

Dulux APP *Surfaceshield*[™] S

3.13

Sacrificial Anti-Graffiti Surface Treatment

How does it work?

APP Surfaceshield S is a **microfilm surface treatment** produced from vegetable biopolymers suspended in water. Being an aqueous solution, APP Surfaceshield S is non-poisonous, non flammable and **meets the most stringent VOC regulations**.

APP Surfaceshield S has specifically been developed for use on **vertical surfaces**. When sprayed, a film is formed which provides efficient and weather-resistant **protection** against graffiti and normal atmospheric dirt and grime. The reversible, protective film **resists substrate penetration** of most types of paint and permanent markers used by graffiti vandals.

Once APP Surfaceshield S is activated with hot water, the protective film begins to swell up after several minutes (i.e. it activates itself) and can then be removed, together with the graffiti or other dirt without the use of any solvents, chemicals and/or other corrosive techniques. The protective coat sacrifices itself and must be re-applied to renew the protective function.



In normal cases, APP Surfaceshield S is neither visible on the surface nor causes colour changes. It may however, slightly alter the light reflection of the coated surface.

Suitable substrates

In principle APP SurfaceShield S can be used on most **wettable**, porous and non-porous vertical surfaces including:

- Natural stone
- Concrete
- Aluminium
- Steel
- Wood
- Clinker
- Artificial stone
- Suitable painted surfaces
- Brick
- Sandstone*

* Soft and easily damaged substrates, such as Limestone and some Sandstone, may require specialized preparation prior to treatment with APP Surfaceshield. Refer to your Dulux Protective Coatings Specifications Consultant for specific advice.

It is important that the surface can withstand the parameters required for the graffiti removal (hot water pressure) without damage. On surfaces that cannot be wetted or strongly repel water, APP Surfaceshield S should only be used after first reducing the surface tension with a dishwasher detergent.

The combination of the biopolymer molecules used in APP Surfaceshield S allows the homogeneous film to bridge over small punctures on the surface. During rain or periods of high humidity, the film may absorb some water and change appearance slightly. Even with this change, the film remains very resistant to rainfall and stormy weather. The absorbed water is eventually released through diffusion and/or evaporation.

APP Surfaceshield S is subject to wear, particularly in cases where the surface is regularly flooded or where poor drainage exists. Such extreme cases must be **inspected regularly** (every 12 months) and if necessary, a single additional coat of APP Surfaceshield S should be applied to exposed locations.

Mechanical damage should be repaired as quickly as possible.

Refer to Table 1 on the following page for a more detailed comparison between the APP Surfaceshield products available.

Dulux APP Surfaceshield™ S

3.13

Table 1: APP Surfaceshield Product Comparison

Product		Surface Type	Protection Against
APP Surfaceshield S	<ul style="list-style-type: none"> • Self sacrificial vertical surface treatment • Medium-long term surface protection • Re-application required • No hazardous chemicals or solvents required to clean graffiti 	<p>Non porous surfaces</p> <ul style="list-style-type: none"> • Suitable non ferrous substrates • Suitable painted or coated surfaces <p>Porous surfaces</p> <ul style="list-style-type: none"> • Clay/brick masonry • Natural stone • Concrete • Non-glazed tiles • Wood <p>Very porous surfaces</p> <ul style="list-style-type: none"> • Sandstone 	<ul style="list-style-type: none"> • Vandalism caused by graffiti, paint and permanent markers • Atmospheric pollution, dirt and grime
APP Surfaceshield HD	<ul style="list-style-type: none"> • Non-Sacrificial vertical surface treatment • Long-term surface protection • Single application • Use of cleaning agents or graffiti removers may be required for removal of stubborn contamination 	<p>Porous surfaces</p> <ul style="list-style-type: none"> • Clay/brick masonry • Natural stone • Concrete • Non-glazed tiles <p>Very porous surfaces</p> <ul style="list-style-type: none"> • Sandstone 	<ul style="list-style-type: none"> • Vandalism caused by graffiti, paint and permanent markers • Atmospheric pollution, dirt and grime • Construction damage, grout staining and marking
APP Surfaceshield HD-H	<ul style="list-style-type: none"> • Non-Sacrificial horizontal surface treatment • Long-term surface protection • Single application • Use of cleaning agents or mechanical scrubbing may be required for removal of stubborn contamination 	<p>Porous surfaces</p> <ul style="list-style-type: none"> • Clay/brick masonry • Natural stone • Concrete • Non-glazed tiles <p>Very porous surfaces</p> <ul style="list-style-type: none"> • Sandstone 	<ul style="list-style-type: none"> • Chewing gum • Oil and food stains • Tyre marks • Mould • Dirt & Grime

