BLINDS & WINDOW COVERINGS

A Pathway to Sustainability

norfolkblinds

INTRODUCTION

According to recent estimates, buildings generate nearly 40% of annual global CO2 emissions.[1]
Of those total emissions, building operations contribute 28% annually, while building materials and construction are responsible for 11%.

To meet the goals of the Paris Agreement by 2030, humanity must cut its carbon emissions by half – a daunting but necessary task to avoid dangerous climate change impacts. It is critical that design and construction professionals understand their role in reducing the built environment's carbon footprint, and the tools available to assist them.

With their ability to block, screen or limit sunlight, blinds play a significant role in improving the thermal efficiency of buildings. By helping users manage heat gain, blinds can reduce the energy consumption associated with artificial heating and cooling systems, thus enabling buildings to reduce their carbon footprint over their lifespan. Blinds can also be digitally connected and operated via building management systems to achieve even greater sustainability outcomes.

In addition to their contributions to energy efficiency, evaluation of different blinds and window coverings should consider several environmental factors, including the manufacturing process and its associated waste, raw materials, packaging, transport, and more. It must also factor in embodied carbon, referring to the CO2 emissions associated with materials and construction processes throughout the whole lifecycle of a product or building.

In this whitepaper, we take a close look at how architects, designers and specifiers should evaluate the sustainability of blinds and what tools are available to help them do so.

"By blocking sunlight and preventing heat loss, blinds are able to limit the need for artificial heating and cooling."

EMBODIED CARBON

For years now, the industry has focused its climate efforts on operational-energy consumption with great improvements in the efficiency of modern lighting, heating and cooling systems and a shift towards renewable energy supplies. Embodied carbon is a sometimes overlooked source of emissions within the built environment. Building products are extracted, manufactured, transported, installed and used, with each stage of the process consuming resources and energy, and generating CO2 emissions. There are also emissions associated with the end-of-life of a product or material.[2]

Determining the embodied carbon of any building material is impossible from the finished product alone. It requires detailed self-assessment and process transparency on the part of the manufacturer. To assist with product selection, more manufacturers and industry groups are publishing environmental impact data on their products, often with third-party verification. There are also new tools that make it possible to compare life cycle analyses and environmental product declarations (EPD) during the course of a building project.

The range of third-party environmental certifications includes Global GreenTag, Health Product Declaration, LEED, GECA, Ecospecifier, Greenguard, Life Cycle Analysis (LCA), C2C (Cradle to Cradle), ISO 14001, and Green Tick, and more. The certification process typically involves considering the net environmental impact of a product or building over its lifespan, with some relevant factors including responsible sourcing, sustainable material choice, health impacts, waste, pollution, and socioeconomic concerns, in addition to embodied carbon emissions.

IMPROVING ENERGY EFFICIENCY

Improving energy efficiency of buildings in operation leads to reduced carbon emissions. 'Thermal efficiency' refers to the building's ability to retain warmth during colder weather and keep cool during warmer weather thus requiring less energy to artificially or cool the building all-year round. Certain design features, such as blinds, can help improve a building's thermal efficiency.

A thermally-efficient building envelope has far-reaching benefits. First, by reducing a building's energy consumption, it also reduces its carbon footprint significantly. Second, while a thermally-efficient design can sometimes cost more upfront, operational costs will decrease in the long-term. Third, an interior environment that is maintained at a comfortable temperature has positive effects on the overall wellbeing of its occupants.

Blinds and window coverings are among the tools designers and specifiers can utilise to improve thermal efficiency. The Australian Window Association (AWA) estimates up to 40% of a home's heating energy can be lost through windows and up to 87% of its heat gained through them.[3] In summer, blinds reduce heat gain by reflecting the heat back out of the window (especially if the external surface is white or near white). In winter, a well-fitted blind can trap still air in the space between the blind and the window, preventing heat loss. Blinds can also allow permissible heat gains from the low-angle sun thus reducing space heating and cooling loads.

Building modelling conducted by the National Energy Foundation (UK) using a model office highlighted that internal shading by a venetian blind could save 10% of HVAC energy and a roller screen up to 23%.[4] The savings in HVAC energy increased to 43% and 47% respectively if the window coverings are installed externally.[5]

Operable blinds and window coverings offer greater flexibility, giving users the choice to keep window coverings open or closed for privacy, to maximise natural light or control glare, take advantage of heat from the sun in the winter, and reduce heat gain in the summer.

BMS INTEGRATION

Despite the benefits of operable blinds and window coverings, one study found that 75% of residential window coverings remain in the same position every day.[6] This practice decreases potential energy savings as it does not account for the changing position of the sun and variations in temperature and weather conditions during the day.

