KAWNEER
AN ARCONIC COMPANY

VALUE ENGINEERING IN A DIFFERENT CLASS

Glazing systems for the Education sector by Kawneer

OPTIMISE WITHOUT COMPROMISE

Sibson Building, University of Kent
Photo: Quintin Lake

Contents

A GLOBAL INNOVATOR IN GLAZING SYSTEMS

Kawneer originally began in the United States over 100 years ago, and its aluminium craftsmanship can still be seen in many landmark buildings across the world including New York's Flat Iron building and the Statue of Liberty. Today it's part of the Arconic Group, a global leader in technology, engineering and advanced manufacturing.

Over the last 50 years in the UK, we've become renowned as one of the leading suppliers of engineered glazing, with a comprehensive range of architectural aluminium building products which includes curtain wall, windows, commercial entrance doors and framing systems.

Our years of experience, combined with expertise, innovation and aluminium's flexibility and recyclability, make our building systems the right solutions for today and tomorrow.

Kawneer has offices and manufacturing plants at locations across the US and Europe, and in the UK we're based in London and Runcorn, Cheshire.

Our London base offers architectural and contractor support, while our Runcorn design and engineering plant was established in 1963 and has 150,000 sq ft of fully integrated manufacturing space. We currently employ 160 full time staff, with an annual turnover of around £34m.

Kawneer extrude, paint and thermally break all of our systems at our main production facility in Runcorn.

This ensures that our systems remain competitive and readily available to our Fabricator network.

John Bradfield Centre, Cambridge

Class-leading Glazing

John Roan School, London
Photo: John McAslan + Partners / Hufton+Crow

From primary schools to universities, we've built up an enviable track record of success in the Education sector together with extensive knowledge and experience in providing tailored systems that meet or exceed every expectation.

Indeed, much of our recent product development has been to meet the specific demands of Education projects, including our 451PT Framing System, AA®190 TB Thermally-Broken welded commercial Entrance Door, the AA®720 SL Window System and our LouvreShield ventilation and fall protection System.

But the chief reasons for our success are the benefits we bring to any Education project, right from the start by being able to deliver a wide range of system solutions to meet both the technical and commercial requirements of the project.

City Heights Academy, Lambeth
Photo: ©TimCrocker

Success in Schools

The Templeman Library, University of Kent
Photo: Quintin Lake

DETAILED DESIGN SUPPORT

We'll support you in the earliest stages of a project with design advice to ensure our systems meet your technical and cost brief.

VALUE ENGINEERING

Our Architectural Adviser team will help to deliver a value-engineered solution without compromising on the quality of the system.

BESPOKE SOLUTIONS

Our in-house facades team can provide you with bespoke project solutions that fully meet specific project design criteria such as bespoke fins/brise soleil solutions.

SUSTAINABILITY

All our aluminium contains a minimum 80% recycled content, completely traceable back to origin for BES 6001 – Responsible Sourcing of Materials accreditation.

PRICE AND SUPPLY CERTAINTY

As all our materials are manufactured in the UK, we can guarantee supply and short lead times – which also means we can hold fixed prices for the duration of a project.

FULLY-TRAINED DEALER NETWORK

Our nationwide network of authorised Dealers have been extensively trained through our unique Kawneer Installation Certification scheme (KIC) to maintain the highest possible installation standards.

DEFECT REDUCTION

On large, complicated projects we'll carry out regular site inspections and provide a detailed report highlighting any areas that need improvement.

WARRANTIES

For added peace of mind, we offer a unique range of warranties from our 30-year paint warranty to our 10-year system warranty.

ENHANCED SECURITY

All of our main systems have been fully tested to PAS 24 standards

The Sustainable Solution

Spires Academy, Canterbury
Photo: Peter Cook

Kawneer products are designed to help your project meet BREEAM standards, as part of an integrated, whole building approach. But our dedication to sustainability goes much further besides.

We're always looking for ways to reduce our environmental impact, and set new industry standards for sustainability. For example, our aluminium extrusions have a life expectancy of 50 years – far higher than other construction materials – and we use a minimum of 80% recycled aluminium content.

Production waste is recycled back to the smelter, and with extrusion, paint and thermal break rolling under one roof production miles are minimised; and since 2015 we've reduced our power consumption by 24% and gas consumption by 11%, also our water usage by 80% since 2010 and landfill waste by 75% since 2013.

