

Test Bench System Measures Handle Vibration in Hammer Drills

A new test bench system for hammer drills: Validation for handle vibration

David Rempel, Alan Barr, and Andrea Antonucci. International Journal of Industrial Ergonomics, August 2016.

Overview

Workers can be exposed to high levels of hand vibration when drilling into concrete or rock using hammer drills, exposures that can cause Hand-Arm Vibration Syndrome. The standard ISO method for measuring vibration generated by different tool designs relies on human testing, but because no two operators are the same test results can vary widely. The researchers designed a robotic test bench system using a mannequin on a slide, and validated the results by comparing them to human test results.

Key Findings

- The similar handle vibration measures between the test bench system and human testing indicates that the dynamics of the test bench resembled human dynamics.
- Although the ISO method of human testing calls for drilling downward, and the robotic system performs horizontal drilling, the results were comparable.
- There can be large differences between subjects with human testing, while the robotic system minimized variance.
- The test bench allows for rapidly comparing many drilling factors, such as bit design, drilling force, bit sharpness, drill type, and vibration dampening.

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See abstract:

<http://bit.ly/2eXNL5T>

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