



**Tackling the overheating issue:**  
The ultimate industry guide to solar  
control glazing in residential applications.

## What is solar control glass?

Solar control glass, such as the Pilkington **Suncool™** range, allows sunlight to pass through a window or façade while radiating and reflecting away a large degree of the sun's heat. The indoor space remains bright and much cooler than would be the case if standard glass was installed.

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**Phil Brown**, Pilkington UK European regulatory marketing manager, offers a deep dive into new building regulations designed to combat the overheating issue by driving up solar control specifications.



## Overheating: a hot topic

**61%**

of specifiers have  
seen rising demand  
for solar control glass

**62%**

of specifiers see  
climate change as  
driving demand for  
solar control glass

All of the top-ten warmest years in the UK have occurred since 2002, a sign of the grip that climate change continues to have.

And the Summer of 2021 saw new records broken that add fresh concern to the climate debate, with the Met Office issuing its first ever extreme heat warning in the UK.

An uncomfortable truth is that a hotter climate holds alarming consequences, not least exposed by the UN's landmark climate change report declaring a 'code red for humanity'.

Estimates vary that between 2,000 and 8,000 heat related deaths occur in the UK each year, much of the risk thought to be caused by exposure to high indoor temperatures.

So, keeping buildings cool is increasingly as much a safety issue as it is one of comfort.

But combatting the issue with cooling systems alone conflicts with our obligations to meet net-zero emissions targets. One study estimates that air conditioning accounts for almost one tenth of the UK's electricity consumption.

Building product manufacturers, architects and specifiers, developers and policymakers each need to find innovative solutions for combatting the risk of overheating in a sustainable way.


And encouragingly, building policy is beginning to recognise this critical issue, with new regulations set to be introduced amid a major housing boom that will leave a lasting legacy on the UK – and at a potential tipping point for climate change.

Innovative, high performance building products like solar control glazing, which are commonplace for controlling building temperature in hotter climates, will be increasingly used in the fabric of UK homes under the new regulations – providing a sustainable way of keeping the heat at bay.

It's clear that the specialist glazing is already finding a strong footing in the UK market. A recent industry survey we conducted found that two in five specifiers (41%) had seen a rise in demand for solar control glass in the last 12 months.

Building regulations, energy costs and climate change were each cited as key factors behind this demand increase.

We'll be working alongside the building design community, and the glass and glazing supply chain, to help housebuilders in meeting or surpassing these new regulations, creating safer, futureproofed homes.



## Solar control glass: debunking the myths

### How does solar control glass work?

In the warmer months, solar control products such as Pilkington **Suncool™** 70/35, reflect the sun's heat to help maintain a cooler internal temperature.

This makes it particularly suited to glazing that faces East, South or West, as this receives the most solar heat. It achieves this while still enabling a high level of visible light transmittance.

In winter, the thermal insulation properties help to keep rooms warmer with a Ug-value of only 1.0 W/m²K. As well as excellent solar control, our range can help to reduce glare.

### Is it necessary for UK homes?

It's understandable that many believe that solar control glass is not necessary in a temperate climate like the UK.

Yet increasingly occurring heatwaves and alarming new temperature records are driving many building designers and housebuilders to futureproof homes with solutions such as solar control glass.

What's more, new regulations coming into force in 2022 are also set to drive further specifications of solar control glass, as policymakers act to combat the threat of overheating in homes while reducing demand on energy-intensive cooling systems. We unpick these new regulations on page five.

### Does it let the heat out in the winter?

Advancements in coating technology have long helped manufacturers to combine solar control with other functionalities.

With low-e performance, high performance solar control glass can help to improve energy-efficiency and occupant comfort year-round. This means, while it helps to retain heat during the cooler months, it also reduces solar gain during the summer.

It can also be combined with other glass types ranging from noise control, strength and security, to self-cleaning properties.

