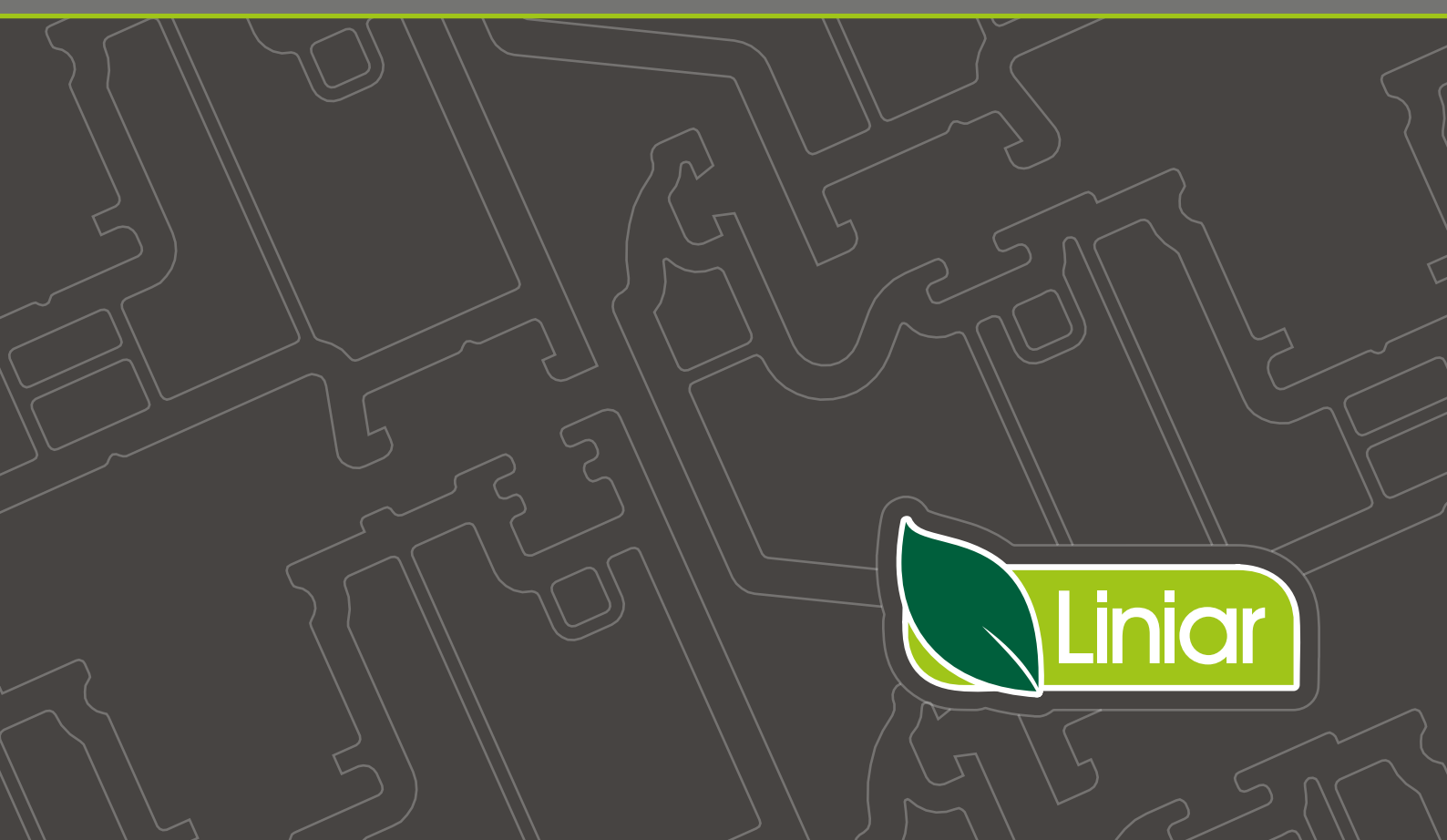




Specification guide

for energy efficient windows and doors





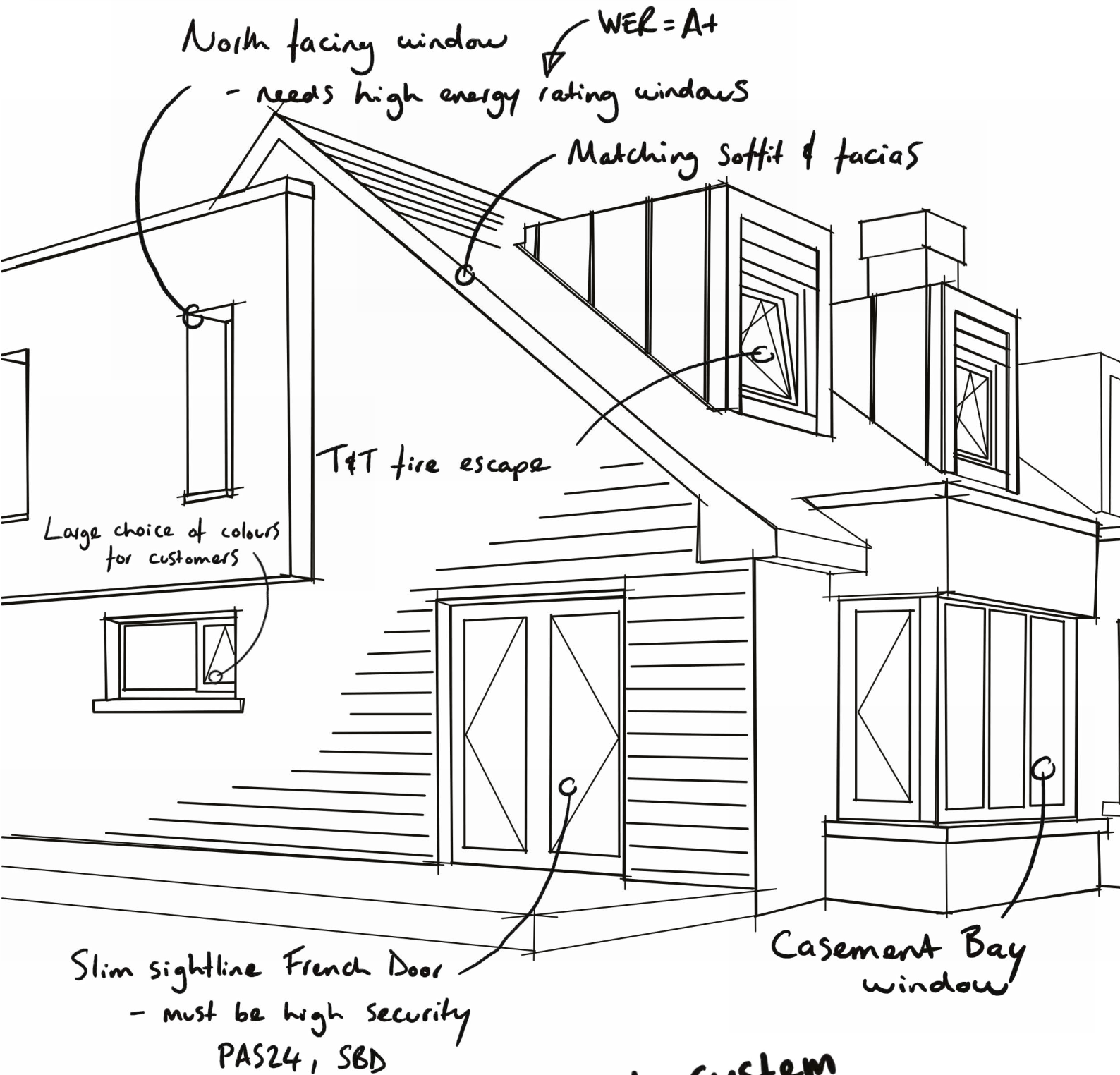
“Fusing industry experience
with innovation, sustainability
and loyalty.”

Front page image



White bay and casement windows
Bellway Homes

JOB REFERENCE: ARMES

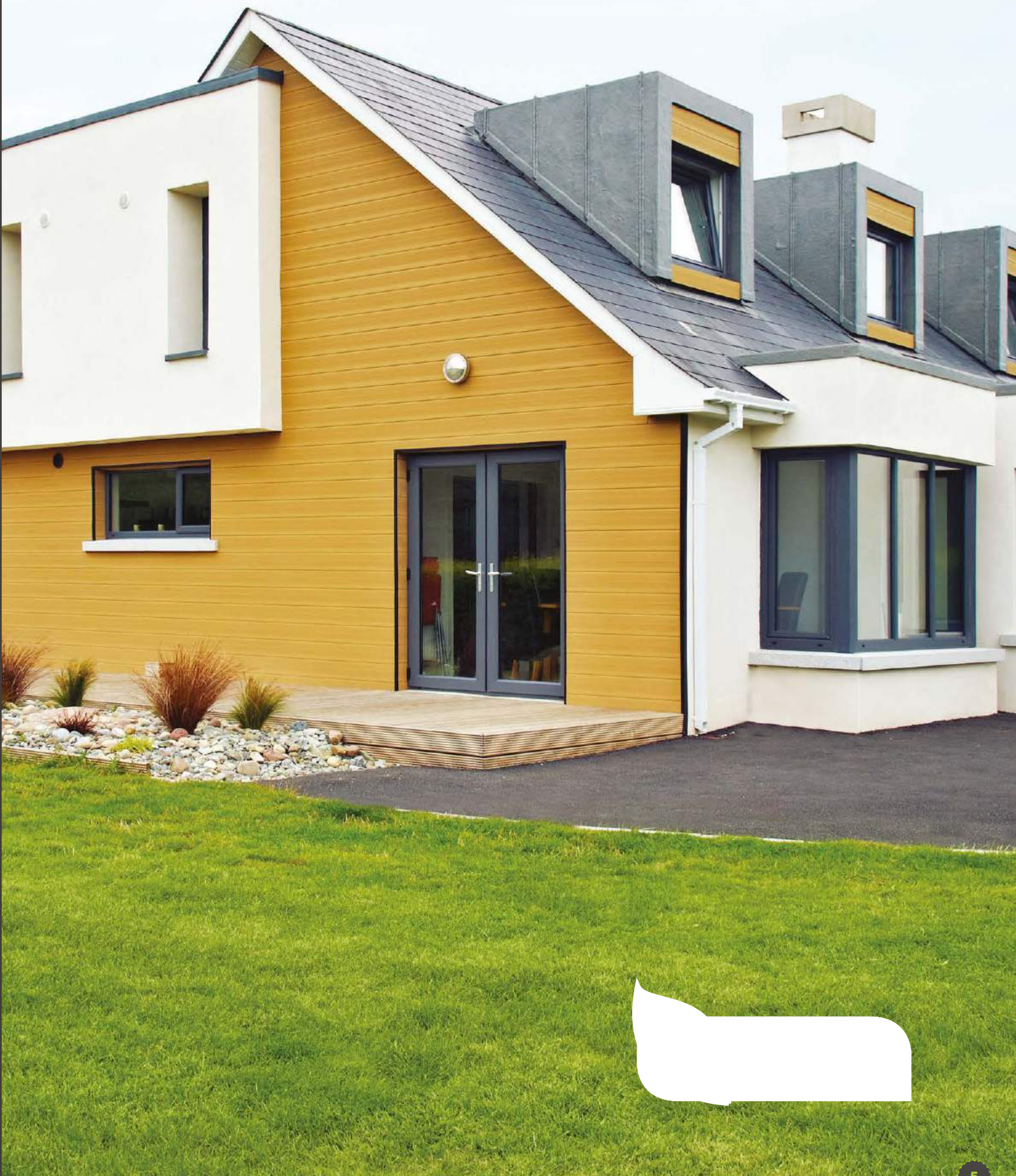


Other Notes:

- o Lead free profiles
- o Minimal steel reinforcement
- o Low threshold PVCu Bi-Fold
- o Wide range of innovative products
- o Manufactured in the UK

Which system
will I use...







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Why PVCu windows?

uPVC (unplasticised PolyVinyl Chloride) was the term used in Britain before the name was changed to PVCu in the late 1980s to fall in line with the rest of Europe. It's called PVCu on the continent because most European languages place the noun (the word PVC in this case) before the adjective (U).

1. Thermal efficiency



It's well known that PVCu is a low conductor of heat, helping to retain warmth within a building and keep the cold out. This is further enhanced by designing multiple chambers inside the window profiles, allowing them to trap air and create a thermal barrier.

Add double or triple glazing to a PVCu frame, and U-values as low as 0.8 W/m²K can be achieved.

According to the British Fenestration Rating Council (BFRC), when it comes to 'A' rated windows, PVCu outperforms any other material, with 10 times more PVCu windows achieving an 'A' rating compared to the nearest alternative.