* For optimum protection against graffiti APP Surfaceshield HD can be combined with APP Surfaceshield S.

Dulux APP *Surfaceshield*[™] S

3.13

Application

1. Surface Preparation

Always ensure that the surface to be protected is **completely clean** and free of dust, dirt, oil and silicone and is wettable. In cases of heavy soiling, and in particular with soot and other greasy residues from the air, the surface must be thoroughly cleaned with an industrial detergent and hot water. For large surfaces, it is best to use a high-pressure cleaner with a regulated injection nozzle, through which the detergent is added in 2 to 5% concentrations. For surfaces that have been previously blasted (with sand or other abrasives) or ground, the blasting material and any other residue must be completely washed away. Dust can seriously impact the adhesion of the dried APP Surfaceshield S coating, giving it a flaky appearance.

APP Surfaceshield S should be applied to **pH-neutral surfaces**. Application over strongly alkali surfaces (such as new concrete or freshly applied mineral paint) may cause **yellowing** of the film but will not affect its protective properties. This yellowing can normally be washed out after 2 weeks using cold water (lightly flood the affected area) or, in the short term, can be bleached out using sodium bisulphate (2-4% in water). The alkalinity of a surface can be easily measured using pH indicator paper prior to application.

If a concrete surface is still “dusty” after pre-cleaning, it should be treated with an **alkali silicate based densifier** and then rinsed with water until the surface is pH-neutral.

When using APP Surfaceshield S on **painted and/or plastered surfaces**, great care is required as many paint systems and plasters cannot withstand exposure to hot water or are very pressure-sensitive. Due to the difficulty in knowing how well the paint or plaster was applied, application of APP Surfaceshield S to a **small test area** is recommended, prior to performing the entire project.

If the substrate that is to be protected is unstable or tends to “flake off” it may be necessary to first lightly impregnate (not saturate) the substrate with **APP Surfaceshield HD**. Once APP Surfaceshield HD has dried, the application of APP Surfaceshield S can be started. An unstable surface can be identified if white remnants remain on the back of your hand once it has been run over the dry surface.

Dulux APP *Surfeshield*[™] S

3.13

2. Application

The amount of APP Surfeshield S required will vary in relation to the porosity of the surface being coated. Refer to table 1 for a rough indication of the **spreading rates** required for the surface to be protected.

The application of too much APP Surfeshield S can cause large amounts of rain water to be absorbed by the coating. This may lead to delamination as the protective film becomes heavy and is pulled downwards. An excessively thick layer can also result in the formation of runs or droplets and may cause yellow or brown discolouration. Excess material can be reduced by dabbing the applied surface with a sponge or by pressure washing with cold water.

Table 1: Estimated coverage of SurfaceShield APP-S

SURFACE	PREPARATION GUIDE	SYSTEM		COVERAGE (m ² /L)
HARD, NON POROUS (ferrous and non ferrous surfaces, painted or coated surfaces)	Clean and degrease surface to remove contaminants.	1st Coat	APP Surfeshield S	5-6
POROUS (clay bricks, natural stone, concrete)	Clean and degrease surface to remove contaminants. If required, wet the surface with water prior to application.	1st Coat	APP Surfeshield S	3-4
		2nd Coat	APP Surfeshield S	3-4
		1st Coat	APP Surfeshield HD	5
		2nd Coat	APP Surfeshield S	3-4
VERY POROUS (sandstone)	Clean and degrease surface to remove contaminants. Flood the surface with water prior to application.	1st Coat	APP Surfeshield S	2-3
		2nd Coat	APP Surfeshield S	2-3
		3rd Coat	APP Surfeshield S	2-3
		1st Coat	APP Surfeshield HD	3-4
		2nd Coat	APP Surfeshield S	2-3
		3rd Coat	APP Surfeshield S	2-3

