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DIAMOND SHAVING OF CONTAMINATED CONCRETE SURFACES

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"The Marcrist Industries Limited Concrete Shaver is an electrically driven, self-propelled concrete and coating removal system that can be used for radiological decontamination of large areas or hot spots on floors and walls. This technology consists of a 25-cm (10-in.) wide diamond impregnated shaving drum and contains a vacuum port for dust extraction.

The concrete shaver is ideal for use on open, flat areas. The shaver may also be used on slightly curved surfaces. This shaver produces a smooth, even surface with little vibration and abrades embedded steel as well as concrete.

The shaver is more than five times faster than the five-piston pneumatic scabbler at removing contamination from concrete. Because of this increased productivity, the shaver is 50% less costly to operate than baseline technologies.

The U.S. Department of Energy has successfully demonstrated the concrete shaver for decontaminating floors for free-release surveys prior to demolition work."

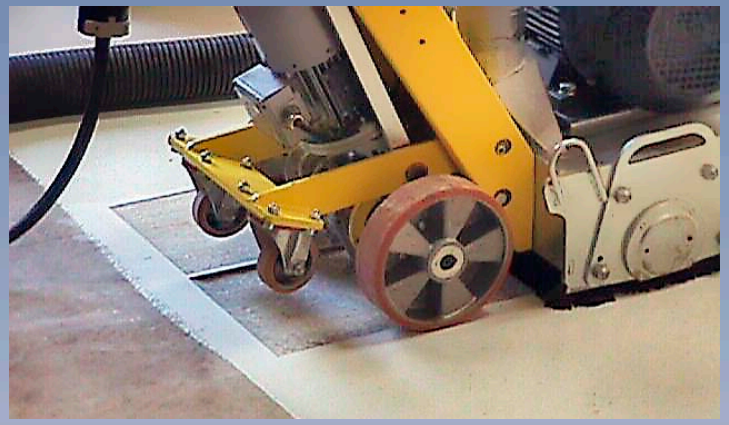
TAKEN FROM A DOE TECHNOLOGY SUMMARY ON
THE CONCRETE SHAVER DEMONSTRATED AT THE HANFORD SITE,
RICHLAND, WA

Diamond Floor Shaver System

- The Marcrist diamond floor shaver effectively removes radiological contamination from concrete floors, including steel embeds, at incremental depths from 1mm to 10mm with an accuracy to within 0.1mm shaving depth.
- It is a self-propelled, walk-behind machine, easily moved by a single worker with minimal vibration, offering forward and reverse motion at variable speeds.
- It features a vacuum port, allowing complete capture of potential airborne contaminants.

Diamond Floor Shaver System

- It produces up to 50% less volume of waste than other methods, generating a very dense waste product, which is easily captured and prepared for disposition.
- It saves time and disposal costs by eliminating the need for reworking and multiple passes.
- It offers a blade life of up to 20,000 square feet when use averages 1/8” (3.0mm) removal depth.



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The Marcrist Shaver uses a patented system of 100 dry cutting diamond blades with offset diamond segments that interlock to provide complete shaving of the concrete surface.

Grooves are eliminated, which allows for immediate direct frisk reading to analyze results.

"The resulting smooth surface helps to ensure that surface beta scans and direct measurements supporting final site survey are performed efficiently, effectively and reliably."

— Michael Snyder
Principal Radiological Engineer, Rancho Seco Nuclear Plant

Radiological Contamination 100% Contained

When attached to an appropriate size vacuum, the dust produced is completely contained.

Dust is collected in drums through a HEPA vacuum system ready for disposition and disposal. 55 gallon waste drums are typically used in nuclear environments.

Production is dependent on depth of shaving, but averages 100 square feet per hour.

