

# Window Coverings

## - A Key Component of Environmentally Sustainable Design



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### Introduction

Released in August 2021, the latest Intergovernmental Panel on Climate Change (IPCC) Report<sup>i</sup>, is perhaps the strongest call to climate action ever issued. Pointing out that scientists are observing changes in climate in every region and across the entire global climate system, it finds that unless there are immediate, rapid, and large-scale reductions in greenhouse gas emissions, limiting warming to close to 1.5°C or even 2°C will not be possible<sup>ii</sup>.

While relevant to virtually all aspects of human endeavour, findings of this type are particularly pertinent to the construction sector. As the EU Energy Commission has pointed out, when considered from a demand side perspective, the CO<sub>2</sub> emissions of the global construction and materials manufacturing industries represent the largest human contribution to the problem.<sup>iii</sup> If crisis is to be averted, in other words, the construction sector needs to become a major part of the solution.

Conceived as a means of doing exactly this, Environmentally Sustainable Design (ESD) refers to work that “protects our environment, secures today’s living standards and future proofs our community against rising energy, water and waste disposal costs.”<sup>iv</sup> Utilised in Australia by all levels of government, as well as many architectural firms and others, ESD Frameworks have become accepted as important parts of the planning process.

While ESD requirements have relevance to all types of building products and materials, this whitepaper is concerned exclusively with blinds and window coverings, and the ways in which they can help specifiers meet them. Outlining why these products should rightly be considered environmentally friendly, it shines a light on the ones that represent the right choice for those intent on helping secure a sustainable future.



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## Sustainable Design Frameworks & Sustainable Management Plans

ESD frameworks cover ten key categories: indoor environment quality, energy efficiency, water efficiency, stormwater management, building materials, transport, waste management, urban ecology, innovation, construction and building management.

Though sometimes overlooked in the context of sustainability, blinds and window coverings have a key role to play. High quality products of this type, specified appropriately, can help projects meet several of the above

metrics, particularly Indoor Environment Quality, Building Materials, and Energy Efficiency.

The requirements of ESD vary according to project size. While small and medium-sized projects require only a simple assessment at the planning stage, large projects (including ten or more residential dwellings or more than 1000m<sup>2</sup> of non-residential Gross Floor Area) must submit a Sustainable Management Plan (SMP). This is a detailed assessment that covers all ten categories.<sup>v</sup>



## Indoor Environment Quality

'Indoor Environment Quality' refers to components and designs that enhance the comfort and wellbeing of occupants, and ensure that factors like air quality, thermal comfort, acoustic comfort, and the presence of natural light are optimised.<sup>vi</sup>

Sustainable buildings are those in which natural light can be controlled. They enable occupants to reduce bright light – and therefore also heat and glare – where necessary, but they don't block out natural light altogether. Rather, they always allow a connection to the outside world to be maintained. They 'bring the outside in', while at the same time, maintaining thermal comfort.

The key to this control is high-quality, easily adjustable window coverings; products that anyone – regardless of age, disability, or ambulatory challenges – can operate.

Indoor air quality is a more important consideration than most people realise. Poor indoor air quality is caused by a range of factors, including the presence of chemicals in building materials.<sup>vii</sup> If not addressed it can result in sick building syndrome (SBS), a phenomenon that can have adverse short term health effects including headaches and irritation of the eyes, skin, and throat. In extreme cases, where substances like asbestos or Volatile Organic Compounds (VOCs) like formaldehyde are present, its impacts can involve serious health effects like cancer and respiratory disease.<sup>ix</sup>

Like many other building materials, window coverings that include such chemicals can contribute to SBS. Ensuring they don't means using only products certified as containing low levels of VOCs. Relevant certifications to seek out include low VOC certification from Greenguard and Greenguard Gold, EPD – Environmental Product Declarations, HPD – Health Product Declarations, GreenTag, and Green Star.

## Energy Efficiency

Blinds and window coverings can have their biggest impact within the Energy Efficiency category of ESDs. To demonstrate why this is the case, let us consider the Sustainable Design Framework of Wyndham City Council.<sup>x</sup>

One of the policy's stated aims is to minimise the need for auxiliary heating and cooling in all relevant buildings. To do this it requires, among other things, that projects achieve energy efficiency improvements that exceed NCC Section J Deemed to Satisfy (DTS) requirements by 25 per cent or more.<sup>xi</sup>

This represents a significant challenge. Before discussing how it can be achieved, it is important to note that the most recent update to the Code (NCC 2019 Section J)

takes two components that were previously considered separate, external walls and glazing, and redefines them together as part of the buildings 'external façade'.<sup>xii</sup>

This change means that commercial facades with a high ratio of glazing to wall area require higher performance glazing compared to NCC 2016. It means that, for glazing ratios above 60% (i.e. typical commercial buildings built today), thermally broken double-glazing systems may be required, where previously single glazed low-e glazing was adequate. And it means that, as the glazing ratio increases, the Solar Heat Gain Coefficient (SHGC) of the glazing becomes more stringent.

