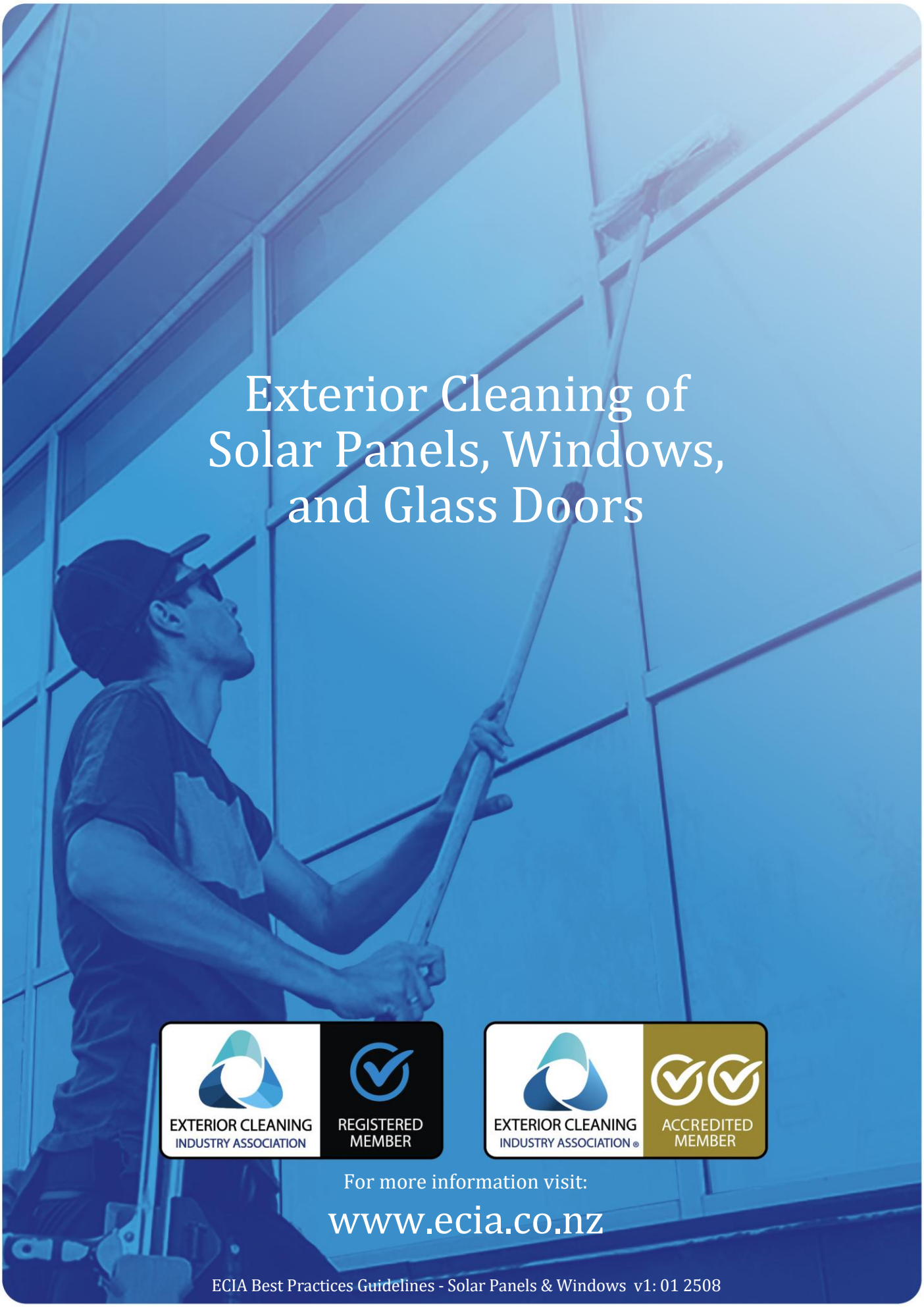
Exterior Cleaning of Solar Panels, Windows, and Glass Doors



EXTERIOR CLEANING INDUSTRY ASSOCIATION REGISTERED MEMBER

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Best Practice Guidelines.

