



# Specifying Steel Surface Finishes

Gloss, Texture and Coating Fundamentals

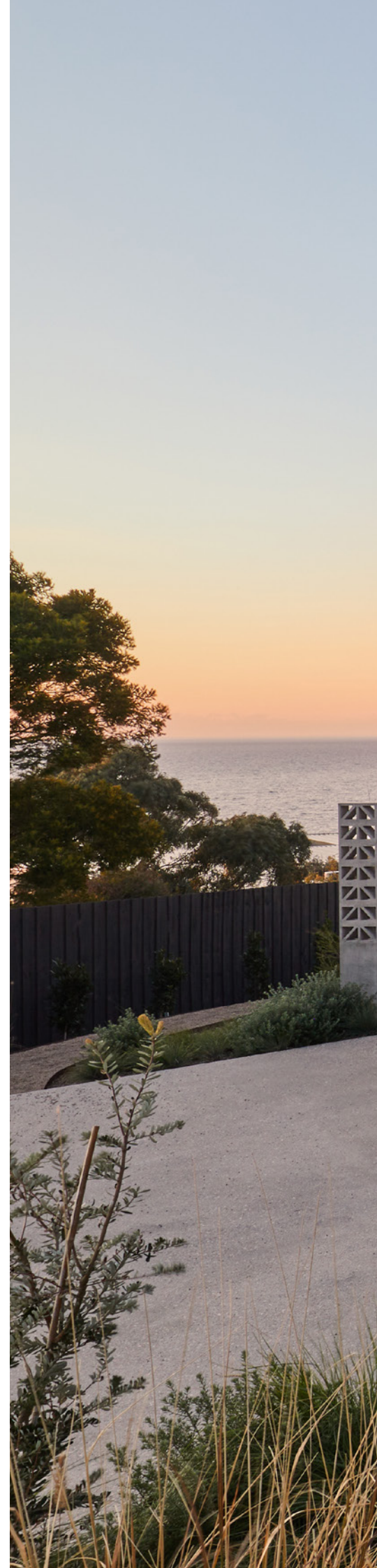
**UniCote®**

## INTRODUCTION

Steel surface finishes are a defining element of contemporary Australian architecture, shaping both the visual character and long-term performance of buildings. In exterior applications such as wall cladding, roofing and other architectural steel elements, finish selection extends well beyond colour. Gloss level, micro-texture and coating system all influence how steel performs in service, affecting aesthetic consistency, durability and, in certain contexts, thermal and energy-related performance of the building envelope.

Within Australia's varied and often demanding environmental conditions, including high ultraviolet (UV) exposure, coastal salinity and urban pollution, surface finish characteristics become a critical specification consideration. Appropriate finish selection can help mitigate visual effects such as oil canning, reduce the visibility of minor fabrication or installation tolerances, and improve resistance to fading, chalking and corrosion. These factors are particularly significant for large-scale facade and roof planes, where surface inconsistencies are more readily amplified by light, orientation and viewing distance.

This paper examines the technical relationship between gloss variation, micro-texture and coating systems as they apply to architectural steel finishes used in exterior cladding, roofing and related applications. By understanding how these variables affect the finished product, architects are better equipped to specify finishes that support design intent while meeting durability and performance expectations over time.





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## Gloss levels explained

In the context of steel surface finishes, gloss refers to the degree to which a coated surface reflects light in a specular, mirror-like manner. It is typically measured as a percentage that indicates how much incident light is reflected from the surface rather than diffused. Gloss level has a direct influence on how colour is perceived, how surface irregularities are revealed or concealed and how a facade performs visually under changing daylight conditions.

### Zero-gloss and matte finishes

Zero-gloss and matte finishes produce a soft, diffuse appearance with minimal surface sheen. By scattering light rather than reflecting it, these finishes reduce the visibility of panel shape effects “waviness”, oil canning and surface irregularities, particularly across large, flat facade areas. (Note oil canning is not applicable to products made from G300 steel.)

These types of finishes are often well suited to lighter colours, where reduced reflectivity prevents harsh highlights that can draw attention to fixings or junctions. In premium residential, civic and education projects, matte finishes are frequently specified to achieve a restrained, natural material expression. They also tend to be more forgiving in high-dust or exposed environments, as reduced reflectance helps mask dirt retention and minor surface marks.

### Satin finishes (approximately 5–10%)

Satin finishes provide a balanced appearance that introduces gentle reflectivity without producing strong

glare. This lower-end gloss level enhances colour richness and depth compared to matte finishes, while avoiding many of the maintenance requirements associated with higher gloss coatings. Satin finishes are commonly specified in commercial facades, industrial buildings and mixed-use developments where an understated reflectance is desired.

