Dulux APP *Surface*shield™ *S* 3.13

Sacrificial Anti-Graffiti Surface Treatment

How does it work?

APP Surfaceshield S is a **sacrificial microfilm surface treatment**.

A waterborne product derived from vegetable biopolymers, APP Surfaceshield S is non-toxic, non flammable and safer to apply. APP Surfaceshield S' low volatile organic component formulation meets the most stringent of 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 most 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.

To clean the surface, the APP Surfaceshield S is first activated with **hot water**. The protective film activates (begins to swell) and after several minutes can be completely removed, together with graffiti, pollution and other contaminants with high pressure hot water. There is no need for the use of any solvents, chemicals and/or other corrosive techniques. The clean and damp surface is then re-treated with APP Surfaceshield S in order to restore the protective function.

In most cases, APP Surfaceshield S is neither visible on the surface nor does it cause colour change. It may however, slightly alter the light reflection of the coated surface, creating a minor difference in surface sheen.

Suitable substrates

In principle APP Surfaceshield S can be used on most **wettable**, porous vertical surfaces including:

- Natural stone
- Concrete
- Clinker
- Artificial stone
- 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 to ensure that the substrate is sound and can withstand the high pressure hot water method required for graffiti removal without damage.*

The biopolymers in APP Surfaceshield S can bridge small pinholes in the surface. During rain or periods of high temperature and humidity, the film may absorb some water and change appearance slightly. These conditions may activate the swelling characteristics of the coating. The absorbed water is eventually released through diffusion and/or evaporation, however in extreme cases of water reabsorption, reapplication of the APP Surfaceshield S may be required.

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 also 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 urfaceshield S	▪ Self sacrificial vertical surface treatment ▪ Medium term surface protection ▪ Re-application required after cleaning ▪ No hazardous chemicals or solvents required to clean most graffiti ▪ 1 or 2 coats required depending on substrate porosity	**Porous surfaces** ▪ Clay/brick masonry ▪ Natural stone ▪ Concrete ▪ Non-glazed tiles **Very porous surfaces** ▪ Sandstone	▪ Vandalism caused by graffiti, paint and permanent markers ▪ Atmospheric pollution, dirt and grime
APP Surfaceshield HD	▪ Non-Sacrificial vertical surface treatment ▪ Long-term surface protection ▪ Single application ▪ Use of cleaning agents or graffiti removers will be required for removal of graffiti	**Porous surfaces** ▪ Clay/brick masonry ▪ Natural stone ▪ Concrete ▪ Non-glazed tiles **Very porous surfaces** ▪ Sandstone	▪ Vandalism caused by graffiti, paint and permanent markers ▪ Atmospheric pollution, dirt and grime ▪ Construction damage, grout staining and marking
APP Surfaceshield HD-H	▪ 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	**Porous surfaces** ▪ Clay/brick masonry ▪ Natural stone ▪ Concrete ▪ Non-glazed tiles **Very porous surfaces** ▪ Sandstone	▪ Chewing gum ▪ Oil and food stains ▪ Tyre marks ▪ Mould ▪ Dirt & Grime

Surface Preparation and Application

Surface Preparation

Always ensure that the surface to be protected is **completely clean** and free of dust, dirt, oils, 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 alkaline surfaces (such as new concrete or freshly applied mineral paint) can affect the coating and cause **yellowing** of the film. In this circumstance the protective properties of the coating will be affected – the affected film must be removed, the pH rechecked and if suitable, reapplication of APP Surfaceshield S will be required. The alkalinity of a surface can be easily measured using pH indicator paper prior to application and should be recorded prior to any coating works beginning.

If the substrate that is to be protected is very porous or unstable, it may be necessary to first apply a light coat of **APP Surfaceshield HD** (do not saturate surface). Once APP Surfaceshield HD has completely dried, the application of APP Surfaceshield S can be started. Removal of graffiti products from porous surfaces is much more difficult compared to smooth surfaces.

Dulux APP *Surfaceshield™ S* 3.13

Application

The amount of APP Surfaceshield S required will vary in relation to the porosity of the surface being coated. Refer to table 2 for a rough indication of the **spreading rates** required for the surface to be protected.

Note: If APP Surfaceshield S beads and runs upon application, then an even film will not be achieved and its overall performance characteristics will be affected.

An excessively thick layer of APP Surfaceshield S can result in increased absorption of rain water, resulting in a heavy, swollen film that may delaminate. An excessively thick layer can also result in runs or droplets that may discolour. Removal of existing coating and re-application will be required.

