



Sioo:x

Wood Protection Manual

V2 Feb 23

Carefully Crafted Timber



Why Use Sioo:x

Architects and designers have always loved the natural beauty and versatility of real timber and are increasingly appreciating its carbon capture credentials for responsible building design. A common consideration for timber on exterior facades is the perceived ongoing maintenance and uneven weathering on different parts of a building. The Sioo:x Wood Protection System (pronounced 'Cee Oh') is a 'reactive' coating system that uses a unique technology to combat these issues.

By creating a protective barrier to timber, the system minimises the frequency of maintenance coats when compared to other semi-transparent coatings. Sioo:x mirrors the natural aging process of timber by accelerating the creation of a weathered, driftwood appearance while giving long-life protection in a completely environmentally friendly way.

With other transparent coating systems some areas will fade due to UV exposure and other areas won't. Sioo:x creates a generally consistent driftwood tone across a building albeit with some variation in the rate of reaction and the ongoing aesthetic.

Advantages:

- Less maintenance costs in the long term compared to other semi-transparent coatings.
- Helps to solve the problem of uneven weathering.
- For exterior vertical and horizontal surfaces.
- Beautiful, driftwood look that is generally uniform across all faces of a building.
- Strengthens the surface of the timber and protects against damaging UV radiation, helps prevent mildew, mould and mild rot.
- Forms a beautiful and high performing combination with plantation grown, modified timbers, such as Abodo's Vulcan.
- Vapor-permeable (the timber breathes).
- Free from Red List chemicals as required by the Living Building Challenge.
- Water-based for easy maintenance and wash-up – no solvents.
- Sioo:x coated timber is easily recycled or disposed of at end-of-life.

Omaha House: With the ocean on three sides, the Sioo:x on Vulcan Cladding WB12 has weathered to a dark patina, as expected after three years.