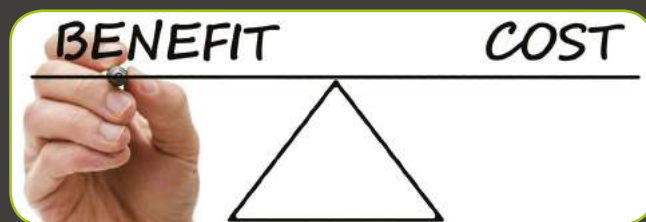
3. Low maintenance



With PVCu, the ongoing maintenance consists of a wipe down with warm soapy water, making them simpler and more cost effective to look after. Woodgrain or foiled windows with minor scratches can be repaired using a RAL-matched pen.

Contrast this with timber windows – they need treating or painting on a regular basis, which is time consuming and can be costly. Aluminium windows can fade and oxidise when exposed to the sun, often requiring the use of specialist cleaners and coatings to restore.

2. Benefit vs. cost



There are three distinct areas where installing PVCu windows saves on cost and adds benefit:

- Lower purchase price and installation costs
- Higher energy savings over the life of the windows, and
- Lower maintenance costs.

According to the Glass & Glazing Federation's Energy Saving Calculator, if single glazed windows of an alternative material are replaced by 'A' rated PVCu double-glazed windows, annual savings would be achieved.

4. Durable



PVCu windows have an expected life span of up to 35 years.

Frames will not rot, corrode, warp or split, and special additives make them tough enough to suit European requirements. In addition, the lightweight nature of a PVCu frame makes it easier to handle and install, reducing time on site for fitters and contractors.

5. Attractive



The old chunky white PVCu frames seen in the 1980s are well and truly in the past.

With a wide range of woodgrain effects and colours, as well as slim sightlines, PVCu windows can be as aesthetically pleasing as their timber or aluminium counterparts.

Designs have advanced to the extent that sashes can sit flush in the frame, mirroring a pre-1932 style timber frame – ideal for conservation properties where timber is preferred, or alternatively to offer a sleek, contemporary appearance.

6. Weather proof



PVCu windows are ideal for the damp British weather. The frames will not swell or rot, and co-extruded gaskets provide excellent resistance to air and water.

With both timber and aluminium frames, the seals are added in afterwards. Joints can also shrink back over time, causing gaps in the seals.

With PVCu, the gaskets are welded together as part of the manufacturing process, providing a continuous seal all the way round and eliminating draughts for longer.

7. Eco friendly



It's often believed that PVCu windows are not environmentally friendly.

In fact, the case can be argued for quite the opposite.

- PVCu windows can be made from 100% lead-free materials, better for both family living and for the environment.
- PVCu windows use less energy to produce in the factory, in comparison to both aluminium and timber windows.
- The ongoing energy savings are higher, with more PVCu windows achieving BFRC 'A' ratings than other materials.
- A PVCu window is 100% recyclable and can be recycled up to 10 times, giving each window an estimated life span of 350 years – far more eco-friendly than depleting timber sources.





◀ Black arched casement windows
Burscough Wharf



White casement windows with
Georgian bars
University of Chichester



Specifying Liniar

Our mission is to be recognised as a leading force for quality and excellence in product development - fusing industry experience with innovation, sustainability and loyalty.

Ideal for 21st century developments

One of the newest and most technically advanced window systems on the market, the Liniar system was launched in 2008 by bringing together some of the window industry's most experienced and forward thinking designers and a technical team with over 500 years of industry experience between them.

With a focus on research, development, design and testing, Liniar continues to push the boundaries when it comes to product innovation.

British made

Liniar's 100% lead-free PVCu profile is made in the heart of the UK, its award-winning extrusion facility in Derbyshire boasting the largest mixing plant in Europe.

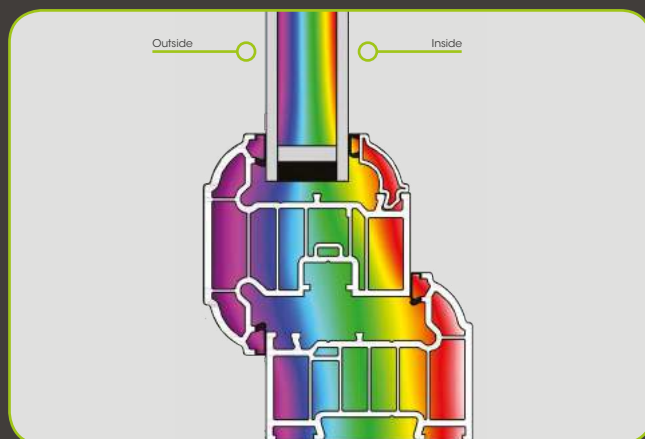
Continued investment in the factory, facilities and research and development keeps Liniar at the forefront of innovation.



Thermally efficient

Whether double or triple glazed, Liniar windows outperform other leading brands in the UK, thanks to its innovative multi-chambered profile design.

The Liniar EnergyPlus window can achieve an incredible U-value of 0.8 W/m²K when manufactured with triple glazing - achieving Passivhaus standard and creating a carbon neutral dwelling.



Research and development

The team's knowledge and experience have ensured they designed out the challenges and pitfalls that earlier window systems experienced.

Liniar's patented co-extruded bubble gasket, glazing platforms and screw retainer combine to make the Liniar range easier to fabricate as well as being more fitter-friendly - making it the cost-effective choice of system for large developments.



Why specify Liniar?

The Liniar range has been designed to meet the demanding requirements of today's construction market.

Reducing installation time whilst increasing energy efficiency, the Liniar system continues to lead the way - beating legislative requirements and building regulations well in advance of due dates.

The Liniar range of casement windows, French windows, tilt and turn windows and pivot windows; along with residential doors, French doors, bi-folding doors, patio doors, and composite doors are suitable for installation into low-rise and high-rise applications, new-build developments and refurbishment projects.

White fire exit casement windows
The Anchorage, Liverpool



Technically advanced

Constant product innovation means customer feedback can regularly be incorporated, leading to the one of the most technically advanced window and door systems available on the market.

A 3D printer is used to create a prototype for each new product, enabling enhancements to be made at the design stage.

More reasons to specify **Liniar**

1

British made

Liniar profiles are extruded in Derbyshire at the HL Plastics manufacturing plant, which features the largest PVCu mixing plant in Europe. Continued investment in the factory and facilities keeps Liniar at the forefront of innovation.

2

Comprehensive colour range

Liniar's coloured foils give the appearance of woodgrain and won't peel or scratch off - and the whole Liniar range is available in a wide choice of colours with an easy clean, low maintenance finish.

3

Designed by experts

The Liniar range is designed, manufactured and supported by a forward-thinking team with over 500 years' experience within the window industry.

4

Fully tested

Not only does Liniar carry out weather testing and security testing, it has invested in a robot for cyclic testing - giving peace of mind that Liniar products will endure the rigours of daily living.

5

More thermally efficient

Liniar's revolutionary profiles are far more thermally efficient than traditional PVCu window profiles. By removing unnecessary steel reinforcement, instead developing the latest in multi-chambered profile technology.

6

Strong and secure

Liniar windows and doors are tested to the latest security standards; PAS 24:2012 enhanced security performance was passed with flying colours. Built-in security features mean that Liniar frames hold Secured by Design status.

7

Most cost-effective

The reduction in steel results in a more cost effective window at the fabrication stage. Fitter-friendly features also reduce installation times and the occupant also benefits with systems capable of A+ and a U-value as low as 0.8.

8

Less frame, more glass

Ultra-slim sightlines designed into Liniar products allow in maximum natural light - and result in more attractive windows and doors.

9

Better for the environment

Liniar frames have always been 100% lead-free, well in advance of legislation. Furthermore, all elements of a Liniar window are fully and easily recyclable at the end of its life.

10

Guaranteed

Liniar profiles come with a 10 year guarantee against cracking, warping and discolouration.

For more information visit the Specifier's Centre at www.liniar.co.uk/specifiers



About Liniar

With a focus on research, development and design, Liniar continues to push the boundaries when it comes to product innovation.

Other PVCu windows are energy efficient. Other PVCu windows are strong and secure. The Liniar system is both. Its range of lead-free profiles has been designed from scratch, significantly reducing the need for steel reinforcement and eliminating draughts and leaks whilst delivering superb aesthetics and the highest Windows Energy Ratings as standard.

Liniar isn't constrained by history or by corporate politics. Designed and manufactured by HL Plastics Ltd, Liniar PVCu profile is fully British made. The extrusion facility in Derbyshire boasts the largest mixing plant in Europe and continued investment in the factory, facilities and research and development keeps the Liniar range at the forefront of innovation.

An award-winning company, HL Plastics was visited by the UK Prime Minister in 2014, who was keen to discover the benefits of the thermally efficient profiles and the significant investment the company

continues to make in plant, machinery, employees and training.

Having grown significantly since the launch of the Liniar range in 2008, the company has retained its friendly approach and flat structure. This means it is able to respond to customer demands quickly and effectively, giving the brand a well-deserved reputation of excellence within the industry.

Embedded in the firm's culture is a clear customer focus combined with an ethos of constant innovation and development, quality systems and testing – all of which means Liniar customers always have access to the most modern products in the industry and can stay ahead of the game in a competitive market.

With a customer base of approved window fabricators and installers all over the UK and Ireland, together with commercial, technical and design teams to support customers, specifiers can rest assured the Liniar range can meet and exceed industry regulations across its entire product range.



At a glance...

- The Liniar brand belongs to HL Plastics Ltd, part of the Flamstead Holdings group
- £60 million turnover (2014)
- > 400 employees
- Capital investment of £5m per annum
- 10% market share of UK PVCu profiles in the UK
- National Fenestration Awards Systems Company of the Year 2014
- Derby Telegraph Company of the Year 2014
- Flamstead Holdings listed in "1000 companies to inspire Britain"
- Winner of the 2014 Lloyds Bank Growing Business Award - mid-sized company

Fully accredited

It's important to Linar to prove its products are backed by the highest standards, and an ongoing testing programme ensures that all systems remain fully compliant – often ahead of legislation.

ModLok™



Developed by Linar, ModLok™ technology not only provides the most secure locking mechanism and unbeatable strength, but also enables the PVCu to be disposed of in the most environmentally friendly way possible at the end of its life.

Secured by Design



Secured by Design is a police-backed initiative, with this status being awarded to products designed with exceptional security features as their main priority. Linar products that qualify to hold this certification are tested to meet the requirements of the Association of Chief Police Officers.

BBA Approval



The BBA (British Board of Agreement) is the UK's major authority offering approval of construction products, systems and installers. Their certificates are recognised by architects, engineers and specifiers as an impartial and unbiased review on the performance of products, and Linar holds a certificate for the whole window system.

BS EN ISO 9001:2008



The Linar factory has achieved BS EN ISO 9001:2008 accreditation, meeting British Standards for a quality management system. The standard is based on a number of principles including a strong customer focus, management motivation, the process approach and continuous improvement. By continuing to meet this standard, Linar customers benefit from consistently great products and service.

PAS24:2012



This accreditation is part of the British Standards system and shows that every component used to make the product has been subjected to a series of tests, demonstrating enhanced security performance, air and water tightness and wind loading to BS6375 for peace of mind.

BS EN 12608:2003



BS EN 12608:2003 is the standard of quality, consistency and performance required for PVCu extruded hollow profiles. Products are regularly tested to ensure that they continue to meet these standards.

Thermal efficiency vs. reinforcement

Many old 'first generation' PVCu windows relied heavily on steel reinforcement. It was considered essential to securely fix hardware such as hinges and locking mechanisms, in addition to increasing the stiffness of the frame and reducing deflection when subjected to wind gusts. For many years, this was the accepted make up of a PVCu window – and some are still manufactured in this way.

In more recent times energy efficiency became a more prominent topic and the evolution of window products continued with the introduction of PVCu thermal inserts.

These inserts replaced the thermally inefficient steel, occupying the same internal chamber and creating a multi-chambered thermal barrier in the same 3-chambered profiles. Not exactly a giant technological leap, more of a 'gap filler' and not without its drawbacks – these thin inserts add very little to the stiffness of a profile, nor do they provide a secure fixing for hardware.

This resulted in many window systems providers having two different offerings – one which is thermally efficient (with thermal inserts) and one suitable for enhanced security (with steel).

In 2007 the Linar team set about designing a brand new system with a blank sheet of paper and loads of new ideas – a system which would be both thermally efficient AND strong and secure.