We are the world's first supplier of architectural aluminium products to achieve BES 6001 for responsible sourcing of construction products.

BES 6001 Certificate Number
BES 650797

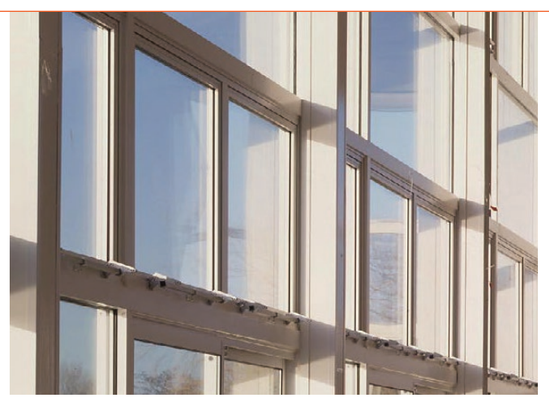
BES 6001
Responsible Sourcing
www.greenbooklive.com

We've also undertaken an independent Life Cycle Assessment for our Runcorn facility, and Environmental Product Declarations for our three main systems – curtain walls, doors and windows. The LCA enables us to understand how our product, materials and systems impact on the environment, highlighting how we can improve performance, while the EPDs look at the impact of raw material usage, the aluminium extrusion process and at end of life (e.g. recovery and disposal) – all of which helps architects, specifiers and building owners to fully assess our green credentials prior to working with us.

AIRC, Cranfield University
Photo: Neil Hoyle Photography

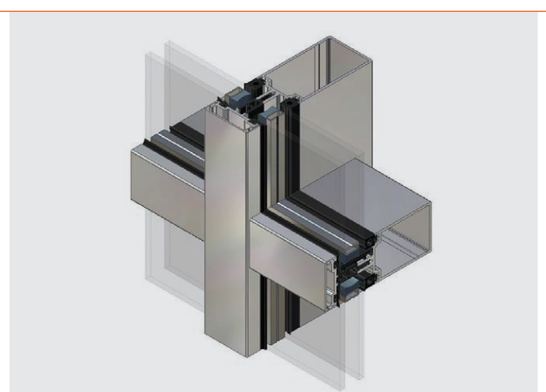
The Kawneer Range

A summary of our products specifically designed for use in Education sector projects.



451PT FRAMING SYSTEM

Suitable for ground and first floor applications, this system combines thermal performance with exceptional aesthetics.



AA®100 50MM CURTAIN WALL SYSTEM

A stick-frame assembly with excellent weather performance through drainage and ventilation of the glazing rebates.

AA®4110 LIFT/SLIDE & SLIDING PATIO DOOR

A cost-effective solution for projects that demand the highest levels of thermal and weathering performance.

AA®190 TB DOOR

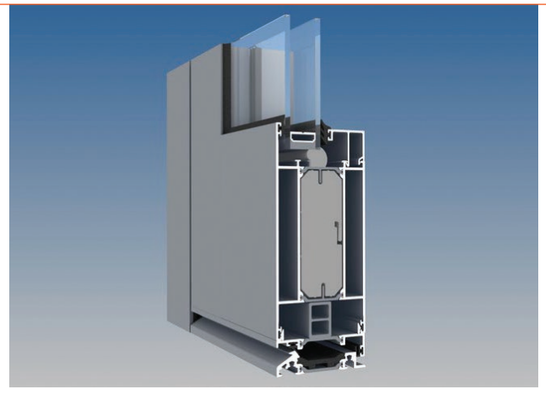
An all-purpose door for heavy use in high traffic areas and automatic entrances, with an optional finger guard pivot stile.

AA®720 SL WINDOW SYSTEM

With slim, elegant sightlines, the AA®720 SL achieves a cost-effective solution without sacrificing thermal performance.

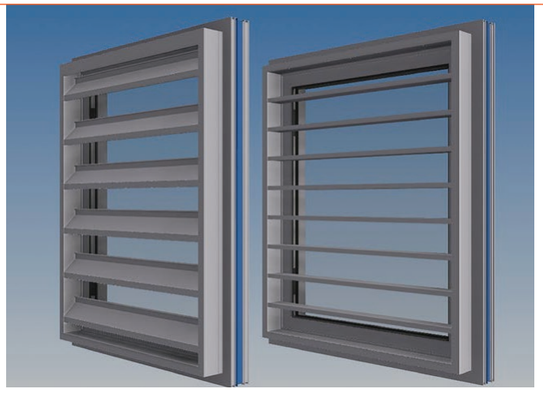
AA®3610LS VERTICAL SLIDING WINDOW

Opening the top and bottom sashes on the AA®3610LS allows stale air out of the top of the window and cool fresh air to be drawn in via the bottom.