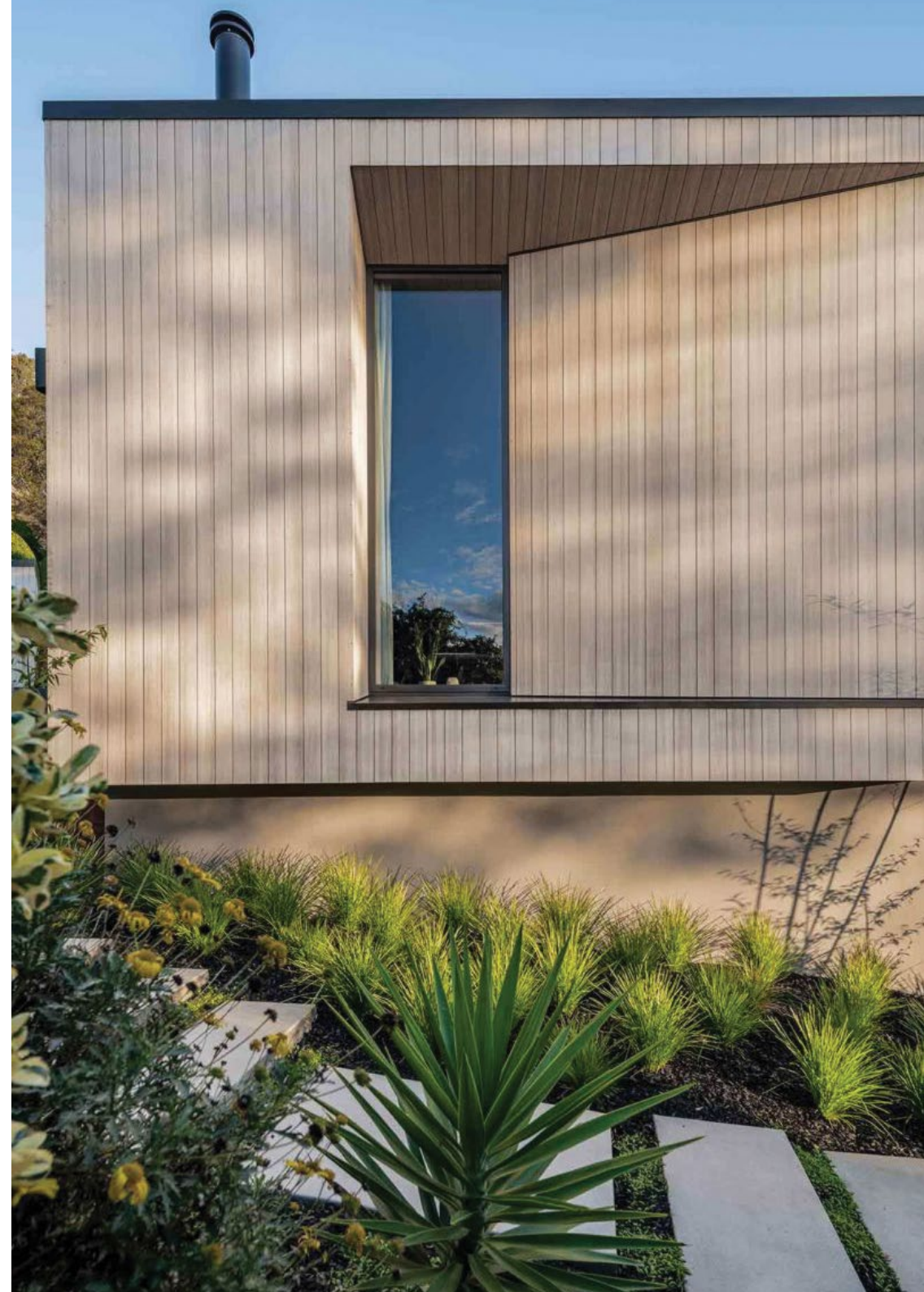
How It Works

Sioo:x uses a patented 2-part silicon-potassium technology.

Sioo:x Wood Protection (Panel or Deck) – Part 1 penetrates the fibres of the timber to form a flexible network of crystals to create a strong and protective barrier. Sioo:x cures by reacting with carbon dioxide and moisture in the atmosphere to form an insoluble and flexible silica network within the timber surface. The silicon molecules then grow and expand in the cells and around the wood fibers, deep into the wood, creating the network. The formation of the silica network toughens the surface of the timber and forms an effective vapour permeable barrier against the effects of the weather. Re-application of Part 1 may be up to 10-12 years for cladding and 8-10 years for decking.

Sioo:x Surface Protection PRO UV (Panel or Deck) – Part 2 bonds with Part 1 to seal and protect it whilst the curing process is complete, creating a breathable, water repellent layer that erodes away over time as part of the weathering process. Re-application of Part 2 will vary depending on the maintenance circumstance of your project however may be up to 7 years for cladding and 1-2 years for decking.

The products are formulated differently for vertical wall applications (Panel) versus horizontal decking applications (Deck).



The Weathering Process and What to Expect

Sioo:x reacts with moisture and carbon dioxide to cure over 1-3 years depending on the project application, timber species and weather conditions. The curing process does not rely on UV radiation from the sun.

As curing progresses there will be a gradual change of colour with the timber initially brightening to a light whitewash tone, usually within six months, then gradually darkening to mid-grey 'weathered' tones. The colour tone of different surfaces will evolve at slightly different rates e.g. Sioo:x to soffits or non-exposed walls compared to walls fully exposed to the weather (Refer chart and images adjacent).

Traditional coating products fade with exposure to UV from the sun resulting in the problem of uneven weathering to different faces of a building.

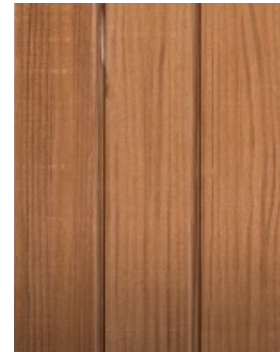


When wet, the appearance of Sioo:x coated timber will change, becoming darker in colour and patchy. As the timber dries, the colour will lighten back to its original appearance.

Sioo:x helps to solve this problem. As Sioo:x cures it maintains a general uniform tone across all faces of the building regardless of exposure to UV.

NOTE: Shaded areas (soffits or non exposed walls) can be sprayed lightly with water (a garden sprayer is ideal for a light mist) to accelerate weathering.

