

RiskTopics

OSHA Respirable Crystalline Silica Standard: Tips for Developing a Compliance Strategy

Zurich Resilience Solutions - Risk Engineering

This RiskTopic outlines the OSHA standard for respirable crystalline silica and provides suggestions for developing a compliance strategy.

Introduction

On March 25, 2016, US OSHA issued a Final Rule workplace exposure standard covering respirable crystalline silica. This standard changed the general industry, construction, and maritime standards. In general, the standards are the same for each industry. There are some differences in compliance techniques in the standards for the construction industry. The standards went into effect June 23, 2016, and all required industries must comply. This RiskTopic provides a summary of the OSHA standard and tips for developing a compliance strategy. A list of useful references is included at the end of the document for additional information.

Discussion

Crystalline silica is a common component in sand, stone, rock, concrete, brick, and mortar and is used as filler in paints and other products. OSHA estimates that 2.3 million workers are exposed to respirable crystalline silica in their workplaces with approximately 2 million in construction and 300,000 in general industries such as brick manufacturing, glass making, foundries, jewelry, pottery/ceramics, and oil exploration (hydraulic fracturing, also known as fracking).¹ The health effects of crystalline silica are most commonly lung disease, silicosis and lung cancer. Inhalation and ingestion exposures have been associated with chronic obstructive pulmonary disease (COPD) and kidney disease. A copy of the full standard and other materials can be accessed at: <https://www.osha.gov/dsg/topics/silicacrystalline/>. Here is a summary of the key points of the OSHA standard.

- **Industries Covered:** The standard includes changes to the general industry, construction, and maritime standards.
- **Permissible Exposure Limit (PEL):** The standards set a PEL of 50 micrograms per cubic meter (ug/m³) (roughly one-half of the previous general industry standard) and an action level (AL) of 25 ug/m³.
- **Initial Assessment and Routine Monitoring:** Work areas should be initially assessed for silica exposures following detailed sampling and analytical methods specified in [Appendix A](#) of the OSHA standard. If the assessment finds exposures below the AL, then no further monitoring is required. If exposures fall between the AL and PEL, follow-up monitoring should be conducted every six months. If exposures equal or fall above the PEL, monitoring should be conducted every three months. The results of the

monitoring should be communicated to employees within 15 days of receiving the test results and include control strategies to be employed. Follow-up assessment monitoring should also be conducted if a change in production, process, controls, or work practices may lead to exposures above the AL. In some instances, companies may be able to use what OSHA calls objective data to make the exposure assessment. Objective data is outside silica exposure data on operations, jobs or tasks similar to those at the company's facilities, such as might be provided by industry associations, universities or other similar groups. The data used must closely match the current work tasks to be acceptable.

- **Control Techniques:** The standard requires feasible engineering and work practice controls to be used first before using personal protective equipment (PPE) (e.g., respirators). Respirators can only be used if feasible engineering controls do not reduce exposures below the PEL. Respirators can also be used while engineering controls are implemented and during maintenance activities. Dry sweeping or clean-up of dust containing silica is only allowed if it will not increase the silica exposure or other methods (e.g., HEPA vacuums or wet methods) are not feasible. Companies in general industry or maritime must establish regulated areas to control employee/visitor traffic where silica exposures above the PEL may occur. Signs should be posted at the regulated areas to raise awareness and control access. Companies must develop a written exposure control plan that outlines areas where silica exposures may be present and the controls, work practices and PPE usage that will be used to control the silica exposures.

The version of the standard for the construction industry also includes a table ([Table 1 of the OSHA Standard](#)) of common activities (e.g., masonry sawing with wet controls) and employers are considered in compliance if the engineering, work practice and PPE controls specifically outlined in the table are used for activities at the construction site. The tasks and controls must closely match those listed in Table 1. Tasks from Table 1 that are conducted indoors should include local exhaust as a control. Also, if employees perform multiple tasks from Table 1, the controls specified should be used for the entire time the employee is performing the multiple tasks. For example, if respirators are specified for one of the multiple tasks, they should be used throughout all tasks.