AA®720 SERIES DOOR SYSTEMS

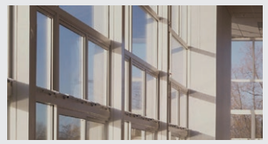
Available in two levels of thermal performance to enable flexibility of design, performance and cost.



LOUVRESHIELD

A simple and aesthetic solution that provides both ventilation and fall protection.

451PT Framing System



City Heights Academy, Lambeth
Photo: ©TimCrocker

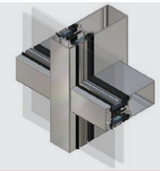
Designed in close collaboration with SCAPE, the thermally-efficient 451PT Framing System provides slimline, dual colour and multi-glazed framing modules of various widths and heights featuring fixed lights, opening vents and insulated panels.

It uses shear block construction where contoured shear blocks are screw-fixed to the verticals, forming a spigot for horizontal members, and can take glazing options between 24mm and 28mm.

FEATURES

- Meets the current building regulations thermal requirements
- Narrow 50mm sightlines for attractive aesthetics
- A tried and tested solution ideal for large window designs
- Flush glazed, so easy to apply
- Concealed drainage with moisture directed to the outside of the building
- Suites with our AA®720 Windows, AA®3610 Vertical Sliding Window and all Door Systems

AA®100 50mm Curtain Wall System



A stick-frame assembly with excellent weather performance via drainage and ventilation of glazing rebates at every mullion and transom connection in a zone-drained system, and at the base and above mullion joints in a mullion-drained system.

The system offers design flexibility with a variety of mullion depths, several thermal break options and aesthetic external capping. Its outstanding performance and ease of installation make it ideal to tailor to individual project requirements.

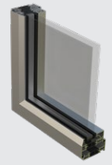
We also have a large choice of face caps to enable total design flexibility to suit your individual aesthetic requirements.

John Roan School, London
Photo: John McAslan + Partners / Hufton+Crow

FEATURES

- Concealed zone drainage, with each pane acting as an individual self-draining unit, or mullion drainage with ventilation and drainage via the mullions
- Glazing up to 50mm
- Available in both capped and structural silicone glazed forms
- Large choice of face caps for total design flexibility
- Bespoke face caps available (subject to approval)
- Fire-resistance in accordance with Pr EN 1364-3, with up to 30 minutes integrity and insulation
- Patented transom overlap detail for a uniform aesthetic finish
- Tested and certified in accordance with CWCT Sequence B
- Enhanced thermal performance meets or exceeds current Building Regulations
- Incorporates AA®130 Brise Soleil System
- Allows integration of opening windows, including a concealed vent option
- HC/VC gasket system provided as an alternative to structural glazed solutions