When applying APP Surfeshield S, ensure that the first coat results in a homogeneous protective film on the surface. The **damp and thereby shiny surface** must dry evenly. If the shine suddenly disappears at individual locations shortly after spraying, indicates that the material has been excessively absorbed by the porous surface. Immediately re-apply APP Surfeshield S to these areas. The second coat should preferably be applied once the first coat is hand-dry or when the wet-look (darker look) of the porous surface diminishes and APP Surfeshield S becomes largely invisible.

On **non-porous surfaces**, such as metals, it is important not to apply too much material per coat as this may result in tear-like running or a leopard skin pattern once dried. The surface must also be **completely dry** before starting to apply APP Surfeshield S.

On **semi-porous** and particularly on **porous substrates**, it is important that the surface is **completely wet** (soaked with water) before the first coat of APP Surfeshield S is applied. This is necessary to avoid too much APP Surfeshield S being absorbed by the wall. APP Surfeshield S is impervious to water and hence the applied water will be completely removed from the wall without any problem.

Dulux APP *Surfaceshield*[™] S

3.13

In the case of strongly absorbent surfaces, the work should always be carried out in a team of **two applicators**. One should flood the vertical surface with water, in order to achieve good wetting, while the other applies APP Surfaceshield S immediately afterwards onto the damp (but no longer dripping) surface.

The first coat of APP Surfaceshield S must be touch dry before the second coat is applied. The drying time in warm or dry weather is 30-60 minutes, although in damp and/or cold weather the drying process can take up to half a day. At temperatures of around 5°C (air and surface), the drying of the film can take one or more days.

Depending on the relative humidity, APP Surfaceshield S may be applied down to a surface temperature of 5°C. Once the applied product has transformed to the gel form, the danger of APP Surfaceshield S freezing has passed.

For the best results, APP Surfaceshield S should be applied using an **airless spray gun**. In practice, the coating thickness of APP Surfaceshield S cannot be exactly measured due to the different surfaces. The amount of APP Surfaceshield S that can be sprayed depends on the nozzle/spay tip used, the distance between the vertical surface and the nozzle and the speed of movement of the arm holding the pistol.



The following parameters should be followed:

- Spraying angle between 30° for porous surfaces and 60° for non-porous surfaces.
- Boreholes between 0.17mm and 0.21mm.
- Maintaining a distance of 30-40cm from the spray-head to the surface.
- Maximum pressure of approximately 160-180 bar. An adjusted pressure of 50-80 bar is recommended when spraying large, even surfaces. A reduction to about ≤50 bar is suggested for applying on complex or difficult to reach surfaces (such as window frames).

During application, vertical and horizontal overlapping should be used. Semi-circular arm movements are not recommended. A single coat of APP Surfaceshield S normally corresponds to two overlapping horizontal spay movements plus two overlapping vertical spray movements.

The airless unit should be cleaned after every use by pumping hot water into the unit and rinsing it.

Dulux APP *Surfaceshield*[™] S

3.13

3. Graffiti removal

The surface with the graffiti must be **activated** for several minutes by soaking the surface with hot water (without pressure) and then be kept dripping for 2-4 minutes. During this time, the APP Surfaceshield S film begins to swell. It is very important that the **film swells up under the graffiti**. In the case of cold external or wall temperatures or with soft surfaces (can only withstand low water pressure), good activation with hot water is particularly important. These conditions may require additional hot rinses and extra time for APP Surfaceshield S to fully activate. Failure to completely activate Surfaceshield S may compromise the graffiti removal.