### How available is it?

We manufacture solar control glass in the UK, providing better lead times and availability for customers. It's the result of significant investment in our off-line coater, and for almost ten years we have been producing Pilkington **Suncool™** at our base in St Helens.

We also manufacture Pilkington **Activ SunShade™** Blue and Pilkington **Activ SunShade™** Neutral

in the UK, products that combine self-cleaning and solar control properties, and are ideal for use in conservatories.

# Around the world: how solar control is making a difference in tougher climates

## The Jade

Tall buildings clad almost entirely in glass have some significant advantages. They afford their occupants a spectacular view of the surroundings, and their interiors also tend to be filled with glorious natural light, dawn till dusk.

But, without careful engineering, these benefits can come at a significant cost – especially in locations with extreme or variable climates – and that is maintaining a steady interior temperature throughout the changing seasons.

This was exactly the challenge faced by the designers of The Jade, a new development in downtown Nova Scotia, Canada.

On its first two floors, the building maintains its much-loved 1920s art deco façade, behind which commercial shopping units will be housed. Above this, however, is a fully glazed 11-storey tower that rises to take its place in the Halifax skyline.

While winters in Halifax drop well below freezing – the lowest temperature ever recorded was -25°C and winter temperatures often reach -8°C – its summers often reach 30°C, so the glass on the building had its work cut out regulating the internal temperature.

The architect chose to deploy Pilkington **Suncool™** 50/25, a solar-control glass that helps prevent excessive heating during the warmer months.

It works thanks to a cutting-edge multi-layered coating that lets in just 25 per cent of the sunlight's heat energy, while still permitting 50 per cent of the visible light to enter the building, with no change to its natural colour balance. The result is an interior that is filled with daylight and unobscured views and won't cost the earth in air conditioning.

The other key part of the glazing's job is to keep residents warm during the cold winters, which it does well thanks to its excellent low-emissivity performance. This means that rather than allowing heat to radiate away from the interior, the glass reflects it back into the building, helping to save on heating bills and creating a comfortable living space all year round.





Designed by SAOTA  
Photographer: Adam Letch

## Lake Huron House

Lake Huron House sees local “cabin country” architecture completely reimagined to create a modern family retreat on the banks of one of North America’s five Great Lakes.

Taking a contemporary architectural approach, the residence maximises its breath-taking lakeside views, while remaining sensitive to its surroundings and sustainability impact in a climate of extremes.


To achieve its statement aesthetic and enhance the beautiful natural setting, one of the key components of the design is the use of glass. Glass not only provides distinct visual features throughout the home, functionally it serves as a robust external surface that plays a vital role in maintaining the building’s energy efficiency.

With many demands on the crucial material, the architects turned to the Pilkington product portfolio, to ensure the perfect glass solution was delivered.

Pilkington **Suncool™** 70/35 OW T was specified for the project to help bring the outdoors in by creating the perfect balance of natural light, while minimising solar heat gain. Having an eye on sustainability was key, and this specification delivers excellent thermal properties that can help reduce the home’s energy consumption.

By combining the Pilkington **Suncool™** coating with extra clear true low iron Pilkington **Optiwhite™**, it ensures that the neutral appearance does not spoil the beautiful views of the landscape and creates a bright and airy internal living space.

The glazing ensures that the occupants can enjoy the vistas and are comfortable all year round, while reducing the need for constant air conditioning, in turn cutting energy bills and making the home more environmentally friendly.



## Are new overheating building regulations a missed opportunity to create safer, sustainable cities?

**Phil Brown**, European Regulatory Marketing Manager at Pilkington UK, reviews new building regulations for England designed to help tackle the overheating issue in a sustainable way.

In the UK, architects are well-versed in measures to keep homes warm in winter.

Insulation and glazing solutions have long been specified to make buildings more energy efficient and to reduce the need for heating. And, in newer developments, architects have been able to make the most of the latest insulating solutions, making new builds airtight and even more effective at retaining heat during the winter.