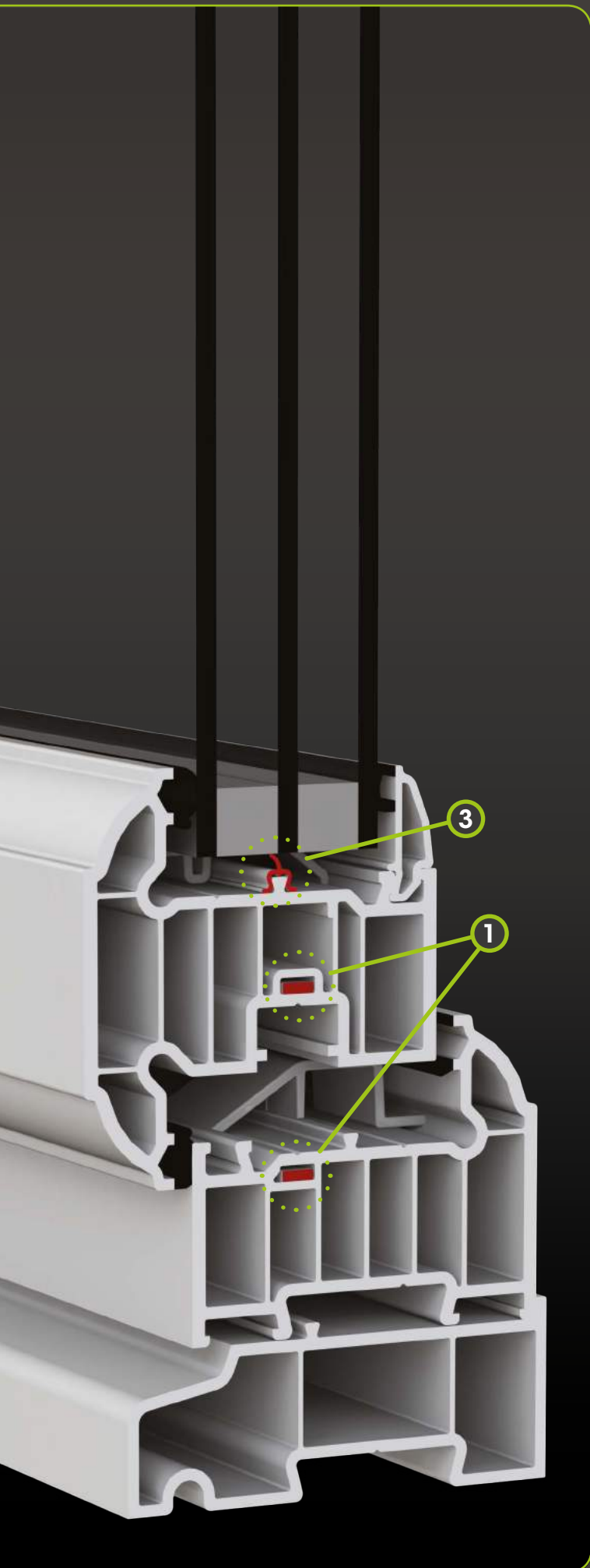
Firstly, there were to be no thermal inserts – the multi-chambered effect was designed to be part of the profile, with both the amount of internal webs and their spacing being fine-tuned with Therm software to achieve exceptional thermal performance.

This principle could only be applied to specific profiles within the system, with transoms and mullions remaining steel-reinforced using a steel box section within the central chamber – this provides the rigidity needed within the frame.

Secondly, the issue of secure fixing for hardware was addressed by incorporating a rectangular pocket directly behind areas where fixings would be used, achieving screw pull-out forces equivalent to that of 1.2mm thick steel when inserted with a PVCu screw retainer (1).

The Linar window system has been independently tested and verified by the British Standards Institute, meeting PAS 24 with reduced steel and BS6375; air and water leakage and wind loading for structural strength.

By making the most efficient use of materials and avoiding the need for expensive triple glazing, the overall cost of manufacturing a window has also been reduced – delivering benefits to fabricators, installers and end users.



Patented bubble gasket

Historically, PVCu window systems were fitted with a range of EPDM (rubber) gaskets at the fabrication stage, similar to the method still used on timber and aluminium windows. The resulting permeability of the assembled frame was dependent upon the quality of each seal joint, with many suffering from draughts and wind noise.

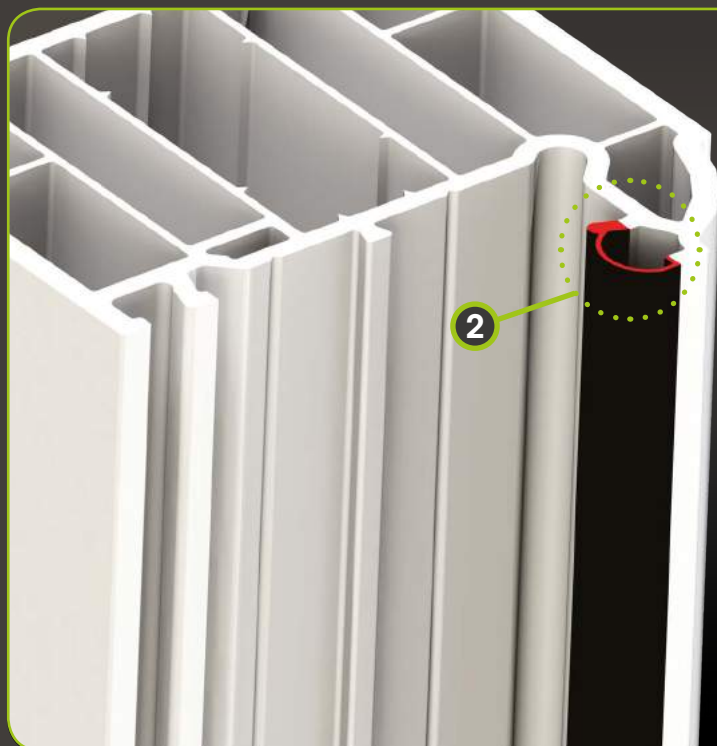
The PVCu extrusion process lends itself to the well-established technology of co-extrusion - adhering the gasket onto the frame using a separate extrusion machine during manufacture. This evolutionary step eliminates the time-consuming gasket insertion process and creates a more reliable corner seal at each joint.

Many PVCu window systems make use of co-extruded gaskets, most adapting existing profiles to the process.

Starting from scratch, the Linar team had no constraints, and spent a significant amount of time developing its patented bubble gasket **(2)** to outperform all others in speed of fabrication and in permeability - achieving a zero air leakage during independent tests at BSI.

The design of both the gasket and the area behind the gasket is crucial, not only to the permeability of the finished window, but during the welding process where hard lumps can form in the corners of each joint, cracking sealed units.

Linar's dual-action gasket performs equally well as a soft dynamic seal on opening sashes as it does as a firm glazing gasket for sealed units, its tolerance friendly design always ensuring a whistle-free seal inside and out - and no gaps, not even in the corners.



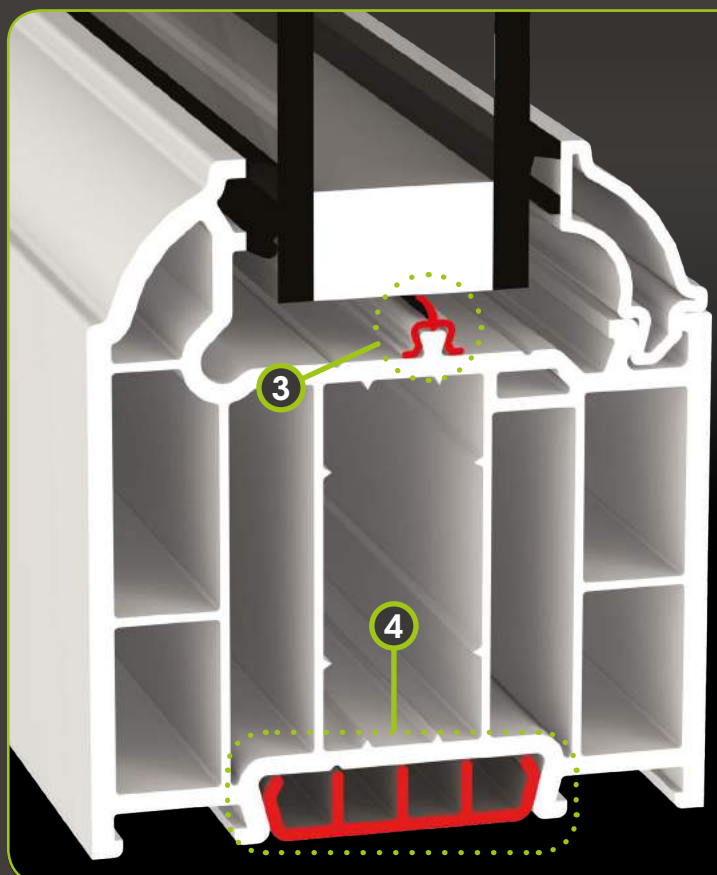
Enhanced performance

As the quantity and spacing of internal webs reduce thermal transmittance through Linar frames, the flow is directed towards the path of least resistance. To address this, the Linar design team introduced a brace of simple but effective ancillary products.

The first is the innovative glazing flipper **(3)** - this can be clipped onto the short central up-stand within the glazing area, creating a thermal barrier and additional gasket, and sealing the perimeter of any glazed unit - keeping the heat in and moisture out.

The second is the patented thermal dam **(4)** - introduced to address heat loss at the outer edge of the frame, Linar's clip-in thermal dam creates a multi-chambered barrier with optimized leg spacing and is manufactured from recycled material produced during the extrusion 'start-up' procedure.

The result is a supremely energy efficient double glazed product, one capable of achieving a cost-effective A+ Window Energy Rating, or 1.2 Wm²/K U-Value and if required a triple glazed 0.8 Wm²/K U-Value window.





Fully tested and compliant

Not only does Liniar carry out weather testing and security testing, it has invested in a state of the art articulated robot for in-house cyclic testing and development - giving peace of mind that Liniar products will endure the rigours of daily living.

All Liniar systems conform to the provisions of BS 6375 Part 1 for weather performance and Part 2 for window operation and strength characteristics.

Liniar's patented bubble gaskets give optimum weather performance, being co-extruded onto window and door profiles to give a full continuous seal and eradicate draughts.

Liniar systems exceed Part L requirements with the innovative multi-chambered profile achieving BFRC A+ rating as standard. Liniar also provides a database of over 1,000 BFRC thermal simulations to refer to. For more information on the requirements of Part L, please refer to **Approved Document L**.

Liniar has also developed Part M compliant low thresholds with shootbolt facility, for its range of residential, composite, French, patio and bi-folding doors. For more information on Part M, refer to **Approved Document M**.



Approved fabricators



Liniar windows and doors are manufactured by a wide network of fabricators across the UK, many of which have gone through a stringent testing and validation process to become Liniar Approved Fabricators.

Where a Liniar fabricator has the stamp of approval, you can be assured the windows and doors they produce:

- Contain only Liniar supplied or approved parts
- Use only Liniar approved manufacturing processes
- Conform to the latest British Standards
- Have been quality checked before leaving the factory
- Are CE marked in accordance with the latest regulations.

In addition, all Liniar Approved Fabricators have a clear dispute resolution process in place - giving customers assurance that any problems will be swiftly dealt with, together with the peace of mind offered by the Liniar 10 year profile guarantee.

Recycling and sustainability

PVCu is now recognised as a sustainable option when it comes to fenestration products, with the Liniar range leading the way in its environmental credentials.

All PVCu windows are recyclable, but the Liniar system is simpler, and cheaper, to recycle at the end of its life than other systems. The low steel content in a Liniar window results in speedier separation of PVCu and steel and our externally mounted ModLok™ products can be separated in seconds,

As each window can be recycled up to 10 times, this gives PVCu windows an estimated life span of 350 years – more eco-friendly than depleting timber resources.

As a company, Liniar continually strives to improve its environmental performance and reduce its carbon footprint, and has even developed new products to avoid wastage and create opportunities to re-use the PVCu offcuts that would otherwise be sent to landfill.

The company is proud of its record of ZERO operational wastage, with 100% of production waste PVCu (around 1,200 tonnes per year) re-ground at its in-house recycling facility before being formulated into new products. The Liniar decking range is made from 86% recycled PVCu, with its plastic piling range composed of a staggering 100% recycled material.

Liniar's environmental policy is to ensure its processes, conditions and systems shall have as little effect on the environment as is reasonably practicable.

It is the company's policy to:

- Comply with the relevant environmental legislation and codes of practice
- Minimise the risk to the public from its operations
- Protect the natural environment
- Conserve resources and minimise waste
- Train and supervise staff to ensure their actions are with due care for the environment
- Require contractors to meet the same standards of environmental care
- Assess the environmental impact of any new site development
- Regularly assess the environmental impact of the company's operations.

The Liniar fleet delivers products nationwide around the UK. All vehicles are selected with low emissions and the highest fuel economy in order to minimise this impact.



Liniar's **product range**

A continued programme of investment in research and development results in the highest quality products. With 21 patents and 23 Registered Community Designs to protect the range, the Liniar team leads the way in innovation.



Casement window

A Liniar casement window offers total versatility, with its traditional British style offering slim sight lines to let in maximum light.

