

globalglass®



Insulated double and triple glazed units, custom-built to specification and manufactured to the highest standards

Insulated glass units

 synseal®

Global Glass - a specialist supplier

The Global Glass specialist manufacturing and supply division has been established to expand Synseal operations beyond core PVC-U extrusion activities with the ability to provide high quality sealed insulated glass units to fabricator partners that are optimised to deliver the best possible thermal efficiency when used in combination with the company's proven conservatory roof and PVC-U window and door systems.

With plants in three strategic locations, Global Glass has grown steadily and is now one of the Top 10 volume IGU makers in the UK today, manufacturing in excess of 4,000 IGUs per day.

Global Glass offers a highly focussed range which principally caters for volume demand, majoring on 28mm double glazed units and also supplying triple glazed units built to specification, as and when required. Variations of spacer bar (warm edge spacer, aluminium spacer and warm edge super spacer) and Clear, Blue, Aqua and Bronze colours are available, together with decorative glass solutions, Argon or Krypton gas-filling and Low-E and low maintenance glass coating options.

The exclusive Celsius premium performance glass delivers added value in both commercial and retail market arenas and is a key differentiator for Global Glass.

Three efficient IGU manufacturing plants

In November 2011 Global Glass was created when a local Nottinghamshire sealed unit maker Midland Glass Supplies, was acquired by Synseal. Initial operations at Global Glass

Huthwaite focussed on toughened roof glass, sold in combination with the UK's best-selling Global conservatory roof to provide an efficient service to customers for Global roof kits, including made to measure high performance roof glass units. Global Glass Huthwaite is now Synseal's prime manufacturing facility for window and door IGUs.

In May 2012, a second glass plant was added with the acquisition of K2 Conservatories to create Global Glass Blackburn, which boasts well-established glass unit manufacturing operations and a unique premium product offering in the shape of Celsius performance glass. The exclusive Celsius range offers three formulations:

| | |
|--|--|
| CELSIUS Clear™ PERFORMANCE GLASS | ideal for conservatory window frames with a centre pane U-value of 1.0 W/m²K |
| CELSIUS One™ PERFORMANCE GLASS | an effective roof glass specification with a centre pane U-value of 1.0 W/m²K |
| CELSIUS Elite™ PERFORMANCE GLASS | the ultimate roof glass specification with a centre pane U-value of 0.9 W/m²K |

In July 2014 a third glass plant was added with the acquisition of the business and assets of Prospect Inc. Ltd, trading as Systems Glass, to create Global Glass Wigan. Located at Challenge Way in Wigan with convenient access to both the M6 and M58 motorways, this facility supplies quality products which include insulated glass units for window frame and roof applications as well as quantities of single sheet toughened glass.



globalglass® huthwaite

is Synseal's No.1 IGU manufacturing plant in volume output terms. Our Huthwaite plant builds and despatches many thousands of high quality sealed units every single day.



globalglass® blackburn

is now Synseal's centre of excellence for roof glass, enabling Global Glass Huthwaite to concentrate on producing window and door glass in volume.



globalglass® wigan

has an existing capacity of 9,000 window and door glass IGUs per week which will be increased further through additional Synseal investments to fully maximise the potential of this spacious site.

Looking to the future

Investment for growth

In the UK glazing industry it is widely accepted that the average market quality control reject rate for sealed glass units is 2.5%, however Global Glass achieves a low reject rate of just 1% for window glass and 1.5% for roof glass.

Continued investment is crucial to maintain and improve product quality and customer service standards and meet the strong demand for high quality IGUs from Synseal's trade fabricator and installer customer base. Recent business improvements include:

- New toughening furnace and glass handling equipment at Global Glass Huthwaite
- New furnace, IGU line and arrissing equipment to almost double capacity at Global Glass Blackburn
- New cutting table at Global Glass Wigan
- New production layout improvements at Global Glass Wigan are ongoing to maximise the potential of the plant
- New order optimisation batching and delivery vehicle scheduling procedures
- New purpose-built delivery stillages to reduce breakages in transit
- New manufacturing plant loading procedures to eliminate double handling
- New edge protectors and banding of units to eradicate potential damage when loading
- New invoicing system with improved unit identification to consolidate despatched items
- Electronic data interfaces (EDI links) with major customer accounts, to speed order processing and maximise efficiency



Producing quality units every time



The perfect glazing solution

Global Glass - superior quality built-in



Global Glass operates state of the art dedicated double and triple glazing lines to ensure maximum efficiency

Global Glass is a specialist manufacturing division of Synseal Extrusions Ltd. Specify Global Glass to ensure the very best in product quality and service.

