CASE STUDIES

Solar Shading in Science & Medical Environments

Smartlouvre Technology

Science & Medical Solar Shading

CASE STUDIES

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Case Study Optoelectronic Room Southampton University

Background:

Southampton University is one of the largest universities in the UK, with a leading Optoelectronics Research Centre and Clean Room.

This Integrated Photonics Cleanroom (IPC) is designed for scientific experiments and for planar processing of a very wide range of materials not normally found in silicon processing facilities.

Acceptable ambient temperatures are crucial to maintain an acceptable working environment.

The problem:

Due to the high rate of air exchange, air conditioning as a retrofit solution was completely impractical.

The view to the outside was considered a critical design feature of the lab and could not be altered.

The design that covered the glazed façade also holds special significance to the lab as it reflected a significant milestone in the lab's history.

A solar control solution was needed to be complimentary and not obscure the design from view.

Results:

- Significant reduction in internal temperatures
- Light and easy to install
- Compliant with all standards and regulations
- Maintained ability to view out

KOOLSHADE®
The Ultimate In Passive Solar Shading

The Project Managers recommended Microlouvre Koolshade® solar shading in order to significantly benefit their building with an integrated solution which was quick, non-intrusive and did not interrupt work inside.

Koolshade® screens were quickly and easily installed direct onto the glass using the famous 3M VHB adhesive tape to fix the tracks, top and bottom, directly to the glass panels.

University of Southampton

Immediately, significant reductions in temperature were experienced, such that you could feel the difference when touching the glass on the inside before and after the screens were fitted.

Case Study ION Science

Background:

ION Science has over 30 years of expertise designing, manufacturing and supplying PID gas sensors, gas detection equipment and leak detectors for a variety of industries and applications.

Smartlouvre worked with ION Science to implement Microlouvre Koolshade® over the skylights to ensure control over work environment temperature and thus reduce energy costs.

Requirements

- Short period installation
- Roof glazing
- Easy installation using non mechanical fixing
- Need to have perfect outward vision
- Need to have pure natural light (100% CRI)
- Zero heat transmission essential

The Problem:

Since ION moved into their stunning, ultra-modern, cedar-clad 'Passive' complex building, there has been a problem with heat passing through the glass roof where their gas leak and sensing equipment is designed has proved problematic.

The ION Science team struggled with solar heat gain pouring through workshop skylights because temperature regulation for sensitive testing equipment was essential.

Typical air conditioning was both difficult to balance and inadequate, causing many problems for personnel and equipment.

Other methods to reduce internal temperature whilst maintaining natural light and vision out, like window films, had been tried but these solved none of the problems.

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THE SOLUTION

Microlouvre Koolshade® Screens have now been quickly and easily fitted to the skylights, using 3M Griplock tape thereby avoiding the need for any drilling or mechanical fixings whilst maintaining an essential air gap between screen and glass to allow heat dissipation. Griplock allows the screens to be easily removed for window cleaning.

Koolshade® provides up to 100% perfect solar shading but with an incredibly 80% open area for near perfect vision, daylighting and natural ventilation.

How can this be possible? It's simple, well not so simple, because there are up to 700 angled paper-thin micro louvres only 1.25mm wide and 0.3mm thick woven into every metre of ION screen.

RESULTS

- Heat block and temperature reduction
- Views out
- Air Conditioning reduction
- Controlled glare
- Passive solar shading

"*Microlouvre Koolshade® is a good product and does exactly what we needed it to do. Fair price compared to other estimates we received for alternative methods*" Adam Wyeth - ION Science.

Case Study The Huntington & Langham Estate

Background:

Smartlouvre worked with The Huntington & Langham Estate care home to stop intense solar gain through ground and first floor windows.

The challenges were:

- A curved building
- Upward laminar air circulation
- Very high internal temperatures

The Managing Director of this care home, spent years looking for a solution to the excessive solar gain from the ground and first-floor windows.

The problem:

It all started in 1978, when Marilyn Hoare, the founder and owner, launched Huntington House, one of the country's first nursing care facilities.

Marilyn was a nurse living in Surrey at the time, and she was so enthusiastic about providing high-quality nursing care for the elderly that she decided to make her dream a reality by offering inexpensive, luxurious 24-hour nursing care.

On the ground, she put a 700mm projection Brise soleil that did not work and cost a fortune. The majority of the day, they only covered 20% of the ground windows.

They needed to save cooling expenses and make the interior spaces usable, which were mostly inaccessible due to the increased heat.

The Solution:

Since the building is curved and the wind may whip around it, we had to adjust the Lift In / Lift Out (LILO) to accommodate for the nature of the inclement weather.