Exterior Cleaning of Solar Panels, Windows, and Glass Doors.

Most solar panels, windows and their associated fasteners and joinery require periodic cleaning to maintain their functionality and the conditions of their warranty.

Many window and glass door products require a 3-monthly clean to maintain the conditions of their warranty.

Solar Panels require a periodic clean to remove the build-up of organic material and debris.

The intention of regular cleaning is to remove the damaging build-up of organic material, atmospheric contaminants, and dirt from the surface of the solar panels, windows, and glass doors. This work generally involves using a soft brush, or mop & blade with a glass cleaner, or a pure water system or pressure equipment with a treatment cleaning solution, to clean the panels, windows, or doors, without causing any damage to the adjoining substrate, framing or joinery.

These cleaning instructions should be read in conjunction with the ECIA Code of Practice (CoP), the operational guidelines of the Cleaning Agent and Equipment suppliers **and the maintenance instructions of the Solar Panel, Window or Door Manufacturer and any other relevant Industry Guidelines** or Codes of Practice.

If the work is being undertaken by a professional Cleaning Company, or Other Trade, these instructions should also be read in conjunction with their Safe Operating Procedures and any Apprenticeship or NZQA training recommendations.

A current version of the CoP can be downloaded from the ECIA website (www.ecia.co.nz), as can the following summary cleaning procedures.

- Exterior Cleaning of Coated Claddings, Decks, Fences, Gutters, Roofs, and Walls.
- Exterior Cleaning of Driveways, Hardstands, and Playing Surfaces.
- Exterior Cleaning of Solar Panels, Windows, and Glass Doors.
- Exterior Cleaning of Membrane Decks & Roofs and Asphalt Shingles.

The Associate Members listed in this document, and their branded products or services, are an example of those used by our Members to support exterior cleaning work. They have been included to educate users as to their supply and “like for like” options. Please refer to the supplier’s instructions as to how these products should be used prior to use.

1 Preparation:

Before undertaking any Solar Panel, Window or Glass Door cleaning work, it is highly important to scope out the work to ensure that it can be undertaken safely and that it will not damage the products, property, or the environment.

Consideration should also be given to cleaning the unwashed area under Solar Panels and the Frames and Joinery of glass products at the time of the work.

In some instances, the cleaning of the Frames and Joinery may require a different process to the cleaning of the Windows or Glass Doors to ensure that they are not damaged by the cleaning solutions.

In all circumstances washing discharge needs to be managed so that it does not contaminate the stormwater or a waterway or harm pets and animals.

Good preparation and the use of appropriate equipment and cleaning solutions can also greatly reduce the amount of water and time needed to clean an area.

If available and appropriate, consider using sources of non-potable water for exterior cleaning work.

Where possible a broom or blower should be used to clear away any loose debris from the area being cleaned prior to wet cleaning.

2 Cleaning Options:

The use of appropriate cleaning systems and equipment will prevent damage to the Solar Panels, Windows & Glass Doors and produce a better-quality result.

The recommended cleaning process generally involves using (separately or together) a **pure water system, a mild surfactant or a glass cleaner to wash the surface at the time of the work.**

The choice of cleaning system will be determined by the products Warranty maintenance instructions, the supplier's usage instructions, and the equipment that you are using.

Under no circumstances should abrasive or bleached based cleaning solutions, hot air guns, petrol, scouring liquids, or thinners be used to clean Solar Panels, Windows, or Glass Doors.

Before undertaking any work using non-potable water, a cleaning solution, or a pressure washer, you should undertake a test spot, in an inconspicuous area, to ensure that there is no damage to the Solar Panels, Windows, Glass Doors or the associated Joinery.

