehabilitation. An occupational physician can operate at a level beyond the individual worker and can consider potential impacts across a workplace population and the work environment. The knowledge, training and skills of occupational physicians distinguish them from other medical practitioners.

Personal exposure to inhalable dust

Personal exposure to inhalable particulate matter refers to the mass fraction of total airborne particles that is inhaled through the nose and mouth. The inhalable convention, which is a target specification for sampling instruments, is defined with a 50% statistical cut at an aerodynamic diameter of 100 µm (source: EN 481). Exposure is measured as mg/m³, representing a full shift.

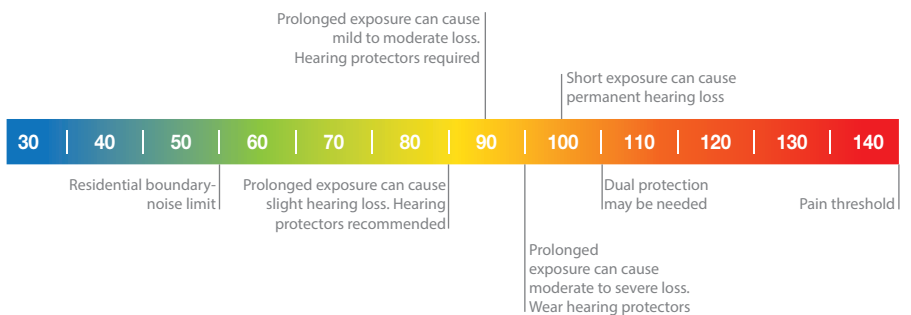


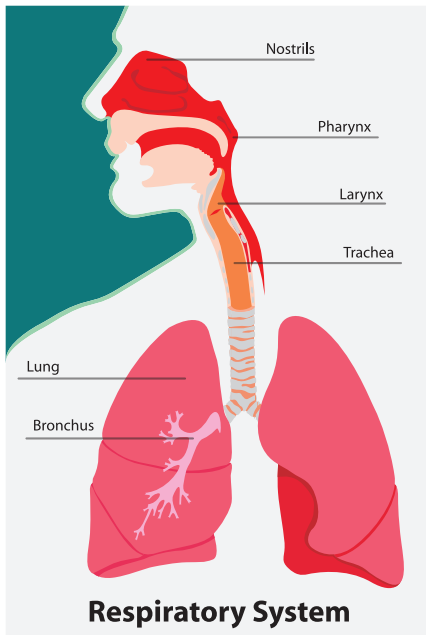
Probability or aerosol penetration as a function of aerodynamic diameter, internationally agreed by CEN/ISO/ACGIH

A review of monitoring methods for inhalable hardwood dust, IOM (Institute of Occupational Medicine), 2011

Personal exposure to noise

Personal exposure to noise is the worker's daily exposure to noise (normalized to an 8-hour shift), calculated taking into account the average levels of noise and the time spent in each working area. It is expressed as dB(A).





Personal exposure to respirable crystalline silica

Respirable dust refers to those materials that may penetrate down to the lower airways. The respirable convention, which is a target specification for sampling instruments, is defined with a 50% statistical cut at an aerodynamic diameter of 4.25 μm (source: EN 481).

Personal exposure to respirable crystalline silica means the mass inhaled crystalline silica (SiO_2) in the respirable fraction as defined above. Exposure is measured as mg/m^3 , representing a full shift.

Pneumoconiosis

Pneumoconiosis refers to a range of diseases that are caused by the inhalation of dusts that are then retained in the lungs. There is usually a long delay between the time at which a person was exposed to the dust (often over a long period of years) and the onset of the actual pneumoconiosis disease—often 10 years or more. Therefore, cases of the disease that are emerging now could be a consequence of the conditions in the respective workplace of the sufferer over 10 years ago.

Reduced dynamic lung function and chronic obstructive pulmonary disease (COPD)

Exposure to high quantities of dust, reactive dusts and crystalline silica, can lead to a loss of dynamic lung function, which when the reduction reaches a certain level may be diagnosed as COPD. COPD affects the air flow in and out of the lungs and causes dyspnea, often with chronic coughing and sputum and is an important cause of work disability, reduced quality of life and death.

Silicosis

Silicosis is a dust-related lung disease and the main disease caused by respirable crystalline silica dust (RCS). It causes the development of small, hard lumps of scar tissue that show up on X-ray. The diagnosis is therefore based on signs on X-ray.

- Chronic silicosis normally takes some years to develop. This is the most common form of silicosis. The level of exposure can be low, while exposure time is normally more than 10 years.
- Acute silicosis may develop over a short period of exposure and can have fatal consequences within a few months and up to within five years of the first exposure. This form of silicosis can occur in cases of very high exposure and is not found among workers in a cement plant.

The main symptoms are coughing and breathing problems. Employees with silicosis have a greater risk of developing tuberculosis and lung cancer and can also develop kidney diseases, arthritis and related illnesses.

8. References

Useful resources, regulations and standards

European Committee for Standardization

<http://standards.cen.eu/>

EN 149

European Standard for respiratory protective devices: filtering half masks to protect against particles. Requirements, testing, marking.