Total quality control is carried out using two basic principles: building-in quality at every stage and continually improving quality standards in order to achieve optimum performance and customer satisfaction.

Insulated glass unit (IGU) manufacturing for windows, doors and conservatories is all undertaken on-site at a specialist Global Glass plants located in Huthwaite, Nottinghamshire and Blackburn and Wigan in Lancashire. This ensures quality control of manufactured products, stock, cost base management, reliability of supply chain materials and, even more importantly for customers, precise management of price, lead times and product availability.

The IGU assembly process is automated and testing is computerised to ensure a consistently high quality product. With investment in the latest technologies and modern machinery, Global Glass delivers products which are consistent in quality.



New purpose built glass stillages



Toughening furnace at Huthwaite

Operational processes are constantly reviewed to reduce waste, diagnose potential problems and identify solutions quickly and systematically.

The Global Glass team continually works towards improving quality management practices to:

- Achieve and improve customer satisfaction
- Improve and innovate working methods
- Increase efficiency and reduce both waste and cost
- Ensure high levels of corporate care and responsibility

Insulated glass units

Choosing a sealed glass unit manufacturer is a critical decision. Consumers are increasingly demanding higher energy ratings to keep their homes warmer and heating bills lower.

Combining energy efficient frames and glass is crucial to delivering overall window thermal performance. Whether the BFRRC Window Energy Rating scheme or FENSA U-value rating is selected as the route to technical compliance, Global Glass is the supplier of choice for thermally efficient sealed units. Whatever the rating required, Global Glass has the IGU products to meet energy efficiency needs. With Argon or Krypton glass-filled cavities and warm edge spacer bar options, Global Glass can deliver a range of thermal

performance solutions to satisfy customer requirements. Global Glass employs a continuous improvement policy to ensure that both manufacturing technology and production standards are optimised.

This policy has already seen investment in state-of-the-art gas filling technology, improved toughening facilities, inspection systems and logistics. Further strategic investments in both technology and processes will be deployed as Global Glass intends to lead the way in advanced glass manufacturing technology.

Global Glass constantly strives to find new ways to design, produce and deliver market leading IGU products.



Double glazed units

Double glazed sealed unit construction options are aluminium spacer bar, warm-edge spacer bar or a warm-edge super spacer bar (which is ideal for non-rectangular roof glass), with either 2 part or butyl hot-melt secondary seals depending on specification.

Vertical sliding sash windows are typically glazed with 24mm DG units (4:16:4). Domestic specification casement windows/doors and conservatory roofs are typically glazed with 28mm DG units (generally 4:20:4, although a range of pane and airgap configurations are available including 6:16:6 and 6:18:4).



Triple glazed units

Triple glazed sealed unit construction options are aluminium spacer bar, warm-edge spacer bar or a warm-edge super spacer bar, with either 2 part or butyl hot-melt secondary seals depending on specification.

Domestic specification casement windows/doors can be optionally glazed with 36mm TG units (4:12:4:12:4) or 40mm TG units (4:14:4:14:4), according to the system specified.

Low maintenance, solar control & Low-E glass coatings

The Global Glass range of low maintenance and solar control glasses are a perfect choice for customers looking for the ultimate in glass solutions.

Low maintenance glass

A revolutionary low maintenance coating is applied to the glass as part of the manufacturing process, which means that it is fused to the surface of the glass and therefore lasts the lifetime of the pane. The coating uses the rain and natural light from the sun to efficiently combat the dirt and grime that accumulates on the outside of the window. By reducing the need for manual cleaning, low maintenance glass provides an ideal and safe solution for keeping hard to reach or hazardous glazed surfaces clean.

How does it work? There are two processes. Firstly, the special coating harnesses the natural daylight which triggers the breakdown of the dirt and grime on the outside of the glass and secondly, when the rainwater hits the glass, rather than forming droplets, it flattens and spreads out across the surface of the glass helping to wash away the dirt and grime. This sheeting effect also minimises spots and streaks by helping the glass to dry more quickly and evenly.



