ANODISED ALUMINIUM WHITEPAPER

Seven outstanding features of anodising and how they relate to modern building design

This document has been prepared by
Australian Aluminium Finishing Pty Ltd (AAF).
For further information refer to back page.

www.aafonline.com.au

INTRODUCTION

Aluminium alloy is a highly versatile material that has allowed architects and building designers to usher ideas into the physical world. From curtain walls to shop fronts, sun louvres to decorative featured if your project is architectural, odds are that aluminium features in one form or another.

Aluminium weighs 60 percent less than steel and requires considerable less maintenance[1]. It also won't degrade on external walls like timber does[2].

Aluminium naturally forms a thin and relatively soft oxide layer on its outer surface, however there is one special process that enhances alloy whilst still preserving its natural beautiful appearance. This process is called anodising.

Since it saw common use in construction, Anodising has been considered best practice for finishing architectural aluminium[3] and is specified for its robust, weather resistant composition that protects the very base of the metal.

In anodising, the process conditions are controlled so that the surface is grown and transformed. Ultimately, this process creates products whose finish has amazing and unique properties combined with extraordinary durability.

THE PROOF IS IN THE BUILDING

The Sydney Cricket Ground Trust wanted the façade to be ''modern and stylish'' and blend with the clock tower.

A series of vertical fins made of bronze-coloured ''anodised'' aluminium, the same finish used on Apple devices has created colour nuances and reflections in different light.

✱ COVER
Melbourne School of Design

▼ BELOW
The Sydney Cricket Ground Trust
AAF Evershield® Jamaican Chocolate.

7 WONDERS OF HIGH GRADE ANODISING*

E

Environment & Sustainability

Independent sustainability analysis confirms the signifiant advantages of anodising in the environment. Powder coatings principally embody large petro-chemical based products and polymers.**

N

Natural Beauty

Anodising is the transformation of the aluminium itself into a natural metallic finish. In modern building design anodising complements and blends with other natural building materials.

D

Durability

In everyday use we touch anodised products such as iPhones and kitchenware. With hardness comes durability, and Evershield High Grade anodising rates 9 on MOHS scale of hardness, comparable to rubys/corundum. Iconic anodised Australian buildings, now exceeded 50 years and still in great condition.

L

Lustres & Colours

AAF's Evershield new colour range includes "Illustro" finishes. A unique mid-range lustre provides a silky feel, touch and look. Anodising bright finishes provide exceptional gloss readings.

E

Edge-Cover

In the paint/powder industry "edge pull" refers to pulling back from edges leaving lower film builds creating weak points. Anodising's immersion process is ideal for perforations, punching or indeed any aluminium extrusion.

S

Seaside Applications

High grade anodising is incomparable when it comes to durability in seaside locations. AAF Evershield "Coastal" provides added protection, with proven durability and suitability for architectural seaside locations.

S

Security. Warranty & Accreditation

All anodising is not the same. Specifying AAF EverShield High Grade Anodising is supported by Third Party Accreditation and the AAF warranty programme.

* White Paper on Anodising (https://www.aafonline.com.au/assets/Uploads/WhitePaperFiles/AAF-Whitepaper.pdf)

** KMH Enviromental Impact Comparison (https://www.aafonline.com.au/content/download/14530/253552/file/White-Paper-Anodising.pdf)

ENVIRONMENT AND SUSTAINABILITY

A recent example of the use of anodising in modern building design is the 6 Green Star building at 8 Chifley Square in Sydney.

One key feature included an integrated externally shaded façade. Solar shading anodised by AAF Evershield High Grade Anodising.

▶ RIGHT
6 Green Star
Mirvac project, 8 Chifley Square – Evershield® anodised solar shading.

Why does anodising outperform its alternatives?

For starters, paints and powders are petro-chemical based organic finishes. These are generally more susceptible to the effects of UV light and weather over time. Even high grade polyesters will eventually be impacted by colour-fade, loss of gloss and chalking which all can limit the finish service life. Anodising, on the other hand, just like its base alloy, is 100% and indefinitely recyclable. The finish is integral to the alloy, a much harder finish and cannot peel off.

▶ RIGHT
Charles Darwin Centre, Darwin
A Paspaley Project, Architects Pei Cobb Freed & Partners, New York. Street level 5 story façade, Dragonscale by Locker Group.

AISF Design Award 2015 – Best Use of Anodising. The Judges felt that the anodising was a highlight, elevating the car park to visually stunning.

NATURAL BEAUTY

Anodising is the transformation of the metal itself, creating a remarkable natural finish that outlasts almost any finish available. Paints and Powders are petro-chemical based products applied onto the base aluminium. Anodising, due to this natural metal composition, creates an unsurpassed metallic finish that is available in various lustres and colours. Anodising complements and blends with other natural building materials such as timber, bricks, concrete & steel. Anodising is natural and enhances other finishes.

