

Graffiti Resistant Coatings

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What Is Graffiti?

Graffiti is the deliberate **defacement** of property without the owner's consent. Graffiti artists use aerosol paint cans most commonly, as it combines paint and applicator and is easy to conceal, although heavy-duty felt-tip markers, paint and brush, large crayons, lipstick and even blood are also used. In fact, just about anything that can quickly leave a mark can be used to graffiti property.

Graffiti artists are attracted to broadwall areas with **high visibility**, particularly those that are **rarely cleaned**, as these walls present a more permanent showcase for their "art" or tags. It is a well-known fact that where graffiti is removed almost immediately, subsequent graffiti is much slower to appear, as such areas are not deemed to be worth the effort. Also, tags are more likely to appear on walls already carrying tags, as the ego of the graffiti artist will not allow a rival's tag to remain unchallenged.

So, an effective plan against graffiti must include (among other things) an effective graffiti-resistant coating system that allows rapid removal of the offending graffiti.



What Are "Graffiti-Resistant" Coatings?

We often hear a coating being described as "anti-graffiti", referring to any coating that is used in graffiti-prone areas for the purpose of preventing the permanent adhesion of graffiti to the substrate. The term "anti-graffiti" can be misleading, however as it implies that the coating somehow prevents graffiti from being applied to it. If only this were possible!

Note that due to the wide range of materials that can be used for graffiti, complete removal of the graffiti cannot be guaranteed in all cases.

Are All Graffiti-Resistant Coatings The Same?

There are generally three types of coating used in protection of surfaces against the adhesion of graffiti:

- *Sacrificial*
- *Semi-Sacrificial*
- *Permanent [Non-Sacrificial]*

Sacrificial coatings are usually clear, thin film wax emulsions applied to the surface to be protected. When defaced, the sacrificial coating is usually hosed off with hot water and a new coating is immediately reapplied.

Semi-sacrificial coatings are usually high build acrylics that shed a few microns of the top layer each time the graffiti is scrubbed off. After several cleaning cycles, and before the coating is completely worn away, a further coat or two are reapplied to restore the original appearance.

A permanent graffiti-resistant coating is a coating that resists permanent damage or discolouration from the application of graffiti, and is also resistant to the harsh graffiti removal agents used to clean the surface. Such coatings are usually fairly glossy and chemically inert and thus minimise the ability of the graffiti to penetrate or adhere to the coating and so make subsequent removal easier. The permanent graffiti resistant coating is the easiest to maintain, as it withstands repeated cleaning using conventional graffiti removal cleaners such as Dulux Graffiti Eraser.

This Tech Note will focus on coatings offering PERMANENT graffiti-resistance.

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What affects the Graffiti Resistance of a Coating?

Graffiti resistance of a coating are affected by components of the graffiti medium (product formulation), the type of coating onto which it is applied, and the substrate, as detailed below:-

Graffiti Media Used – Type/Colour/Brand/Quality

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, solvent-borne enamels being far more common. The organic solvent component of enamel spray paints can soften single pack coatings.

Different brands of aerosol spray enamels differ with regard to the mix of solvents present in the paint; 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.

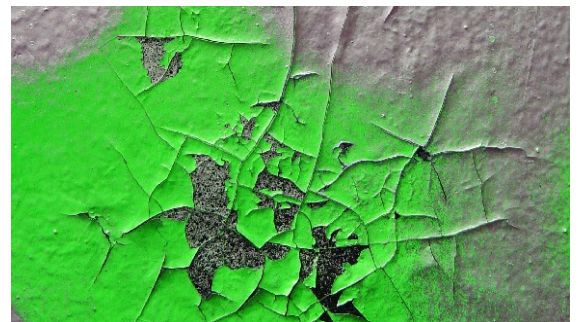
Heavy-duty markers based on xylene, toluene or other harsh solvents can affect paintwork also. Alcohol or water based markers do not affect paintwork to any degree.

Some spray paint pigment colours and heavy duty marker ink colours contain dyes and 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. Often this appears as "shadowing", becoming apparent after the majority of the graffiti has been removed.



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



Underlying paint shows severe cracking due to solvent attack from graffiti medium.