Normal glass

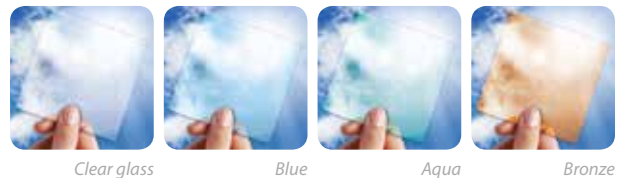


Low maintenance glass

- Permanent low maintenance coating lasts the lifetime of the window
- Perfect for areas that are hard to clean
- Glass stays cleaner for longer
- Less dirt and grime adheres to the window, so any cleaning is quick and easy
- Reduced window cleaning costs
- Less frequent use of cleaning materials, so kinder on the environment
- Available in a range of tint colours

Solar control glass

Solar control coated glass can be used on windows, doors and most commonly on conservatory roofs to help prevent the build-up of heat during the hot summer months. The coating on the glass helps reflect heat from the sun back to the outside atmosphere, giving a more comfortable and useable living space. The glass is available in a range of tints which allows the glass to absorb more heat, whilst the coating reflects heat back to the outside.



- Solar coating reflects heat back to the outside
- Tinted glass absorbs heat
- Tint and coating together both absorb and reflects heat for maximum comfort

Low-E glass

Low-E glass has a microscopic metal coating which reflects central heating back into the room. DG units incorporating this specially coated glass offer up to 33% better insulation than conventional insulated glass units, to keep homes warmer and reduce heating bills.

Global Glass - custom-made to project specifications

Global Glass can supply a wide range of colours and coatings to suit each project, including clear and patterned glass types, Low-E glass in a range of tinted colours, low maintenance glass and Argon or Krypton gas-filled options.

Energy efficiency

Spacer bars

Dividing glass panes in a sealed DG or TG unit, the spacer bar is bonded to glass panes creating an airtight cavity which is then filled with air or gas, as specified. To prevent condensation the spacer bar is filled with a desiccant to absorb any moisture. The spacer bars are manufactured from either aluminium or a low heat conductive material and are important in the achievement of energy ratings. Global Glass offers a choice of:

Aluminium spacer bars

- Durable • Light • Flexible

Warm-edge spacer bars

- Thermal performance • Reduce condensation

Warm-edge super spacer bars

- Thermal performance • Reduce condensation
- Highly pliable for shaped glass panes

Gas filling



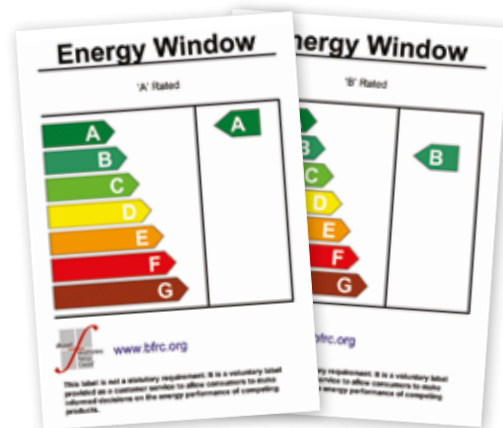
Air currents between sealed IGU glass panes carry heat to the top of the unit and settle into cold pools at the bottom. Filling this airgap space with a less conductive, more viscous, or slow-moving gas minimizes the convection currents within the space, reduces

conduction through the gas and the overall transfer of heat between the inside and outside is reduced.

Global Glass offer Argon and Krypton gas fills, with measurable improvement in thermal performance. Argon is inexpensive, non-toxic, non-reactive, clear, and odourless. Krypton is non-toxic, non-reactive, clear, and odourless and delivers better thermal performance than Argon, but is more expensive. Krypton gas filling is particularly useful when slimline, high-performance bespoke sealed units with smaller airgaps are required.

Window Energy Ratings

Window Energy Ratings (WER) are design simulations that can accurately calculate how energy-efficient a specified window will be in use. The WER system is based on a scale of A-G, with A-rated windows being the most energy-efficient. Up to 25% of heat within homes escapes through windows, so consumers are increasingly demanding A-rated windows to retain domestic heat and lower energy bills.



A Window Energy Rating and label applies to a whole window (frame and glass) rather than the frame or glass components individually. A combination of multi-chambered PVC-U window frame profile, spacer bar and high performance glass will create the most thermally-efficient project solution. Door Set Energy Rating (DSER) calculations provide similar thermal evaluations for doors.