But in heatwaves, these measures can serve to exacerbate the problem. If excessive heat is coming through the windows into houses with insufficient ventilation, this can lead to serious issues with overheating.

This is the challenge that new building regulations coming into force from 15th June 2022 aim to address, by implementing changes to reduce overheating in new homes in England.


### Overheating regulations

The new Part O of the Building Regulations is expected to impact on glass specifications, changing the way that new dwellings are designed and built to mitigate the effect of extreme temperatures such as those experienced in August 2021.

Importantly, the simplified method given in the supporting Approved Document O differentiates between residential buildings in the 'high risk' areas of urban and suburban London and central Manchester to those elsewhere in England, which are deemed as 'moderate risk'.

For new residential buildings or parts of buildings in the 'high risk' areas with openings on opposite facades, it is stated that maximum glazing area should be 15% or 18% of floor area, dependent upon orientation,

“By striving not just to meet regulations, but to exceed them, developers and architects can help futureproof buildings against climate change.”



and shading should be provided on glazing between North East and North West (turning clockwise via South). There are also requirements for maximum area of glazing in the room with the most glazing.

For high-risk residential buildings without openings on opposite facades, then maximum glazing area should be 11 - 15% of floor area, dependent upon orientation. Where shading is required, glazing with a maximum g value of 0.40 and a minimum light transmittance of 0.70 is one of the accepted solutions.

However, for residential buildings outside of urban and suburban London or central Manchester, there's no requirement for shading as long as the maximum glazing area for that orientation is not exceeded.

In effect, the simplified method of Approved Document O creates a tiered approach by location to the issue of overheating, where only two 'hotspots' are deemed to require more significant measures to prevent high internal temperatures.

Yet residents in other UK cities are just as vulnerable to excessive temperatures as those in London. For example, Birmingham and Leeds are highlighted in studies on urban heat island intensity – which analyses temperature difference between urban and rural areas – as being at a similarly high risk of rising temperatures as London and Manchester.

This 'urban heat island' effect was experienced by Ian Forrester at BBC Manchester, whose new build flat in the city reached excessive temperatures this summer due to a lack of solar control glass. In the Times he detailed some of the consequences – food goes off very quickly, children in the building have had heatstroke, and a neighbour's dog died in the heat. Residents have been forced to install costly and energy intensive cooling systems in order to keep temperatures bearable.

## A missed opportunity?

With overheating a clear and growing problem in residential buildings across the country - including major cities outside of urban and suburban London and central Manchester - it raises the question, is the double standard set out in the new regulations an oversight? Is a failure to acknowledge the risk of overheating outside of these hotspots a missed opportunity to create more sustainable cities across the country? Maybe, but it doesn't have to be.

Housebuilders and architects should consider specifying high performance solar control glass in residential buildings in all cities to help prevent overheating.

Ultimately, it may not be changes to building regulations that cause measures to be implemented to avoid overheating, but rather residents' need to avoid increasingly unbearable temperatures.

This is especially the case where retrofit is concerned, as it's not currently foreseen that corresponding regulations will be implemented to enforce upgrades to be made in existing properties.

The Government's Climate Change Committee has warned that more than half a million homes built since 2017 will need to be retrofitted to ensure they stay cool. They also estimated the costs of retrofitting mitigation measures into a property to be four or five times more than if they had been included at the building stage.

By striving not just to meet regulations, but exceed them, developers and architects can help futureproof buildings against climate change and reduce the overall carbon footprint of a development, making it more attractive to both investors and residents.

Keep up to date on regulation changes by visiting our **Part L hub**.

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**Pilkington United Kingdom Limited**

Registered office: European Technical Centre,  
Hall Lane, Lathom, Nr Ormskirk, Lancashire L40 5UF  
Fax 01744 692 880  
enquiries@pilkington.com  
**[www.pilkington.co.uk](http://www.pilkington.co.uk)**