We have installed end stops, locking pins, and bump pads. Microlouvre Koolshade® was the only option as they the building required ventilation and uninterrupted vision out.

They had looked at all film and external blind options and trialled film, but soon realized that MicroLouvre® was the best and most cost-effective option.

Results:

- Thermal and visual comfort
- Solar heat reduction
- Pure, natural daylight in

And of course, the ability to now rent out all of the rooms on the estate, with no overheating, hot-spots or closed windows.

Case Study Wesley Taylor Village

Background:

The Wesley Taylor Village offers independent retirement living; accommodation, social activities, services and assistance as required. The building design features an external glass elevator shaft to support residents and maintain the views of their stunning beach location on the Narrabeen Peninsula.

Overheating of the lift shaft caused the management to abandon the use of the lift in summer due to both personal welfare of the tenants & mechanical operational issues due to the material heat mass.

Requirements

As a result, low mobility tenants were confined to the ground floor levels.

Solving the problems caused by the glass elevator shaft in this retirement village reaching internal temperatures of 50°C.

- Overheating issue
- Need to have pure natural light (100% CRI)
- Zero heat transmission essential

The Problem:

Post occupancy, it was found that the internal temperatures of this elevator rose to over 50°C.

The management abandoned the use of the elevator during the summer months due to both the welfare of the residents and mechanical operational issues caused by material heat mass.

As a result, low mobility residents were confined to the ground floor levels.
Architects Maitland and Butler were engaged to find a solution to the overheating issue.

They approached Greene Fire (our Australian distributor) who worked together with them to model the impact on the solar heat gain which was achievable by installing Microlouvre Koolshade® screens.

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THE SOLUTION

Prior to considering Microlouvre Koolshade®, the architects had completed a sun study which showed how large, fixed horizontal louvres could provide enough shading through the hottest part of the summer day to keep the internal temperature in the lift shaft to a tenable level.

However, when the sun angle was below 33 degrees (up to 11am at the height of summer), there would be no protection and therefore the early morning sun would heat the elevator before the horizontal louvres could have any effect.

In comparison tests with the building's design tolerances, Microlouvre Koolshade® proved to deliver 35% shading at 0 degrees sun angle and full shading when the sun angle was at 40 degrees, therefore it was selected by the architect as the optimum shading solution.

Following install, further tests showed that MicroLouvre® had reduced the midday summer temperatures inside the elevator by as much as 50% and the lobby area it was housed in, reduced

THE RESULTS

- Improved comfort levels inside the building by more than 10 degrees celcius
- Did not need to perform major works like replacing glass windows or installing heavy louvres needing structural supports
- Improved the aesthetics of the building by creating a uniform look from the outside
- Still have near perfect vision through the glass from the inside
- Provides screening the internal lift mechanism, adding to the aesthetic quality of the surrounding garden
- MicroLouvre is easily removed for ongoing cleaning & maintenance as well as allowing access to the lift shaft structure

Case Study Pacific Wildlife Research Centre

Background:

The Pacific Wildlife Research Centre (PWRC) is located on Westham Island, Delta,British Columbia, and is on a site of 720 acres surrounded by inland water and dikes.

Environment Canada (EC) acquired the property from the Reifel Family in1972 which currently houses 48 staff consisting of EC employees and research associates from Partners, NGO's and Simon Fraser University, Burnaby, British Columbia.

The Problem:

During summertime, the windows were not protected from the high solar heat levels causing discomfort in the workstations.

For this project, the sunlight was elevated causing the radiation to hit the windows from an indirect angle to the building. Therefore, a different method of installation was required for some windows on the building.

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The subject project replaced an existing one storey structure with a new two storey building consisting of a main floor library and meeting rooms and a second storey with twenty new workstations for scientists, biologists, planners and technicians.

The addition is visually distinct by designing the building using green features. The new building utilizes a narrow depth office floor plate for superior daylighting and an efficient naturally ventilated space with opening windows.

The window pattern and structural grid are generated from the planning module for workstations in the open office offering a direct connection between users and the sanctuary.

SOLUTION

During summertime, the windows were not protected from the high solar heat levels causing discomfort in the workstations.

For this project, the sunlight was elevated causing the radiation to hit the windows from an indirect angle to the building.

Therefore, a different method of installation was required for some windows on the building.

RESULTS

- Thermal comfort
- Reduced room temperature
- Controlled glare nuisance
- Optimised solar heat gain control
- Bird protection
- Made from +90% recycled copper scrap
- Highly sustainable
- 100% recyclable

Case Study HRL Laboratories

Background:

State of the art research facility which uses excessive air condition loads. In order to meet stringent fire safety standards they required a retrofit shading solution.