Synseal can provide expert advice to assist in all aspects of WER and DSER specification, with simulations carried out in accordance with BS EN ISO10077-2.



Celsius Performance Glass

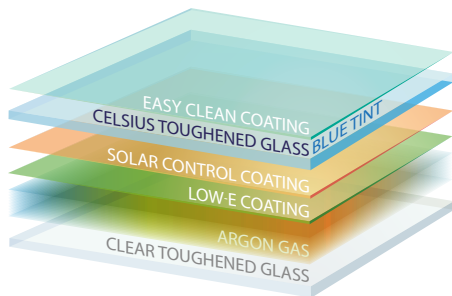
The exclusive Celsius range is suitable for residential and commercial installations and supplied in three formulations: Celsius One, Celsius Elite and Celsius Clear. An easy clean 'non-stick' coating is standard across the range and reduces cleaning maintenance by up to 70%.

Celsius One and Celsius Elite reflect approximately 3 times more solar energy than standard glass and deliver superior levels of UV protection. The blue tinted coating applied to Celsius One and Celsius Elite units significantly reduces

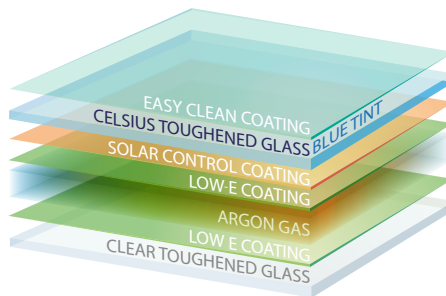
visible light transmission, to soften the impact of natural light passing through a conservatory roof and increase homeowner comfort.

Celsius Clear maximises natural light with a visible light transmission of 61%. This neutral tinted glass is ideal for the side of window frames of a conservatory, or north-facing conservatory roofs that need to allow in more warmth during winter while still offering suitable heat reflection during the summer months.

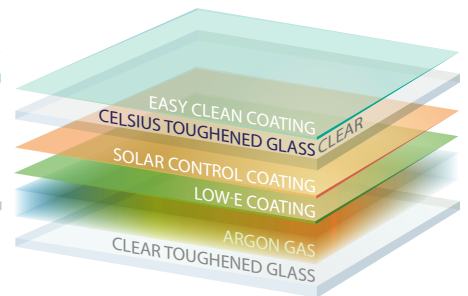
CELSIUS One™ PERFORMANCE GLASS



CELSIUS Elite™ PERFORMANCE GLASS



CELSIUS Clear™ PERFORMANCE GLASS



Celsius performance glass sealed units are constructed using various layers/components, as illustrated. Please note these visuals are for illustration purposes only and do not represent exact thickness scales. Colours shown are not indicative of actual glass colouring.



Manufacturing standards

The Celsius range carries the BS EN 1279-2 and BS EN 12150-1 standards and is backed by a 10-year warranty against seal failure.

Mobile demonstration units

The unrivalled thermal performance of Celsius performance glass compared to standard specification double glazing can be clearly demonstrated using Synseal's mobile heat lamp retail demo units, enabling UK homeowners to literally 'feel the difference'.



Certificate of Authenticity

Celsius toughened roof glass units and clear glass units for conservatory window walling are specially processed, stamped and protected with an itemised 'Certificate of Authenticity' to enable UK consumers to register their genuine Celsius installations online and receive 10 year enhanced warranty benefits for added peace of mind.



Global Summer interior finished in Chartwell Green with Celsius Elite high performance glass

Celsius Performance Glass utilises a Low-E and solar control combination coating, with an Argon filled cavity, to control the amount of visible light, UV and heat that pass through the glazed unit. Easy Clean technology has also been added to reduce maintenance requirements.

