Surface Remediation Guide

Critical Safety Warning

Never mix bleach with oxalic acid or any other acid. This reaction can produce highly toxic chlorine gas. Do not switch between chemical treatments on the same area until the surface, tools, buckets, brushes, and sprayers have been thoroughly rinsed and flushed with clean water.

Health & Safety Protocols & PPE

Before mixing or applying any chemical solutions, especially oxalic acid or sodium hypochlorite bleach, confirm the product label and current Safety Data Sheet have been reviewed, the required controls are in place, and the following personal protective equipment (PPE) and environmental controls are strictly used.

- Eye Protection: Chemical splash goggles or a full face shield must be worn. Acid and bleach splashes can cause severe ocular damage.
- Skin Protection: Heavy-duty nitrile or neoprene chemical-resistant gloves. Wear long sleeves, long trousers, and closed-toe safety footwear (e.g., rubber boots) to prevent chemical burns from drips or overspray.
- Respiratory Protection: A P2/N95 particulate respirator mask is critical when scooping and mixing dry oxalic acid powder to prevent inhaling the highly irritating dust. When spraying bleach in poorly ventilated areas, use a half-mask with organic vapor/acid gas cartridges.
- Environmental & Runoff Control: Do not allow chemical runoff, wash water, or contaminated rinse water to enter stormwater drains, waterways, or marine environments. Contain, collect, divert, or wet-vac runoff where practical. Protect adjacent vegetation by pre-soaking and post-rinsing the soil.
- Chemical Interaction Warning: NEVER mix bleach and oxalic acid, or bleach with any other acid. This reaction can produce highly toxic chlorine gas. Wash all tools, buckets, brushes, and sprayers thoroughly between different chemical applications.
- Product Instructions & SDS: Always follow the product label, supplier instructions, and current Safety Data Sheet for mixing, PPE, storage, first aid, spill response, and disposal requirements.

Quick Reference Treatment Table

Stain Type	Typical Appearance	Recommended Treatment	Key Caution
Iron stains or rust on concrete	Orange, red, or brown rust marks	Oxalic acid	Do not use bleach on rust stains.
Timber tannin stains on concrete	Brown organic staining from wet timber	Diluted household bleach	Keep runoff out of stormwater and garden areas.
Iron tannate stains on concrete or timber	Dark blue, black, or grey staining	Oxalic acid	Neutralise timber after treatment if it will be oiled or stained.

Always test first: Before treating a large area, test the selected chemical on a small inconspicuous area and allow it to dry. Check for colour change, surface etching, sealer damage, or unwanted timber discolouration before continuing.

Use the table above to select the correct treatment, then follow the relevant procedure below. If the stain type is uncertain, stop and test first rather than applying the wrong chemical.

1. Iron Stains (Rust) on Concrete



The Solution: Oxalic Acid (Jac Jays – available from Bunnings)

Iron oxide (rust) is insoluble in water. Oxalic acid creates a chemical reaction that converts the rust into iron oxalate, which is water-soluble and can simply be rinsed away. **Never use bleach on rust.**

Step 1: Surface Preparation: Sweep the concrete and wash the stained area with a basic degreaser to remove surface oils. Allow the concrete to dry completely so the acidic solution can penetrate the pores.

Step 2: Mixing the Solution: In a heavy-duty plastic bucket, dissolve 1/2 to 1 cup of oxalic acid powder into 1 gallon (approx. 3.8 L) of warm water. Safety note: Always add acid to water, never water to acid.

Step 3: Application & Agitation: Apply the solution directly to the dry rust stains. Scrub vigorously with a stiff-bristled nylon brush. Do not use a wire brush, as discarded metal bristles will create new rust spots.

Step 4: Dwell Time: Allow the solution to dwell for 10 to 15 minutes. Lightly mist with water if it begins to dry under sunlight. Do not allow the acid to dry on the surface.

Step 5: Rinse: Flush the area thoroughly with a hose or low-pressure water blaster. Avoid high-pressure washing that may etch concrete or damage timber. Repeat only if required for heavily embedded stains.

2. Timber Tannin Stains on Concrete



The Solution: Household Bleach (Sodium Hypochlorite)

Tannins are organic, water-soluble compounds that leach out of wood (especially hardwoods like Kwila or Cedar) when it gets wet. Because they are organic, bleach is highly effective at breaking them down and pulling the brown colour out of the concrete.

Step 1: Dry Sweep: Clear all leaves, organic debris, and dirt. Ensure the surface is dry to maximise bleach absorption.

Step 2: Mixing the Solution: Mix 1 part household bleach with 3 parts water in a pump sprayer. Add a drop of liquid dish soap to break the surface tension and act as a surfactant.

Step 3: Application: Spray or pour the mixture evenly over the brown tannin stains. The oxidation reaction will cause the stains to fade almost immediately.

Step 4: Scrub & Dwell: Work the solution into the concrete divots using a stiff nylon broom. Let it sit for up to 15 minutes.

Step 5: Environmental Rinse: Flush the area with fresh water while controlling runoff. Do not allow bleach-contaminated rinse water to enter stormwater drains. Ensure adjacent garden beds and lawns are heavily watered to dilute any incidental contact.

3. Iron Tannate Stains on Concrete or Timber



The Solution: Oxalic Acid (Jac Jays – available from Bunnings)

These are the dark blue or black stains that appear when iron (often from materials like Corten steel) reacts with the natural tannins in wet timber. Oxalic acid breaks the iron-tannin bond, turning the black stain clear.

Step 1: Removal of Source Material: Wash the surface to remove any loose metal dust or shavings. Allow the surface to dry fully.

Step 2: Mixing a Stronger Solution: Dissolve 1 cup of oxalic acid powder into 1 gallon of hot water. Hot water maximises dissolution of the crystals and accelerates the reaction speed.

Step 3: Application: Apply heavily to the black stains. If treating timber, brush directly along the grain. The black discolouration should neutralise and fade rapidly.

Step 4: Dwell & Agitate: For deeply embedded stains resulting from hot grinding sparks, use a stiff brush and allow a 10 to 15-minute dwell time while keeping the surface wet.

Step 5: Rinse & Neutralise (Critical for Timber): Rinse with copious amounts of water. If treating timber that will be oiled or stained later, the acid must be neutralised to prevent long-term degradation of the wood fibres. Apply a solution of 1/2 cup baking soda per gallon of water, let sit for 5 minutes, and perform a final rinse.

Cleanup, Storage & Disposal

- Do not return mixed or diluted chemicals to their original containers.
- Store oxalic acid and bleach separately in labelled, sealed containers, away from incompatible substances and out of direct sunlight.
- Collect leftover solution and contaminated rinse water where practical, and dispose of it in accordance with the product label, Safety Data Sheet, and site environmental requirements.
- Rinse tools, buckets, brushes, and sprayers thoroughly before reuse or storage.
- Complete a final check to confirm the treated surface is clean, runoff has been controlled, and no chemical residue remains on adjacent surfaces or vegetation.