Available in sculptured or chamfered profile, 28mm double or 36mm triple glazing, internally or externally beaded, with standard 4-chamber or EnergyPlus 6-chamber profile – with a wide choice of opening configurations, colours, finishes, hardware and glazing options, with Georgian bars also available.



Tilt & Turn window

Perfect as a fire escape or simply to let in more fresh air, Liniar tilt and turn windows are available with either 'tilt before turn' and 'turn before tilt' options.

Available in sculptured or chamfered profile, 28mm double or 36mm triple glazing, internally beaded - available with a wide choice of opening configurations, colours, finishes, hardware and glazing options, with Georgian bars also available.



Flush Sash window

The latest exciting development from Liniar, the flush sash offers the realism of a traditional pre-1932 timber window combined with 21st century thermal benefits. With the sash fitting flush into the frame, this window can also offer a contemporary appearance.

Available in sculptured profile with the flush finish on external faces, 28mm double glazing, internally beaded, with a wide choice of opening configurations, colours, finishes, hardware and glazing.



Pivot window

Offering a full 180° pane rotation, the Liniar pivot window provides a clever solution for high windows that are difficult to clean from the outside.

Available in chamfered profile, 28mm double or 36mm triple glazing, internally beaded, with a wide choice of colours, finishes, hardware and glazing options.



Residential door

The Liniar range of PVCu doors is designed to perfectly match the suite of windows and offers the same thermal benefits.

Available in sculptured or chamfered profile, 28mm double or 36mm triple glazing, internally beaded, with standard 4-chamber or EnergyPlus 6-chamber profile – together with threshold options including Part M compliant and a wide choice of colours, finishes, hardware and glazing options.



Composite door

Offering up to six times the insulation properties of a timber door, a Liniar composite door guarantees high security combined with maintenance free enduring performance.

Available in sculptured or chamfered profile, with 44mm or 49mm door slabs, together with a wide choice of colours, finishes, hardware and glazing options.



French door

The Linar French door range is designed to perfectly match the suite of windows, offering the same thermal benefits with a choice of 'open in' or 'open out' styles.

Available in sculptured or chamfered profile, 28mm double or 36mm triple glazing, internally beaded, with standard 4-chambered or EnergyPlus 6-chambered profile – together with a wide choice of colours, finishes, hardware, thresholds and glazing options.



ModLok™ Patio door

The Linar sliding patio door was designed from scratch to take advantage of the very latest technology, and has been cyclic tested by Linar's in-house robot to provide assurance that it's built to last.

Available in sculptured profile with external sliding and internal beading, EnergyPlus 6-chambered profile, 28mm double or triple glazing, with a wide choice of colours, finishes, thresholds and glazing options.



Standard bi-fold door

The original bespoke designed PVCu bi-folding door, the Linar standard bi-fold offers opening configurations up to 4 panes wide.

Available in sculptured profile with outward or inward opening, internally beaded, multi-chambered profile, 28mm double glazing, with a wide choice of colours, finishes, thresholds and glazing options.



ModLok™ bi-fold door

The ModLok™ bi-fold door is a heavy duty solution for applications up to 7 panes wide. Cyclic tested to more than 10 times British Standard, the Linar ModLok™ bi-fold combines the structural benefits of an aluminium with the energy efficiency of PVCu. The ModLok™ bi-fold features aluminium reinforcing with a high security locking mechanism. Available in the same colours, finishes and glazing options as the Standard.

The Linar outdoor range

Not only for housing and commercial developments, the Linar range also includes outdoor products, providing low maintenance PVCu solutions for a variety of applications.



Piling and retaining systems

Surprisingly strong, the Linar range of piling is made from recycled PVCu and is available in a variety of styles for different applications. From flood defence to soil retention, utility trench piling to track side shelters for the rail industry, plastic piling is a cost effective alternative to steel or timber. A free CPD training session is available – please contact us.



Fencing

With a range of posts and gravel boards, together with picket fencing for permanent and temporary use, the Linar fencing range won't rot or rust and provides a low maintenance alternative to timber or concrete.



Verandahs and decking

A huge success in the caravan and holiday home industries, Linar verandah and decking systems are also used for domestic gardens and landscaping applications. Beautifully foiled finishes give the sculptured balustrade system an authentic, maintenance free appearance, and a wide range of accessories is also available.

70mm system



Liniar's innovative lead-free 70mm window system is available in a choice of chamfered and sculptured suites, with all style options in a wide range of colours and finishes to suit any building or project.

Thermally efficient

Liniar's revolutionary 70mm profiles are far more thermally efficient than traditional PVCu window profiles. By removing unnecessary steel reinforcement, instead developing the latest in multi-chambered profile technology, the heat stays where it belongs - inside the property.

Cost effective

The reduction in steel results in a more cost effective window at the fabrication stage. Fitter friendly features also reduce installation times, saving money on the job. The occupant also benefits with systems capable of A+ and a U-value as low as 0.8.

Better for the environment

Liniar frames have always been 100% lead-free, well in advance of legislation. Furthermore, all elements of a Liniar window are fully and easily recyclable at the end of its life.

Guaranteed

Liniar profiles come with a 10 year guarantee against cracking, warping or discolouration.

- Designed completely from scratch by a team with over 500 years of industry experience
- Fitted with high security multi-point locking as standard
- Available in a wide range of colours and foiled finishes
- Ultra-slim sightlines for maximum light
- Patented co-ex bubble gasket - tested and assessed to BFRC energy rating standards with zero air leakage shown in the results
- Designed with two thirds less steel than a GGF standard window
- Fully tested and accredited
- Met requirements of PAS 24:2012 without the need for steel reinforcing
- All systems conform to BS 6375 Part 1 for weather performance and Part 2 for window operation and strength characteristics.

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French door

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Case study

Redrow Homes is one of the UK's leading residential property developers, and was looking for something slightly different when it came to specifying windows for its brand new development of luxury homes, Abode in Buckley.

The development, consisting of 63 highly-specified 2-4 bedroomed homes, is aimed at the younger house buyer; with Redrow's designers aiming for a combination of traditional and contemporary in one dwelling.

Redrow requested a sample of the Linar flush sash PVCu window, designed by Linar to replicate traditional timber windows from the pre-1932 era, where the sash fits flush into the frame – totally unlike other types of PVCu window. The sample was foiled in flat grey to give this traditional-looking window a modern edge, and the Redrow team liked the contemporary appearance the window delivered.

The aesthetics of the project were so critical that Redrow took the somewhat unusual step of building a house within its head office so they could see what the windows would actually look like when fitted. The replica house was made from stud walls and exterior brickwork.

The project team were delighted with the finished result, not only from the perspective of appearance, but also the ease of installation, which would make the on-site build more efficient for the fitters and



ensure the project could be completed well within the planned timescales.

Steve Walsh, Redrow's Construction Director for the North West region, commented:

“As soon as we saw the flush sash window, we knew it was what we needed for the Abode development.

It ticked all our boxes – lead-free, energy efficient, easy to install – and best of all, it gave us the overall aesthetics we were looking for.”

Window & door configurations

The below tables show the different window and door configurations available from Liniar.

Casement Window



Standard Configurations



Mock Sash Horn



Arched Top Moulding



French Window Fire Escape

Tilt & Turn Window



Standard Configurations



Arched Top Moulding



French Window Fire Escape

Flush Sash Window

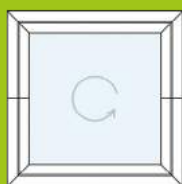


Standard Configurations



French Window Fire Escape

Pivot Window



Standard Configurations

Residential and French Doors



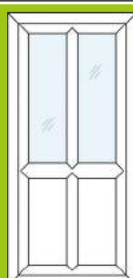
Residential Door Full Glass or Panel



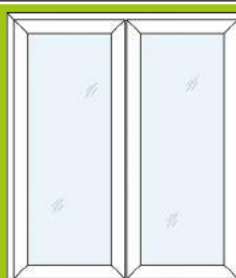
Residential Door with Midrail



Residential Door Half Cruciform



Residential Door Full Cruciform



French Door Full Glass or Panel



French Door with Midrail

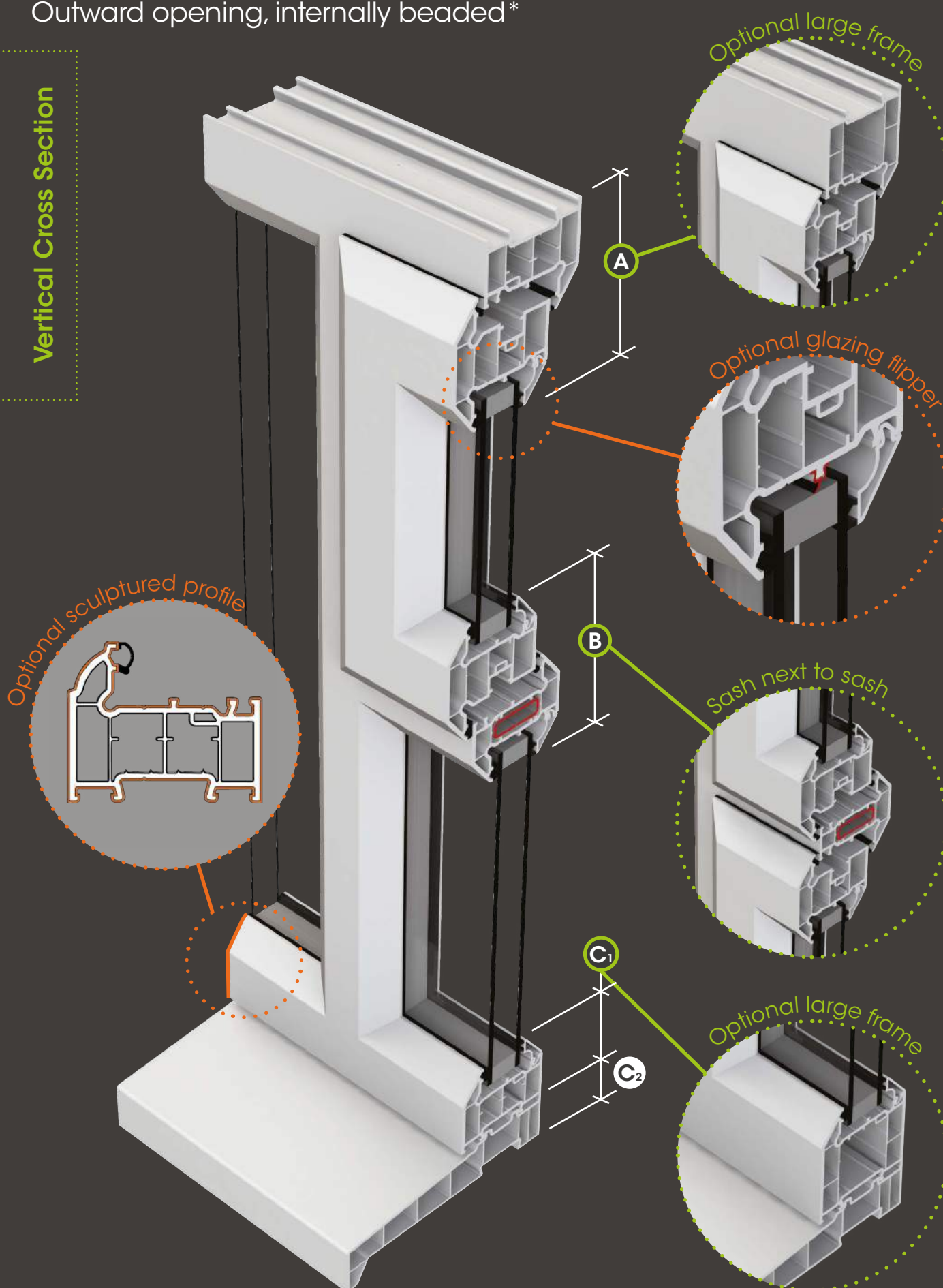


White mock sash horn casement windows
Seddon Homes

Casement **window**

Outward opening, internally beaded*

Vertical Cross Section



* externally beaded options are also available and feature the same sightlines

Technical information

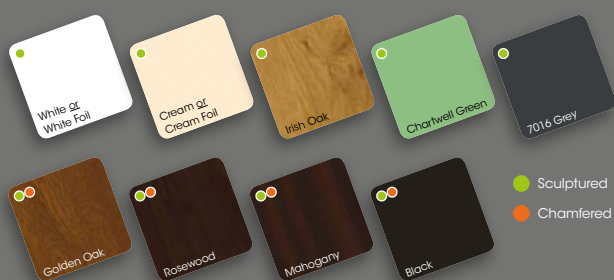
Casement window

- Sculptured and chamfered suites
- 28mm double and 36mm triple glazing
- 4 chambered multi wall profiles
- U-values from 1.2 (DGU) and 0.9 (TGU)
- Patented co-ex gasket