▶ RIGHT

Extensive anodising by AAF and others within Federation Square blends with many other finishes on this iconic Melbourne building.

DURABILITY

The anodising immersion process is a transformation of the surface of the original metal into an incredibly hard and metallic finish. In an everyday sense, we are touching and/or using anodised products. Other examples include scientific instruments, protecting satelites from the harsh enviroment of space plus a full range of building products.

◀ LEFT

After 35 years the Centre Point Tower in Sydney is another example of the extraordinary durability of high grade anodising. Maintaining its brilliant gold colour and lustre, it still stands proud and reflective.

LUSTRE, COLOURS AND CONSISTENCY

Today there are new colouring technologies to create colour derivations of existing technology. Additionally, there is a variety of lustres available including, matt/satin, bright and new mid-range lustres.

In 2015 AAF has launched a new mid-range anodising lustre. With a new soft and silky feel it offers a new dimension in appearance and reflectivity. Powder coatings offer a great variety of colours, but anodising companies such as AAF, now also offer an impressive range of colours and lustres. The AAF Evershield Cosmic range of colours has recently introduced new shades of grey and stainless steel metallic appearances.

New technology, through the use of spectrophotometry, is now used by some anodisers to measure and manage colours between loads, improving the consistency of finishes. For cladded facade projects where colour consistency is key, it is also important to liaise with the anodiser prior to metal procurement so they can also advise on improving final consistency via management of consistently supplied alloy products.

When combined with many new colours and lustres, anodising choices available today have expanded significantly.

Colour Consistency
Colour matching techniques have improved significantly. Under strict specification requirements photospectometer testing was used on 7,000 anodised panels for the podium level of the Shanghai Mori Tower, the highest structure in China. Contractor Permasteelisa, and anodised by AAF in their Sydney plant.

AAF'S EVERSHIELD® RANGE IS GROWING

AAF's nine new illlustro colours maintain the outstanding durability of Evershield® – plus add a new dimension in lustre never before offered in the marketplace.

All 29 displayed colours (except for 3 Evershield® Internal colours) are 'True Metal' coloured, so are exterior durable.

All Evershield® anodising is supported up to a 30 Year Performance Warranty*, see website for more information. Colours are indicative only, refer to Evershield® swatches for a better representation of appearance.

#'illlustro' | to illuminate; brighten; light up; give glory; embellish; enlighten.

Illustro is perfect for adding a subtle reflection and distinctiveness to your next architectural project.

☆ GOLD COLLECTION

☆ COSMIC COLLECTION

MATT

Platinum (E87CM)

Stella Grey (E78NM) ☆

Star Dust (E70NM) ☆

Apollo Grey (E66NM) ☆

Sea Breeze (E67TM)

Portland Stone (E60TM)

Amber Gold (E42TM)

Jamaican Chocolate (E35TM)

Burnt Sienna (E29TM)

Ebony (E26TM)

Summer Maize (E82GM)

Sovereign Gold (E78GM) ☆

Maroochy Sand (E74GM)

ILLUSTRO

Palladium Coin (E87CL)

Macchiato (E36TL)

Aztec Silver (E68NL) ☆

Bronze Monument (E30TL)

Monaco Stone (E65TL)

Gun Barrel (E25TL)

Bold as Brass (E58TL)

Gold Odyssey (E78GL) ☆

Medallion Bronze (E44TL)

BRIGHT

Diamond Light (E87CG)

Moonbeam (E74NG) ☆

Smokey Quartz (E60TG)

Smooth Onyx (E25TG)

Burnished Gold (E80GG) ☆

EVERSHIELD® INTERNAL

Honey Saffron (E81HM)

Swiss Chocolate (E708M)

Winter Grass (E638M)

AAF'S EVERSHIELD® RANGE IS GROWING

AAF's Evershield® Terra Rossa Collection offers a timeless colour scheme of copper hues, combining beauty and durability to create the perfect finish for every architectural, building, and interior design project.

The Terra Rossa anodising colours maintain the outstanding durability of Evershield® with a 25 year warranty.

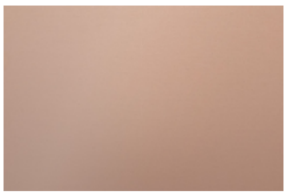
Including colours finished in a timeless and natural matt lustre and our exclusive Illustro satin finish, all displayed colours in this range are creating using true metal colouring and suitable for external use.

All Evershield® anodising is supported up to a 30 Year Performance Warranty, see website for more information.

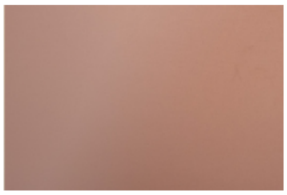
Disclaimer:
Colours are indicative only, refer to Evershield® swatches for a better representation of appearance.