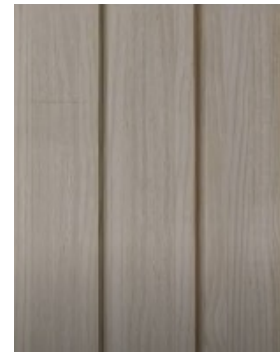
Airborne fungal spores and especially mould spores are a normal component of the outdoor air. Spores are released into the environment from fungi growing on dead or decaying organic matter in the soil or elsewhere in the environment. Fungal spores can settle on surfaces and can germinate when moisture or high humidity is present and create darkening of the timber particularly in south facing aspects and when there is a high degree of moisture and or adjacent vegetation. When this occurs the surface should be cleaned as soon as possible with Maintenance Wash.



Sioo:x on Vulcan – 1 day



Sioo:x on Vulcan – 2 months



Sioo:x on Vulcan – 4 months



Sioo:x on Vulcan – 6 Months



Sioo:x on Vulcan – 18 months



Sioo:x on Vulcan – 5 years



Typical Applications

- Exterior application only (not for interior).
- Vertical surfaces: wall cladding, screening/battens, fences, pergolas.
- Horizontal surfaces: decking, soffits/eaves, pergolas, furniture.
- Performs better when applied to sawn surfaces versus smooth dressed.
- Sioo:x is NOT recommended for the exterior of window and door frames that do not have good eave protection.
- Avoid accumulation of water at the end of timber elements by ensuring adequate clearance for good drainage, ventilation. End Grain Sealer must be applied to exposed ends – refer 'Method of Application'.

Culbara: Located on the Sunshine Coast in Australia, Vulcan Screening Sioo:x, this was photographed six months after completion.

Suitable Timber Species

- Sioo:x performance will vary between timber species.
- Select timber with Class 1 or 2 durability and low movement properties for better performance.
- Any timber species intended to be coated with Sioo:x should be tested and approved by Sioo:x, Abodo Wood or a Distributor for adequate performance of the coating on that particular species. Proven application on projects is also beneficial.
- A band sawn or textured finish is recommended to ensure optimal absorption of the coating. Smooth dressed timber requires sanding with minimum 80 grit sand paper prior to application of coating.
- Medium density softwood timbers are most suitable including thermally modified pine, accetylated pine, pressure treated pine, spruce, douglas fir, larch and cedar.
- Highly dense hardwoods or high leaching timbers may not absorb Sioo:x as well and should be approached with caution.
- If applying to hardwood, ensure a band sawn finish or alternatively brushed or sanded (80 grit).
- Some timbers may exhibit initial reactive discoloration in the form darkening or yellowing after coating with Sioo:x. Often this will fade away after initial weathering. This must be verified by weather testing prior to specification and installation.
- Old or weathered timber will require thorough cleaning prior to application of Sioo:x. Existing coatings must be removed with a suitable stripping agent so that raw timber is present, smooth dressed timber must be sanded with 80 grit sandpaper.
- It is important to seek advice from Abodo or a Distributor in case there are specific application procedures that are advised for a given species.

Te Hononga Hundertwasser: Vulcan Cladding WB10 145x20 Sioo:x photographed six months after completion, the large eaves haven't prevented the timber weathering evenly.



Products

Sioo:x Wood Protection Panel – Part 1

- For vertical surfaces.
- Required 2 coats.
- Re-application 10-12 years.
- No protective clothing is required during application however avoid eyes.
- Coverage 1st coat
 - Softwood 4-6 m2 / L
 - Hardwood 6-8 m2 / L.
- Coverage 2nd coat
 - Softwood 8-10 m2 / L
 - Hardwood 10-12 m2 / L.
- Band sawn finish will result in the lowest coverages and smooth dressed / sanded finish will give the highest. Coating coverage on brushed finish will be in between.
- Available in 1L, 5L and 20L containers.