APP Surfaceshield products should only be applied by experienced applicators trained in product characteristics, application, uses and removal techniques. The applicator should also be responsible for the removal of graffiti and other contaminants, if and when required. QA & general record keeping of the works conducted are important to effectively manage and maintain protected surfaces.

Table 2: Estimated coverage of APP Surfaceshield S

SURFACE	PREPARATION GUIDE	SYSTEM		COVERAGE (m^2/L)
SMOOTH ■ Precast concrete	Clean and degrease surface to remove all contaminants. Remove any surface bond breakers, check surface alkalinity. Note: Pre-wet surface prior to application (damp only) This allows for better set up of the product and prevents over absorption into the substrate. 1 or 2 coat application will depend on substrate condition	1st Coat 2nd Coat	APP Surfaceshield S APP Surfaceshield S	**4-5** **4-5**
POROUS ■ Clay bricks ■ Natural stone ■ Concrete	Clean and degrease surface to remove all contaminants. Pre-wet the surface with water prior to application. This allows for better set up of the product and prevents over absorption into the substrate.	1st Coat 2nd Coat	APP Surfaceshield S APP Surfaceshield S	**3-4** **3-4**
		1st Coat 2nd Coat	APP Surfaceshield HD APP Surfaceshield S	**4** **3-4**
VERY POROUS ■ Sandstone	Clean and degrease surface to remove contaminants. Flood the surface with water prior to application. Note: Pre-wetting the surface prior to application (damp only) allows for better set up of the product and prevents over absorption into the substrate.	1st Coat 2nd Coat 3rd Coat	APP Surfaceshield S APP Surfaceshield S APP Surfaceshield S	**2-3** **2-3** **2-3**
		1st Coat 2nd Coat 3rd Coat	APP Surfaceshield HD APP Surfaceshield S APP Surfaceshield S	**3-4** **2-3** **2-3**

When applying APP Surfaceshield 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 this indicates that the material has been excessively absorbed by the porous surface. Immediately re-apply APP Surfaceshield S to these areas. The second coat can be applied once the first coat is hand-dry or when the wet-look (darker look) of the porous surface diminishes and APP Surfaceshield S becomes largely invisible. Otherwise 2nd and 3rd coats if required can be applied over subsequent days.

On **smooth surfaces**, 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 **clean & damp** before starting to apply APP Surfaceshield S.

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

Dulux APP *Surface*shield™ *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 10°C (air and surface), the drying of the film can take one or more days. Application during very cold weather should be avoided.

Depending on the relative humidity, APP Surfaceshield S may be applied down to a surface temperature of 10°C. Care must be taken to not push this boundary.

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:

- Spray angle between 30° for porous surfaces and 60° for non-porous surfaces.
- Tip sizes between 0.17mm and 0.21mm.
- Maintain 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.

Graffiti Removal

The surface with the graffiti must be **activated** by soaking the surface with hot water (without pressure) and then be kept dripping for approx **15 minutes (this activation period will vary depending on substrate and ambient tempretures)**. 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 will compromise the graffiti removal process. Activation of the Surafceshield S will take longer in very cold conditions and cold substrate temperatures also affect product swelling. Small samples should be conducted to manage the cold temperature effects. A small hand held scrubbing brush can be used to qualify effective swelling of the product. Once easy removal is being achieved, then hot water jetting can be started.

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, stop water jetting and reapply hot water to affected surfaces at low pressure to enable effective swelling of the APP Surfaceshield S film.
- The water temperature at the nozzle should be at least 60°C. If the surface can withstand higher temperatures without damage, a maximum of 80°C can be used.

Dulux APP *Surfaceshield™ S* 3.13

- 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.
- Please note, however, that high pressure wash will cause graffiti to fly off in shreds in all directionsand will have to be collected from nearby surfaces or from a wide area around the target surface. Therefore the use of a lance with built-in pressure regulation (twin-tube lance) is highly recommended.

Dulux cannot guarantee that every type of graffiti can be completely removed. This technology may not be able to protect against graffiti agents which etch, or otherwise damage the substrate. In this case the use of graffiti removal chemicals will be required. APP Surfaceshield S will not be effective in all cases, but is intended to aid removal of graffiti in most.

- 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 damp. 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.

Quality control, transport and storage

Please note:

- 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 preservatives, 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 cleaned up.

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

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 on any of our products, please contact your Dulux Protective Coatings Technical Consultant.