Blinds and window coverings that are automated and controlled via a BMS (building management system) can be optimised to maximise energy savings. Each operable window covering can be controlled using a range of environmental sensors and control systems that continuously monitor the environment and adjust the window covering for optimal thermal performance.

Through automation it is possible to ensure window coverings or blinds are drawn during the warmest and brightest parts of the day or open to allow the sun to warm the interior space or provide natural light. Studies have demonstrated significant improvement in both the thermal performance of adjustable window attachment operation as well as reduced lighting energy consumption when automation is employed.[7]

CREATING HEALTHY INTERIORS

Earlier we noted that the use of blinds to enhance the thermal quality of an indoor environment leads to better health and wellbeing outcomes for occupants. It is well established that thermal comfort is linked to our health, well-being and productivity. Lack of thermal comfort results in 'environmental stress',[9] negatively impacting our experience of the indoor environment. In some cases it can lead to more significant health issues such as heat stroke, or poor sleep quality.[10]

Several studies indicate that even small differences in temperature can influence workers' speed or accuracy by 2% to 20% in tasks.[11] Improvements in work performance can also be achieved with better natural lighting, with benefits most apparent for visually-demanding work. Several studies also link between thermal comfort and student learning, making temperature control a key requirement for schools, libraries and other learning spaces.[12]

Temperature and light control are not the only factors contributing to a healthy indoor environment. Some blinds can contain harmful substances that can emit volatile organic compounds (VOCs), which reduce indoor air quality. Poor temperature regulation and products that emit VOCs are both factors contributing to 'sick building syndrome' (SBS), a condition caused by being in a specific building or other type of enclosed space.

SBS symptoms are associated with acute discomfort, such as eye and nose irritation, headache, dry cough, dry or itching skin, and difficulty in concentration or fatigue. According to various studies, the risk factors for SBS include lower ventilation rates, presence of air conditioning, and higher indoor air temperatures.

For designers and specifiers, it is important to select blinds that meet Australian health and safety standards for VOCs. Avoid shades and curtains made of PVC (Polyvinyl chloride), any products highly treated with flame retardants and other chemicals, and wood and aluminum blinds with finishes that may off-gas VOCs.

The manufacture of PVC blinds can result in the creation of toxic byproducts such as hydrochloric acid, vinyl chloride, mercury, cadmium, lead and dioxin. Designers and specifiers should assess the lifecycle environmental im

ARENA HONEYCOMB BLINDS BY TURNILS

THE MOST ENERGY-EFFICIENT BLIND

Available from Norfolk Blinds, Arena Honeycomb Shades are a stylish, functional, versatile, energy-efficient window covering solution. Suited for any size or shaped window, these shades offer insulating properties to control room temperature without compromising on style. The cellular design of honeycomb shades means that hot air is trapped in the honeycomb cells, slowing down the transfer of hot air from outside-to-in and inside-to-out.

The back of all Arena honeycomb fabrics is white, creating a uniform streetside appearance. The white backing also provides light reflection and UV protection, which reduces heat passing through the shade into the room

With these energy-efficient features, Arena Honeycomb Shades can reduce your heating costs by up to:

- 17%* with 10mm Single Cell translucent fabric
- 28%* with 10mm Single Cell blockout fabric
- 26%* with 20mm Single Cell translucent fabric
- 32%* with 20mm Single Cell blockout fabric

Arena Honeycomb Shades offer a variety of fabrics in a range of cell sizes, colours and styles, which provide for a wide choice of design possibilities. In addition to the variety of colours and fabric designs, Arena Honeycomb Shades also feature different light filtration options for light control, view-through, privacy and protection including Sheer, Translucent and Blockout.

There are also a number of different operating systems and design options to choose from: Glideshift, a sliding cordless system ideal for patio doors and wide expanses; Motorisation, a fully motorised control system; Cordless, for a clean uncluttered look; and EasyRise, with an endless (continuous) cord loop operation. You can upgrade to a fully-automated Momenta motorised system that offers the ultimate in child safety, convenience and ease of operation.

Arena is GREENGUARD® certified for healthier indoor air quality. Healthier indoor air fabrics are anti-static and dust repellent making them low maintenance.

*Savings are based on the installation of fully-recessed, reveal mounted Turnils Arena Honeycomb Shades in an average home in Sydney, compared with the House Energy Rating standard of Holland Blinds from AccuRate, in that home. These calculations have been modelled by an independent third party. Savings will vary based on window type and installation.

> "Through automation, it is possible to ensure window coverings or blinds are drawn during the warmest and brightest parts of the day or open to allow the sun to warm the interior space or provide natural light."

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