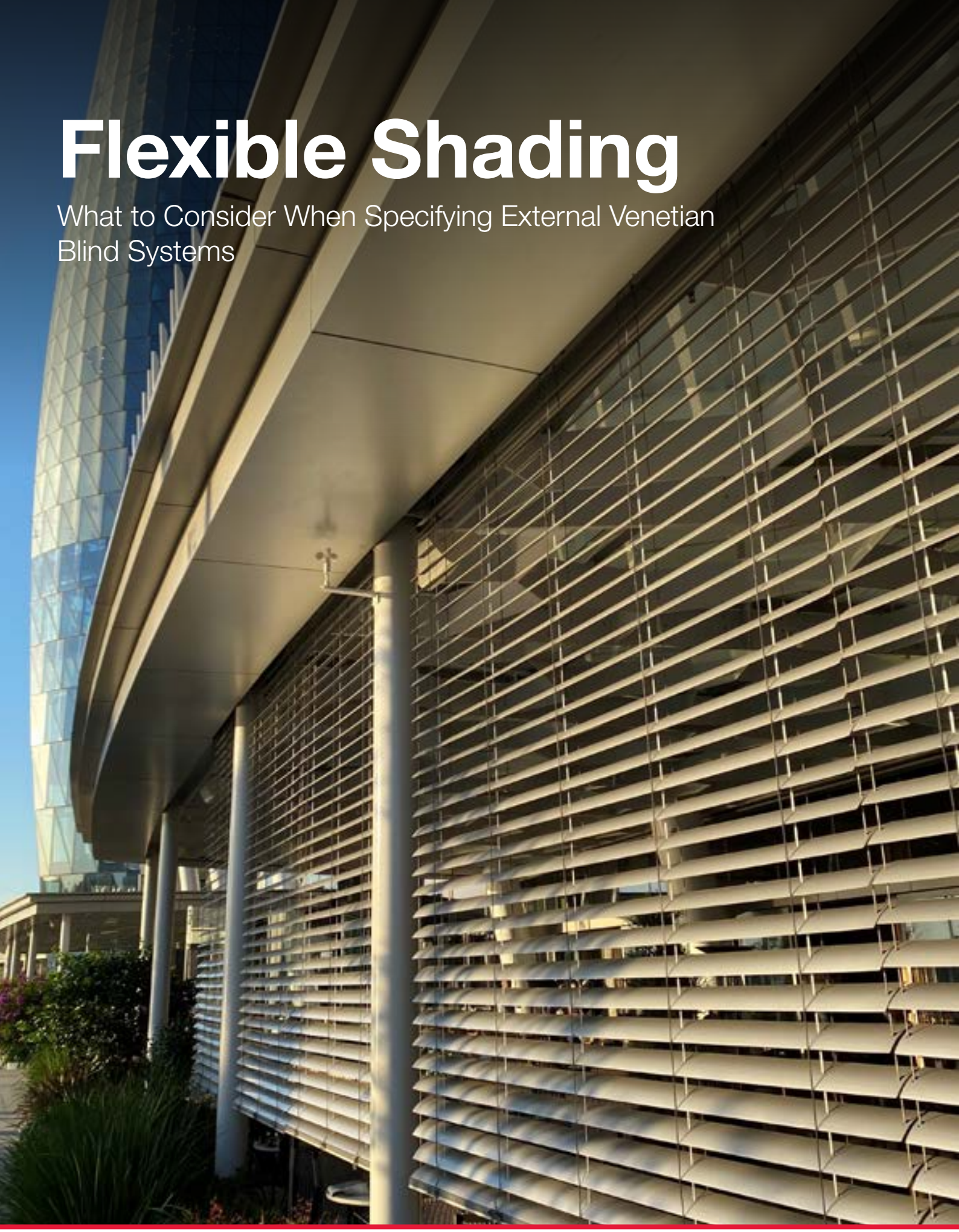

Flexible Shading

What to Consider When Specifying External Venetian Blind Systems

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INTRODUCTION

Shading devices are an important tool for architects and designers when creating energy-efficient buildings. Buildings that utilise passive heating and cooling will usually require appropriate shading to help block unwanted sun in summer while still allowing solar access in winter. Shading also helps control and diffuse sunlight within an interior space, improving user visual comfort.

Out of all the shading devices available, external venetian blinds (EVBs) are among the most effective. EVBs maximise light and thermal comfort levels without the need to restrict outside views while being strong enough to withstand climatic conditions that include high solar radiation and high wind velocity. They also have an attractive appearance that helps distinguish one building facade from another.

