



Worn Drill Bits Decrease Worker Productivity – and Increase Silica Dust and Noise Hazards

The Effects of Bit Wear on Respirable Silica Dust, Noise and Productivity: A Hammer Drill Bench Study

Paul Carty, Michael R Cooper, Alan Barr, Richard L Neitzel, John Balmes, David Rempel. Annals of Work Exposures and Health, 2017.

Overview

Rotary hammers and hammer drills are used extensively in commercial construction for drilling into concrete for tasks including rebar installation for structural upgrades and anchor bolt installation. A CPWR-supported research team has developed a test bench for standardized measurement of dust, noise, force and vibration during concrete drilling. In this experiment, the team tested three drill bits in different states of wear, measuring silica dust, noise, and productivity while drilling into concrete.

Key Findings

- The dull bit generated respirable silica dust levels 80%-114% higher than the sharp bit.
- The sharp bit generated a mean noise level of 112.8 dBA, while the dull bit generated 114.4 dBA.
- The sharp bit penetrated the concrete at 7.76 mm/s-1, while the dull bit did so at 10.16 mm/s-1.
- Carbide tipped bits should be replaced when they show signs of wear in order to improve worker productivity and reduce worker exposure to dust and noise.

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See abstract:

<http://bit.ly/2fZi3YH>

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