Accreditations



Colour Options



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



Product	Dim. A
Small frame & sash L#W011 & L#W031	104mm
Large frame & sash L#W016 & L#W031	124mm

Product	Dim. B
Transom & sash L#W022 & L#W031	114mm
Int. transom & sash L#W027 & L#W031	134mm
Transom & 2 x sash L#W021 & 2 x L#W031	161mm
Int. transom & 2 x sash L#W026 & 2 x L#W031	181mm

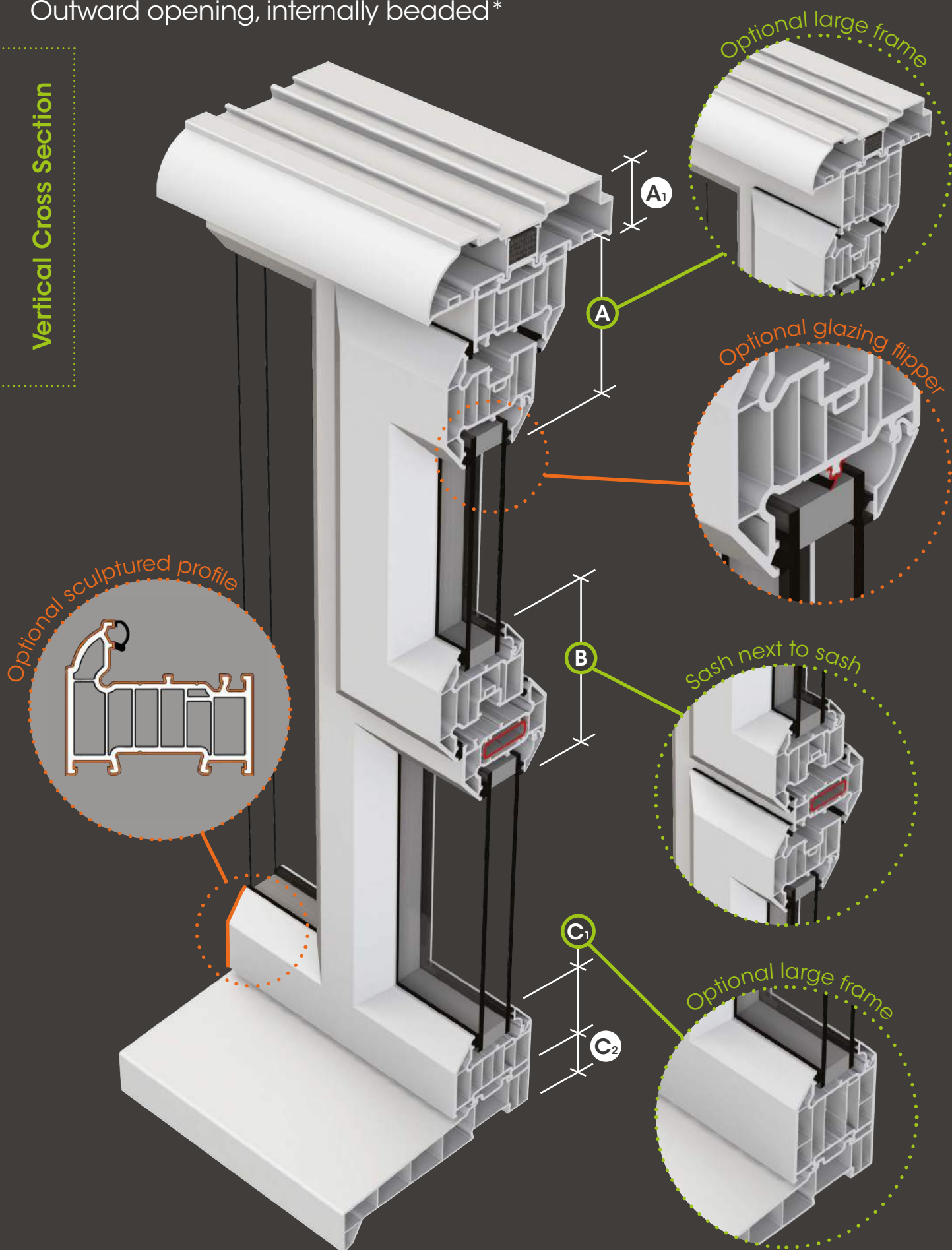
Product	Dim. C₁
Small frame L#W011	57mm
Large frame L#W016	77mm

Product	Dim. C₂
85, 150, 165, 180 cills LSL085, LSL150, LCL165, LSL180	30mm

EnergyPlus Casement **window**

Outward opening, internally beaded*

Vertical Cross Section



* externally beaded options are also available and feature the same sightlines

Technical information

EnergyPlus Casement window

- Sculptured and chamfered suites
- 28mm double and 36mm triple glazing
- Multi chambered EnergyPlus profiles
- U-values from 1.2 (DGU) and 0.8 (TGU)
- Patented co-ex gasket

Accreditations



Colour Options



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



Product	Dim. A₁
Head vent LHV30 & LHV31	30mm
Optional for all Linar products	

Product	Dim. A
Small frame & sash L#W012 & L#W033	104mm
Large frame & sash L#W017 & L#W033	124mm

Product	Dim. B
Transom & sash L#W022 & L#W033	114mm
Int. transom & sash L#W027 & L#W033	134mm
Transom & 2 x sash L#W021 & 2 x L#W033	161mm
Int. transom & 2 x sash L#W026 & 2 x L#W033	181mm

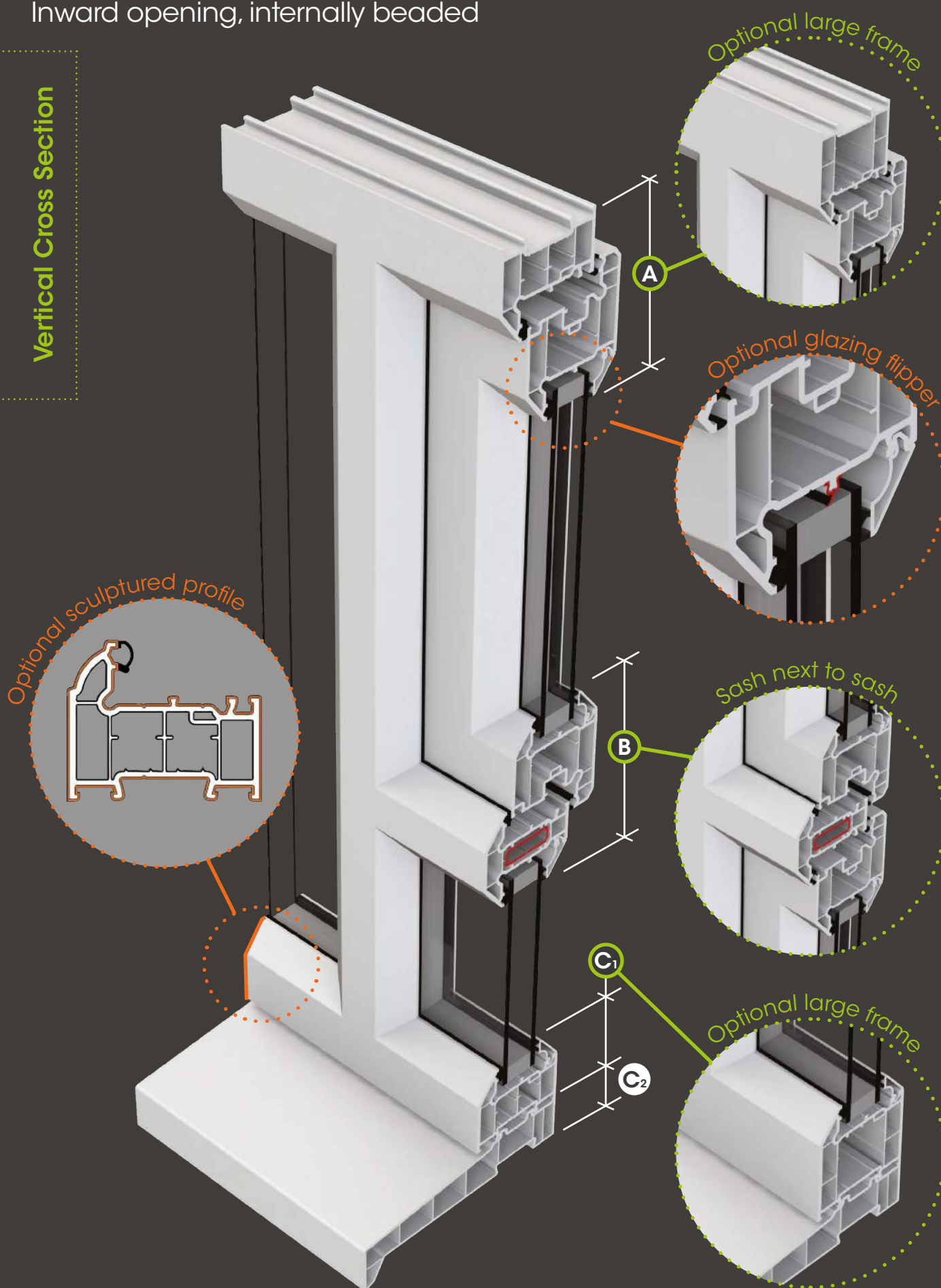
Product	Dim. C₁
Small frame L#W012	57mm
Large frame L#W017	77mm

Product	Dim. C₂
85, 150, 165, 180 cills LSL085, LSL150, LCL165, LSL180	30mm

Tilt & Turn **window**

Inward opening, internally beaded

Vertical Cross Section



Technical information

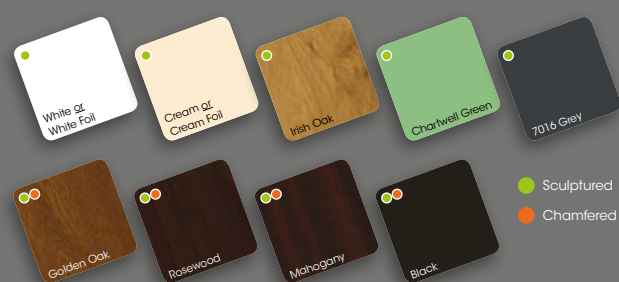
Tilt & Turn window

- Sculptured and chamfered suites
- 28mm double and 36mm triple glazing
- Ideal for fire exits
- U-values from 1.3 (DGU) and 0.9 (TGU)
- Patented co-ex gasket

Accreditations



Colour Options



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



Product	Dim. A
Small frame & sash L#W011 & L#W035	111mm
Large frame & sash L#W016 & L#W035	131mm

Product	Dim. B
Transom & sash L#W021 & L#W035	121mm
Int. transom & sash L#W026 & L#W035	141mm
Transom & 2 x sash L#W021 & 2 x L#W035	175mm
Int. transom & 2 x sash L#W026 & 2 x L#W035	195mm

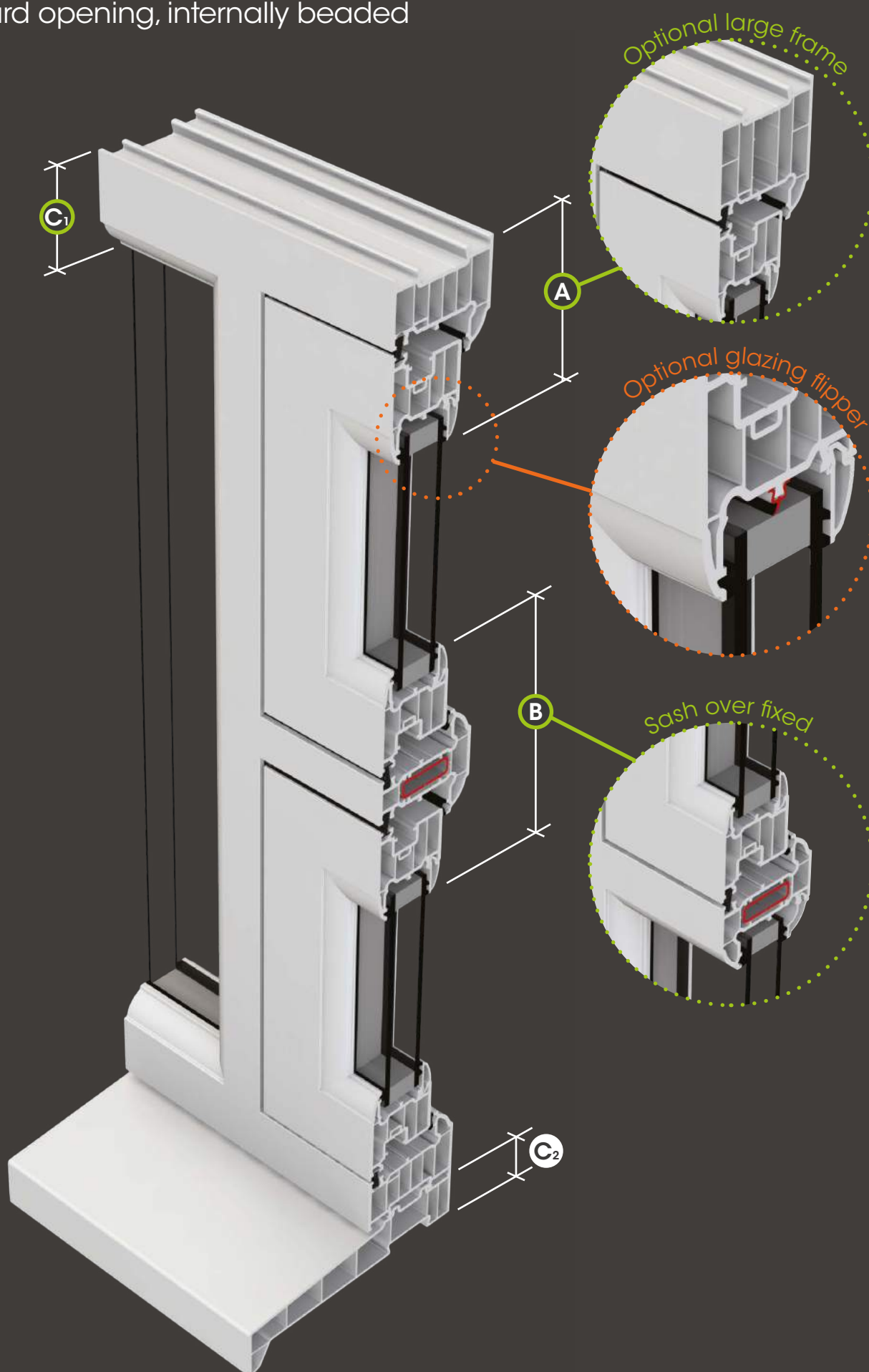
Product	Dim. C₁
Small frame L#W011	57mm
Large frame L#W016	77mm