Sioo:x Surface Protection Panel PRO UV – Part 2

- For vertical surfaces.
- Required 1 coat.
- Re-application up to 7 years depending on maintenance circumstances.
- No protective clothing is required during application however avoid eyes.
- Surface Pro UV containers a UV tolerant fungicide to assist with mould prevention.
- Coverage 1 coat
 - Softwood 8-10 m2 / L
 - Hardwood 10-12 m2 / L.
- Available in 1L, 5L and 20L containers.

Sioo:x Wood Protection Deck – Part 1

- For horizontal surfaces.
- Required 2 coats.
- Re-application 8-10 years.
- No protective clothing is required during application however avoid eyes.
- Coverage as per Sioo:x Wood Protection Panel – Part 1.
- Available in 1L, 5L and 20L containers.

Sioo:x Surface Protection Deck PRO UV – Part 2

- For horizontal surfaces.
- Required 1 coat.
- Re-application 1-2 years.
- No protective clothing is required during application however avoid eyes.
- Surface Pro UV containers a UV tolerant fungicide to assist with mould prevention.
- Coverage as per Sioo:x Wood Protection Panel – Part 2.
- Available in 1L, 5L and 20L containers.

Sioo:x End Grain Sealer – Part 1 and Part 2

- For sealing exposed end grain surfaces e.g. bottom exposed edge of wall cladding top and bottom ends of exposed batten screening or end grain of decking.
- Apply 1 coat of Part 1, wait until touch dry, then apply 1 coat of Part 2.
- For sealing non-exposed end grain e.g. under flashings or joinery, apply 1 coat of Sioo:x End Grain Sealer – Part 2 only.
- Available in 1L containers.

Sioo:x Maintenance Wash

- For maintenance cleaning of timber that has Sioo:x products already applied to it.
- Dilute with water 1:50 (or 1:25 for heavily soiled surfaces).
- Apply with soft brush, leave on for 20 minutes, scrub with a soft brush, rinse well with water.
- Contains 5-15% anionic and non-ionic surfactants.
- Avoid contact with skin and eyes.
- Available in 1L concentrate (approx diluted coverage 1:50 250m2 / 1:25 125m2).

Sioo:x Prewash

- For heavier cleaning surfaces already with Sioo:x and with high level of dirt, oil or mould growth. Also to dissolve and remove previously applied Sioo:x Surface Protection – Part 2 prior to its re-application.
- Dilute with water 1:8 for normal cleaning (or 1:4 for heavy cleaning).
- Wet face, apply with soft brush or sponge, leave on for 10 minutes, scrub with a soft brush, rinse well with water.
- This is an Alkaline product so protect furniture, glass or aluminium to avoid stains.
- Contains potassium silicate and surfactants.
- Avoid contact with skin and eyes.
- Available in 1L concentrate (approx diluted coverage 1:8 40m2 / 1:4 20m2).

NOTE: Expected shelf life of all products is approximately 2 years for unopen bottles.

Application, Equipment and Safety

- Sioo:x can be hand applied with a paint brush, airless spray equipment or speed brush applicator pad.
- For new timber, machine application is recommended in a factory environment to quality control key application variables.
- Application of Sioo:x Part 1 and Part 2 products do not require protective clothing during application however contact with eyes should be avoided.
- Application of Sioo:x Maintenance Wash and Sioo:x Prewash requires avoidance of contact with the skin and eyes.
- Cutting timber that has been pre-coated with Sioo:x products does not require specialist breathing equipment to protect against airborne particles however as a general recommendation, a face mask should be worn during cutting to protect against inhalation of dust and particles.
- Safety Data Sheets (SDS) are available for each products from Abodo on request.



Ballance Studio: After two years, the Vulcan Cladding has weathered to a dark, even patina.



