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OSHA's New Crystalline Silica Standards (General Industry and Construction)

In March 2016, the Occupational Safety & Health Administration (OSHA) issued two new standards - one for general industry/maritime and one for construction - regarding occupational exposure to respirable crystalline silica (silica). For decades, occupational health professionals have recognized that employee exposure to airborne dust containing silica can result in adverse health effects. The Department of Labor first highlighted the hazards in the U.S. in the 1930s and created occupational exposure limits in 1971 after OSHA was created. The exposure limits have not been changed since that time, even though experts are in general agreement that the limits did not provide adequate protection to workers.

Silica is a naturally occurring mineral in various earth deposits including granite and sandstone. It occurs in three different mineralogical forms – quartz, cristobalite and tridymite. Exposure to airborne silica is known to cause fibrotic lung disease (silicosis), lung cancer and other diseases. Sampling methods exist to collect “respirable” silica to determine employee exposures. These methods precisely separate out the small, respirable fraction of airborne silica dust and do not collect the larger “non-respirable” fraction of the total dust cloud. OSHA estimates that over 2.3 million workers are exposed to airborne dust containing respirable silica and that 90% of those workers are employed in construction industries.

New Standards

There are two significant changes in OSHA's new silica standards as compared to the old standards. First, the old standards only established Permissible Exposure Limits (PELs) that limited employee exposures and did not contain any other requirements associated with housekeeping, ventilation, personal protective equipment, medical surveillance or training of employees. Second, the new standards reduce the PEL significantly based on current knowledge of the relationship between exposure (dose) and adverse health effects.

The new silica standards are “substance-specific standards” for respirable crystalline silica. Like other substance-specific standards (asbestos, lead and others) the standards have detailed requirements for employers. These include:

- Measuring employee exposures;
- Creating written exposure control plans (if necessary);
- Implementing procedures for housekeeping, personal protective equipment use, engineering controls and medical surveillance programs (if necessary); and
- Training employees

The new standards establish an Action Level (AL) and a Permissible Exposure Limit (PEL) to limit employee exposures to respirable silica. The new AL is 25 micrograms of silica (all 3 forms) per cubic meter of air ($\mu\text{g}/\text{m}^3$). The new PEL is 50 $\mu\text{g}/\text{m}^3$. Both the AL and the PEL are 8-hour time-weighted averages (TWA). Employers in general industry/maritime are required to conduct initial air monitoring

to determine employee exposures for comparison to the AL and PEL. Employers in construction have options depending on the activity as discussed below.

New Construction Standard (29 CFR 1926.1153)

OSHA considered input and testimony from industry associations and affected individuals and established a table (Table 1) in the new Construction Standard – this table lists 18 common construction activities that are likely to create airborne dust that contains silica and provides “allowable” engineering controls, work practice controls and respiratory protection options that employers can use in lieu of conducting employee exposure monitoring. The table also indicates control measures that must be used depending on the duration of exposure. When employees conduct tasks described in Table 1 and use the controls specified, the employer is not required to perform initial monitoring. If the task is not adequately described in Table 1 or the controls cannot be used, then initial exposure monitoring is required and the rest of the standard must be adhered to.

A medical surveillance program must be made available to employees who are required to wear a respirator for 30 or more days per year.

New General Industry/Maritime Standard (29 CFR 1910.1053)

General Industry employers can “take advantage” of Table 1 in the construction standard if tasks that are performed are “indistinguishable” from the tasks described in the Table. If doing this, you must comply with the rest of the construction standard.

A medical surveillance program must be made available to employees who will be exposed to concentrations in excess of the AL for 30 or more days per year.

Regulated areas must be established in General Industry workplaces whenever employee exposures exceed, or could reasonably be expected to exceed the PEL. These areas must be clearly demarcated and the entrance posted with signs. Only employees authorized by the employer may enter and work in these areas.

Additional Requirements

Both standards require development of a written exposure control plan containing the following:

- A description of the tasks in the workplace that involve exposure to respirable crystalline silica;
- A description of the engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task;
- A description of the housekeeping measures used to limit employee exposure to respirable crystalline silica;
- A description of the procedures used to restrict access to work areas, when necessary, to minimize the number of employees exposed to respirable crystalline silica and their level of exposure, including exposures generated by other employers or sole proprietors; and
- The plan must be reviewed annually to assure continued effectiveness.

Construction employers must designate a competent person to make frequent and regular inspections of job sites, materials, and equipment to implement the exposure control plan.

Both standards have specific housekeeping requirements including:

- Dry sweeping or dry brushing is prohibited where such activity could contribute to employee exposure to respirable crystalline silica unless wet sweeping, HEPA-filtered vacuuming or other methods that minimize the likelihood of exposure are not feasible.
- Prohibiting compressed air used to clean clothing or surfaces where such activity could contribute to employee exposure to respirable crystalline silica unless:
 - The compressed air is used in conjunction with a ventilation system that effectively captures the dust cloud created by the compressed air; or
 - No alternative method is feasible.

Both standards indicate that employers must have a written respiratory protection program and procedures for respirator use in compliance with 29 CFR 1910.134 when respirator use is required.

Both standards require employers to provide information and training to affected employees including:

- Health hazards of exposure to respirable crystalline silica;
- Specific tasks that could result in exposure;
- Specific measures the employer utilizes to control exposures including engineering controls, work practice controls, and respirators to be used;
- An explanation of the OSHA standard; and
- The purpose and description of the employer's medical surveillance program (if required).

If a Medical Surveillance program is required (see above) both standards have identical requirements including an initial (baseline) medical examination within 30 days after initial assignment that includes:

- A medical and work history;
- A physical examination and chest x-ray;
- A pulmonary function test;
- Testing for latent tuberculosis infection; and
- Any other tests recommended by the physician.

Periodic examinations must be provided every 3 years, or more often if recommended by the physician.

The employer must ensure that the physician has a copy of the OSHA standard and provide specific information including:

- A description of the employee's former, current, and anticipated duties as they relate to the employee's occupational exposure to respirable crystalline silica;
- A description of any personal protective equipment used or to be used by the employee, including when and for how long the employee has used or will use that equipment; and
- Information from records of employment-related medical examinations previously provided to the employee and currently within the control of the employer.

Hellman & Associates' (H&A) experienced staff of EHS Professionals, including Certified Industrial Hygienists (CIH) are prepared to assist our clients to assure compliance with these new standards. If your processes and tasks involve potential exposure to respirable crystalline silica we can provide the following assistance:

- Air monitoring and employee exposure assessment;
- Development of written exposure control plans and respiratory protection programs;
- Providing required information and training to affected employees regarding silica hazards, exposure control methods and procedures and respirator use;

- Respirator medical clearance (does not include required medical surveillance provisions such as exams, x-rays and pulmonary function tests);
- Recommendations on engineering controls, work practice controls and personal protective equipment.

The new silica standards have been published and OSHA will begin enforcement according to the schedule shown below. Contact H&A now to get ahead of these new requirements and ensure the safety of your workforce.

Enforcement Dates

Construction:	September 23, 2017
General Industry & Maritime:	June 23, 2018
Hydraulic Fracturing:	June 23, 2018 for all requirements except engineering controls which have a compliance date of June 23, 2021