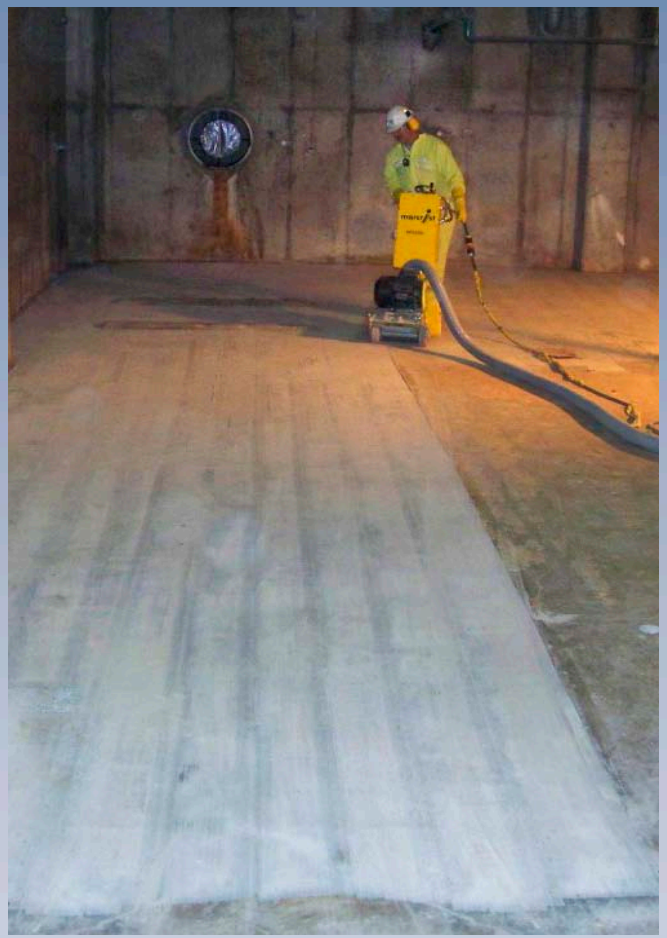
Diamond Floor Shaver Technical Data

POWER SPECIFICATIONS

Output: 8.5 Kw
Power supply: 480 v, 3 phase
Power consumption: 16 Amp
Frequency: 60 Hz
Advance drive motor: 7.5 Kw/ 2850 Rpm
Drive speed: 0-25 ft/min (infinitely variable)

DIMENSIONS

Diamond Drum Shaving width: 10 inches
Maximum cutting depth: 0.5 inches
Blade diameter: 6.0 inches
Width: 19.0 inches
Length: 46.0 inches
Height: 40.0 inches
Total gross weight: 330 lbs.



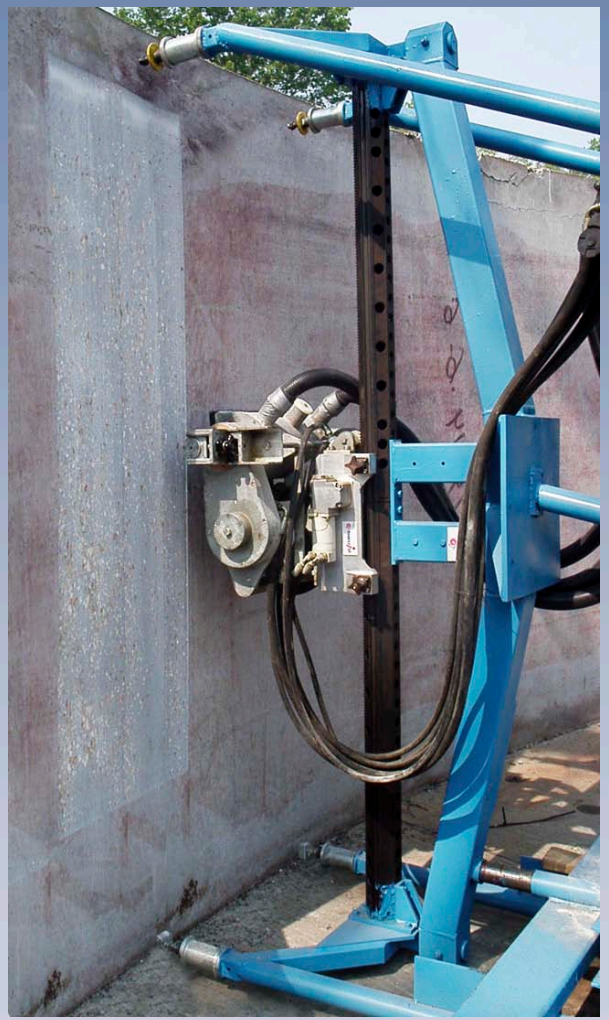
Diamond Wall Shaver System

The diamond wall shaver uses the same patented diamond drum and blades as the floor shaver.