### Standard gloss finishes (approximately 15–35%)

Standard gloss finishes deliver a noticeable increase in reflectivity and colour vibrancy. At this level, architectural forms become more pronounced and colour saturation appears stronger under direct light. While these finishes can contribute to a sharper, more expressive facade, they also begin to reveal surface imperfections more readily. Careful consideration of substrate quality, panel size, fixing strategy and installation sequencing becomes increasingly important to achieve a consistent outcome.

### High-gloss finishes (greater than 70%)

High-gloss finishes produce strong reflectivity and vivid colour expression, often used to accentuate crisp architectural lines, metallic tones or feature elements. However, their reflective nature means that scratches, dents, roller marks and gloss inconsistencies between batches are more visible, increasing specification and quality-control requirements. In addition, high-gloss surfaces can contribute to visual glare for pedestrians or adjacent buildings if not carefully oriented or detailed.

## Design notes

Gloss level plays a defining role in how steel facades are perceived at both close range and across distance. Higher gloss levels amplify colour saturation and brightness, creating a more vivid and attention-grabbing finish that emphasises form and articulation. In contrast, low-gloss and textured finishes soften colour intensity, resulting in a more even, monolithic appearance suited to minimalist or materially restrained designs. Matte surfaces, in particular, reduce specular highlights, allowing geometry, shadow and massing to take precedence over surface sheen.

Colour choice further amplifies these effects. Dark colours respond dramatically to gloss variation: glossy dark finishes introduce depth and reflectivity but can highlight micro-defects, panel junctions and inherent flatness, while matte dark finishes produce a solid, sculptural surface with a more uniform colour reading. Gloss variation can be used strategically to articulate building elements, define transitions or introduce contrast.

## Micro-texture explained

In steel surface finishes, micro-texture refers to the fine surface topography engineered into either the coating layer or the metal substrate itself. Rather than reflecting light in a single direction, micro-textured surfaces scatter incoming light across many angles. As a result, micro-texture directly influences light diffusion, perceived colour softness and overall surface uniformity.

### Zero-gloss and matte finishes

Several approaches are used to introduce micro-texture into steel finishes, each with distinct visual and performance characteristics:

- Embossed textures involve mechanically deforming the steel surface to introduce a subtle, repeating grain. This method modifies the substrate itself to provide a consistent texture that remains visible through the coating system.
- Textured paint coatings are formulated with fine particles or additives that create a tactile, slightly roughened (textured) finish once cured. These coatings are commonly used to mask minor substrate irregularities and enhance visual depth.

- Fine-texture (ultra-matte) coatings incorporate extremely subtle surface modulation designed to replicate the soft appearance of natural materials or premium powder-coated finishes, without pronounced roughness.

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## Coating systems for architectural steel

The performance and appearance of architectural steel are strongly influenced by the coating system selected. Beyond colour, gloss and texture, coating chemistry, application method and substrate compatibility determine how steel responds to environmental exposure, how it weathers over time and how consistently it performs across a facade.

### Pre-painted steel

Pre-painted steel uses factory-applied coatings applied to flat steel coil before roll forming, delivering consistent colour, gloss and film thickness across large facade areas. Available in smooth, matte and textured variants, these systems offer high repeatability and controlled quality.

### Metallic-coated substrates

Metallic coatings form the corrosion-protective base layer beneath many architectural paint systems and strongly influence durability classification and service life.

- **Zinc-coated (galvanised)** steel provides sacrificial protection and is generally suited to internal or mildly exposed environments.
- **Aluminium-zinc alloys** offer improved corrosion resistance in unwashed coastal, industrial or high-humidity locations.
- **Magnesium-aluminium-zinc alloys** enhance cut-edge protection and long-term performance in salt-heavy or moisture-prone conditions.

Substrate selection directly affects warranty eligibility and exposure suitability and should be treated as a primary specification decision.

### Powder coating

Powder coating is applied as an electrostatically charged powder and heat-cured to form a continuous film. It offers a wide colour range and supports matte, textured and metallic finishes. Performance is highly dependent on surface preparation, coating thickness and curing quality. Suitability for large facade systems should be assessed against adhesion requirements, exposure conditions and maintenance requirements.

### PVDF coatings

PVDF (Polyvinylidene Fluoride) coatings are premium architectural finishes used for high-exposure applications. Their fluoropolymer chemistry, defined by strong carbon-fluorine bonds, delivers exceptional UV resistance, colour retention and chalk resistance. These properties make PVDF systems well suited to applications requiring high UV resistance.

Patterned and print-based architectural finishes

Patterned finishes use high-resolution printing during or after the coil-coating process to replicate materials such as timber, stone or metallic grain.

## Finish selection and energy efficiency

Steel surface finishes influence building energy performance primarily through their effect on solar heat gain and facade surface temperature. While cladding does not provide insulation, finish selection can alter the thermal load imposed on the building envelope, particularly in Australia's high solar exposure environments.