| | Standard Glass | 25mm Polycarbonate | CELSIUS One™ PERFORMANCE GLASS | CELSIUS Elite™ PERFORMANCE GLASS | CELSIUS Clear™ PERFORMANCE GLASS |
|---------------------------------------|----------------|--------------------|-----------------------------------|-------------------------------------|-------------------------------------|
| U-value | 2.8 | 1.6 | 1.0 | 0.9 | 1.0 |
| Solar factor | 75% | 55% | 22% | 22% | 42% |
| Visible light transmission | 80% | 68% | 38% | 34% | 61% |
| Heat reflection | 25% | 45% | 78% | 78% | 58% |
| UV protection | 25% | 45% (bronze) | 94% | 94% | 73% |
| Toughened to BS EN 12150-1 | ✓ | ✗ | ✓ | ✓ | ✓ |
| Manufactured to BS EN 1279-2 | ✓ | ✗ | ✓ | ✓ | ✓ |
| 10 year warranty against seal failure | ✓ | ✗ | ✓ | ✓ | ✓ |
| Easy clean coating | ✗ | ✗ | ✓ | ✓ | ✓ |
| Cavity fill | Air | ✗ | Argon | Argon | Argon |
| Tinted | ✗ | ✗ | Blue tint | Blue tint | Neutral tint |

The at-a-glance comparison figures shown are for guidance purposes only. Slight variations may occur due to glass specification, time of year, manufacturing tolerance, point of manufacture and type of instrumentation used.

Solar Factor: The percentage of total energy (heat) from the sun which is able to pass through the glass.

Visible Light Transmission: The percentage of visible light which is directly transmitted through the glass.

UV Protection: The percentage of damaging UV rays from the sun which is unable to pass through the glass.

Technical support

The glass market is forever changing with new technologies, standards and regulations affecting the industry. At Global Glass an experienced and skilled customer care team is always on hand to provide technical advice, address any glass-related questions and assist with project enquiries.

The sub-sections of Building Regulations Part L refer to different building types and itemise U-value thermal performance. Standards for refurbishment of existing buildings are more exacting and provide options for using WER 'whole unit' calculations in place of the established U-values.

Part L requirements for windows, roof windows, rooflights, curtain walling and pedestrian doors

| Part L | Building application | U-value |
|--------|---|-------------------------|
| L1A | New dwellings | 2.0 W/m ² K |
| L1B | Existing dwellings | 1.6 W/m ² K* |
| L2A | New buildings other than dwellings | 2.2 W/m ² K |
| L2B | Existing buildings other than dwellings | 1.8 W/m ² K* |

**Option of WER band C or better. *Option of WER band C or 1.6 W/m²K for buildings essentially domestic in character (e.g. student accommodation).*

Reference document BRE 443 provides U-value specification guidance for non-vertical glazed surfaces.

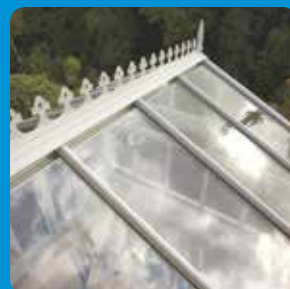


Global Glass provides tailored solutions ideal for both commercial and residential applications

Quality

All Global Glass sealed IGU products carry a 10 year guarantee against failure and are produced in accordance with BS EN 1279-2, BS EN 1279-3 and BS EN 12150-1 under strict quality control procedures to ensure consistency and precision of manufacture, each and every time.

Products undergo a wide range of QC inspections during and after the production process. All equipment is thoroughly checked and maintenance schedules are strictly adhered to.



Conservatory roof glass



High performance window IGUs



Automated glass cutting table



Automated arising line



Synseal's delivery vehicles are specially equipped for glass transportation



IGU line at Blackburn



Synseal's main site and production centre at Huthwaite



Decorative glass manufacturing



Synseal is a leading UK manufacturer of conservatory roof, window and door systems



Global Glass is a specialist manufacturing division of Synseal Extrusions Ltd. Established over 30 years ago, Synseal now employs over 1200 people and has a turnover in excess of £130 million. Main operations are located at a UK-based 35 acre site with 70,000 square metres of production, warehousing and office facilities.

The corporate objective at Synseal is to deliver thermally efficient products of consistently excellent quality and design to markets worldwide, at competitive prices.

Synseal constantly seeks to develop environmentally friendly new products which will support sustainable development and reduce carbon consumption. New ranges are designed with 100% recyclability, improved performance and cost-effectiveness in mind.

Synseal is **ISO14001 accredited** which ensures that all company environmental management systems comply with and even exceed government mandates.

All quality management systems are **ISO9001 accredited** which ensures that all processes are constantly checked and improved upon, to reduce waste and increase efficiency.

Synseal products are independently tested and accredited by the British Standards Institute (BSI) and the British Board of Agrément (BBA).



globalglass®

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