It is hydraulically driven and can be deployed using a robotic arm or other Bluegrass engineered solutions, which allow complete remote operation.

It offers incremental removal depth of 1mm - 5mm per individual pass, and a blade life of up to 15,000 square feet at 1/8” (3.0mm) removal depth.

It is designed to be mounted on a remotely operated tool carrier or hung from a rail-guided tripod. Attachment to the wall may be achieved by pressure from a robotic arm or a simple air or hydraulic cylinder applied against an opposing wall.



Diamond Wall Shaver Technical Data

POWER SPECIFICATIONS

Hydraulically Driven
Power Unit: 40 HP Electric Motor
Weight: 1500 lbs.
Power supply: 480 v, 3 phase
Power consumption: 50 Amp
Deployment Method: Special Frames, Brokk

DIMENSIONS

Diamond Drum Shaving width: 11.5 inches
Maximum cutting depth: 0.5 inches
Blade diameter: 6.0 inches
Width: 2.5 Feet
Length: 5 Feet
Height: 3 Feet
Wall Shaver Head Weight: 300 lbs.

Tripod mounting frame for rail-guided wall shaver system, engineered, fabricated, and deployed by Bluegrass.

Brokk Mounted Diamond Wall Shaver

Wall Shaver mounted on robotic hammer at Rocky Flats Nuclear Weapons Plant. Power unit for wall shaver can be seen in blue in back of room.

Decontamination and Decommissioning

Before

After

Diamond shavers projects have included:

- Plum Brook Reactor Facility
- Rocky Flats Nuclear Weapons Plant
- Westinghouse Waltz Mill Facility
- San Onofre Nuclear Generating Station

Rocky Flats Nuclear Weapons Plant

- Diamond shavers were used to support decontamination activities for the closing of the Rocky Flats Nuclear Weapons Plant.
- Hundreds of thousands of square feet of floors and walls were shaved to depths to one half inch in buildings B371 and B376 at Rocky Flats Nuclear Weapons Plant.
- Decontamination efforts were so successful the balance of the buildings could be demolished using conventional methods.
- The shavers helped keep the project on schedule while the vacuum system eliminated the potential for contaminants becoming airborne.

Floor Shaver removes contaminated concrete, allowing for ease of surveying / monitoring during decommissioning of Building 376 at Rocky Flats Nuclear Weapons Plant.

Plum Brook Reactor

- During the Plum Brook Reactor Facility Decommissioning Project in Sandusky, Ohio, floor and wall shavers were used extensively to remove contaminants in hot cells and the reactor building.

- In support of the project, Bluegrass engineers CAD designed, CNC machined, fabricated, constructed, and deployed custom-built, rail-guided, tripod mounting frames to accommodate both straight and curved hot cell and reactor walls.

Diamond wall shavers with Bluegrass-engineered mountings removing contaminants from flat and concave walls at Plum Brook Reactor Facility.

Plum Brook Reactor

Diamond wall shavers with Bluegrass-engineered mountings removing contaminants from covex walls at Plum Brook Reactor Facilitly.

Plum Brook Reactor

Diamond floor shavers being used to remove contaminants in Plum Brook Reactor decommissioning.

Plum Brook Reactor

Diamond floor shaver being used to remove contaminants in Plum Brook Reactor decommissioning.

Plum Brook Reactor

Finished walls and floors after contaminant removal. Waste is stored in 55-gallon drums at bottom of picture.

Diamond Floor and Wall Shaver System

An optimal system for decontamination and decommissioning of active environments.

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