

Cleaning Concrete

REMOVING STAINS AND CLEANING CONCRETE SURFACES

The major reasons for removing stains and cleaning concrete surfaces are to improve the surface appearance or to prepare the surface for a surface treatment or concrete overlay.

BEVERAGES

If hot water and soap do not work, coffee, tea, alcoholic beverages, and soft drink stains can be removed by applying a bandage saturated with 1 part glycerol (glycerine) diluted with 4 parts water. Two parts of isopropyl alcohol may be added to this mixture to hasten the removal action. The bleaches described for removal of smoke stains are also effective in removing stubborn coffee and other stains. A poultice of talc and trichloroethylene can be used on tough stains.

DIRT

Airborne dirt can collect on any concrete surface to form a dark and sometimes oily build up or stain. Buildings with architectural concrete may need to be cleaned of air pollution-induced dirt deposits to regain their original appearance. Some dirt can be removed by scrubbing with detergent and water or 1 part hydrochloric acid in about 20 parts water. However, special proprietary cleaners, made to remove dirt with minimal attack of the concrete, are often preferred over hydrochloric acid solutions that attack concrete.

A solution of 1 part phosphoric acid to about 3 parts water can be used to scrub away light to moderate amounts of dirt with little to no attack of the concrete. Proprietary cleaners, made with hydrochloric acid and buffers to protect the concrete, are used to remove severe dirt build up. An alkaline pre-wash followed by an acetic acid wash is another cleaning method. The methods used to remove oil can be helpful in removing very oily dirt. Steam cleaning and light sandblasting or water blasting are also effective.

Once a surface is clean, it is good practice to apply a breathable clear sealer (such as a methacrylate or acrylic-based material) or a clear water-repellent penetrating sealer (such as silane or siloxane) to resist dirt build-up and make future cleaning easier. Some cleaning specialists prefer the silane or siloxane treatments for their high breathability (often with a 95% vapour transmission).

EPOXIES

Most solidified epoxies can be removed from small areas by burning them off with a blowtorch. Adequate ventilation must be provided since black acrid smoke will be given off. If a black stain remains, it can be treated as indicated for smoke stains. Abrasive blasting is more appropriate for large areas.

GREASE

Grease does not penetrate into concrete, so scraping and scrubbing usually will remove it.

Scrape off all excess grease from the surface and scrub with scouring powder, trisodium phosphate, or detergent. If staining persists, methods involving solvents are required.

Use refined naphtha solvent (mineral spirits) or a chlorinated-hydrocarbon solvent such as trichloroethylene* to make a stiff poultice. Apply to the stain and do not remove until the paste is thoroughly dry. Repeat the application as often as necessary. If required, scrub with strong soap, scouring powder, trisodium phosphate, or proprietary cleaners specially formulated for removing grease on concrete. Rinse with clear water at the end of treatment.

For large areas, such as the entire floor, use butyl cello solve (with proper ventilation) or a metasilicate or other alkaline floor cleaner to emulsify all grease and oil on the slab surface. Brush scrubbing is usually required. Before the cleaning solutions dries or the emulsion breaks down, flood-rinse with water after scrubbing. Other solvents that can be used to remove grease include sodium carbonate, carbon tetrachloride and chloroform.

* Do not use trichloroethylene to make a poultice as it reacts with strong alkalis such as cement or fresh concrete and forms dangerous gases.

MILDEW

Prepare a solution of 1 oz (0.03 kg) of commercial laundry detergent, 3 oz (0.09 kg) of trisodium phosphate, 1qt (0.95 litres) of commercial laundry bleach, and 3 qt (2.8 litres) of water. Apply to the area with a soft brush. Rinse with clear water after the treatment.

OIL STAINS

The following simple methods should effectively remove oil stains from driveways and parking lots.

Method A: Saturate the area with mineral spirits or paint thinner. Then cover with an absorbent material such as dry Portland cement, talc, cat litter, Fuller's earth, corn meal, or cornstarch. Let stand overnight, and sweep away the cover. Repeat if necessary.

Method B: If an oil stain resists method A, scrub with a trisodium phosphate solution.

Method C: Bleach the surface with laundry bleach.

GRAFFITI

A large number of commercially available products are suitable for removing spray-paint and felt-tip markings from concrete surfaces. These products are generally effective also for removing crayon, chalk, and lipstick. The manufacturer's directions should always be followed. If satisfactory results are not obtained with the first remover applied, a second or third attempt with other products should be made. A single product may not remove both spray-paint and felt-tip-pens stains.

If a proprietary cleaner is not available, methylene chloride can be used. While wearing protective clothing, brush methylene chloride onto the surface, wait 2 minutes, and rinse with water during continued brushing. Oxalic acid or hydrogen peroxide can be used to help bleach out some of the pigment from the concrete pours. Solutions of sodium hydroxide, xylene, or methyl ethyl ketone are also helpful in removing graffiti. Effective cleaning can also be accomplished with water blasting and sandblasting.

After the graffiti is removed, or preferably before a structure is placed in service, an anti-graffiti coating or sealer should be applied. The surface treatment should prevent graffiti from entering the pores of the concrete and should facilitate removal of the graffiti, preferable without removing the surface treatment.

Aliphatic urethanes are considered the best anti-graffiti coatings because of their resistance to solvents, yellowing and abrasion. Solvents such as mineral spirits or methyl ethyl ketone can remove most graffiti from an aliphatic polyurethane without compromising the urethane coating. Acrylics, epoxies, silanes, and siloxanes are also used to make graffiti removal easier; however, acrylics dissolve with the solvent and epoxies tend to yellow or discolour. Silanes and siloxanes may not resist certain graffiti materials as well as urethanes, but they do maintain a high breathability at the concrete surface while resisting penetration of graffiti materials into the concrete.

BLOOD

Wet the bloodstain with clear water and cover it with a thin, even layer of sodium peroxide powder. Take care not to breathe any of the peroxide dust or to allow it to come in contact with the skin, as it is very caustic. Sprinkle the powder with water or apply a water-saturated bandage and allow it to stand for a few minutes. Wash with clear water and scrub vigorously. Next, brush a 5% solution of acetic acid (vinegar) on the surface to neutralize any alkaline traces left by the sodium peroxide. Rinse with clear water at the end of the treatment.

Hydrogen peroxide or trisodium phosphate can be substituted for the sodium peroxide, although they may not work as well. Vinegar neutralization is not necessary with the hydrogen peroxide treatment.

MISCELLANIOUS STAINS

Stains varying in intensity from light yellow to brown sometimes occur on interior concrete and terrazzo floors. They may be due to the original finishing of the floor or the cleaning operations. Such discolourations are usually not hard to remove; it is possible to bring the surface back to its original appearance by applying a Javelle-water-impregnated poultice or by scrubbing the surface with Javelle water.

Stains other than those discussed can be removed by experimenting with different bleaches or solvents on an inconspicuous area. The treated area should always be thoroughly scrubbed with clear water after the treatment so that no traces of the removing agent remain.

For further information on removing stains and cleaning concrete surfaces, contact the BC Ready-Mixed Concrete Association at (604) 436-2083 or the Portland Cement Association at (847) 966-6200.