After activation, the removal of the protective film together with the graffiti and other soiling begins. The APP Surfaceshield S film is **peeled off** from the side with a wide, hot jet of water from a high-pressure hot water unit. The water jet must always be on a 30° to 45° angle to the surface (never vertical).



The water must have sufficient time to penetrate the film under the graffiti. If the graffiti paint is not being peeled off easily, the water jet should be moved to another side of the graffiti in order to give the water on the previously processed side more time to penetrate further into the film beneath the graffiti.

The **water temperature** at the nozzle should be at least 60°C. Slightly lower temperatures are possible, but will increase the time and pressure required. If the surface can withstand higher temperatures without damage, a maximum of 80°C can be used.

The **water pressure** must be adjusted according to the surface to avoid any damage occurring. Hard surfaces, such as granite, require higher pressures of 50-100 bar at the nozzle whereas soft surfaces, such as sandstone, require lower pressures of 50-80 bar at the nozzle. The higher the pressure, the less time will be needed for the removal of the graffiti.

Bear in mind however, that with high pressure, pieces of the graffiti will be peeled off in shreds that will “fly about” all over the place, and will have to be collected from other wall surfaces or from a wide area around the surface. Therefore the use of a lance with built-in pressure regulation (**twin-tube lance**) is highly recommended.

When dealing with **highly delicate surfaces**, such as old stucco, cleaning with a commercial (white) steam cleaner and a sponge may be required. Since the steam cleaner applies steam above the boiling point, the surface must be able to sustain this temperature, otherwise the steam device must be kept away from the surface to dilute the effective water temperature applied.

After the removal of the painted graffiti, the surface should be once again washed thoroughly with hot water. Porous surfaces should then be immediately re-protected with APP Surfaceshield S while they are still wet. APP Surfaceshield S should be **re-applied** in the necessary number of coats and coat thicknesses and overlapped with the surfaces that are already protected. With non-porous and non-absorbent surfaces, allow the vertical surface to dry before starting to apply the new protective film.

Dulux APP *Surfaceshield*[™] S

3.13

Quality control, transport and storage

If the liquid APP Surfaceshield S is contaminated by bacteria or fungus spores during storage or handling, destruction of the product through bacteria and/or fungi can occur. APP Surfaceshield S should not be opened in a damp room due to the fungus spores that are usually present. Once APP Surfaceshield S has dried into the solid form, there is no longer a danger of being broken down by micro organisms (bacteria, fungus spores, etc.).

APP Surfaceshield S contains conservation agents, which ensures it can be stored for long periods in the liquid form. If unopened, APP Surfaceshield S can be stored for up to 2 years from its date of production, assuming the correct storage conditions are maintained. Once opened, APP Surfaceshield S can normally be kept for up to 3-6 weeks, depending on the temperature, the level of contamination of the lid and of the product itself.

APP Surfaceshield S is manufactured by an ISO 9001 certified factory under sterile conditions and filled into containers that are fitted with a seal that has to be ripped off when opened for the first time. Every batch is tested and only dispatched after successfully passing these tests. Each container bears the batch number and date of manufacture. A quality assurance certificate accompanies every delivery of APP Surfaceshield S.

APP Surfaceshield S must not be allowed to freeze, either in transport or during storage. The product is no longer usable once frozen. Before long journeys, or when being stored in the service vehicle in cold weather, the high pressure cleaner and the airless unit should be completely emptied in order to avoid frost damage to the units.

The ideal storage requirements that need to be met are that the product should be stored at a temperature between 5°C and 20°C, not exposed to direct sunlight or stored in a damp room.

Residual APP Surfaceshield S should not be transferred from a used container into a new container. Every time the container is opened the product should be checked visually and by smell.

APP Surfaceshield S is extremely slippery. Any product spilled on the floor should immediately be wiped up or washed away.

Note: This PC Tech Note should be used in conjunction with the relevant Data Sheet before using APP Surfaceshield S.

For more information regarding APP Surfaceshield HD refer to Tech Note 3.14 or for more information on APP Surfaceshield HD-H refer to Tech Note 3.15.

For more information, please contact the Dulux Protective Coatings Technical Consultant in your state.