AA®720 SL Window System

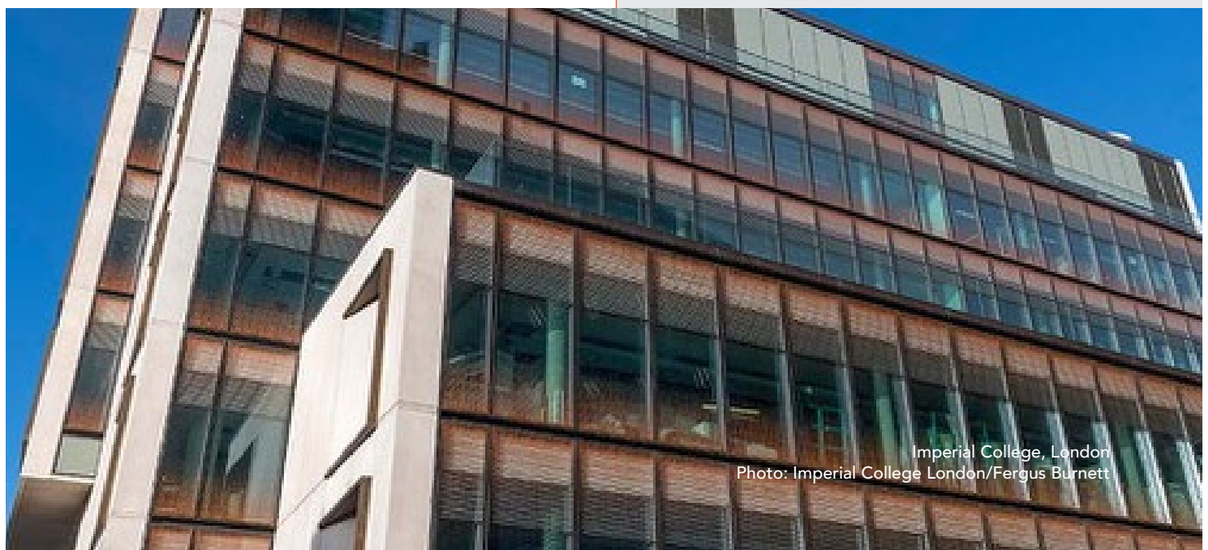


The AA®720 SL Outward Opening Casement Window has been designed specifically for the Education sector, re-engineered for a cost-effective solution without sacrificing thermal performance to help projects stay on budget.

This has been achieved by eliminating the need for reverse glazing adaptors, thus reducing the material needed and fabrication timescales – whilst offering ultra slim 62mm sightlines, maximising the glazing vision area.

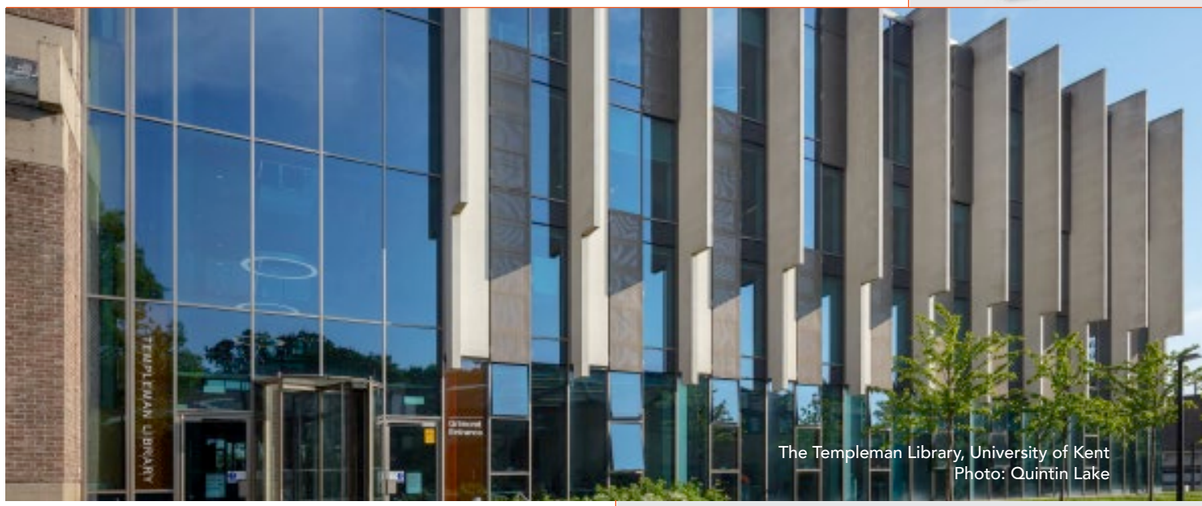
FEATURES

- BRE Green Guide 'A' Rated
- Ultra slim sightlines maximise glazing vision area
- Trickle Ventilation option to help meet Document F requirements
- Available as top hung or side hung windows
- Can be paired with the AA®100/AA®110 Curtain Walling, 451PT Framing and Door Systems
- Accommodates glazing up to 42mm, including triple glazing
- Choice of restrictors available to 100mm
- Maximum sizes: top hung up to 1500mm(W) and 1500mm(H), side hung up to 900mm(W) and 1500mm(H)
- Compatible hardware to complement the AA®720 and AA®540
- Box beads for enhanced security
- Fully tested to achieve PAS 24



Imperial College, London
Photo: Imperial College London/Fergus Burnett

AA®3610LS Vertical Sliding Window



The Templeman Library, University of Kent
Photo: Quintin Lake

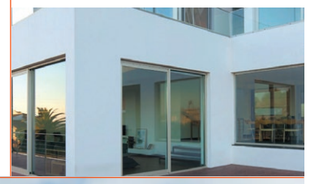
If maximum ventilation, easy operation and optimum air flow are critical project requirements, this is an ideal choice. The system has a fully integrated, flexible vertical slider, thermally broken using a unique polyamide design for ultimate weather and thermal performance with smooth operation.

