

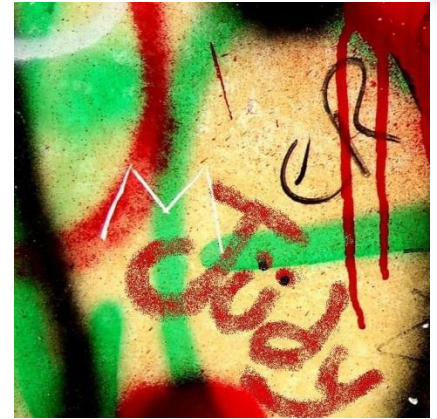
## Anti-Graffiti Coatings and Treatments

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### What Is Graffiti?

Graffiti is the deliberate **defacement** of property without the owner's consent. Graffitiists favour aerosol paint cans, as they are easy to conceal and fast to apply. Heavy-duty marking pens, paint, large crayons lipstick and just about anything else that leaves a mark are also used.

Graffitiists favour **highly visible** broadwall areas that are **rarely cleaned**, as these walls present an enduring showcase for their work. The fact is that where graffiti is removed promptly, subsequent graffiti is much slower to appear, as such areas are not deemed to be worth the effort, and tags are more likely to appear on walls already carrying tags, as the ego of the graffitiist will not allow a rival's tag to remain unchallenged.



So, an effective plan against graffiti must include (among other things) an effective anti-graffiti system that allows rapid removal of the offending graffiti and reinstatement of the original appearance.

### What Are "Anti-Graffiti" Products?

An "anti-graffiti" product is a surface treatment or coating that is used in graffiti-prone areas for the prevention of **permanent adhesion of graffiti** to the substrate. Please note that "anti-graffiti" does not mean that the coating or treatment somehow prevents graffiti from being applied to it. If only this were possible! What it does mean is that graffiti can be removed quickly and efficiently, and this can discourage the reappearance of graffiti. Due to the plethora of graffiti media and the wide range of painted and unpainted surfaces graffiti is applied to, complete removal of all graffiti cannot be guaranteed in all cases.

### Are All Anti-graffiti Products The Same?

There are several types of product used in the protection of surfaces against graffiti:

- *Sacrificial*
- *Semi-Sacrificial*
- *Non-Sacrificial*
  - *Surface Treatments*
  - *Permanent Two-Pack Coatings*

**Sacrificial treatments** are usually clear, thin film emulsions or solutions applied to the surface to be protected. They may be applied directly over the bare substrate, or over other types of coatings. When defaced, the sacrificial coating is completely removed (usually by hot water blast) and a new coating is immediately reapplied.

**Semi-sacrificial coatings** are high build coatings (usually acrylics) that shed a few microns each time the graffiti is scrubbed off. After several cleaning cycles, and before the coating is completely worn away, further coats are reapplied to restore the original appearance.

**Non-sacrificial anti-graffiti** products fall into two categories – invisible surface treatments, or permanent two-pack coatings that normally do not require reapplication after graffiti removal. **Non-sacrificial surface treatments** do not form a film – they chemically modify the surface tension of the substrate, lowering the adhesion of any graffiti applied after treatment. The graffiti is then removed relatively easily by medium to high pressure hot water wash. **Permanent two-pack coatings**, on the other hand, form a very hard, protective film over the substrate, and are either pigmented or clear. Clear two-pack anti-graffiti coatings impart a distinct gloss or sheen, and can slightly darken some substrates such as concrete or bluestone (much like wet concrete looks darker than dry concrete). This change in substrate appearance is only an issue if the coating is not applied on the entire wall, but only up to a certain height. Graffiti is generally removed using aggressive graffiti removal agents that dissolve everything but the two-pack coating.

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### What affects Graffiti Resistance?

Graffiti resistance of a substrate is affected by:

- *Whether it is bare (unpainted), painted or treated*
- *The type of coating on the substrate, and its age*
- *Components of the graffiti medium (product formulation), and its age*
- *Frequency of removal*
- *The substrate profile (smooth or rough)*

These are discussed in detail below.

