Seeing shading in a new light

Sophisticated façade management systems and new shading technologies are redefining commercial fitouts, directly affecting: internal lighting characteristics, heat gain, HVAC efficiency, privacy, glare, as well as user comfort and productivity. *Facility Management* approached prominent manufacturer Horiso for an update on the blind and shading sector.

Australian commercial property has entered a new era in which sustainability and design meet. Tracking and calculating the sun's angle of incidence (SAI)[1] in combination with new shading device technologies has significantly reduced the energy footprint of commercial buildings. By integrating intelligent control of a façade's louvres and sun shades into a building management system (BMS), microprocessors synchronise the shades and louvres with the angle of the sun, constantly adjusting the tilt required to achieve optimal heat and light control.

The building's geographical location, design characteristics and position are overlaid with the architect's drawings and satellite data, factoring in the sun's angle of incidence, and streamed continuously to each individual blind, sunshade and venetian. This process then interacts with the air-conditioning and lighting systems to achieve maximum energy efficiency and optimal light around the clock.

"Not only do blinds and shades – as contemporary architectural features – enhance the look and style of the building, but they also enrich the comfort and wellbeing of occupants regardless of the climate, with maximum light every day and reduced all-round energy consumption[2]," says Bruno Seguin, Horiso's general manager.

Before Australian blind manufacturer Horiso developed the first climate ready dynamic façade, the only alternative was the legacy system, which relied on an astronomical clock that used an aggregate history of Australian sunlight statistics over the past 10 years and set the sunshade monitor to rotate at the same time of the day – every day. 'Sun up' or 'sun down' were the only options. There was no allowance for glare, shade or light reflection from neighbouring buildings, cloud cover or unseasonal weather. This resulted in the all-too-familiar experience of blinds going up when they should be down and similar precarious scenarios, with the ensuing haywire effects on lighting, temperature and energy control.

angle of a property – north, east, south and west – is subject to different aspects of the sun and clouds every minute of the day.

The Horiso Dynamic Façade Controller uses BACnet[3] protocols, which ensure easy integration with all other building management systems. Such systems can be combined and remotely controlled and monitored from any location with a unique graphic user interface (GUI).

"With the shades automatically adjusted by the SAI software," Seguin explains, "building occupants benefit from the immediate comfort of maximum light with no glare in a perfectly controlled environment. With the right shading device, this equates to a 93 percent reduction in solar transmission and a cooling cost reduction of up to 69 percent[4], depending on the configuration of the building."

Our extreme climate has put Australia at the forefront of sun-blocking techniques, starting with the introduction of the venetian blind in the 1960s.

below. External venetian blinds, programmed to track the path of the sun and take account of real-time climatic conditions, have a major effect on overall building efficiency and occupant comfort.

HUGE ENERGY SAVINGS

Overlooked by the historical method was the fact that every façade, level and

External venetian blinds and louvres are typically constructed of aluminium and marine-grade stainless steel. Horiso, for instance, uses a highly elastic special alloy, which is bend-proof, scratch-proof and shock-proof. This also creates the perfect barrier to stop the cold entering the building, maintaining a comfortable temperature and saving on heating costs.

Horiso has conducted successful wind tunnel tests with wind speeds of up to 77 kph and the blinds and louvres are engineered to withstand extreme weather conditions, snow and ice.

Our extreme climate has put Australia at the forefront of sun-blocking techniques, starting with the introduction of the venetian blind in the 1960s. Since those days, Australians have developed a passion for venetian blinds.

Vertical louvres became the leitmotiv of practically every modern home and office in the 1970s.

Then came the vast scenic windows with high-performance glazing to connect the outside with the inside – apart from the cost, there were issues with heat, glare and recycling. Lack of light control also led to inflated air-conditioning and energy usage levels.

PRECISION COUNTS

The precision of louvre and venetian blinds makes for perfect sun control as they rise, tilt and close, aligning the position of the slats to the correct angle of the sun to achieve the maximum natural light.

Today the goal is no longer to block the sun, but to control it by aligning with the natural elements. The latest phase in this evolution is the Horiso Climate Ready range of systems, which herald sustainability as a design feature.

Horiso's unique range of control systems and distinctive design perspective are featured in many leading commercial developments, including:

- 1 Bligh Street, Sydney – the first double-skin façade building in Sydney
- Darling Walk, Darling Harbour Sydney – set to deliver an international excellence benchmark in sustainability
- The Bond, Hickson Road, Sydney – Australia's first 5 Star green building
- Roche Products Building, Dee Why, Sydney – external sun shading creates continuous but distinct lines wrapping around the building, interconnecting with suspended sunscreen elements
- ANZ Building, Docklands, Melbourne – the largest, greenest commercial office building in Australia
- Deakin University, Geelong – sustainable development within an existing heritage building
- New Zealand Insurance Building, Auckland – rated 5 Star Green Star for both design and interior fitout
- Christchurch Civic Centre, Christchurch – New Zealand's greenest building
- Ports of Brisbane – rated 5 Star Green Star Office Design for the first commercial building in Port Central. **FM**

above. Not only are louvres suitable for vertical facades, but they are also ideal in many roofing configurations.

Footnotes

1. Sun's angle of incidence (SAI) – the angle that a ray (of solar energy, for example) makes with a line perpendicular to the surface. For example, a surface that directly faces the sun has a solar angle of incidence of zero, but if the surface is parallel to the sun (for example, sunrise striking a horizontal rooftop), the angle of incidence is 90 degrees.

2. Energy consumption of Horiso venetian blind and control systems – the energy consumption of a single blind system including the control system does not exceed the value of approximately 75K Wh. The consumption for a private household (6 windows = 6 blind systems) does not exceed approximately 375 kWh. The energy consumption of a complete system for a mid-size office building (6 floors, 180 windows, 135 shading systems) does not exceed approximately 8 kWh.
Calculation of Energy Consumption for Blind Systems, Nysan Asia Pacific, 2008

3. BACnet (building automation and control networking protocol) is a non-proprietary protocol used by building management systems that has been designed specifically to meet the communication needs of building automation and control systems for applications such as heating, ventilation and air-conditioning control, lighting control, access control, as well as fire detection systems and their associated equipment. The BACnet protocol provides a mechanism for communication between different pieces of equipment regardless of the particular building service they perform. The Horiso system is non-exclusive in that the protocol can communicate with any building management system. Traditional systems use their own priority protocols, which lack the gateway (or translator).

4. Ninety-three percent reduction in solar transmission, and cooling cost reduction of up to 69 percent, depending on the configuration of the building. Source: Horiso.

Horiso, an Australian-owned manufacturer of solar control systems and specialty blinds since 1995, creates internal and external solar control solutions for the commercial, hospitality, institutional, and residential sectors.

More information
Horiso
www.horiso.com