Rock and Concrete Drilling: Worker Productivity and Bit Wear Patterns

Carbide-tipped bit wear patterns and productivity with concrete drilling

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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, vibration and productivity during rock drilling. In this experiment, the team tested two different carbide bit designs, identifying wear patterns and capturing the effect of wear on productivity.

Key Findings

- Increased bit tip angle, carbide shoulder rounding, and decreased carbide tip width were highly correlated with reduced drilling productivity (e.g., rate of penetration).
- The 10 other wear patterns were not so highly correlated with reduced productivity.
- Manufacturers could use these findings to score or embed wear indicators in drill bits, to inform users when bit replacement was needed.
- To support productive work, contractors should replace concrete bits when they show these wear patterns.

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See abstract:
http://bit.ly/2wgRgxW

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