### Substrate – Painted, Unpainted or Treated?

**Unpainted surfaces**, such as concrete, stone, brick or timber, are generally very **porous**, and hence allow graffiti media to penetrate the pores, making the graffiti difficult to remove. Repeated cleaning with ultra high pressure water wash, abrasive blast, wire brush and other mechanical means of removal are destructive, while the use of chemical strippers and solvents can drive stains and pigments deeper into the substrate.

**Painted surfaces** seal the surface of the substrate, preventing the ingress of graffiti, but may present new problems for graffiti removal (read on).

**Surface treatments** penetrate the surface pores and are largely invisible. Some are effective in repelling water and water based graffiti media, but not other types of graffiti. Others, however, can repel the adhesion of all types of graffiti as well as dirt and spills.

### Types of Coatings and How Graffiti Affects Them

**Single pack paints**, whether solvent-borne enamels or water-based acrylics, have poor resistance to the **solvents** present in graffiti and in the graffiti-removing agent, causing them to soften, wrinkle or dissolve. Dyes penetrate and stain single packs quite readily.

Two-pack paints, being much more highly cross-linked and less porous, are far more chemically resistant and hence will be far less affected by solvent present in graffiti and graffiti-removing agents, and are much less likely to absorb colours.

The most effective anti-graffiti paints are two-pack, solvent-borne polyurethanes. These offer highly cross-linked coatings with very good solvent-resistance, resistance to graffiti-removing agents, low porosity and high gloss levels. (See below for specific product examples.)

All other things being equal, the higher the gloss level, the better the graffiti-resistance. A lower gloss level offers an increased surface area and an improved key for the graffiti to adhere to. Graffiti-removing agents cannot always reach the tiny troughs on the surface to effectively remove the graffiti, resulting in graffiti residues and shadowing.

The colour of the anti-graffiti coating can affect the perception of how well graffiti has been removed. Mid-toned, neutral colours such as mid grey or sandstone show less shadowing (if present) than lighter or brighter, cleaner colours, and hence are preferred for areas frequently attacked by graffiti.

### Age of the Coating

The longer a two-pack polyurethane paint has been applied, the greater the extent of cross-linking, and hence the better the graffiti resistance. It is essential, therefore, to ensure that the newly applied two-pack paint is protected from graffiti attack until it has fully cured. On the other hand, single pack paints, particularly enamels, tend to chalk with time, creating a porous surface that absorbs more graffiti.

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### Graffiti Media Used – Type / Formula / Colour

The graffiti medium used, whether an aerosol spray can or heavy-duty marker, will differ from others in terms of difficulty of removal due to materials present in the **formulation**. **Formulation differences** also occur between **different brands** of the one generic type of medium used, resulting in differences in ease (or difficulty) of graffiti removal.

Higher quality brands will generally contain superior raw materials such as more durable resins, and more fade-resistant pigments. Low quality brands may contain lower levels of pigment and resin and have poor coverage, or may tend to sag or run more, resulting in thinner, more easily removed graffiti. Then again, the running and sagging of the graffiti medium may result in the graffiti covering a greater area and thus requiring more effort to remove.

Aerosol spray cans are generally solvent-borne enamels or water-based paints, enamels being far more common. The organic solvent component of enamel spray paints can affect the existing single pack coatings on the wall; depending on the solvent mix, the effect can range from slight softening to wrinkling to dissolution of the underlying paint. On drying, the underlying paintwork may crack, craze or blister.

Heavy-duty markers based on xylene, toluene or other harsh solvents can affect paintwork also. Alcohol or water based markers do not affect paintwork to any degree, but sometimes invasive dyes can stain the surface.

Some spray paint pigment colours and heavy duty marker ink colours can penetrate and stain certain coatings permanently on contact, making it impossible to entirely remove the graffiti.

Other colours don't penetrate until they come in contact with a solvent present in the graffiti-remover; the solvent dissolves or disperses the pigment or ink and carries the colour into the paintwork over a wider area than the original graffiti. Often this appears as "shadowing", which only becomes apparent after the majority of the graffiti has been removed.

### Age of the Graffiti

The longer the graffiti has been left on the surface, the stronger its adhesion to the surface. Enamel based graffiti (eg spraypacks) crosslink as they age, becoming harder and more difficult to remove. Acrylic paints also harden with time, as coalescing agents and other volatile components evaporate from the paint. In all cases, removing graffiti shortly after it has been applied is **significantly easier** than removing aged graffiti.