High energy consumption was significantly reduced through installation of Microlouvre Koolshade® whilst maintaining occupant comfort and building compliance

Challenges

- Long durability 60+ years
- Maintenance free
- Excessive air conditioning loads
- Stringent fire safety standards are required
- Need perfect outward vision
- Natural ventilation was needed

The Problem:

The key reason for the high-energy consumption in laboratory facilities, is their high ventilation rates and the associated air conditioning loads.

To ensure a comfortable and practical environment within the labs, a consistent building temperature of 24 degrees Celsius was defined.

Post-occupancy, the buildings required 240 ton of refrigeration to be applied to maintain this temperature of 24 degrees.

Alternative solutions to reduce the cooling load through minimising solar heat gain had to be found, and without infringing on Malibu's rigid legislation on reflective glass and window films.

HRL LABORATORIES

THE SOLUTION

What was then known as KoolShade®, a name we have returned to, was installed throughout, ensuring 87% of the sun's rays and its effects were blocked.

The reduction in refrigeration tonnage was recorded at over 17% due to the screens alone.

That was installed in 1960 and 60+ years later, the screens are still in place, performing as they did on day 1, and remain aesthetically pleasing, without any maintenance.

The building management have confirmed that they are simply pressure washed (in-situ) just twice a year and are still 'in great shape'.

THE RESULTS

- 17% reduction in cooling load
- Balanced daylighting and full CRI
- Maintained ability to view out
- Compliant with all standards and regulations
- Easy to clean and durable

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Case Study Alexandra Hospital, Redditch

Unhealthy dangerously high internal temperatures; poor natural or high energy use mechanical cooling spreading viruses.

Smartlouvre Technology

Background:

Alexandra Hospital was facing the same problems that most Healthcare buildings and occupants encounter; unhealthy dangerously high internal temperatures; poor natural or energy-guzzling mechanical cooling spreading viruses.

Extreme overheating was experienced inside the wards and sash-style opened windows were needed for ventilation purposes.

Traditional internal blinds just did not work as now proven by Government Legislation.

Internal systems are also not conducive to clean sanitary conditions.

The problem:

- Zero heat transmission essential
- Stop very high internal temperatures
- Patients and Nursing Staff suffering from overheating
- Poor, unhealthy air quality
- Natural ventilation was essential
- Energy efficient zero maintenance product needed
- Good outward vision needed
- Pure natural daylight light (100%CRI) essential

Results:

- Heat block and temperature reduction
- Natural ventilation
- Views out
- Energy saving

NHS

THE SOLUTION

Worcester Trust adopted an energy-saving drive strategy demanding a highly efficient barrier to solar heat gain, which protected patients and staff, saved or even removed the need for air-con, and provided all the recognised environment comforts.
Microlouvre Koolshade® ticked the boxes in terms of leading to a lower internal temperature and reducing the HVAC load by at least 68%.

A straightforward, quick, and importantly non-intrusive installation with Lift in / Lift out screens was the method used for integration, resulting in overheating elimination, natural ventilation, unobstructed views to the outside, and a massive cut in mechanical cooling costs. With zero maintenance and 60+ year life span this was exactly the right medicine for any hospital.

Case Study Basingstoke Hospital

Smartlouvre worked with Basingstoke hospital to provide solution for the heat gain issues, initially in a Microbiology Laboratory but ultimately also in a clinical ward.

Background:

Basingstoke hospital needed to solve massive problems of heat gain through windows and health problems and energy costs associated with inefficient air-conditioning systems.

High internal temperatures inside the Microbiology laboratories meant using mobile ‘through the window air conditioning units'.

Initially, the project was intended only for the laboratories, but once a clinical ward Sister learned of the impending solution, she insisted her ward be included in the installation

The problem:

- Unbearable internal temperatures, for all staff and patients, even in early Spring
- Inefficient, germ spreading (refer CIBSE guidelines) mobile air-con units were not coping
- Natural ventilation was essential
- Energy efficient product was needed
- Need to have perfect outward vision
- Need to have pure natural light (100%CRI)
- Maximum solar heat gain heat protection was essential

THE SOLUTION

The heat buildup was well into the mid-30°s before Microlouvre Koolshade® screens were installed. Using a simple boom cradle, screens were quickly and easily integrated using side hinges and spring lock catches to allow the screens to be opened for maximum ventilation.

Temperatures immediately plummeted for the benefit of all. Because of these results, it was said that 40 air-conditioning units were no longer required. As Basingstoke hospital is part of a government initiative to save energy – one of the results achieved was cutting the mechanical cooling costs and that's why Microlouvre Koolshade® was the most suitable product for this project.

RESULTS

- Heat block and temperature reduction for patient and staff
- Natural ventilation
- Views out
- Energy saving

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