The problem with a lower SHGC is that it requires dark tinting or the addition of colouring such as green or blue to reduce natural light entering the building. However, as already discussed, the presence of natural light is an important part of indoor environment quality so, from an ESD perspective, tinting is not the answer.

An alternative is needed. Specifiers wishing to satisfy the ESD requirements (and exceed the Section J requirements by 25% or more), require a means to control light (and associated heat gain) without affecting the quality of the indoor environment.

That alternative is effective window coverings. Here, it is important to note that not all window coverings are equally effective. Product choice is critical and the relative effectiveness of each depends on several factors including the material used in its manufacture; its U-value (a measure of its insulation properties)<sup>xiii</sup>, and its g-value (a measurement of total solar energy transmittance through an object).<sup>xiv</sup>

In commercial applications, by choosing the best of these products it is possible to reduce heat gain by up to 77%<sup>xv</sup>. Conversely, reflective roller blinds have been shown to reduce heat loss on single glazed windows by up to 40%<sup>xvi</sup>. They are among the most effective ways to meet thermal efficiency requirements and put projects on the path to satisfying ESD frameworks.

## Building Materials

A key concern here, and a key factor to consider in terms of meeting ESD framework, is 'embodied carbon'. A building product's embodied carbon is defined as all the CO<sub>2</sub> emitted during all phases of its production, including extraction, transportation, manufacturing, demolition, and so on.<sup>xvii</sup> Measuring all these variables is the surest way to arrive at the product's true environmental impact.

In these terms, window coverings perform well. According to British research, "the installation of blinds will reduce overall environmental impact as long as they are used for at least three years and are recycled at end-of-life."<sup>xviii</sup>



## What Types of Window Coverings are the Most Effective?

So, how are specifiers to distinguish between the various products available? What types of window coverings lead the field in terms of Building Materials, Indoor Environment Quality, and Energy Efficiency?

Distinguishing between products based on the first category, Building Materials – and factors like embodied carbon or VOCs – can only be done on a case-by-case basis. It is not a question of comparing types of products. However, product type definitely is relevant when assessing them in terms of Indoor Environment Quality and Energy Efficiency. Those wishing to optimise the former should seek out window coverings that maintain connection to the outside world but can be easily adjusted to moderate glare, UV, and heat.

In terms of Energy Efficiency, the key consideration is material. Put simply, window coverings made from

metallised fabrics improve thermal efficiency, and consequently cut HVAC costs and carbon emissions, more effectively than products made from any other materials. In fact, according to research by Verosol, window coverings featuring metallised fabrics can reflect up to 85% of solar radiation and energy consumption by up to 20%.

The best way to take full advantage of such products is to automate them. When incorporated within a building management system (BMS), they can be optimised and operated according to prevailing climatic conditions. No longer reliant on the vagaries of human operation – and controlled either independently (or as a group) as components within ‘Smart Buildings’ – they can help reduce energy usage by as much as is practically possible and ensure that the requirements of both Section J and ESD frameworks are met.



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## VEROSOL

Verosol, a specialist in the design and manufacture of interior shading fabrics and blinds, was founded with a commitment to sustainability and ethical governance.

Its signature product, SilverScreen employs a process called metallisation to apply a microscopic layer of aluminium onto fabric for use as window coverings. Unlike alternative techniques, metallisation involves vaporising aluminium, and therefore allowing it to bond and infuse into the fabric. As a result, the fabric and the metal become one.

Used in a range of Verosol blinds and window coverings, SilverScreen fabrics reflect up to 85 per cent of solar radiation, reduce SHGC, virtually eliminate UV radiation, and significantly reduce glare – all while leaving residents' occupants' view to the outside world unaffected. Given that they are suitable for automation and incorporation into smart buildings, they lead the field in terms of maximising thermal efficiency.

Not content with this industry-leading performance, Verosol is committed (on an ongoing basis) to underscoring it with universally recognized Environmental Certification.

To date, two Verosol fabrics have received Environmental Product Declarations (EPDs) and another is currently progressing through the certification process.

On top of that, the company has achieved many other certifications (some under certification for the first time, and others under recertification). Including Greenguard and Greenguard Gold Certification, HPD - Health Product Declarations, Global Greentag LCA rate, REACH and RoHS Compliance, and C2C - Cradle to Cradle, these certifications confirm that the products in question meet the requirements of ESD frameworks in terms of Indoor Environment Quality and Building Materials.

Importantly, the quality of Verosol products extends beyond their environmental credentials. Available in a broad range of colours, fabrics, and systems, their sustainability is matched by their ability to help create aesthetically pleasing, functional and liveable interior environments. The right choice for those aiming to meet ESD requirements, they have a clear role to play in ensuring the sobering climate change scenarios presented in the most recent IPCC Report never eventuate.



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