

Coming clean on power washing

How to use high-pressure water to remove dirt, oil, and stains from concrete

BY MARTIN S. MCGOVERN

Many concrete surfaces accumulate dirt so slowly that it's difficult to notice the change in appearance. But when a concrete surface is cleaned, it's often shocking how much better it looks.

Property owners that schedule periodic cleaning can avoid the gradual accumulation of dirt on concrete, and the most effective way to clean concrete without damaging its surface is power washing. Most power-washing equipment is simple to use and cleaning procedures are pretty straightforward. By using the right equipment, water temperature, and cleaning chemicals, contractors can clean virtually all dirt and stains from concrete.

Equipment options

To clean concrete effectively, use a power washer with a pressure rating of at least 3000 psi and a flow rate of at least 4 gallons per minute (gpm). Although higher pressures may be required to remove tough contaminants such as paint and heavy tire-skid marks, most power-washing contractors agree that 3000 psi will do the trick for almost all cleaning jobs.

Once an adequate water pressure is established, flow rate determines the cleaning speed, especially how fast contaminants are flushed from the surface. "You can blast at 10,000 psi, but if you have a flow of only 2 gallons per minute, you're going to have a pile of mud sitting there," says Barry Woods of Hydro Pressure Systems, North Hollywood, Calif. Heavily soiled concrete, therefore, requires higher flow rates. Several contractors recommend a power washer with a volume output of 5 or 6 gpm. When cleaning vertical surfaces, higher flow rates are not as critical be-



Dirt Killer Pressure Washers

Figure 1. By spraying an undeflected water jet, rotary nozzles clean faster than standard fan nozzles.

cause gravity helps contaminants flow from the surface.

Cleaning speed also can be increased by using a rotary nozzle (Fig. 1) instead of a standard “fan” nozzle. To produce a fan pattern, standard nozzles deflect the water on an angle, which slows the water down. Rotary nozzles spin an undeflected water jet in a circular path, so the water leaves the nozzle with greater speed.

To improve cleaning speed on large flatwork areas, many manufacturers offer wheel-mounted power washers that resemble a lawn mower (Fig. 2). Within the metal housing are nozzles mounted on spinning bars. According to Larry Hinckley, general manager of Delco Cleaning Systems, Fort Worth, Texas, workers using standard power-washing wands can clean roughly 900 square feet the first hour but the workers tire and become less productive as the day progresses. Using a walk-behind washer, he says, workers can clean 3,000 square feet per hour and maintain that productivity throughout the day.

Hot or cold water?

Cold-water power washers are cheaper, lighter, and simpler to use than hot-water units, which require a heavy heating coil and burner system to heat the water. Whereas a cold-water unit may cost \$2,000 and weigh 200 pounds, a comparable hot-water unit often will cost more than \$3,000 and weigh more than 400 pounds.

However, hot water cleans faster than cold water, and this rule holds true for power washing. Although cold-water units are suitable for removing dirt and often suffice for smaller, residential applications, most commercial power-washing contractors believe that using hot water is worth the added expense. “The reduced labor costs will more than offset the cost of hot water,” says Hinckley. “You don’t want to be penny-wise and dollar dumb.”

The benefits of hot water are especially clear when cleaning oil and



Figure 2. Wheel-mounted power-washing units increase cleaning speed on large horizontal surfaces.

Delco Cleaning Systems

grease. “The hot water helps lift the oil off the concrete, especially in cold weather,” says Jeff Paulding, president of Dirt Killer Pressure Washers, Owings Mills, Md.

Chemicals help clean specific stains

Although water alone can remove dirt from concrete, cleaning chemicals often are needed to remove specific stains. Many contractors recommend spraying the stain with the recommended chemical and letting it sit for about 15 minutes before power washing the area.

Oil and grease. Removal of oil from parking lots, drive-throughs, and other concrete pavements is the most common concrete power-washing application. In addition to hot water, an alkaline degreaser will greatly increase removal rates of oil and grease. Hot water lifts the oil from the concrete, and the degreaser emulsifies the oil, allowing it to be



Power washing can be used with various chemical strippers to remove graffiti.

Proscoco

flushed from the surface. Some contractors use at least a little degreaser for most jobs, even to remove dirt, which can be somewhat oily. According to Hinckley, alkaline cleaners are also the preferred chemical for cleaning soot from concrete.

Rust. Heavy rust stains can penetrate deeply into concrete, so they can be tough to remove completely. Cleaners containing oxalic acid are most effective.

Graffiti. Graffiti can be very difficult to remove, depending on the type of paint used. Several proprietary chemical strippers are avail-

able, many of which contain a citrus-based solvent, methylene chloride, or potassium hydroxide. Citrus-based solvents are the least aggressive and may not work on certain paints, but they are the safest to use and often have less-stringent disposal requirements. For best results, allow products containing potassium hydroxide to soak into the concrete surface for several hours before power washing. These products also require a subsequent application of an acid neutralizer.

Graffiti also can be removed by a special attachment that includes a tungsten-carbide nozzle that meters sand into the water stream before it exits the nozzle. But the sand will etch the concrete, which may not be desirable. In recent years, softer sodium bicarbonate abrasives have been used with power washers to remove graffiti from concrete (see *Concrete Construction*, February 1999, p. 87).

Avoiding equipment breakdowns

All power washers require routine maintenance because the high-pressure water wears out seals, O-rings, springs, and other components. But you can avoid excessive maintenance costs by following these operating tips:

- Never run the pressure washer without water. This will cause premature failure of the pump seals.
- Don't run the power washer in bypass for more than a few minutes (the unit is running but the trigger is not depressed). The water circulates in a closed loop and heats up quickly. Most pumps have a thermal-relief valve, but if the valve fails, the pump can be damaged.
- Make sure the water source provides the volume of water needed by the pump. If it doesn't, the pump will suck in air, which can damage the pump. The first sign

of air in the pump is a loss of pressure and a hammering noise.

Disposal requirements

Depending on the power-washing chemicals used and the contaminants removed from the concrete, water runoff may be prohibited from entering storm sewers. Municipal codes vary greatly depending on the location. Some regulations, for example, require all discharge to be hauled to a waste-disposal site. Check with the local Environmental Protection Agency office for information on disposal requirements.

Editor's note

Rather than doing the power washing yourself, you may want to consider hiring a power-washing subcontractor. For a list of contractors in your area, contact Power Washers of North America, 1518 K St., NW, Washington, D.C. 20005 (202-393-7044; fax: 202.347.8847; e-mail: pwnahq@aol.com; Web site: www.pwna.org).

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