In general, cleaning solutions should not be allowed to dry on glass products as they can cloud them.

3 Pure Water System Cleaning Process:

Pure Water Systems use filtered water, fed through a pole and a soft brush, to clean Solar Panels, Windows, and Glass Doors, without leaving streaks or residue.

These systems rely on the combined effect of filtered water and brush agitation to clean glass surfaces, and they **do not require cleaning solutions**.

Please refer to the equipment supplier's instructions on how the Pure Water System should be safely and effectively used, including disposal of the resin.

4 Cleaning Solution Usage Requirements:

Cleaning solutions are generally applied to the entire surface area using manual hand sprayers, hose end sprayers or pressure equipment.

The area is then cleaned with a soft brush or broom and the remaining residue is washed off with clean water at hose pressure. It is important that the cleaning solution is **not allowed to dry on the glass as it can cloud the glass. To be clear, these products should be thoroughly rinsed off with clean water after application**

Cleaning work should not be undertaken if there is a risk of wind drift affecting plants, the environment, domestic pets, other properties, clothes lines, and bodies of water (such as ponds and creeks).

It is highly recommended that vegetation close to the work is doused with clean water before and after the work.

Regardless of which cleaning solution you choose you **must always read the label before using the solution and follow the instructions regarding correct dilutions and application methods.**

Please remember that the correct dilution level is in relation to the direct application of the cleaning solution to the substrate. Some pressure equipment, such as venturi systems, will dilute the cleaning solution as part of the application process. To be clear, a venturi system will further dilute a cleaning solution.

In addition, you should never mix a cleaning solution with an unknown compound or mixture as the reaction can cause serious injuries.

If any further information is required before use, please contact the supplier for the products Material Safety Data Sheet (MSDS). These sheets provide detailed information regarding the safe use of the product, including what to do if there is an incident. Businesses and Trades people undertaking exterior cleaning work should always have a copy of the MSDS sheets on hand.

Examples of Cleaning Agent Suppliers include:

- Bio-Sheild, Envirochem.

5 Glass Cleaner Cleaning Process:

Glass cleaner's solutions are generally applied to the entire surface area using a bucket, warm water, and a soft brush or pressure washing equipment.

After application, these products **should be thoroughly rinsed off with clean water.**

A squeegee, with a flexible rubber blade, can be used to remove any excess water and residue. They can also assist in the removal of any lichen, paint, or other contaminates that have stuck fast to the surface.

Generally cleaning solutions should not be allowed to dry on the glass as they can cloud the glass.

Please refer to the supplier's instructions for how much the concentrate needs to be diluted prior to application and how it should be safely used and best applied. If any further information is required, please contact the supplier for the products Material Safety Data Sheet (MSDS).

Cleaning work should not be undertaken if there is a risk of wind drift affecting the environment and it is highly recommended that vegetation close to the work is doused with clean water before and after the work.

6 Other Cleaning Products:

Before using other cleaning products, first check the cleaning maintenance instructions of the Solar Panel, Window or Glass Door Manufacturer.

Under no circumstances should abrasive or bleached based cleaning solutions, petrol, scouring liquids or thinners be used to clean Solar Panels, Windows, or Glass Doors.

7 Unwashed Areas:

The maintenance of the unwashed areas under solar panels is a warranty requirement **for many roofing manufacturers**. In addition to the voiding of the warranty, if these areas are not regularly cleaned, they are particularly vulnerable to fastener failure.

Solar panels typically last 25 to 30 years and many roofs will last 40 to 70 years. Whilst the likelihood of fastener and roof failure in unwashed areas, over a 20 to 30 year period, is dependent upon a range of factors including whether the installation is in an industrial or marine environment, the size of the unwashed area, the pitch of the roof, the presence of mature trees, local rain & wind conditions and the age, condition & quality of the roof fasteners & substrate, **these areas will fail before the rest of the roof, if they are not regularly cleaned**.