- **Designate a competent person:** Construction companies must also designate a competent person. This competent person should visit construction sites and be able to identify foreseeable areas or tasks that may generate crystalline silica exposures and have the knowledge and authority to implement needed controls.
- **Medical surveillance:** Employees in general industry and maritime who may be exposed to respirable crystalline silica above the PEL (AL after June 23, 2020) more than 30 days per year are required to receive medical surveillance within 30 days of initial exposure and every three years thereafter. For the construction industry, medical surveillance applies to employees who must use respirators for exposure control for 30 or more days per year. The medical surveillance consists of a medical history, physical, chest x-ray and pulmonary function testing. The physician conducting the surveillance should provide a written medical opinion to the employee and employer within 30 days of the examination.
- **Employee Training:** Exposure to respirable crystalline silica should be included in the company's hazard communication activities. Employees will need to be trained on the health hazards of crystalline silica, the locations/tasks where silica exposures occur, the control measures that should be in place to reduce exposures (e.g., engineering/wet methods, work practices or PPE), required medical surveillance activities and details of the OSHA silica standard. Construction employees should also be trained in identifying the competent person at their company or on their site.
- **Recordkeeping:** The OSHA standard outlines the types of data that should be maintained. This includes the results of exposure monitoring or other objective data that is used to establish workplace exposures. Records of medical surveillance should be maintained. Also, training records should be maintained as part of the hazard communication training.

Guidance

The following tips are provided to help in planning for compliance with the OSHA Silica standard.

- **Review current operations to determine if silica exposures could exceed the action level or PEL.** Past exposure monitoring or objective data might be useful. If there is no past data, then arrange for exposure monitoring. Be sure to follow the sampling and analytical methods outlined in [Appendix A](#) of the OSHA standard. Identify operations or tasks where controls will be needed.

- **Compare job tasks and duties to those listed in Table 1 of the OSHA Construction Silica Standard.** Construction firms should identify common tasks in their work activities and ensure that the control measures outlined in Table 1 are in place. While these tasks are generally most appropriate for construction firms, some tasks may be similar in non-construction companies, such as during maintenance and repair activities. The Table 1 tasks may provide control ideas for non-construction businesses.
- **Determine possible control methods for operations or tasks where silica exposures may or will likely exceed the PEL.** Consider local exhaust ventilation, wet methods, work practice adjustments, substitution of alternate materials (that don't contain silica) or process isolation. The use of respirators and other PPE as a means of control may only be appropriate after feasible engineering controls have been implemented and exposures are not reduced below the PEL.
- **Identify the "competent persons" that can assess work activities on job sites, determine where silica exposures will exist and outline control strategies.** Assure that construction management and project leadership teams are aware of the role of the "competent person" and provide support to that individual. The requirements of this position include an individual who can identify existing and foreseeable respirable crystalline silica hazards in the workplace and who has authorization to take prompt corrective measures to eliminate or minimize them. The competent person must have the knowledge and ability necessary to fulfill these responsibilities. The naming of "competent persons" is only required in the OSHA Construction Silica Standard, but a similar role may be useful in other companies.
- **Review existing training materials for silica exposures to ensure they contain all of the topics required.** Plan the most appropriate times to hold employee training. Some type of knowledge check, like a post-training quiz, might be warranted to document knowledge transfer.
- **Arrange for a competent physician to perform the medical surveillance for employees who may be exposed to silica above the PEL (or AL) for 30 or more days per year.** For construction companies, surveillance applies to employees who must use respirators for 30 or more days per year. Ideally, a physician with occupational medicine experience would be the best. Provide the physician with information on the company operations, exposures, and specifics on each employee to be examined. Assure the physician will be able to provide medical opinions in a timely manner. Sample medical opinion forms can be found in Appendix B of the OSHA Silica Standard.

Conclusion

Silicosis is an incurable lung disease that can lead to disability and death, lung cancer, chronic obstructive pulmonary disease (COPD) and kidney disease. All companies that have workers who are exposed to silica dust are required to comply with the OSHA silica standards. For more information on Zurich's extensive Risk Engineering and Sustainability services, please contact your Risk Engineer or visit us at [Risk Engineering and Sustainability Services | Zurich Resilience Solutions](#).

References

¹ "UNITED STATES DEPARTMENT OF LABOR." OSHA's Final Rule to Protect Workers from Exposure to Respirable Crystalline Silica. US DOL/OSHA, 26 Mar. 2016. Web. 1 February 2018.

<https://www.osha.gov/dsg/topics/silicacrystalline/>

"Know the Silica Hazard." Work Safely with Silica. The Center for Construction Research and Training, 24 Mar. 2016. Web. 1 February 2018. <http://www.silica-safe.org/>.

"1910.1053 - Respirable Crystalline Silica." Occupational Safety and Health Administration, www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.1053. Accessed 10 Oct. 2023.

"1926.1153 - Respirable Crystalline Silica." Occupational Safety and Health Administration, www.osha.gov/laws-regs/regulations/standardnumber/1926/1926.1153. Accessed 10 Oct. 2023.

Other resources

[OSHA Crystalline silica](#)

[OSHA Standard 1926.1153 - Respirable crystalline silica including Table 1](#)

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