Product	Dim. C₂
85, 150, 165, 180 cills LSL085, LSL150, LCL165, LSL180	30mm

Flush Sash **window**

Outward opening, internally beaded

Vertical Cross Section



Technical information

Flush Sash window

- Sculptured suite
- Flush sash finish on external faces
- 28mm double or triple glazing
- U-values from 1.3 (DGU) and 0.9 (TGU)
- Patented co-ex gasket

Accreditation



Colour Options



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



Product	Dim. A
Small frame & sash LSW011/012 & LSW030	102mm
Large frame & sash LSW016/017 & LSW030	122mm

Product	Dim. B
Transom & sash LSW022 & LSW030	112mm
Int. transom & sash LSW027 & LSW030	132mm
Transom & 2 x sash LSW021 & 2 x LSW030	157mm
Int. transom & 2 x sash LSW026 & 2 x LSW030	177mm

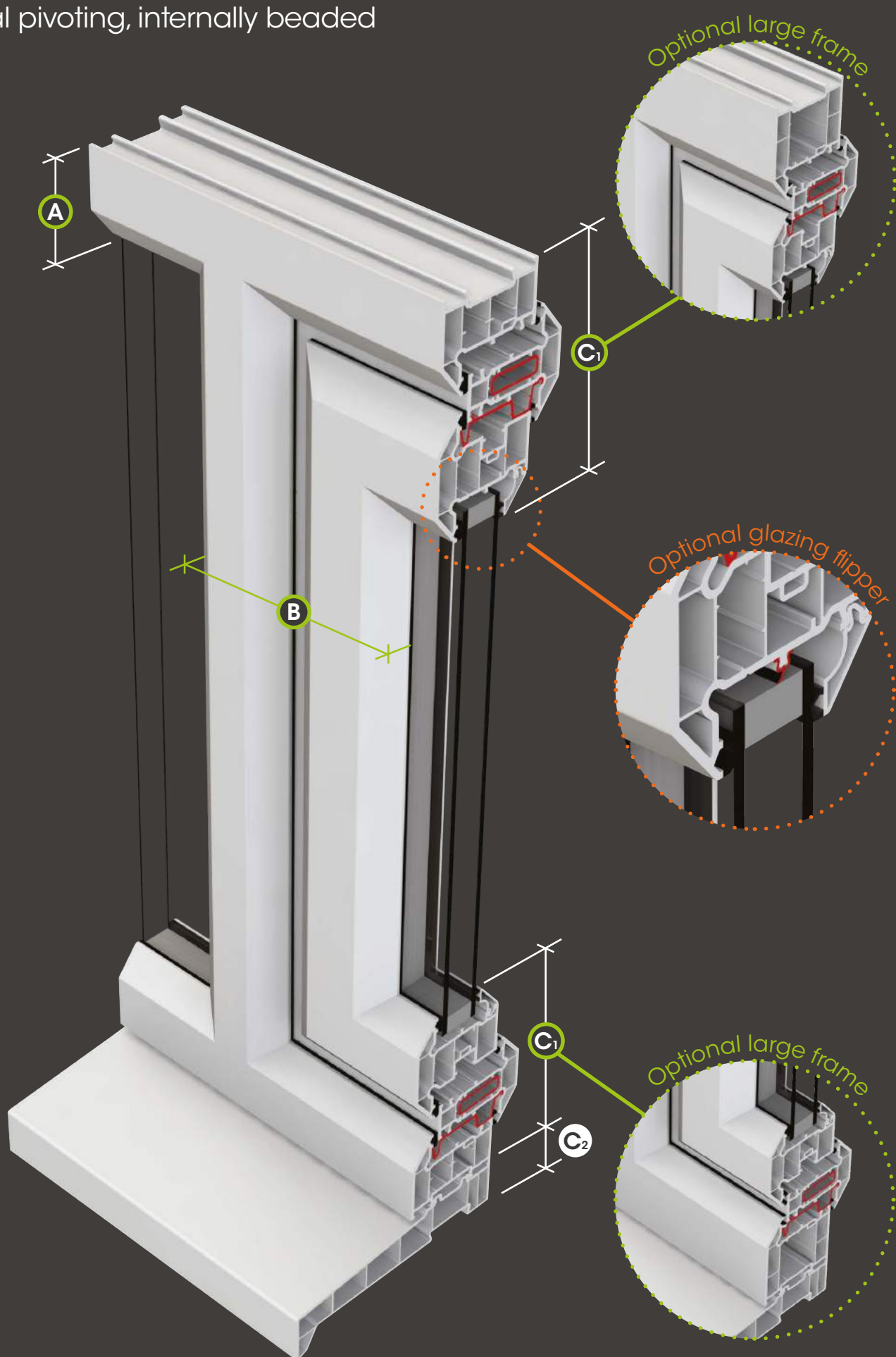
Product	Dim. C₁
Small frame LSW011/012	57mm
Large frame LSW016/017	77mm

Product	Dim. C₂
85, 150, 165, 180 cills LSL085, LSL150, LCL165, LSL180	30mm

Pivot **window**

Central pivoting, internally beaded

Vertical Cross Section



Technical information

Pivot window

- Chamfered suite
- 28mm double and 36mm triple glazing
- Ease of cleaning from inside the property
- U-values from 1.3 (DGU) and 1.0 (TGU)
- Patented co-ex gasket

Accreditation



Colour Options



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



Product	Dim. A
Small frame LCW011	57mm
Large frame LCW016	77mm

Product	Dim. B
Transom & sash LCW021 & LCW031	153mm
Int. transom & sash LCW026 & LCW031	173mm

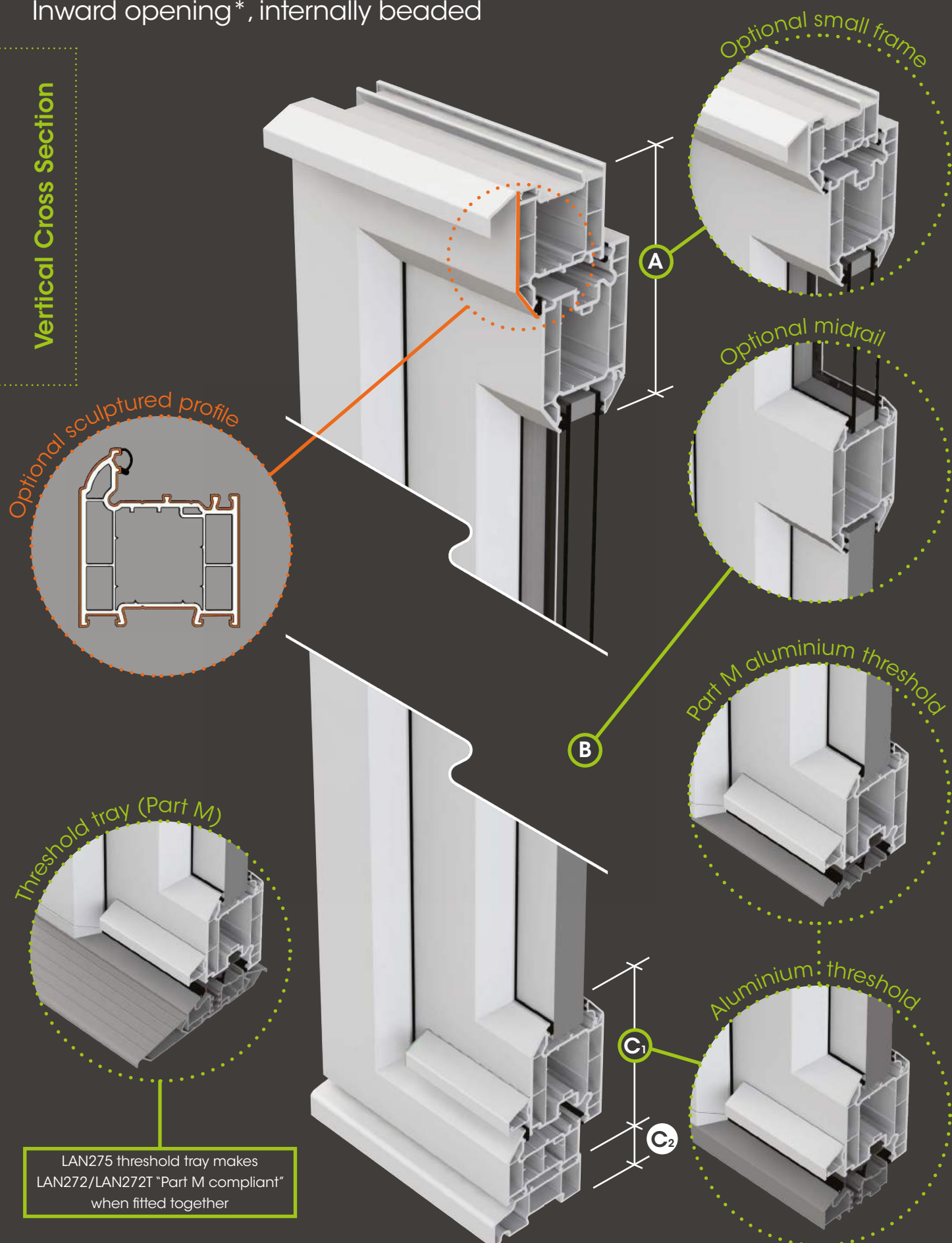
Product	Dim. C₁
Small frame & sash LCW011 & LCW031	143mm
Large frame & sash LCW016 & LCW031	163mm

Product	Dim. C₂
85, 150, 165, 180 cills LSL085, LSL150, LCL165, LSL180	30mm

Residential door

Inward opening*, internally beaded

Vertical Cross Section



* outward opening options are also available and feature the same sightlines

Technical information

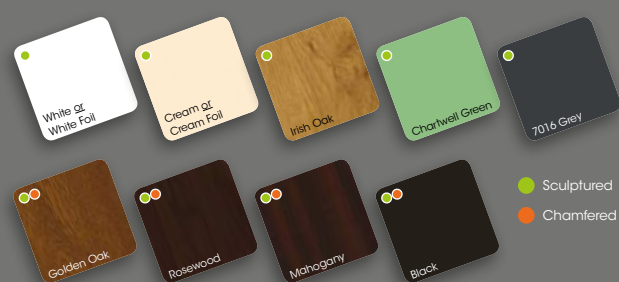
Residential door

- Sculptured and chamfered suites
- 28mm double and 36mm triple glazing
- 4 or 6 multi chamber EnergyPlus profiles
- U-values from 1.3 (DGU) and 1.0 (TGU)
- Patented co-ex gasket

Accreditations



Colour Options



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



Product	Dim. A
Small frame & sash L#W011 & LSW037*	136mm
Large frame & sash L#W016 & LSW037*	156mm

Product	Dim. B
Int. transom L#W026	87mm
Midrail L#W029	117mm

Product	Dim. C₁
Large frame & sash L#W016 & LSW037*	156mm
Small frame & sash L#W011 & LSW037*	136mm
Aluminium thresh. & sash LAN272/272T & LSW037*	127mm
Part M ali. thresh & sash LAN271 & LSW037*	112mm

