LEADING SAFETY PRACTICE 0090/30062023

CONCRETE VACUUM DRILL

MAJOR TRANSPORT INFRASTRUCTURE AUTHORITY

This innovative control effectively reduces crystalline silica dust exposure for both the drill operator and nearby workers.

A purpose-designed, cordless, concrete vacuum drill has been developed to eliminate the inhalation of crystalline silica dust.

The vacuum drill captures dust at the source, ensuring safety and cleanliness in work areas. Its cordless design completely eliminates electrical and trip hazards, making it an even safer choice for workers.

Concrete hammer drill and wearable vacuum back-pack in use (left), workers using concrete vacuum drill (right).

The Situation

Before the introduction of this new industry changing equipment, workers primarily relied on personal protective equipment and dust suppression techniques using water to mitigate the risk of respirable silica exposure.

However, this created additional hazards, including the exposure of electrical equipment to water. Furthermore, these measures do not completely eliminate the risk of respirable crystalline silica, as the dust can still become airborne when it dries and is disturbed, potentially exposing workers.

The Union Road and Mont Albert Road level crossing removal project required a substantial amount of concrete drilling work.

This posed a challenge for the contractor to find an engineering control solution that not only met the task requirements but also allowed the user to work efficiently in a crowded work environment while eliminating the risk of exposure to respirable crystalline silica dust generated during the drilling activity.

The Solution

The solution to address these challenges involved the utilisation of purpose-designed drilling equipment equipped with a hollow drill bit.

This innovative equipment effectively captures and removes the dust at the cutting edge of the drill bit.

The dust is then extracted by a wearable M class vacuum pack, significantly reducing the reliance on Personal Protective Equipment controls.

This solution provides a more efficient and effective method of dust control, minimising the risk of respirable crystalline silica exposure for the workers involved and the concrete drilling activities.

Benefits and learnings

Health: the capture of respirable crystalline silica emitted during drilling activities prevents short-term exposure and significantly reduces the potential for long-term health disorders such as silicosis.

Safety: the vacuum keeps the work area clean and free of debris. The dust is kept out of the atmosphere and away from the workers. The unit does not require electrical cords, eliminating trip and electrical hazards.

Ease of use: the portable nature of this equipment allows for easy relocation between work areas, resulting in time and cost savings.

Precision: an added benefit of vacuum drilling is its precision and accuracy.

Cost: M class vacuum, hollow drill bit and hammer system RRP, approximately $2623 per unit.

Scan the QR code for a video of the concrete vacuum drill in action.

Program Office: Level Crossing Removal Project
Work Package: Union Road and Mont Albert Road
Principal Contractor: Subterranean Solutions
Solution Vendor: Hilti (Aust) Pty Ltd

Contact: Will Grainger (SEPA Health and Safety Leader)
William.Grainger@sepalliance.com.au
0400 510 150

MTIA9714

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