Regulatory Compliance

OSHA Standard for Protection from Silica Exposure

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OSHA Standards of Reference

29 CFR 1910.1053 Standard for General Industry and Maritime

29 CFR 1926.1153 Standard for Construction

Frequently Asked Questions:

The Occupational Safety and Health Administration (OSHA) has promulgated the Final Rule for occupational exposures to respirable crystalline silica. There are two separate Standards, the first covers General Industry and Maritime, and the second covers Construction. While there are similarities between the two, there are some significant differences with some of the requirements. This article addresses questions that you may be asked. Please refer to the Honeywell Technical Data Sheet for an overview of the General Industry and Construction Standards. Copies of the complete Standards and Amendments can be found of the ***Honeywell*** web site. Agricultural operations are covered by 29 CFR Part 1928.

Q1: What is Silica?

Silica is a compound of the two most abundant elements in Earth's crust, silicon and oxygen. Its chemical name is silicon dioxide, with the symbol SiO_2. There are three main crystalline varieties of silica. The most common is quartz, which comprises 13% of the Earth's crust. The other two are cristobalite and tridymite. Small, airborne particles of silica, referred to as respirable crystalline silica, can penetrate deep into the lungs and can be harmful if exposed for long durations.

Q2: Why did OSHA create a new Standard for exposure to Silica?

OSHA has determined that the previous permissible exposure limits (PEL) of 10 milligrams per cubic meter (10 mg/m3) for respirable crystalline silica did not adequately protect workers, exposing them to an increased risk of developing silicosis and other non-malignant respiratory diseases, lung cancer, and kidney disease.

Q3: What are the most significant changes from the previous regulation for protection from silica?

Respirable crystalline silica, which includes quartz, cristobalite and tridymite, is included in OSHA's Table Z for particulate exposure. This Table provides guidance in determining the PELs for several hazardous particulates. All other requirements for protection from silica in all forms was covered by the various overarching OSHA standards, including those for Hazard Communication, Medical Evaluations and Record Keeping. The two new silica standards consolidates these elements, plus includes specific worker safety requirements not included in the more general standards covering these topics. The most significant changes include:

a) The Permissible Exposure Limit (PEL) has been reduced from 10 mg/m3 to 50 micrograms per cubic meter (50 µg/m3) for silica as quartz. The PEL for the other two forms of silica were already close to 50 µg/m3.

b) An Action Level of 25 micrograms per cubic meter (25 µg/m3) has been added.

c) A written exposure control plan and specific housekeeping steps to minimize exposure by employees are required.

d) There are specific medical conditions that must be reviewed during the OSHA Medical Evaluation, plus a medical examination is required initially as a baseline and every three (3) years as long as the exposure continues.

e) Hazard communication and training also have specific requirements that stress the importance of minimizing exposure to respirable crystalline silica.

Q4: What criteria did OSHA use when establishing the PEL at 50 µg/m3?

The new PEL for silica is based on evidence OSHA evaluated during the rulemaking process. It is OSHA's determination that a PEL of 50 µg/m3 is appropriate because it is the lowest level technologically feasible for most operations in the affected industries. OSHA does recognize that a PEL of 50 µg/m3 of will be a challenge for several affected sectors, and thus the use of respirators for a limited number of job categories and tasks will be required.

Q5: Why did OSHA create two different Standards, one for General & Maritime Industries, and one for the Construction Industry?

OSHA issued two Standards in order to tailor the requirements to specific circumstances found in the different industries. The Silica Standard for General Industry and Maritime is similar to other contaminant specific standards, focusing on the exposure rather than the task. When reviewing silica exposure in the Construction industry, OSHA identified application groups based on construction activities, tasks, or equipment that are commonly recognized to create silica exposures.

Q6: What are the main differences between the two Standards?

Some key differences are noted below.

a) The dates that companies must be in compliance are different. Most notably companies in the construction industry must be in full compliance by June 23, 2017 while companies involved in general industry and shipyards have until June 23, 2018 to be in full compliance.

b) Engineering out contaminant exposure is the preferred method for all industries. The Construction Standard includes a table of activities and recommended engineering practices. This table also includes information on when and what type of respiratory protection must be used for the different activities, with and without implementing engineering practices.

c) The Construction Standard requires medical surveillance of all employees exposed to silica 30 or more days per year, regardless of whether the exposure is at or above the Action Level. The General Industry Standard requires the medical surveillance if the exposure is at or above the Action Level (25 µg/m3) for 30 or more days per year.

d) Both the General Industry Standard and the Construction Standards require a written exposure control plan, however the Construction Standard also requires that the Program Manager responsible for the exposure control plan be identified and communicated to employees.

Q7: What industries include activities where workers are exposed to silica?

Some common industries include:

Asphalt Paving Products

Asphalt Roofing Materials

Concrete Products

Cut Stone

Dental Equipment and Supplies

Dental Laboratories

Flat Glass

Hydraulic Fracturing

Industries with Captive Foundries

Iron Foundries

Jewelry

Mineral Processing

Mineral Wool

Nonferrous Sand Casting Foundries

Non-Sand Casting Foundries

Other Ferrous Sand Casting Foundries

Other Glass Products

Paint and Coatings

Porcelain Enameling

Pottery

Railroads

Ready-Mix Concrete

Refractories

Refractory Repair

Shipyards

Structural Clay

Q8: What are the activities in the construction industry where workers are exposed to silica?

Some common activities include:

Crushing machines

Dowel drilling rigs for concrete

Drivable saws

Handheld and stand-mounted drills (including impact and rotary hammer drills)

Handheld grinders for mortar removal (i.e., tuck pointing)

Handheld grinders for uses other than mortar removal

Handheld power saws (any blade diameter)

Handheld power saws for cutting fiber-cement board (with blade diameter of 8" or less)

Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials

Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: demolishing, abrading, or fracturing silica-containing materials

Jackhammers and handheld powered chipping tools

Large drivable milling machines (half-lane and larger)

Rig-mounted core saws or drills

Small drivable milling machines (less than half-lane)

Stationary masonry saws

Vehicle-mounted drilling rigs for rock and concrete

Walk-behind milling machines and floor grinders

Walk-behind saws

Q9: What type of respiratory protection should be used for exposure to respirable crystalline silica?

Respirable crystalline silica is a particulate, so depending on the concentration workers should be provided with either a filtering facepiece or a reusable facepiece with filters. Filters may be any of the nine designations established by the National Institute for Occupational Safety and Health (NIOSH). The classifications are ‘N’ (non oil-based aerosols present), ‘R" (oil-based aerosols may be present but filters are limited to one 8 hour shift) and "P" (oil-based aerosols may be present), and either 95%, 99% or 99.97% efficient.

