

TECHNICAL BULLETIN



AUSTRALIAN ALUMINIUM FINISHING

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THE BASICS OF ALUMINIUM CARE

All metals are susceptible to a natural process known as corrosion. Both natural and man made environments help reduce metals to their natural form, though the extent at which this occurs can vary considerably. In the case of aluminium, this natural form is aluminium oxide.

Aluminium and its alloys generally are more corrosion resistant compared to others. The moment aluminium is exposed to oxygen in air; a very thin, inert and transparent native oxide layer naturally forms and gives aluminium its good corrosion resistance. Surface treatments such as anodising and powdercoating are finishes designed to further improve upon this property.

Corrosion resistance, coupled with their mechanical properties, give Aluminium and its alloys their privileged use in many diverse applications and constructions.

POWDER-COATED AND ANODISED ALUMINIUM

Powder-coat, once oven cured, becomes a solid and tough coating which adheres to the surface of properly pre-treated Aluminium. Powder coatings can be made in a multitude of colours, with various lustres, textures and special effects. The great range of colour options, make powdercoating a versatile and popular choice.

Aluminium Anodised finishes, result in the controlled formation of an oxide layer which is much harder, more durable and about a thousand times thicker than the thin oxide layer naturally formed. It has excellent tolerance in coastal environments and its appearance proves popular in architecturally designed features as well as window and door suites.

Both anodising and powder coating provide finished items with decorative value, as well as a level of protection from their environment. However, as with other types of metal, certain conditions and environments can render aluminium aesthetically unacceptable, even once Powder-coated or Anodised. It is therefore prudent to provide precaution and care for finished aluminium articles and components. Some of these precautions and care measures are listed below.

AVOID MATERIALS THAT CAN HARM ALUMINIUM

Aluminium and its alloys are inherently corrosion resistant to materials in the pH range of 5 – 8. Strong Alkaline and Acid substances, those containing chloride, fluoride or sulphate additives as well as abrasive materials can degrade and attack this oxide layer. Consideration also needs to be made for higher temperatures, stronger concentrations and longer contact times, as these may significantly accelerate the rate of any chemical action.

Historically, one of the times of greater risk tends to occur upon building sites where materials that are highly alkaline or highly acidic come in contact with either bare or anodised aluminium. In order to prevent the risk of chemical attack which can lead to staining and discoloration, such substances should be prevented from contact with aluminium.

The following are a few examples of substances which are highly alkaline or highly acidic.

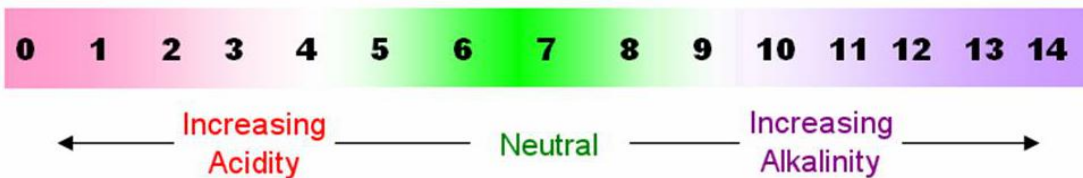
GUIDE TO PH OF SOME COMMON BUILDING MATERIALS

Guide to pH of some Common Building Materials

Brick Cleaning Acid
Acid Containing Cleaners

Water

Wet Cement Mortar & Residue
Stucco & Cement Render
Plaster
Tile Adhesive & Grout
Alkaline Cleaners



A) Preventative Care

“It is important to prevent the attack of anodic oxidation coatings by corrosive agents such as contaminated moisture, condensates, cement and plaster splashes.” (Ref. AS1231-2000; Appendix D - Handling and Temporary protection during transportation and installation)

To avoid and minimise risks, it is recommended that aluminium surfaces are protected from attack via;

- As late-a-stage as possible Installation in order to minimise the possibility of on-site damage
- The application of a suitable protective barrier (e.g.; sheet film, tape or strippable coatings) prior to delivery on site or as soon after before works commence.

Note, the use of brand name or generic lubricants, oils, petrochemical agents...etc, are not effective as protective barriers against materials that can harm aluminium.

B) Immediate Clean

Depending on temperature and concentration, strong alkaline and strong acid materials can attack and leave stains on aluminium within minutes of contact time! So it is vitally important that measures be taken to prevent the risk of this occurring.

If for some reason, accidental splashing or spattering of foreign materials or their run-offs does occur, the Aluminium surface should be;

- Immediately wiped clean and
- Rinsed thoroughly with copious amounts of clean water, especially in cracks and crevices.

C) Regular Cleaning Maintenance

Just as you might provide regular care in maintaining the appearance of your motor vehicle, similarly, it is prudent to provide regular care in maintaining the decorative appearance of your powder coat or anodise finish.

Build up of soils and other grime can hold moisture to the coated surface, and this is detrimental to powder coatings and anodise finishes. This build up can facilitate a corrosive condition which may lead to damage of the coating, particularly in a coastal or salt air environment.

Powder and Anodic coatings should be cleaned and maintained in accordance with their relative standards; AS1231-2000 for anodising and AS3715-2002 for Powder-Coatings. Other references are appended at the end of this document.

