



## SELECTING THE RIGHT SOLAR SHADING CAN REDUCE ENERGY COSTS BY UP TO 16%

Rising energy costs and the need to reduce carbon footprints has made energy efficiency a top priority. Solar shading is a cost-effective solution to tackle overheating in high-performing buildings.

Solar shading significantly reduces the need for mechanical air conditioning. Aircon does not have an effect on radiant heat exchange and can also negatively impact on indoor air quality. Using solar shading and less of air conditioning saves energy and saves you money.

### SUSTAINABILITY

Passive cooling techniques such as shading systems are identified as priorities by the Internal Energy Agency as non-energy intensive means of reducing the need for airconditioners. The ESCORP/EU25 study quantified that 80 million tonnes of CO<sup>2</sup> could potentially be saved by installing solar shading.

### KEY BENEFITS

- Reduced heat gain in summer.
- Reduced heat loss in winter.
- Controls daylight.
- Controls glare.
- Improved indoor air quality.
- Reduced energy costs (heating, cooling and lighting).
- Building compliance.
- Privacy and security.
- Maintaining views to the outside.
- Allows more glazing to be used.
- Reduced emissions.
- High colour rendering index.
- Improved acoustics.
- Improved glass performance (improve don't replace).
- Improved thermal, visual and acoustic comfort improves overall well-being and productivity of staff.

## HOW SOLAR SHADING SAVES YOU MONEY

### CONTROLLING LIGHT AND GLARE

People naturally prefer daylight to other sources of illumination. Daylight has a positive effect on the biological rhythms of our bodies, improving emotional and cognitive responses.

Proximity to natural elements such as greenery and sunlight has been associated with a 15% improvement in wellbeing and creativity, and a 6% increase in productivity, but excessive exterior light, or glare, can hinder visual comfort. There are regulations in place that require the attenuation of light at workstations.

Shading allows the most to be made of natural daylight and unlike solar control glass, which is a purely passive product, shading solutions can react to varying external conditions.

### REDUCING HEAT LOSS

Glazing is a weak point in a building's thermal performance and a major source of heat loss.

The 'go-to' solution would be to upgrade the glazing but shading should be the initial step, especially if there are building constraints, such as conservation areas, as shading helps provide insulation for glazed areas.

### CONTROLLING HVAC

Window blinds reduce heat loss during the winter and heat gain in the summer, thereby reducing a building's heating and cooling requirements. Air conditioning currently accounts for 10% of the global electricity use. With that figure increasing it can increase a building's energy consumption (and associated carbon emissions) by up to 100%.

Shading can aid natural ventilation of buildings during warmer times of the year, if windows are opened. Modelling shows internal shading is an investment and can save up to 16% of HVAC energy.

### REDUCING HEAT GAIN

To be energy efficient, most modern buildings are highly insulated and 'airtight', but this significantly increases the risk of over-heating.

Overheating becomes more of a prominent problem with the reality of global warming, as higher temperatures are expected across the UK during the next 30 years, with heat related deaths tripling by 2050.

Appropriately controlled shading can significantly minimise the risk of overheating.

### PRODUCTIVE ENVIRONMENTS

We spend up to 90% of our time indoors, so ensuring such environments are comfortable is essential.

Productivity is impacted by thermal comfort. Temperatures which are too low inhibit dexterity while temperatures that are too high result in perceived lower air quality and health implications, such as increased stress and blood pressure. Heat also facilitates the spread of infection and diseases, a massive risk in healthcare and childcare sectors.

Performance affected from glare and reflections can cause eye strain and headaches.

Glazing is poor at preventing external sound entering our buildings, such as passing traffic or noisy neighbours. Inside, glazing acts as a hard surface allowing noise to rebound into the room. A softer furnishing at the window can absorb this sound, creating a more pleasant environment.

Shading, integrated into the building's design, can help achieve thermal, visual and acoustic comfort. Neglecting these aspects of building design can result in overall reduced productivity, increased costs and more frequent sick leave.

# THE BENEFITS OF SOLAR SHADING IN COMMERCIAL BUILDINGS

## H HVAC REDUCTION

Building modelling proves substantial HVAC savings of up to 16% for highly-glazed office space using internal shading.

With optimal integration the need for airconditioning can be reduced.

Shading systems are beneficial all year round as they reduce the need for cooling when hot and reduce the need for heating when cold.

## A ARTIFICIAL LIGHTING

Artificial lighting can be reduced by controlling and optimising the amount of daylight with shading. People naturally prefer daylight to other sources of illumination.

## CAPITAL SAVING

Solar shading is a self-financing climate control system. An analysis of HVAC systems in three climate zones - Stockholm, Amsterdam and Madrid showed how solar shading paid for itself in less than a year.

## S SOLAR GAIN & OVERHEATING

Shading prevents overheating. Solar gain (G TOT) with double glazed windows can be reduced from 0.85 to 0.24 by using shading.

## HEAT LOSS & INSULATION

Glazing is a weak point in a building's thermal performance and a major source of heat loss. Shading insulates a building's glazed areas. A single glazed window can have its insulation improved by over 50%.

## D DAYLIGHT HARVESTING

Shading allows harvesting of natural light, which improves indoor comfort, occupants well-being and reduces the use of artificial lighting, saving money.

## DAYLIGHT EXPOSURE

Insufficient daylight affects task performance and can cause visual and physiological disorders e.g. headaches, eyestrain, depression and reduced vitality.

Office workers exposed to daylight and contact with the outside world have been found to sleep an average of 46 minutes more every night compared to those in offices with no natural light.

## PRIVACY

Shading offers two way privacy and a functional/visual divider in buildings.

## G GLARE CONTROL

Light and glare is effectively controlled by shading. Shading regulates luminance according to varying visual comfort needs.

## COLOUR RENDERING

Artificial light can cause inadequate colour rendition with detrimental effects in terms of stress levels and productivity.

## P PRODUCTIVITY

Work performance diminishes below 19-22°C and above 23-24°C. Shading systems can contribute to superior work performance, increased concentration and well-being in the workplace.

## INDOOR COMFORT

Almost 90% of our time is spent indoors. Thermal, visual and acoustic comfort aids emotional, attitudinal and cognitive response in an individual.

## BENEFITS OF AUTOMATION

Optimal, dynamic performance delivered by motorised window shading significantly reduces the risk of overheating.