By opening the top and bottom sashes simultaneously, this unique solution, allows stale air out of the top, while fresh air is drawn in via the bottom. The AA®3610LS has been successfully cycle tested to represent over 75 years of use too, so maintenance costs will be kept to a minimum.

FEATURES

- Linked, double sliding and fixed lights for total flexibility
- Can accommodate punched openings, coupled or composite units
- Bead glazing from 24mm-32mm, with thermal and safety glass options
- Integral muntin bar option to replicate traditional wooden sash windows
- Concealed drainage for better aesthetics
- Integral handle pull option
- Unique interlock design for exceptional weathering and thermal performance
- Flush opening avoids damage or interference with internal furnishings and offers added safety at ground floor level
- Can suite with Kawneer Curtain Wall and Framing products
- Independently tested to PAS 24

AA®4110 Lift/Slide and Sliding Patio Door



Duns Primary School, Berwickshire
Photo: Alan McAteer

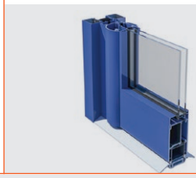
The AA®4110 Lift/Slide and Sliding Patio Door is a cost-effective solution for projects that demand the highest levels of thermal and weathering performance.

The AA®4110 thermally insulated system delivers optimum levels of quality and performance with the lift/slide technology providing effortless operation enabling maximum panel sizes up to 3m x 3m with maximum weights up to 160kg sliding and 250kg lift/slide.

FEATURES

- Available as parallel slide or lift/slide options
- Panel sizes up to 3m x 3m
- Panel weights up to 160kg sliding and 250kg lift/slide can accommodate glazing from 28mm to 36mm
- Two and three track options – arrangements with up to 6 panels
- Stainless steel rollers offer smooth and effortless operation
- Beaded sash frame for onsite glazing
- Dual colour option for specification of a different colour finish inside and outside

AA®190 TB Door

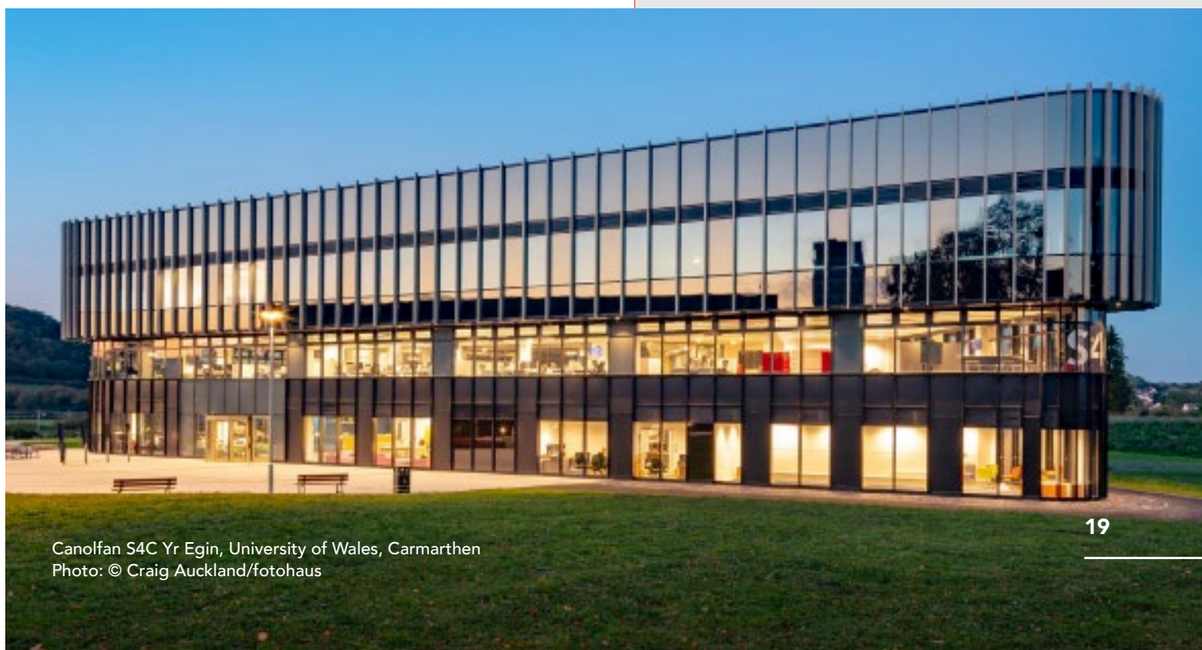


An all-purpose door for use in high traffic areas and automatic entrances, with robust construction suitable for heavy/severe use. Its welded corner construction makes it the strongest aluminium door available, with four separate weld points for exceptional strength tested to the severe duty requirements of BS 6375-2: 2009.