Essentially these recommendations within these standards include;

1. Regularly* washing the finish with warm water containing a pH neutral; wetting agent or detergent.
 2. Use a non-abrasive fibre brush or sponge
 3. Thoroughly rinse with copious amounts of clean water immediately after every cleaning process
- The above should be carried out during cooler temperatures and preferably in shade.
 - After cleaning, the anodised aluminium may be treated with a good quality wax polish (AS1231-2000, App.C)
 - However, if heavy soiling does occur, more regular cleaning is recommended.

Environment	*Minimum regular clean and check interval
Non-hazardous	12 months
Tropical	9 months
Swimming and Leisure Pools	6 months
Marine	3 months
Industrial	3 months
Hazardous	1 month

D) Stubborn Residue

For the cleaning of greasy, oily, sooty substances or adhesive residue, the Powder coat suppliers suggest the use of White-spirits or Isopropyl alcohol in combination with using a soft cloth and gentle wiping. Nothing stronger is permitted for use on Powder coat. It is also suggested that a small non-visible area be tested initially to ensure that no colour change or damage will occur, particularly on darker and glossy colours.

For residue on External grade Matt Anodised surfaces. A plastic scouring pad like 3M Scotch-Brite (Type A –Red) together with water and a suitable pH neutral detergent as mentioned above may be tried in a small inconspicuous area. Immediately after every cleaning process, thoroughly rinse with copious amounts of clean water. A high pressure water jet using only clean cool water may also be used for this process.

E) Don't Do's

Do not use;

- Abrasive materials, tools or anything that may scratch
- Strong acids or alkaline substances or other materials which can cause corrosion.
- Strong solvents including; thinners, petrol, diesel, turps or kerosene.
- Degreasers, pesticides, brand name lubricants or agents of unknown composition
- Laundry or dish detergents, oven cleaners or other harmful agents
- Agents on surfaces that are warmer than 25°C during cleaning
- On significant areas, agents/methods that have not been successfully used before
- Do not allow build up against the finish of; debris, agents or moisture, to reside for any extended period of time or allow immersion in soil, water or concrete.

F) Guidance on Acid Cleaning Masonry Walls containing Anodised Aluminium Components

- Ensure brick layers work is as clean and tidy as possible to minimise the degree of acid cleaning later required.
- Seek advice from the Brick Manufacturer regarding their brick cleaning recommendation for the particular bricks used on your building.



Important points to remember;

- Ensure brick cleaning is performed by a competent professional with experience in acid cleaning masonry containing anodised aluminium joinery.
- The masonry & anodised aluminium components must be thoroughly saturated by hosing with water before any acid solution is applied & kept wet ahead of the acid solution application.
- Ensure that the concentration of the acid solution being used does not exceed the concentration recommended by the brick manufacturer and in no instance is stronger than 10:1 (water to acid), preferably 20:1 or weaker.
- Ideal work area is between 9-12 square metres & no more than 20 square metres.
- When temperatures are elevated or winds are about, water evaporates faster, therefore, reduce the size of the work area to reduce risk of damage to masonry and anodised aluminium components.
- Also bear in mind that higher temperatures result in faster rates of acid reaction, so it's more important to keep acid solution concentration lower and reduce acid contact times.
- Ensure that the anodised aluminium components are thoroughly rinsed with clean water immediately following application of acid solution to the masonry area.

As a guide, below are the results of an experiment designed to compare the effects of a 10:1 & a 20:1 acid solution in contact with anodised aluminium finish for prescribed times without rinsing. It should be noted that surface seal quality improves with time over the first few weeks after anodising. The age of the anodising finish in the results below is at least 1 month old prior to testing.

Metal Surface Temperature	10:1 water to acid mix			20:1 water to acid mix		
	10 mins.	20 mins.	30 mins.	10 mins.	20 mins.	30 mins.
20°C	A	A	B	A	A	A
30°C	B	B	B			
40°C						

Key: A = No stain apparent, B = Faint stain apparent, C = Noticeable stain

Note

Details contained herewith do not constitute specific advice, merely they are provided as a matter of courtesy and as general information only. You should seek your specialist's advice, to ensure that any information or suggestion meet your specific requirements. Reference should be made to the respective standards for the finish concerned as well as Australian Aluminium

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Reference

Further instructions for maintenance and cleaning are available from, among others, the:

Australian Standard (AS) Australia, (AS 1231-2000, App. C, Maintenance of Anodised Aluminium)
 Australian Standard (AS) Australia, (AS 3715-2002, App. C, Maintenance and repair of Powder-Coated Aluminium)
 American Architectural Manufacturer's Association (AAMA) U.S.A., (AAMA 610-1979 Cleaning Procedures)
 American Architectural Manufacturer's Association (AAMA) U.S.A., (AAMA 609- Cleaning Procedures)
 Aluminium-Zentrale Beratungs- und Informationsdienst in D-40003 Düsseldorf (Aluminium Center, Advisory and Information Service)
 Gütegemeinschaft für die Reinigung von Metallfassaden e.V. (GRM) in D-90402 Nürnberg (Registered Quality Association for the Cleaning of Metal Facade Elements).
 CSR – PGH Bricks & Pavers – Brick Cleaning Supplement
www.pghclay.com.au/Professional/Downloads/Show_8.aspx



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