It is recommended that Unwashed Areas under Solar Panels are cleaned using a Benzalkonium Chloride Treatment Cleaning process. Please refer to the ECIA Best Practice Guidelines for the “Exterior Cleaning of Claddings, Decks, Fences, Gutters, Roofs, and Walls” for more information on Treatment Cleaning programs.

8 Pressure Equipment Considerations:

The use of Pressure Equipment and Systems to clean Solar Panels, Windows and Glass Doors can save time and produce a better-quality result.

If using pressure equipment, it is important that you understand and follow all the operating instructions, precautions, personal protective requirements, and safety rules associated with the equipment.

- Pressure Equipment can be used to **Pressure Wash**, **Soft Wash** or **Treatment Clean** surfaces.
    - **Pressure Washing** is the application of high quantities of water, at a pressure of up to 3,000 PSI (at the nozzle), to clean surfaces at the time of work.
    - **Soft Washing** is the application of cleaning solutions and lower quantities of large droplet water, at a pressure of up to 600 PSI (at the nozzle), to clean surfaces at the time of work.
    - **Treatment Cleaning** solutions are applied, using Soft Washing techniques, to remove organic material over time.
- To be clear, Pressure Washing primarily relies on water pressure to clean surfaces at the time of the work, whilst Soft Washing primarily relies on cleaning solutions to achieve the same outcome. Treatment Cleaning is dependent upon the cleaning solution and weather to remove organic material over time.
- **Pressure Washing techniques should not be used to clean Solar Panels, Windows, and Glass Doors.**
- **The ECIA does not generally recommend the Pressure Washing of roofs.**
- Cleaning solutions may need to be mixed, prior to being used with a Pressure Washer.
- Before using Pressure Equipment, you should undertake a test spot, in an inconspicuous area, to ensure that there is no damage to the substrate

- Commercially rated machines (that can produce a flow of 10L pm or more) should be used to clean larger areas as it will reduce water usage, and the time needed to complete the work.
- Special care is needed when using pressure equipment to clean glass doors and windows to avoid unnecessary water ingress.
- It is important to use a nozzle type compatible with the Pressure Washer and the work being undertaken. There are a wide range of specialist nozzles used by exterior cleaners including Fan Head and Rotary Head Nozzles.
    - Fan head nozzles typically come in a range of colour coded spray angles (0˚, 15˚, 25˚ & 40˚). Examples of how these nozzles can be used are listed below.
        - Low pressure nozzles can be used to apply and rinse cleaning solutions. These nozzles are also known as soap nozzles.
        - 40˚degree nozzles can be used to rinse cleaning solutions.
        - 25˚, 15˚, 0˚ degree and Rotary head nozzles **should not be used to clean Solar Panels, Windows and Glass Doors.**
- Specialist accessories, including telescopic lances and hoses, can be used with many pressure washers to assist in the cleaning of glass products.
- Glass doors and windows, on single storey buildings, should only be hand cleaned, unless the pressure washer is being used by an experienced person. This is to avoid unnecessary water ingress.
- It is recommended that windows on multi-storey buildings are cleaned by professional exterior cleaners using specialist equipment.
- Pressure Equipment options include Pressure Washers and Drones.

Pressure Washer Equipment Suppliers include:

- Pressure Solutions

9 Discharge Management:

The Resource Management Act 1991 (RMA) is designed to protect our environment, and all exterior cleaning work must comply with it. The RMA is enforced by local Councils and polluters can be issued with abatement notices or prosecuted.

All cleaning agents can have both a direct and prolonged impact on the surrounding environment and all washing discharge should fall or be diverted onto unsealed ground (such as grass) using bunding, sandbags and proprietary filter systems.