MATT

Prosecco (E70RM)
R187 G168 B158 LRV44



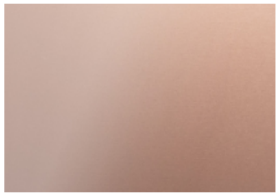
Desert Haze (E59RM)
R173 G133 B117 LRV28



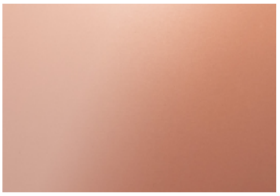
Kalahari (E53RM)
R163 G116 B100 LRV23

Merlot (E35RM)
R116 G70 B66 LRV9

ILLUSTRO



Blush (E64RL)
R184 G148 B133 LRV33



Copper Coin (E56RL)
R170 G124 B107 LRV24

Tuscan Red (E47RL)
R158 G95 B81 LRV16

Cabernet (E36RL)
R123 G70 B67 LRV9

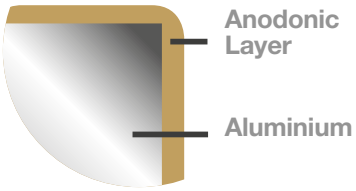
EDGE-COVER

WHAT IS EDGE PULL?

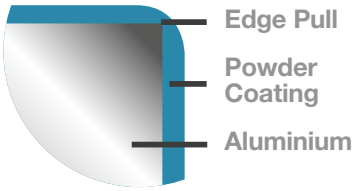
Powder and paints are primarily applied through spray systems. A coating applied to a sharp edge will pull back from the edge, leaving the edge with a lower film build[5]. This is known as “edge pull” and creates weak points which are more susceptible to edge corrosion.

Anodising’s winning edge cover avoids the weak points that arise on paint/ powder coating finishes.

ANODISING



POWDER COATING



SEA-SIDE APPLICATIONS

High grade anodising is incomparable when it comes to durability in seaside locations[6]. The higher salt (chloride) content in the sea-side air can significantly impact the durability for many finish options, whether for aluminium or other metals.

▶ RIGHT

Award Winning Boheme, Bondi Beach, anodised in AAF Evershield Coastal Grade, colour “Platinum”. Winner of the Fenestration Australia 2013 Award for the best use of anodising.

SECURITY – NOT ALL ANODISING IS THE SAME

ACCREDITATION

Third Party Accreditation has become an essential part of the Australian building industry[7]. The Australasian Institute of Surface Finishing recently outlined and launched a Third Party Accreditation program for anodisers. Companies such as AAF have joined the inaugural programme to reinforce support for consistent anodised quality in the industry.

ANOAUDIT
ANODISING THIRD PARTY LICENSING
AUSTRALIAN INSTITUTE OF SURFACE FINISHING

ANODISING EXTENSIVE WARRANTIES

Due to extraordinary durability of high grade anodising, extensive warranty periods are available. Refer to the AAF website for details on AAF Evershield warranty Grade anodising.[7]

www.aafonline.com.au

25 Year Performance Warranty

IN SUMMARY – ANODISING IS THE REAL DEAL

The real case for Anodising is its natural metallic lustre finish. Anodising increases the thickness of the natural oxide layer on the surface of metal parts rather than adding a layer of paint or powder. Its immersion process ensures all the surfaces are equally coated all the way to (and including) the edge which is especially important for louvres, solar shading, perforations and extrusion, and is something powder coating's 'edge pull' cannot achieve.

The final result is a real metallic finish that is highly sustainable, looks great and will genuinely change with light and weather conditions depending on reflectivity and season.

References

1 Vectran Fiber, "Tensile Properties", 2010 http://www.vectranfiber.com/BrochureProductInformation/TensileProperties.aspx

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3 Service One Inc, " Maintenance and Restoration of Architectural Aluminum" http://www.denkalift.com/documents/SOI_Technical_Paper_on_Architecural_Aluminum.pdf

4 Dulux Powder Coating, "Hot Dip Galvanising", September 2009 http://www.duluxprotectivecoatings.com.au/technotespdf/1.2.5%20HDG%20-%20Painting%20Considerations.pdf

5 Gonzalez, J.A. et al, "The Behavior of Anodized Aluminum in Sea and Brackish Water", 1994

6 AI Group, "Non-conforming product research project", 2013 http://www.aigroup.com.au/portal/site/aig/standards/nonconformingproductresearch/

7 AAF, "Standards, compliance certification and traceability" http://www.aafonline.com.au/specifiers_warranty/terminology_explained

This document has been prepared by Australian Aluminium Finishing Pty Ltd (AAF). With 4 anodising plants located in Sydney, Melbourne and Brisbane, AAF is the largest anodiser in Australia.

Evershield® high grade anodising is AAF's warranty grade process.

AAF

AUSTRALIAN ALUMINIUM FINISHING

EVERSHIELD®

HIGH GRADE ANODISING

FOR MORE INFORMATION ON ANODISING PLEASE VISIT:

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