Colour is the dominant factor. Light-coloured finishes, such as whites, creams and light greys, have higher solar reflectance, reducing heat absorption and limiting surface temperature rise. This can help moderate heat transfer into the building and reduce cooling demand, especially on large or highly exposed facades. Dark colours absorb more solar radiation, increasing surface temperatures and potential heat gain. Where darker finishes are required for design reasons, their use should be coordinated with facade orientation, shading and insulation strategies to manage thermal performance effectively.

Research confirms that facade colour has a measurable impact on building energy demand.<sup>1</sup> A multi-climate study found that light-coloured envelopes reduced cooling loads by 51 to 76 per cent, while increasing heating demand by 6 to 28 per cent. Dark-coloured finishes produced the opposite effect, lowering heating loads by 18 to 41 per cent but increasing cooling demand by 50 to 76 per cent. These findings reinforce the importance of climate-responsive colour selection as part of performance-based facade design.

**Note:** The influence of facade colour on operational energy demand is moderated by other design features, such as insulation and thermal mass, with the strongest effects observed in non-insulated or lightly insulated envelopes.

## Reflectivity and visual comfort: Specular vs diffuse surfaces

The surface finish of metal cladding plays a significant role in visual comfort and safety outcomes, particularly in large-scale infrastructure and transport-adjacent projects. How a surface reflects light can influence glare levels, user comfort and potential safety risks for occupants, pedestrians and operators. Understanding the difference between specular and diffuse reflectivity is therefore essential when specifying exterior finishes.

Matte and low-gloss finishes exhibit predominantly diffuse reflectivity, meaning incoming light is scattered across multiple directions rather than reflected as a concentrated beam. This diffusion significantly reduces glare, minimising intense reflections that can distract drivers, train operators or pilots, particularly during low-angle sunlight conditions at sunrise and sunset. Reduced glare also improves visual comfort for pedestrians and workers in high-exposure environments by limiting eye strain and visual fatigue.

High-gloss finishes produce specular reflectivity, where light is reflected in a single, mirror-like direction. Concentrated reflections can create momentary visual distraction or discomfort for drivers and pilots, particularly when surfaces are oriented toward traffic routes or flight paths. In addition to glare, specular surfaces can concentrate solar heat onto adjacent materials or elements, potentially contributing to localised thermal stress. As a result, glossy finishes should be carefully assessed in relation to the surrounding environment, context and building use.





## Exploring colour, gloss and texture with UniCote®

A considered approach to gloss level, micro-texture and coating system selection enables architects to deliver steel façades that balance visual refinement with long-term performance and environmental resilience. UniCote®, Australia's leader in premium coloured steel solutions, addresses these requirements through a layered portfolio of finish ranges that allow precise control over reflectivity, surface character and durability across exterior applications.

The UniCote® Matt Collection, including finishes such as Basal Matt, Monolith Matt and Midnight Matt, offers deeply subdued, low-reflectance surfaces. These finishes are particularly suited to contemporary architecture seeking restrained material expression and consistent colour reading under Australia's high solar exposure.

Complementing this, the UniCote® Satin Collection, drawn from the broader Tasman Range, provides a carefully calibrated mid-gloss aesthetic through finishes such as Pilbara Grey Satin, Tudor Satin, Blue Metal Satin, Cyad Satin, Obsidian Satin and Cosmic Satin. These satin finishes introduce gentle reflectivity that enhances colour depth and architectural articulation while avoiding the visual harshness associated with higher-gloss coatings.

Beyond gloss control, UniCote's broader finish ecosystem supports more complex specification requirements. The UniCote® Essential colour range enables project-specific solutions where colour, finish performance or exposure conditions require tailored approaches, while the TheUniCote® Tasman colour range provides a versatile selection of smooth, soft-touch and low-gloss surfaces inspired by the New Zealand landscape. The UniCote® LUX Signature colour range combines advanced coating technologies with high-fidelity patterned and textured surfaces inspired by materials such as weathered steel, selected timber tones and zinc-titanium finishes, allowing architects to achieve distinctive material expression without the durability or maintenance constraints of natural alternatives.

UniCote's premium pre-painted steel range offers coating systems formulated to perform under local environmental conditions. The portfolio includes products designed for standard, coastal and severe exposure zones with enhanced substrate protection and coating systems to improve durability, colour stability and resistance to corrosion and UV degradation. With a broad selection of colours, gloss levels and surface textures, UniCote® provides architects with flexible specification options for roofing, wall cladding and architectural applications, while maintaining low maintenance requirements and consistent long-term performance.



Micro-texture plays a critical role in giving steel facades a softer, more tactile visual quality often associated with higher-end materials such as weathered zinc, copper, anodised aluminium or finely powder-coated metals

## REFERENCES

- <sup>1</sup> N. Erkara, T. Turel, and A. Kuruçay, "Investigation of the Effect of Building Shell Colors on Energy Performance in Different Climate Zones," ZeroBuild Journal, Vol. 2, No. 2 (2024): 129–38.