Under no circumstances should washing discharge be allowed to enter the stormwater or a waterway. This is illegal and can be managed using drain matts, bunding, sandbags, proprietary filter systems and the best practice processes outlined in the ECIA CoP. The same processes and products should be used to contain, control, and manage a spill of the cleaning agent.

When using cleaning solutions to clean solar panels, or the windows on multi-level properties where the discharge falls on to a lower roof, the downpipes will have to be disconnected (unless they have a proprietary diverter), to avoid contamination of the stormwater.

In addition, if the roof is being used to collect water, the downpipes should remain disconnected for the period specified by the Cleaning Agent supplier, to avoid contamination of the water tank.

Examples of standard Discharge Management practices that you would expect to see when a professional company is cleaning your solar panels, windows or glass doors include;

- Bunding to contain discharge waste for recovery and disposal.
- Bunding to divert discharge waste onto unsealed ground.
- Downpipe diverters to discharge wash water onto unsealed ground.
- Disconnected downpipes to divert wash water onto unsealed ground.
- Drain mats to stop discharge from entering the stormwater. These will often be used in conjunction with bunding, filter products and recovery systems.
- Filtration socks and bags to prevent contaminants entering the stormwater.
- Support team members to support work on multilevel properties and in high traffic areas.
- Water recovery systems, such as pumps and watervacs, to capture the wash water for discharge onto unsealed ground, or offsite management as appropriate.

Examples of Discharge Management Suppliers and proprietary branded products include:

- In\Out Debris Diverter, Garmour, GutterWitch Flexi Diverter

10 Health & Safety:

You should always use safety glasses, gloves, overalls, and gumboots when diluting, mixing, and applying cleaning agents. It may also be appropriate to use a respirator in some instances. You should also wear earmuffs when using some pressure cleaners.

When using ladders as a workstation it is critical that they have first been checked over for damage, are stable, secured and that you maintain three points of contact during use.

For sloping and multi-level properties, and when working on roofs, telescopic lances, harnesses, secured ladders, mobile platforms, elevated work platforms, edge protection and scaffolding may also be required.

Professional fall protection equipment such as harnesses, edge protection, mobile platforms, elevated work platforms and scaffolding should only be used by people with the appropriate experience, certificates, or qualifications.

The WorkSafe Roof Maintenance Guidelines note that fall restraint harness systems are required for short duration work, such as exterior cleaning and repair work, that is undertaken in minutes instead of hours.

The WorkSafe Guidelines also note that long duration work, which lasts hours or takes place over several days, including some cleaning and painting work requires the use of elevated work platforms, edge protection or scaffolding, depending upon the nature of the work and property.

All work undertaken by professional trades must conform to the Health & Safety at Work Act 2015 and the Good Practice Guidelines provided by WorkSafe New Zealand. In addition, a competent cleaning company will have in place a Health & Safety Plan to support their work. Some jobs may also require Safe Operating Procedure (SOP), Job Safety Analysis (JSA), Environmental Management Plan (EMP) and Site-Specific Safety Plan (SSSP) documentation to support the work.

You should also consider using professional exterior cleaners to clean areas requiring the use of fall protection equipment.

Examples of Health & Safety practices that you would expect to see when a professional company provides an exterior cleaning service include;

- Mobile platforms to clean windows on multilevel properties.
- Elevated work platforms to clean windows on multilevel properties.
- Rope access systems and cradles to clean windows on multilevel properties.
- Fall restraint harnesses to clean solar panels on roofs.
- Permanent anchor points for harnesses on commercial properties.
- Personal Protective Equipment, including hearing protection, safety glasses, gloves, hardhats, overalls, and gumboots.
- Temporary barricades and signage to control access to work areas.
- Temporary ladders brackets and footings to access roofs.
- Spotters and support team members to support work on multilevel properties and in high traffic areas.
- Edge Protection and Scaffolding when cleaning a roof prior to repair or repainting.