EN 352

European Standard for hearing protectors: general requirements and specific parts.

- EN 352-1: Earmuffs
- EN 352-2: Earplugs
- EN 352-3: Helmet mounted earmuffs
- EN 352-4: Level-dependent earmuffs
- EN 352-8: Earmuffs with entertainment radio

EN 481

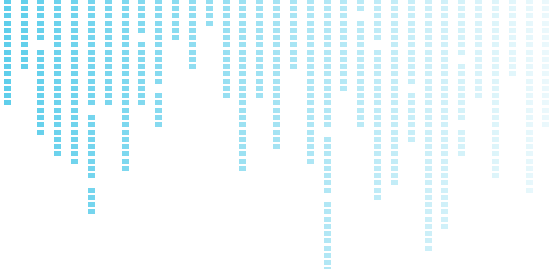
European Standard for workplace atmospheres: size fraction definitions for measurement of airborne particles.

EN 689

European Standard for workplace atmospheres: guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy.

EN 1232

European Standard for workplace atmospheres: pumps for personal sampling of chemical agents. Requirements and test methods.



International Labour Organization (ILO)

<http://www.ilo.org>

ILO Recommendation 112

Occupational Health Services Recommendation from the International Labour Organization.

ILO Convention 161

Occupational Health Services Convention from the International Labour Organization.

International Organization for Standardization (ISO)

<http://www.iso.org>

ISO 8253-1:2010

International Standard on Acoustics: Audiometric test methods. Part 1: Pure-tone air and bone conduction audiometry.

The European Network on Silica (NePSi)

<http://www.nepsi.eu>

NePSi is the acronym for the European Network on Silica formed by the European employee and employer sector associations that have signed the Social Dialogue "Agreement on Workers Health Protection through the Good Handling and Use of Crystalline Silica and Products Containing it" on 25 April 2006, representing 15 industry sectors, i.e. more than 2 million employees and representing turnover exceeding € 250 billion.

National Institute for Occupational Safety and Health in the United States (NIOSH)

<http://www.cdc.gov/niosh>

NIOSH N95/99

As part of the Centers for Disease Control and Prevention and (CDC), the National Institute for Occupational Safety and Health in the United States (NIOSH) is responsible for conducting research and making recommendations and providing world leadership for the prevention of work-related illnesses and injuries. N95/N99 refers to the classification and testing of respiratory masks.

About the World Business Council for Sustainable Development (WBCSD)

The World Business Council for Sustainable Development (WBCSD), a CEO-led organisation of some 200 forward-thinking global companies, is committed to galvanising the global business community to create a sustainable future for business, society and the environment. Together with its members, the council applies its respected thought leadership and effective advocacy to generate constructive solutions and take shared action. Leveraging its strong relationships with stakeholders as the leading advocate for business, the council helps drive debate and policy change in favour of sustainable development solutions.

The WBCSD provides a forum for its member companies – who represent all business sectors, all continents and a combined revenue of more than \$7 trillion – to share best practices on sustainable development issues and to develop innovative tools that change the status quo. The council also benefits from a network of 65+ national and regional business councils and partners organisations, a majority are based in developing countries. www.wbcsd.org



About the Cement Sustainability Initiative (CSI)

The CSI is a global effort by 24 leading cement producers, with operations in more than 100 countries. Collectively, these companies account for around 30% of the world's cement production and range in size from very large multinationals to smaller local producers. All CSI members have integrated sustainable development into their business strategies and operations, as they seek strong financial performance with an equally strong commitment to social and environmental responsibility. The CSI is an initiative of World Business Council for Sustainable Development (WBCSD).

www.wbcsdcement.org

Disclaimer

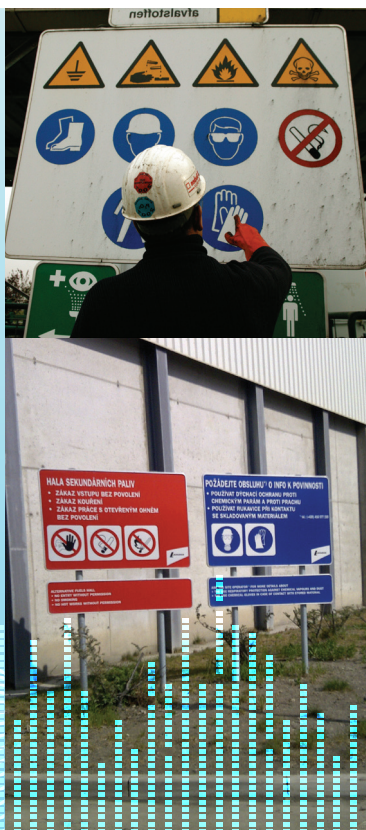
This report is released in the name of the WBCSD. It is the result of a collaborative effort by members of the secretariat and executives from member companies participating in the Cement Sustainability Initiative (CSI). Drafts were reviewed among CSI members, so ensuring that the document broadly represents the majority view of this group. This does not mean, however, that every member company agrees with every word.

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