Red colour has penetrated and dyed the deteriorated, porous paintwork.

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Graffiti Resistant Coating Used – Generic Type/Gloss Level/Colour

Single pack paints, whether solvent-borne enamels or water-based acrylics, have poor resistance to graffiti. Solvents present in the graffiti and the graffiti-removing agent will all affect single pack paints, causing them to soften, wrinkle or dissolve completely. Dyes penetrate and stain single packs more 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 graffiti-resistant 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 troughs on the surface to effectively remove the graffiti, resulting in graffiti residues.

The colour of the graffiti-resistant 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 Graffiti Resistant Coating

The longer a two-pack 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.

Age of the Graffiti

The longer the graffiti has been left on the surface, the stronger its adhesion to the surface. Enamels 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 **psychological 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.

Frequency of Graffiti Removal

Paints generally are subject to "wear-and-tear", particularly on exterior exposure and in areas subject to contact with passers-by. Paintwork subject to graffiti obviously has additional wear-and-tear as the graffiti is cleaned off. The more frequent the graffiti removal, the greater the wear-and-tear.

The use of abrasive nylon pads to remove graffiti will accelerate the deterioration of the surface of the coating, reduce the gloss level of the paintwork 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 gloss level of the surface.

Substrate Type and Condition

The substrate itself can influence the extent of graffiti attack and effectiveness of graffiti removal.

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If the surface is very smooth (such as sheet metal on the exterior of trains, for example), then adhesion of graffiti to the surface tends to be much lower, and hence is easier to remove. Also, there are no pits or cracks in the surface for graffiti residues to cling inside whilst the surface is being cleaned, so complete removal is much easier.

If the surface has a low profile texture and/or is porous, graffiti will adhere to it more easily as the surface provides a mechanical key for the graffiti to adhere to. Removal of graffiti is also made more difficult as the surface provides pits and troughs for the graffiti to cling inside.

Examples of Graffiti-Resistant Coatings

Two-Pack Polyurethanes

- **Durethane[®] Clear** is a clear two-pack polyurethane available in matt and high gloss. The Matt Clear may be used directly on concrete.
- **Quantum[®] FX** is a semi-gloss metallic polyurethane offering a high level of metallic sparkle and available in either Fine or Coarse Metallic.
- **Quantum[®] Clear** high gloss polyurethane sealer for Quantum FX where a highly glossy “wet look” is required. Quantum Clear will enhance the graffiti resistance of Quantum FX.
- **Weathermax[®] HBR** is a semi gloss to gloss polyurethane, specially formulated for application by brush and roller to give a superior finish with minimal brush-marking and can also be applied by spray. It is the perfect graffiti-resistant topcoat for in-situ and maintenance work. Available in all Dulux[®] Colour Specifier colours.

Two-Pack Epoxy Acrylics

- **Acrathane[®] IF** is a two-pack, high gloss epoxy acrylic. The advantage of this product is that it is isocyanate-free and therefore can be spray applied on site where OH&S restrictions may prohibit the spray application of polyurethanes. Available in all Dulux[®] Colour Specifier colours.
- **Acrathane[®] IF Clearcoat** is a clear gloss finish, which can be used as a topcoat over existing finishes or directly on concrete.

What are Graffiti-Removing Agents?

These are solvents, or mixtures of solvents and surface-active agents that are used to dissolve and/or emulsify graffiti and remove it from the surface. They are chemically active (and may be quite corrosive) so as to effectively break down the graffiti. Protective equipment should be worn whilst handling and using graffiti-removing agents; if they are strong enough to attack paint effectively, they may be strong enough to react with skin tissue too.

Sometimes, removal of heavy deposits of graffiti is achieved with the aid of abrasive nylon pads or steel wool. Due to the wide variety of graffiti media used, more than one product may be necessary to improve the outcome. No single graffiti-removing agent is currently capable of removing all types of graffiti media.

Dulux offers a general-purpose graffiti-removing agent, **Graffiti Eraser[™]**. Aerosol spray paints, most permanent markers, inks, crayons and lipstick can be effectively removed from the surface (usually complete removal of spray pack enamels is achieved in a matter of minutes) using **Graffiti Eraser[™]**.

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