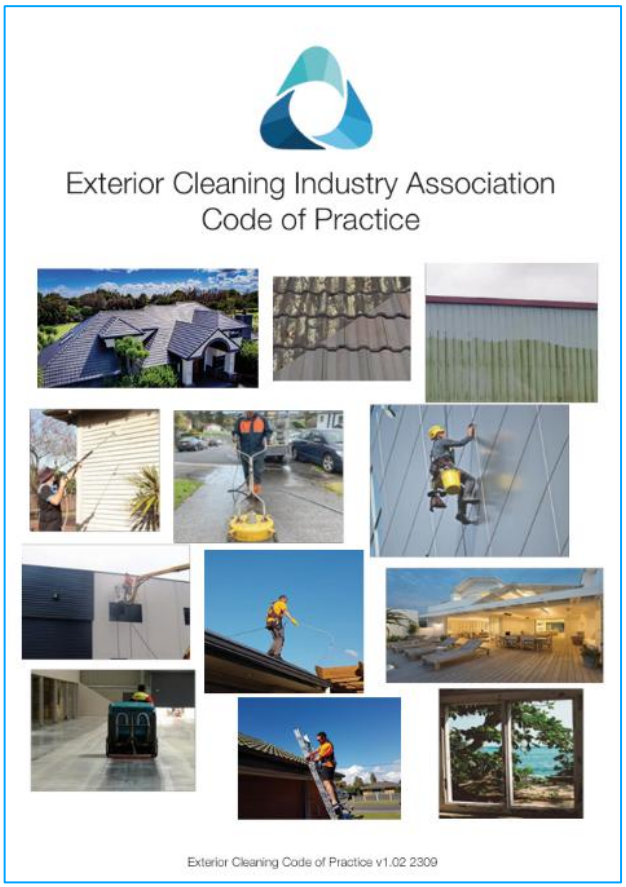
Examples of Health & Safety Suppliers and proprietary branded products include:

- Gamour, LadderSecure, Spice HR.

11 Meaning of Industry Terms & Words

- **Asbestos** containing cladding and roofing products have the potential to cause significant harm and competent persons or licensed operators must be consulted prior to the commencement of work to ensure that correct procedures are followed. Under **no circumstances** should water pressures of over 50 PSI be applied to Asbestos cladding and roofing products.
- **Benzalkonium chloride** is a disinfectant based cleaning agent that provides temporary protection against regrowth.
- **Code of Practice.** The ECIA CoP outlines acceptable and recommended trade practices that the consumer can expect to see when a competent company provides an exterior cleaning service in the maintenance of a property or as a component part of another service, such as preparation of a property prior to repair work or painting.
- **Downpipe Diverters** are accessories that can be fitted into downpipes to divert debris from stormwater and water tanks systems. Some diverters can also be used to divert roof and gutter cleaning discharge.
- **Down streaming** is the use of a venturi injector to introduce cleaning solutions, into your water stream, after the pump output.
- **Hydrogen Peroxide** is a bleaching and disinfecting agent that tends to be used for specialist applications.
- **Manual Washing** work involves using a hand sprayer, hose end sprayer, a soft brush and hose, or a combination of these, to clean exterior surfaces.
- **Pressure Washing** is the equipment application of high quantities of water, at a pressure of up to 3,000 PSI, to clean surfaces at the time of work.
- **Quats** are a common ingredient in disinfectants and sanitizers.
- **Sodium Hypochlorite's** are bleach-based cleaning agents. They are cost effective, work very fast and are a commonly available cleaning agent.
- **Soft Washing** is the equipment application of lower quantities of large droplet water, at a pressure of up to 600 PSI, to clean surfaces at the time of work.
- **Surfactant** based cleaning agents included soaps and detergents.

- **Treatment cleaning** solutions are applied using Soft Washing techniques, to remove organic material over time.
- **Weather Cleaning** treatment programs involving applying a cleaning solution to kill the organic material, which wind and rain will typically remove over a period of 10 to 12 months.

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