Product	Dim. C₂
85, 150, 165, 180 cills LSL085, LSL150, LCL165, LSL180	30mm

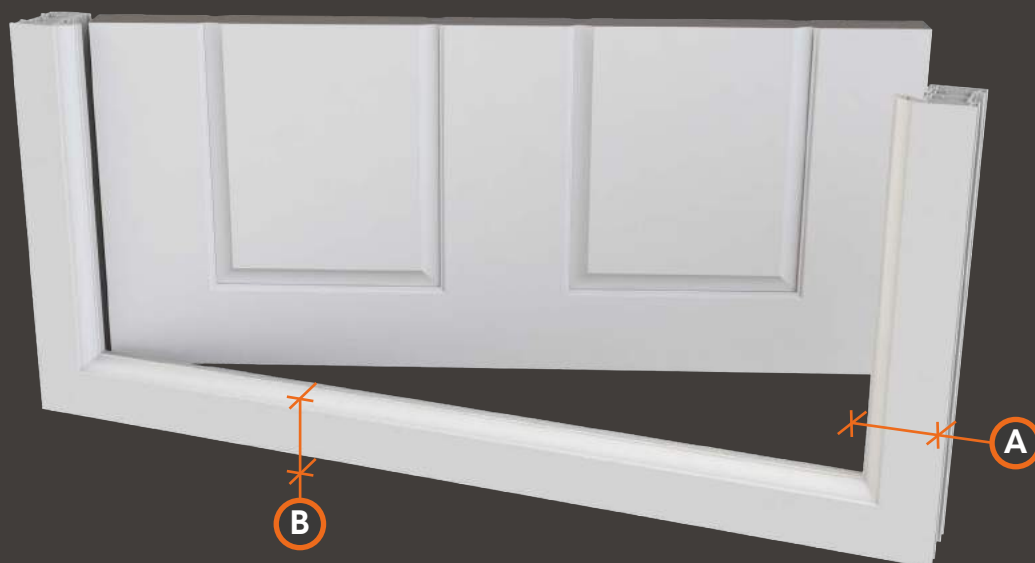
* SLCW037 for chamfered suite

Replace notation with (C) for Chamfered suite or (S) for Sculptured suite

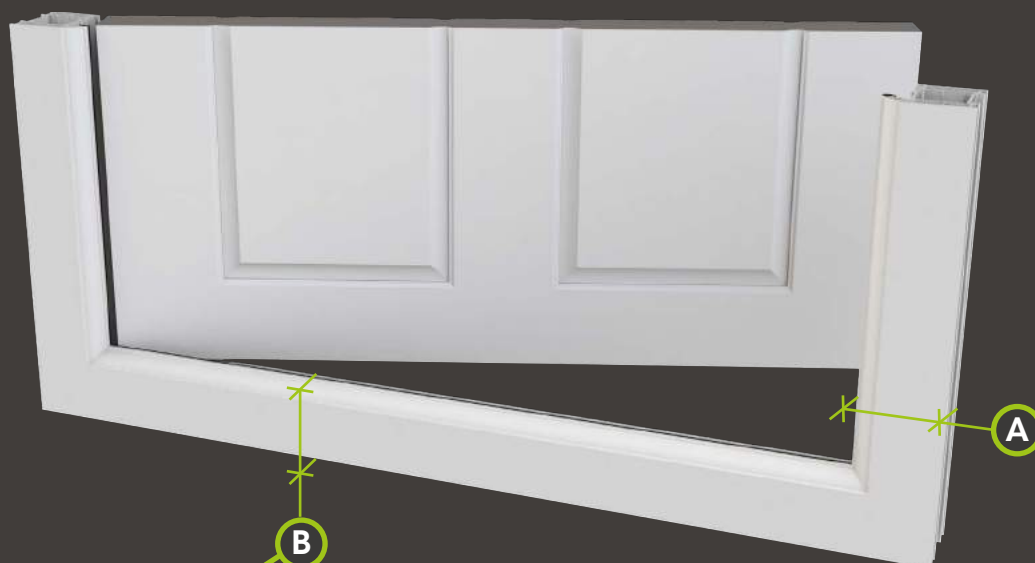
Composite door

Inward opening*

Horizontal Cross Section
44mm Door Slab (Option X)



Horizontal Cross Section
49mm Door Slab (Option Y)



Small frame threshold



Aluminium threshold



Part M Aluminium threshold



LAN275 threshold tray makes
LAN272/LAN272T "Part M compliant"
when fitted together

* outward opening options are also
available and feature the same sightlines

Technical information

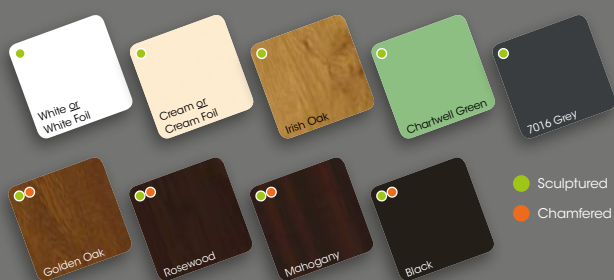
Composite door

- Sculptured and chamfered suites
- Wide variety of 44mm and 49mm door slabs
- Part M low threshold options
- Capable of PAS24 (specific door slab required)

Accreditations



Colour Options (outer frame only)



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



44mm, Option X

Product	Dim. A
Composite frame LSW018	67mm

Dim. B	
Composite frame LSW018	67mm
Proprietary thresholds available, contact your preferred supplier	

49mm, Option Y

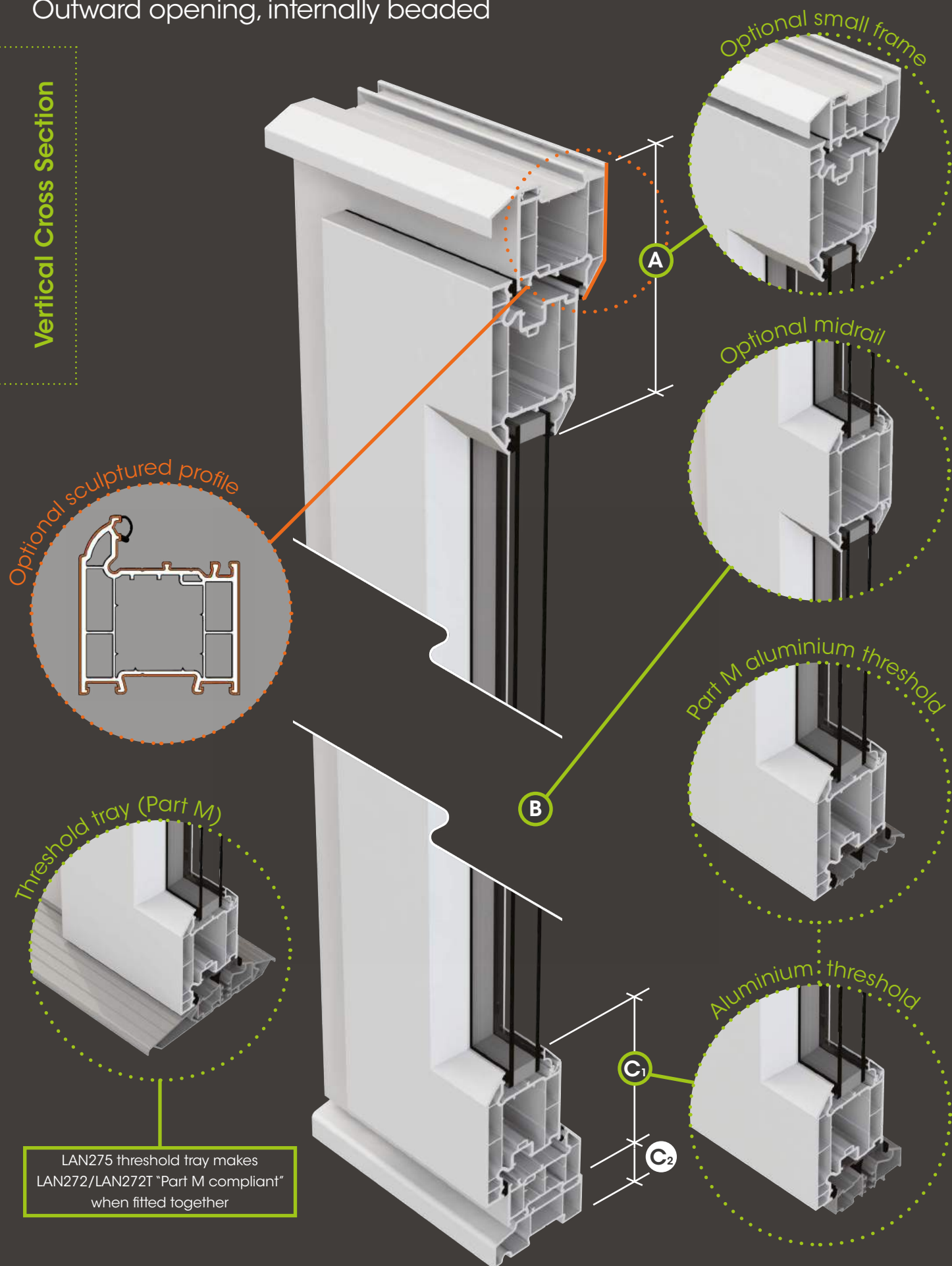
Product	Dim. A
Small frame L#W011 or L#W012	57mm
Large frame L#W016 or L#W017	77mm

Product	Dim. B
Large frame L#W016 or L#W017	77mm
Small frame L#W011 or L#W012	57mm
Aluminium threshold LAN272 or LAN272T	25mm
Part M threshold LAN271	15mm

French door

Outward opening, internally beaded

Vertical Cross Section



LAN275 threshold tray makes LAN272/LAN272T "Part M compliant" when fitted together

Technical information

Residential door

- Sculptured and chamfered suites
- 28mm double and 36mm triple glazing
- 4 or 6 multi chambered EnergyPlus profiles
- U-values from 1.3 (DGU) and 1.0 (TGU)
- Patented co-ex gasket

Accreditations



Colour Options



Additional colours are available to order as specials.
The colours shown in this brochure give an indication only.



Product	Dim. A
Small frame & sash L#W011 & LSW036*	136mm
Large frame & sash L#W016 & LSW036*	156mm

Product	Dim. B
Int. transom L#W026	87mm
Midrail L#W029	117mm

Product	Dim. C₁
Large frame & sash L#W016 & LSW036*	156mm
Small frame & sash L#W016 & LSW036*	136mm
Aluminium thresh. & sash LAN272/272T & LSW036*	127mm
Part M ali. thresh. & sash LAN271 & LSW036*	112mm

Product	Dim. C₂
85, 150, 165, 180 cills LSL085, LSL150, LCL165, LSL180	30mm

* SLCW037 for chamfered suite

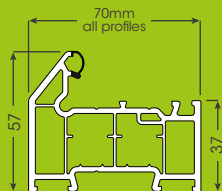
Replace notation with (C) for Chamfered suite or (S) for Sculptured suite

