

OSHA standards for dry crystalline silica dust

What is crystalline silica?

Crystalline silica is a basic ingredient of the Earth's crust, found in many naturally occurring and man-made materials, including rock, soil, sand, concrete and brick. Quartz is the most common form of crystalline silica. Cristobalite and tridymite are two others.

What are the risks?

When workers crush, cut, chip, drill or grind objects containing crystalline silica, the mineral may be broken down into small particles, becoming a dry particulate inhalation hazard. Crystalline silica dust exposure is associated with foundry work, sandblasting, hydraulic fracturing and many other jobs. The Occupational Safety and Health Administration (OSHA) estimates that 2 million workers are exposed to silica dust in the United States.¹

Crystalline silica dust has been recognized as a serious health hazard to industrial workers for decades. Workers who are exposed to crystalline silica dust are at increased risk of developing serious health problems, including silicosis—an incurable lung illness—as well as lung cancer, chronic obstructive pulmonary disease (COPD) and other respiratory diseases—even kidney disease.

What are the standards?

OSHA established exposure limits for crystalline silica more than 40 years ago. In June 2016, two new OSHA standards for crystalline silica came into effect: one for maritime and general industry and the other for the construction industry.

The new standards establish a permissible exposure limit of 50 micrograms of respirable crystalline silica per cubic meter of air (50 $\mu\text{g}/\text{m}^3$) as an eight-hour time-weighted average in all industries covered by the rule.²

The 2016 standards include additional provisions to help protect employees, including requirements for exposure assessment, exposure control methods, respiratory protection, medical surveillance, hazard communication and recordkeeping.

While respiratory protection is the only personal protective equipment (PPE) prescribed by the new standards, other forms of PPE, including protective clothing, are critical to maximizing worker protection.

Controlling the spread of crystalline silica dust

With all workplace hazards, OSHA expects employers to apply the hierarchy of exposure controls to protect workers. Employers should eliminate hazards or substitute lower-hazard alternatives first. Next, engineering solutions should be implemented, followed by administrative controls. If these controls have been applied and residual risk remains, then the use of personal protective equipment (PPE) is warranted.

In addition to on-the-job exposure, workers can unknowingly carry crystalline silica dust home on their clothes, shoes, skin, tools and vehicle interiors. Other people, especially family members, can be exposed to silica that has become embedded in auto upholstery, home furniture and clothing via shared laundry loads. Similarly, crystalline silica dust can be circulated through household air and transmitted through person-to-person contact.

OSHA has standards aimed at preventing the incidence of these so-called “take-home toxin” events. The 2016 crystalline silica standards include requirements for establishing regulated/restricted areas, engineering controls, work practices and housekeeping to contain and control crystalline silica exposure.

What protective apparel is available?

Employers can help prevent the spread of crystalline silica dust by choosing effective protective garments for workers and requiring them to don and doff apparel on-site. Employers in many industries trust protective garments made with DuPont™ Tyvek®, which are:



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lightweight



Durable



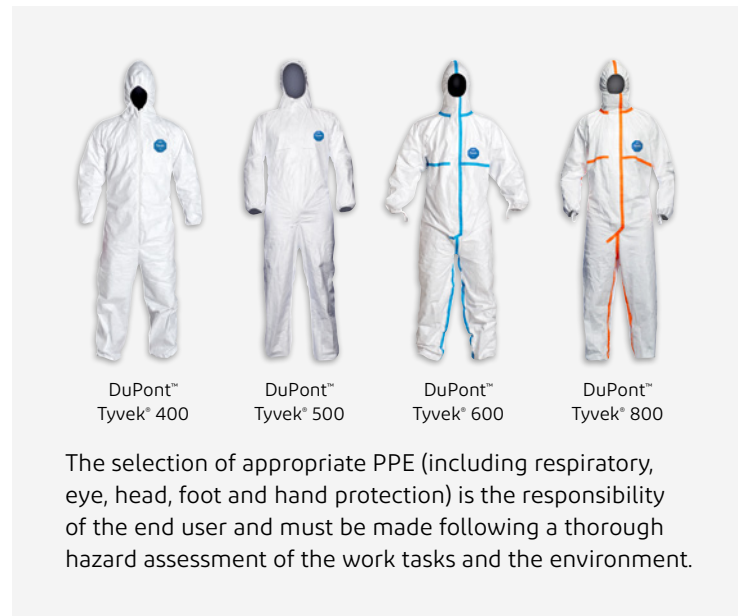
Low linting



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biologically inert

With Tyvek® protective garments, protection is built into the fabric itself. The barrier extends throughout the garment and helps provide excellent protection against particles in the 1-2 µm range. (Spunbonded polypropylene fabric, by contrast, has an open structure and offers a poor barrier against particles in the 1-2 µm range.)

Tyvek® garment options include coveralls with or without respirator-fit hoods, lab coats and aprons, as well as a variety of accessories, including hoods, sleeves and skid-resistant shoe and boot covers. Tyvek® coveralls feature a comfort-fit design that improves worker mobility and makes the garments easier to put on and take off.



The selection of appropriate PPE (including respiratory, eye, head, foot and hand protection) is the responsibility of the end user and must be made following a thorough hazard assessment of the work tasks and the environment.

References:

¹[OSHA Fact Sheet](#): OSHA's Respirable Crystalline Silica Standard for Construction, 2017

²[OSHA Standard for Crystalline Silica](#): General Industry and Maritime

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