Removing graffiti shortly after it has been applied has other benefits too:

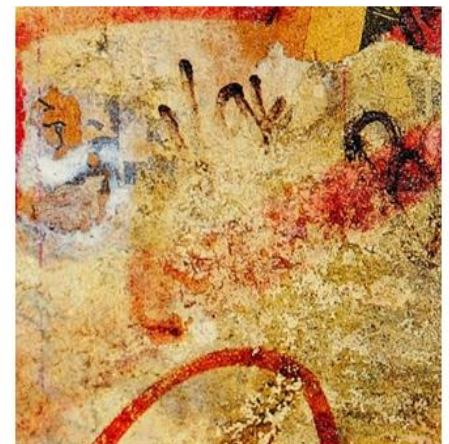
- There is generally **much less graffiti** to clean – graffiti tends to multiply with time as graffitiists readily recognise property that is rarely cleaned, and target it to increase their graffiti's exposure time.
- Tags attract more tags. Areas with no tags are of less interest to graffitiists than areas where tags abound, as each is keen to "mark their territories" where others have done so before.



White graffiti paint runs across the surface of pre-existing graffiti



Underlying paint shows severe cracking due to solvent attack from the graffiti



Red colour has penetrated and dyed the deteriorated, porous paintwork

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### Frequency of Graffiti Removal

Paints are generally subject to “wear-and-tear”, particularly on exterior exposure and in areas in contact with passers-by. Paintwork subject to graffiti obviously bears additional wear-and-tear every time the graffiti is cleaned off. Abrasive materials, such as nylon scourers, to remove graffiti will accelerate the deterioration of the coating, reduce its gloss level and increase the surface area to which new graffiti will adhere, making subsequent graffiti removal increasingly difficult. Leaving graffiti-removing agents on the surface for longer than the manufacturer’s recommendation may also affect the coating.

Conversely, infrequent removal of graffiti, particularly in high visibility areas, presents a desirable target for graffiti artists, so decreasing frequency of cleaning for the sake of coating preservation is not a viable option.

### Typical Surface Profiles and How Graffiti Affects Them

The substrate itself can influence graffiti attack and effectiveness of graffiti removal. If the surface is smooth and continuous (such as sheet metal), then the graffiti has little to key to and removal is easier.

If the surface is rough or porous, it provides a strong key for graffiti to adhere to. Removal of graffiti is also made more difficult as the rough surface provides pits and troughs for the graffiti to cling inside, even when using abrasive pads or scrubbing brushes in addition to graffiti-removing agents.

If, however, the surface is extremely rough and chunky, then it can actually act as a deterrent, as tags are difficult to write quickly over such surfaces and the result is far less readable. Spray packs don’t go far on rough surfaces, as the increased profile requires much more paint in a given area than smooth surfaces. This is the intent of the Geelong Bypass Sound Barrier’s design - deep contours and rich colour, although the surface is still protected with an invisible non-sacrificial treatment (*Dulux APP Surfeshield HD*).

### So, Which “Anti-Graffiti” Product is Best?

The choice of which anti graffiti product to specify and use depends on:

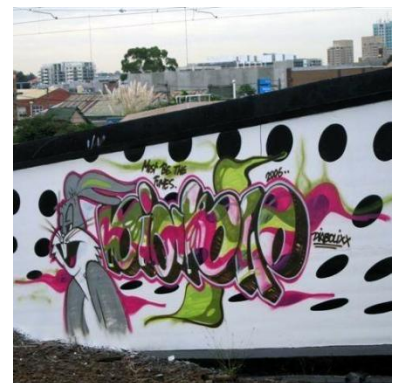
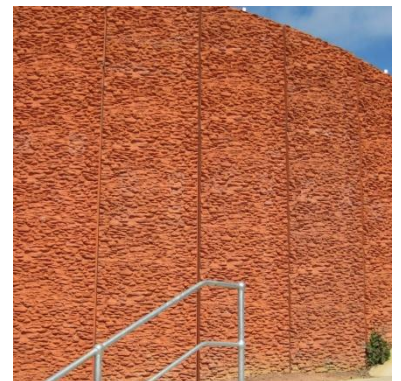
- *How you want the surface to look*
- *How you want to maintain the surface (DIY or Contract Maintenance)*

### Surface Appearance Considerations

If a design feature of your facade is natural stone or unpainted concrete, then a two-pack finish (even a clear) may not give you the look you want, but a surface treatment certainly will – the surface will appear natural. If, however, you want to coat your substrate in a particular colour and keep it graffiti-free and looking great, then a two-pack finish is the best choice.