Window/door product chart

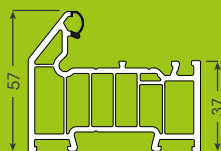
Chamfered Profile



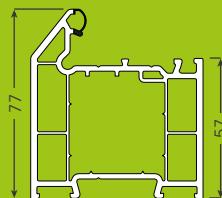
LCW041 28mm Bead



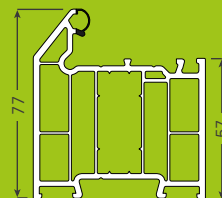
LCW011
Small Main Frame



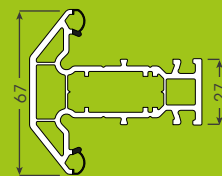
LCW012
EnergyPlus Small
Main Frame



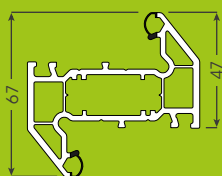
LCW016
Large Main Frame



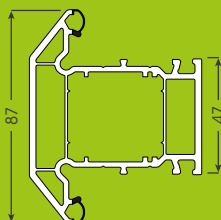
LCW017
EnergyPlus Large
Main Frame



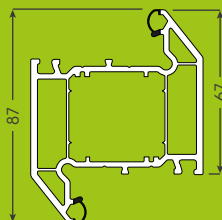
LCW021
Transom T



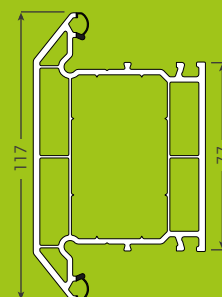
LCW022
Transom Z



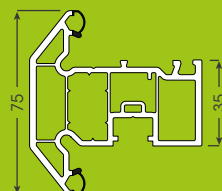
LCW026
Int. Transom Z



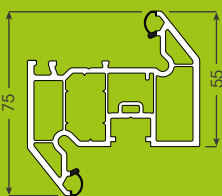
LCW027
Int Transom Z



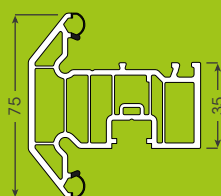
LCW029
Midrail



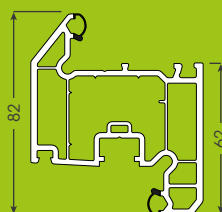
LCW031
Sash T



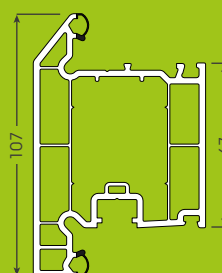
LCW032
Sash Z



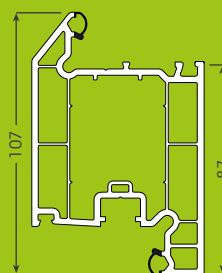
LCW033
EnergyPlus Sash T



LCW035
T&T Sash

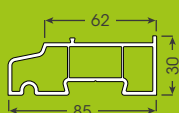


SLCW036
Door Sash T

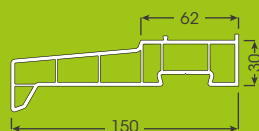


SLCW037
Door Sash Z

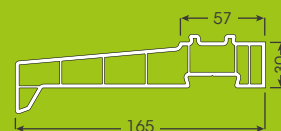
Cills



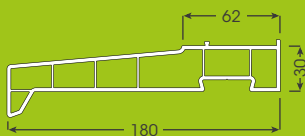
LSL085
85mm Stub Cill



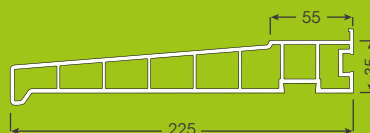
LSL150
150mm Cill



LCL165
165mm Cill



LSL180
180mm Cill



LCL225
225mm Cill

Sculptured Profile



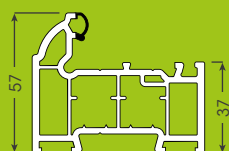
LSW041 28mm bead



LSW042 36mm bead



LPD083 Flush Sash bead



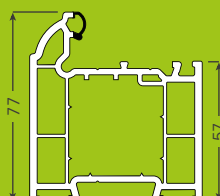
LSW011

Small Main Frame



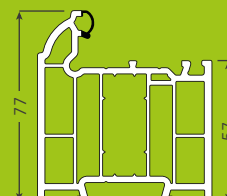
LSW012

EnergyPlus Small Main Frame



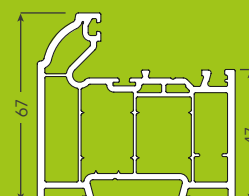
LSW016

Large Main Frame



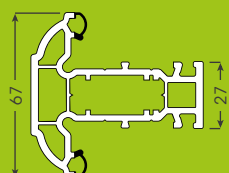
LSW017

EnergyPlus Large Main Frame



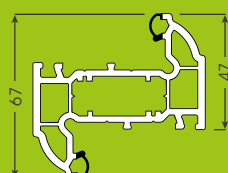
LSW018

Composite Door Outer Frame



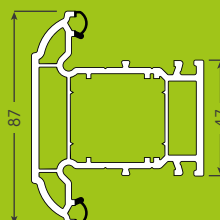
LSW021

Transom T



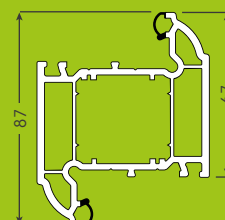
LSW022

Transom Z



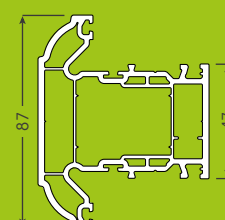
LSW026

Int Transom T



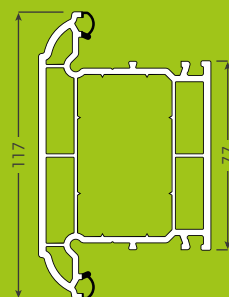
LSW027

Int Transom T



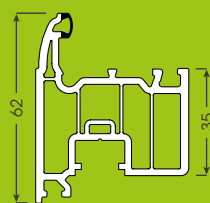
LSW028

44mm Comp. Door Transom T



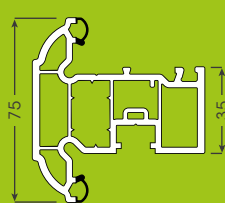
LSW029

Midrail



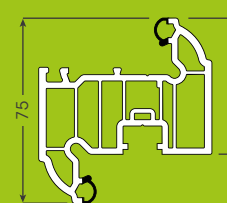
LSW030

Flush Sash



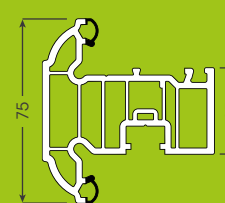
LSW031

Sash T



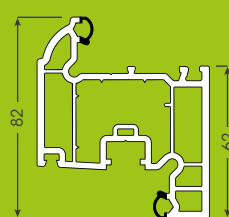
LSW032

EnergyPlus Sash Z



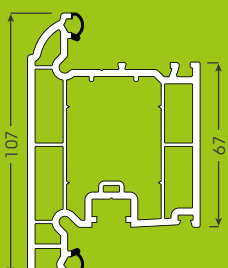
LSW033

EnergyPlus Sash T



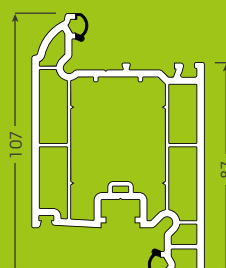
LSW035

T&T Sash



LSW036

Door Sash T



LSW037

Door Sash Z

Window/door product chart

Ancillary PVCu

								
LAN101 Screw Retainer	LAN102 Glazing Flipper	LAN103 Single Butt Joint	LAN104 Head Drip	LAN105 Cill Drip	LAN106 20mm Frame Extension	LAN107 Thermal Dam	LAN111 Cover Strip	LAN112 Small Trim
								
LAN113 Heavy Duty Butt Joint Capping	LAN114 Struct. Butt Joint Capping	LAN116 10mm Frame Extension	LAN118 Composite Door Mechanical Joint	LAN126 50mm Frame Extension	LAN131 Large Trim	LAN134 Bay Pole	LAN135 Bay Pole Nest	LAN141 20mm rebate add on
								
LAN142 35mm rebate add on	LAN153 90° Corner Post	LAN160 20mm Georgian Bar	LAN161 28mm Georgian Bar	LAN162 20mm Slim Georgian Bar	LAN165 Cill Reinforcing	LAN171 Low Threshold Trim	LAN180 Comp. Door Reinforcing	

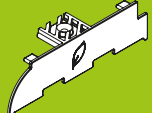
Ancillary Aluminium

								
LAN211 Std. Butt Joint	LAN212 Med Duty Butt Joint	LAN213 HD Butt Joint	LAN214 Structural Butt Joint	LAN230 Flush Sash French Window Adapter	LAN231 Small Bay Pole	LAN232 Large Bay Pole	LAN233 Bow Pole	LAN234 Bay Pole
								
LAN251 135° Corner Joint	LAN252 150° Corner Joint	LAN253 90° Corner Joint	LAN271 Part 'M' Compliant Low Threshold	LAN272 Std Low Threshold	LAN272T Thermally Broken Std. Low Threshold	LAN273 Threshold Packer	LAN274 Threshold Packer	
								
LAN275 Low Threshold Tray	LAN276 Sculptured Kick Strip	LAN277 Chamfered Kick Strip	LAN278 Low Threshold Half Tray	LAN279 Comp. Door Low Threshold Seal Carrier	LAN291 Meeting Stile Adapter			

Steel Reinforcement

									
LSR011	LSR016	LSR017	LSR018	LSR021	LSR026	LSR028	LSR031	LSR035	LSR036/LSR036P

Head Vent

			
LHV30 Head Vent	LHV31 Head Vent Channel	LHV32 Head Vent End Cap	LHV Head Vent Foam

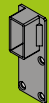
Aluminium Reinforcement

				
LAR011	LAR021	LAR026	LAR029	LAR031

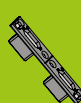
Ancillary Steel



LAN301
Fixing Cleat



LAN314
Structural Joint
Fixing Cleat



LAN371
Low Threshold
Shootbolt Keep



LAN311
Butt Joint Jack



LAN331
Small Bay
Pole Jack

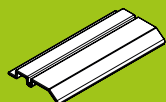


LAN332
Large Bay
Pole Jack

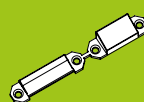


LAN353
Square Bay
Pole Jack

Ancillary Mouldings



LMO301
Glazing Platform



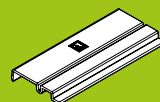
LMO302
Interlocking
Wedges



LMO303
Run Up Ramp



LMO305
Cill Drip End
Cap



LMO311
36mm Glazing
Platform



LMO316
Flag Hinge
Packer



LMO321
Chamfered French
Door End Cap



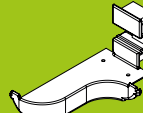
LMO322
Sculptured French
Door End Cap



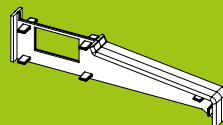
LMO323
Pivot End Cap



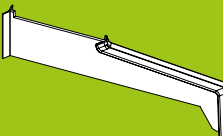
LMO021
PVCu Transom
Mech Joint



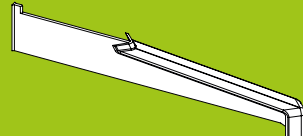
LK001/LK002
Sculptured/
Chamfered Mock
Sash Horn Kit



LMO354
In-line 150mm Cill Joint



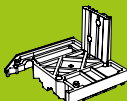
LMO355
135° 150mm Cill Joint



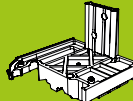
LMO356
90° 150mm Cill Joint



LMO357
Corner Protector



LMO371
Chamfered Low
Threshold Moulding



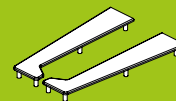
LMO372
Sculptured Low
Threshold Moulding



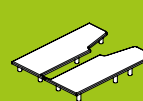
LMO275
Low Threshold Tray
End Cap



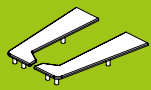
LMO365
150mm & 165mm Cill
End Cap



LMO381
180mm Cill End Cap



LMO386
85mm Cill End Cap



LMO325
225mm Cill End Cap



LMO011
Outerframe Mech
Joint Block



LGA401
Repair Gasket



LGA412
Flush Sash
Button Strip



LGA418
12mm
Brush Pile



LGA432
Flush Sash
Brush Pile Seal



LGA435
Bay Pole
Nest Seal



LGA479
Composite Door
Low Threshold Seal
Carrier Q-Lon



LBF197
Q-Lon

Gaskets

Clip On Georgian Bar



ULI
Intermediate
Bridging Clip



ULCC
Cruciform Clip



CJC2VS
Cruciform Joint
Cover



GB2VS
Featured Low
Level Bar



EP2VS-OVF
Featured End
Cap



EP2VS-55
Chamfered End
Cap



UL28
28mm Double
Sided Clip

Adhesive Tape
4943F-16
16mm grey
bridging clip tape
4943F
40mm grey
cruciform tape

ModLok™ Patio door



As with the window system, the Linar sliding patio door was designed from scratch to take advantage of the very latest technology, and has been cyclic tested by Linar's in-house robot to provide assurance that it's built to last.

Strong and secure

The Linar patio door features the patented ModLok™ system, a combined reinforcement and multi-point locking system developed in conjunction with Yale. In addition, all external sliders feature multiple anti-lift properties to combat would-be intruders.

Unique 'air glide' system

Other patio doors operate on a four-wheel steel opening system. The Linar patio features a unique eight-wheel acetal system, providing stability, durability and smooth, silent operation.

Self-cleaning track

One of the reasons other patio doors are hard to open is when dirt and mud fall into the track. The Linar patio features built-in brushes that sweep the track clean every time the door is opened.

Attractive

With ultra-slim sculptured sightlines, no unsightly crash stops and a built-in decelerator, the Linar patio door is one of the most attractive on the market.

- 2, 3 and 4 pane options available
- Slim sash design (80mm high)
- Optional mechanically jointed outer frame
- Thermally broken Part M low threshold available - just 25mm high with integral ramp
- External sliders are anti-lift, providing additional security
- Patented centre seal creates continuous seal between sash and threshold to prevent water tracking
- Patented decelerator discreetly fixed in head - eliminates unattractive external fix crash stop
- Mechanically jointed, fully sculptured midrail, with letterbox facility
- Patented sealing packer for fixed sash, no need to fit brush pile, halving insertion time
- Fully foiled finish including trims