Method of Application

– Cladding and Screening

- Ensure the timber is dry <16% MC and preferably with a sawn or brushed finish. Smooth dressed timber must be sanded with 80 grit sandpaper.
- For new timber, it is recommended to be applied by an accredited applicator in controlled factory conditions.
- For new hardwood timber to be coated on site, cleaning with Sioo:x Prewash is recommended to open up the cells of the timber, then sand with 80 grit if the timber is smooth dressed. Prewash may not be required for softwoods.
- Old or weathered timber will require thorough cleaning prior to application of Sioo:x. Existing coatings must be removed so that raw timber is present. Sioo:x Prewash is recommended to help break up previously applied penetrating oils. Sand smooth dressed timber with 80 grit prior to coating.
- For coating of new or existing hardwood refer to section 'Suitable Timber Species' for preparation advice.
- Avoid application in strong sunlight, rainy conditions or below 5 degC.
- Stir products thoroughly before and during application.
- Wipe spills immediately with a wet rag.
- Cover glass, aluminium and objects exposed to splashes – the products are slightly alkaline and can stain.
- Apply Sioo:x Wood Protection Panel – Part 1 adequately to ensure penetration into the timber. Apply only to exposed faces e.g. front face and sides of cladding boards. For batten screening apply to all 4 sides.
- Allow minimum 2 hours dry time or until touch dry.
- Apply second coat of Sioo:x Wood Protection Panel – Part 1.
- Allow minimum 4 hours dry time or until fully dry.
- Apply Sioo:x Surface Protection Panel PRO UV – Part 2, 1 coat to all 4 sides if possible (front, sides and back) to seal the board.
- Allow minimum 1 hour dry time prior to exposure to rain.
- It is preferable to apply Surface Protection - Part 2 no later than 3-4 days after application of Wood Protection - Part 1.
- During timber installation, weather exposed end-grain of timber will require application of Sioo:x End Grain Sealer – Part 1 and Part 2, 1 coat of each, second coat on touch dry of first coat.
- End-to-end joins of cladding boards or ends not exposed to the weather e.g. protected by flashings will require application of Sioo:x End Grain Sealer – Part 2 only, 1 coat.

NOTE: If adhesive sealant such as Sikaflex 11FC or equivalent is used in the join then Sioo:x End Grain Sealer – Part 2 will not be required.

Maintenance – Cladding and Screening

Wood is a natural material and even when treated with a wood protection or a preservative can be impacted by dirt and atmospheric fallout including fungal spore.

It is important to inspect Sioo:x treated surfaces regularly and avoid dirt or mould build up that could lead to a reduction of coating life or appearance.

Sioo:x treated surfaces are easy to keep clean due to the toughened surface and regular cleaning will enhance the life of the coating.

Following is a range of maintenance circumstances. The time periods shown are indicative and are based on Sioo:x performance on Abodo Vulcan timber. These times may vary for other timber species.

NOTE: Do not use a high pressure washer.

Wash

- An annual wash down is required with an ordinary garden hose, neutral pH detergent such as Sioo:x Maintenance Wash and soft bristle brush. Rinse surface thoroughly with water.
- A wash down may also be considered post – installation after a minimum 6 months of weathering, to remove dirt and dust accumulated on the timber during construction.

Dirt build-up, light surface mould or discolouration

- Clean with Sioo:x Maintenance Wash.
- If heavy brushing is required, consider the application of Sioo:x Surface Protection Panel – Part 2, 1 coat, to reseal the surface.

Heavy dirt, persistent mould, stubborn stains or graffiti

- Clean with Sioo:x Prewash.
- Apply Sioo:x Surface Protection Panel – Part 2, 1 coat, to re-seal the surface.

Repair of minor surface damage, wear and tear, scuffing and scratching

- Clean the surface with Sioo:x Maintenance Wash.
- Apply Sioo:x Surface Protection Panel – Part 2, 1 coat to the affected area.

Repair of exposed raw timber that has been cut

- Apply the full treatment of Sioo:x Wood Protection Panel – Part 1, 2 coats and Sioo:x Surface Protection Panel – Part 2, 1 coat to the untreated area.

5 – 7 years since the first application of Sioo:x Surface Protection Panel PRO UV – Part 2

- To freshen-up the timber or make the surface more robust or lighten the colour.
- Clean with Sioo:x Maintenance Wash.
- Apply Sioo:x Surface Protection Panel PRO UV – Part 2, 1 coat, to re-seal the surface.

10 – 12 years since the first application of the full Sioo:x system – Parts 1 and 2

- Clean with Sioo:x Prewash.
- Apply full system treatment Sioo:x Wood Protection Panel – Part 1, 2 coats and Sioo:x Surface Protection Panel PRO UV – Part 2, 1 coat.