### Maintenance Considerations

A sacrificial product may seem like a good idea with its water-based, low VOC credentials, easy graffiti removal using hot water wash and ease of reapplication, but what happens if the asset manager forgets the correct procedure and attempts to



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remove graffiti with a conventional (solvent based) graffiti remover? Does a small building (for example a railway station) have different constraints from a very large or long structure (for example, a freeway noise wall)?

Consider all the features you require, and the most practical method of graffiti removal for your job, before you specify.

### Anti-Graffiti Products from Dulux

#### Sacrificial Treatments

- **APP Surfaceshield<sup>®</sup> S** is a water-based microfilm surface treatment that provides protection against graffiti and normal atmospheric dirt and grime. APP Surfaceshield S allows for the safe, effective and economical removal of most types of graffiti, saving treated surfaces from costly traditional methods of removing graffiti such as chemical stripping, abrading or scarifying. Invisible and vapour permeable film.

#### Non-Sacrificial Surface Treatments

- **APP Surfaceshield<sup>®</sup> HD** (heavy duty) is a water-based, non-film forming solution used to treat and protect vertical surfaces from damage caused by graffiti and pollution in a single application. It penetrates even the smallest pores without modifying the appearance of the substrate. Graffiti and pollution can be removed using hot water pressure cleaning. Stubborn graffiti may be removed using Graffiti Eraser in combination with hot water pressure cleaning. Invisible and vapour permeable film.
- **APP Surfaceshield<sup>®</sup> HD-H** (heavy duty, horizontal) is ideal for protecting trafficable surfaces against spills, greasy substances, chewing gum, food and stains. All surface contaminants can be removed using hot water pressure cleaning. Invisible and vapour permeable film.

#### Permanent Two-Pack Coatings

- **Durethane<sup>®</sup> Clear** is a clear two-pack polyurethane available in matt and high gloss. The Matt Clear may be used directly on concrete.
- **Quantum<sup>®</sup> FX** with **Quantum<sup>®</sup> Clear** topcoat - **Quantum<sup>®</sup> FX** is a semi-gloss metallic polyurethane offering a high level of metallic sparkle available in 60 colours. **Quantum<sup>®</sup> Clear** is a very high gloss polyurethane sealer designed specifically for Quantum FX for maximum graffiti resistance.
- **Weathermax<sup>®</sup> HBR** is a gloss polyurethane, specially formulated for application by brush and roller, and can also be applied by spray. Full colour range. It is the perfect anti-graffiti topcoat for maintenance work.
- **Acrathane<sup>®</sup> IF** is a two-pack, high gloss epoxy acrylic. Full colour range. The advantage of Acrathane IF is the isocyanate-free formula and therefore can be spray applied on site where OH&S restrictions may prohibit the spray application of polyurethanes.
- **Acrathane<sup>®</sup> IF Clearcoat** is a clear gloss epoxy acrylic suitable for existing finishes or directly on concrete.

### Graffiti-Removing Agent from Dulux

Graffiti-removing agents are usually mixtures of solvents and/or surface-active agents that are used to dissolve and/or emulsify graffiti and remove it from the surface of permanent two-pack coatings. They are chemically active (and may be quite corrosive) so as to effectively break down the graffiti. Personal protective equipment should be worn whilst handling and using graffiti-removing agents; if they are strong enough to attack paint effectively, they can affect skin tissue too. Abrasive nylon pads or steel wool can aid the removal of heavy deposits of graffiti.

- **Dulux Graffiti Eraser<sup>™</sup>** is a powerful, versatile, and fast-acting graffiti-removing agent. Aerosol spray paints, most permanent markers, inks, crayons and lipstick can be effectively removed from the surface, usually in a matter of minutes.

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