In one study, EVBs were identified as the most effective shading device to control heat gains and daylight through fenestrations in an office building.[1] With this in mind, architects, designers and specifiers need to have a detailed understanding what it takes to design an effective EVB system, including opportunities for motorisation and automation.

Below we examine the design factors to consider when selecting an EVB system for your next project.

INTERNAL VS. EXTERNAL SHADING

The main functions of a shading system are the protection of the building envelope from solar radiation in summer conditions, thus preventing overheating by blocking the access of unwanted energy flow into the building, as well as allowing an appropriate amount of sun into the building during winter.

In terms of solar heat gain prevention, externally-placed solar shading devices are considered more effective than internal devices.[2] External shading systems have one significant advantage over internal systems: they reduce unwanted solar heat gain by preventing solar energy from entering the building in the first place. In comparison, the solar energy absorbed by an internal shading device has already been admitted into the building and is subsequently radiated as heat within the interior environment.

Reports note that an estimated 76% of sunlight that falls on standard double-pane windows and enters your home or business will become heat.[3] An effective external shading system can block 90% or more of solar gain, which can contribute to lower air-conditioning demands and lower energy costs over time.[4]

Internal shading must be supplemented with external shading to fulfil other comfort-related functions such as protection from sunlight, thermal control, privacy, and brightness control.[5] As they are not as effective in reducing solar heat gain as external systems, internal blinds, drapes, roller shades and similar devices are mostly used as decorative features internally.

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COMPONENTS OF EVBS

External venetian blinds are sun shading systems attached in front of windows that are particularly effective at controlling the amount of heat and light that enters a space from the outside. This is due to their unique construction comprised of horizontal slats made from either wood or metal and suspended on ladder cords. The blinds can be raised and lowered to fully cover and uncover the window; the slats can tilt open and closed to modulate privacy and light control.

With a lengthy history of use in residences and commercial buildings of many styles, venetian blinds remain one of the most popular shading devices available. Modern EVB systems allow natural light to penetrate through the glazing, while removing solar heat and glare. Due to this capability, EVBs are unique among all other shading devices.

Most EVBs are constructed from three materials: aluminium, PVC (polyvinyl chloride, or plastic) or wood (for slats only). Different blade profiles and widths are available, ranging from 50mm to 150mm. Note that it is preferable to use wider blinds for exteriors as they are more robust and weather-resistant, provide greater durability and offer a better view from inside to outside. Other components include the head rail, gear box, gate bracket, ladder braid, base rail and tilting device.

When it comes to installing EVBs, you have various options for mounting, including a built-in recess, or a weather cover or pelmet. There are also a range of operating types, with options for manual, motorised remote control, or fully-integrated automation. Motorised EVBs are available with different drive options including motor, crank or corded.

CHOOSING THE RIGHT MATERIALS

Material choice is a key consideration when choosing an EVB because it affects costs, maintenance requirements, aesthetics, and durability. The way components are manufactured also plays a role in how they perform over the long term.

Some characteristics to avoid when selecting an EVB include exposed plastic components, rolled edge blades, that are rigid and can crease and dent, side channels that can collect dirt, and side clips that can easily snap off. In the harsh Australian climate, products with plastic components can rapidly deteriorate due to UV exposure and temperature changes, causing EVBs to fail. In addition, imported products with long lead times or no local support should raise a flag as it can mean long wait times for replacement parts.

Wood is often considered the most aesthetically-pleasing material, but it is less durable than aluminium or PVC, even if the wood has been chemically treated. Due to this, wood will require more maintenance over its service life than other material options.

When all factors are considered, aluminium is the best option for EVBs. It is highly durable, strong yet light, and naturally corrosion resistant. It has excellent thermal performance with high radiation reflection, low radiation absorption and low transmission values. Further, aluminium systems can be engineered to withstand extreme wind loads, making them a suitable option even in the most challenging weather conditions. Note that, as a general rule, extruded metal components are more durable and stable than bent components.

DESIGN CONSIDERATIONS FOR EVBS

Site location and building design

Understanding the specifics and needs of the site is critical when designing shading solutions. In particular, understanding the sun's position in the sky in relation to the building during the cooling season is necessary so that the shading can be positioned correctly.

The appearance of a building can be significantly affected by shading. The earlier in the design process shading devices are taken into consideration, the more likely it is that they can be seamlessly integrated into the project's overall architectural style.