The Grounds: Sioo:x is the perfect low maintenance solution for multi-residential apartments. Photographed after nine months of weathering.

Method of Application – Decking

- For new timber, recommended to be applied in controlled factory conditions.
- Old or weathered timber will require thorough cleaning prior to application of Sioo:x. Existing coatings must be removed so that raw timber is present.
- Ensure the timber is dry <15% MC and preferably with a sawn or brushed finish or sanded with 80 grit sandpaper.
- For application to hardwood refer 'Suitable Timber Types' for preparation advice.
- Avoid application in strong sunlight, rainy conditions or below 5 degC.
- Stir products thoroughly before and during application.
- Wipe spills immediately with a wet rag.
- Cover glass, aluminium and objects exposed to splashes – the products are slightly alkaline and can stain.
- Apply Sioo:x Wood Protection Deck – Part 1 adequately to ensure penetration into the timber. Preferably apply to all faces (upper, bottom and sides) or otherwise apply only to exposed faces (upper and sides).
- Allow minimum 2 hours dry time or until touch dry.
- Apply a second coat of Sioo:x Wood Protection Deck – Part 1.
- Allow minimum 4 hours dry time or until fully dry.
- Apply Sioo:x Surface Protection Deck PRO UV – Part 2, 1 coat. Apply to sides coated with Part 1, if possible apply to all 4 sides (front, sides and back) to completely seal the board.
- Allow minimum 2 hour dry time prior to exposure to rain.
- During timber installation, weather exposed end-grain of timber require application of Sioo:x End Grain Sealer – Part 1 and Part 2, 1 coat of each, second coat on touch dry of first coat.
- Non weather exposed ends of decking boards e.g. under flashings require application of Sioo:x End Grain Sealer – Part 2 only.

Coastal Banks Peninsula: Photographed six months after completion, Sioo:x on Vulcan Cladding is the perfect material for an outdoor shower.



Maintenance – Decking

Wood is a natural material and even when treated with a wood protection or a preservative can be impacted by dirt and atmospheric fallout including fungal spore.

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Sioo:x treated surfaces are easy to keep clean due to the toughened surface and regular cleaning will enhance the life of the coating.

Following is a range of maintenance circumstances. The time periods shown are indicative and are based on Sioo:x performance on Abodo Vulcan timber. These times may vary for other timber species.

NOTE: Do not use a high pressure washer.

Wash

- An annual wash down is required with an ordinary garden hose, neutral pH detergent such as Sioo:x Maintenance Wash and soft bristle brush. Rinse surface thoroughly with water.
- A wash down may also be considered post – installation after a minimum 6 months of weathering, to remove dirt and dust accumulated on the timber during construction.

Dirt build-up or light surface mould or discolouration

- Clean with Sioo:x Maintenance Wash.
- If heavy brushing is required, consider the application of Sioo:x Surface Protection Deck – Part 2, 1 coat, to reseal the surface.

1 – 2 years since the first application of Sioo:x Surface Protection Deck – Part 2

- Clean with Sioo:x Maintenance Wash.
- Apply Sioo:x Surface Protection Deck – Part 2, 1 coat, to reseal the surface.

Heavy dirt, persistent mould, stubborn stains or graffiti

- Clean with Sioo:x Prewash.
- Apply Sioo:x Surface Protection Deck – Part 2, 1 coat, to re-seal the surface.

Repair of minor surface damage, wear and tear, scuffing and scratching

- Clean the surface with Sioo:x Maintenance Wash.
- Apply Sioo:x Surface Protection Deck – Part 2, 1 coat to the affected area.

Repair of exposed raw timber that has been cut

- Apply the full treatment of Sioo:x Wood Protection Deck – Part 1, 2 coats and Sioo:x Surface Protection Deck – Part 2, 1 coat to the untreated area.

8 – 10 years since the first application of the full Sioo:x system – Parts 1 and 2

- Clean with Sioo:x Prewash.
- Apply full system treatment Sioo:x Wood Protection Deck – Part 1, 2 coats and Sioo:x Surface Protection Deck – Part 2, 1 coat.

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