POWDER ACTUATED TOOL
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Silica Exposure using a Powder Actuated Tool

Crystalline silica is a common mineral that is found in construction materials such as sand, stone, concrete, brick, and mortar. When workers cut, grind, drill, or crush materials that contain crystalline silica, very small dust particles are created. These tiny particles known as “respirable” particles can travel deep into workers lungs and cause silicosis, an incurable and sometimes deadly lung disease.

On March 24, 2016, OSHA issued a final silica standard for the construction industry. The new standard went into effect on June 23, 2016, and employers are required to comply with the federal standard on September 23, 2017.

In routine forced entry fastening tasks where concrete or masonry is the base material, often a small amount of surface spalling occurs. Questions were asked on the amount of crystalline silica exposure a worker may see during forced entry fastening tasks. To provide data to the industry, we have located a test where crystalline silica exposure was measured.

The test was conducted by TNO a European independent research organization in the Netherlands that focuses on applied science.

For this project, TNO studied emissions of respirable quartz dust when working in concrete with a powder actuated tool. During the test, plywood boards were fastened to concrete using 37mm (1-1/2”) fasteners fired by a powder actuated tool

By firing 1600 fasteners per day (8 hours) with a spacing of 80mm (3 inches) it was determined that the average operator exposure was 15 µg/m³ (micrograms of silica per cubic meter of air). This is well below the OSHA action level of 25µg/m³ averaged over an 8-hour work day and the 50µg/m³ permissible exposure limit.

These readings were consistent with various models and forms of forced entry fastening tools.

The actual report can be found at: http://www.dustfreeworking.tno.nl
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