As EVBs are mounted on the exterior of windows, ample space must be provided for them during the design process. Depending on how the windows are designed, any sun shading solution will need to be fitted to ensure the view from the windows are not obstructed. The longer the drop of the EVB, the bigger the pelmet needed to hide the stacking of the EVBs. The bigger the pelmet the more area it covers. Some pelmets cannot be extended, meaning the bigger the drop, the more of the blades you can see under the pelmet line.

Additionally, one must consider how an EVB terminates into the base. The blind cable guides need to be taut, so they need to be terminated in a place that can withstand pressure.

When it comes to motorised or automated EVBs, ensure that there are power provisions to all openings. The proper connections should be provided for the EVB itself, sensors (e.g. wind and light sensors) and other equipment. For manual systems, it is still advisable to provide power provisions so as to provide the ability to later retrofit the systems once construction is completed.

Manufacturing and support

Any life-cycle cost analysis of the use of shading devices must take into account the requirement to maintain, repair, and clean them, especially if they are operable. Local manufacturing and support is vital. Locally manufactured products are manufactured specifically with the Australian climate in mind and to meet Australian standards for safety and quality. It also means if any defects arise or urgent repairs are needed, they can be addressed quickly and efficiently.

Sustainability and circular economy principles

The term "circular economy" refers to an economic framework that emphasises the recycling and repurposing of materials and goods, particularly as a means of continuing production in a sustainable way. With more owners taking on an eco-friendly mindset, it is important for designers and specifiers to identify products that support a sustainable approach to building design.

There are several characteristics of sustainable products and brands to look out for when selecting EVBs. This includes components that can be recycled, a manufacturing process that minimises waste and optimises raw material consumption, raw materials that are certified from sustainable sources, and a focus on recycling offcuts and wastage. The quality of the product should not be overlooked, as products that are built to last a long time are typically better for the environment.

Motorisation and automation

Motorisation and automation of your EVB is essential to gain the much-desired flexibility that is simply not possible with a manual system. An automated EVB is not only more convenient, but it can also be programmed to a set schedule and integrated with sensors to open and close depending on levels of light and wind. EVBs can be optimised to extend, tilt blades and retract to optimise internal temprature, sunlight and reduce glare. These capabilities will help save on electricity bills and reduce the need for artificial lighting and HVAC systems.

Choosing a high-quality, European-made motor is recommended. The motor should be fitted with a soft clutch (soft break) to make it quieter. Wind sensors should also be fitted on EVBs if they are installed outdoors. Wind sensors help protect the blinds by retracting them at 35 to 40km/hr winds so they are not damaged and do not cause any damage to the property.

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HORISO EXTERNAL VENETIAN BLINDS

High performance, technically advanced venetian blind systems

Horiso Australian-made External Venetian Blinds can be specified for external or internal use with the benefit of reducing solar heat gain, maximising the use of daylight, controlling airflow and providing privacy, making them an energy-efficient, environmentally-friendly shading option.

External Venetian Blinds use aluminium or timber slats, which can deploy for full window coverage, tilt from 0° to 130° for varying light filtration, and fully retract by way of manual, motorised or automation control.

The tilting slats provide the optimal amount of daylight, minimising the need for artificial lighting. Slats also preserve views and minimise air-conditioner usage by maintaining effective airflow and reducing overall solar heat gain. By controlling solar glare, Horiso systems are also able to reduce eye irritation and improve computer screen visibility, contributing to higher comfort and productivity levels.

Horiso blinds are designed to last, with no plastic components in slats. All steel components are 316 marine-grade. Slats are roll formed, making them flexible and crease proof and have no rolled edges. All slats are double Omega punched, ensuring correct spacing and stability.

In addition, heavy-duty stainless steel cables are used, and systems are designed with no side channels or side clips. Pelmets are extruded for added durability and can be extended. All products are locally manufactured, with some imported from Europe. Customers benefit from direct access to a local support team, short lead times and easy servicing and part replacement when required.

Horiso’s range of specialty venetian blinds are designed and manufactured to operate as motorsied controlled systems with additional automation integration options. Automated control offers hands-free automatic sun tracking deployment of your shading system according to the sun's position throughout the day, controlling glare, shading and heat gain with an emphasis on the comfort and well-being of the user. Features include, BMS integration, plug and play installation, single or group control of blinds, and more.

Where automatic control is required, local representatives are available to provide advance on where to fit sensors and how to best meet project needs.

Benefits

- Reduce thermal heat gain by up to 93%
- Optimise shading at varying sun angles
- Contribute to achieving a high environmental green building rating
- Prevent potential UV damage
- Provide years of reliable operation with minimal maintenance
- Offer various control options (manual, motorised and automated control)

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