It can be installed with a finger guard pivot stile to prevent injury to fingers accidentally caught between the hinge stile and frame. The door has also been tested to PAS 24 for enhanced security performance of single and double leaf external doors.

FEATURES

- The only door with welded construction, with a Kawneer Lifetime Guarantee for peace of mind
- Suitable for external or internal medium, heavy and severe duty use
- Independently tested to PAS 24 Standard
- Child-friendly finger guard pivot stile protects against trapped fingers when opening and closing
- Butt hinge option available
- Single, double action, auto swing and bi-parting doors offer design flexibility
- Threshold options include low threshold to comply with Document M
- Single or dual colour options



Canolfan S4C Yr Egin, University of Wales, Carmarthen
Photo: © Craig Auckland/fotohaus

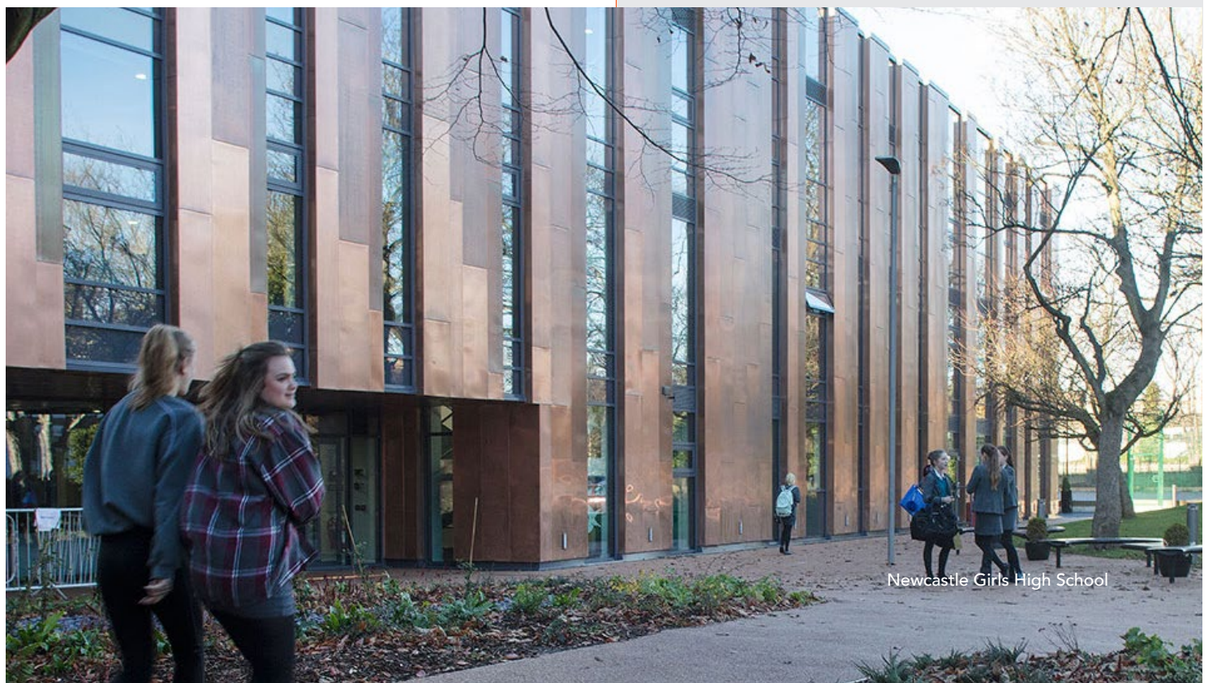
AA®720 Series Door Systems

Developed to meet current and future European requirements for thermal performance, the AA®720 Door is available in two levels of thermal performance – the AA®720 and the AA®720 HI – for complete design, performance and cost flexibility.

The 72mm profiles incorporate the very latest thermal technology including extruded polyamide thermal breaks, insulated centre seals and foam isolators, and can suite with our curtain walling and framing products.

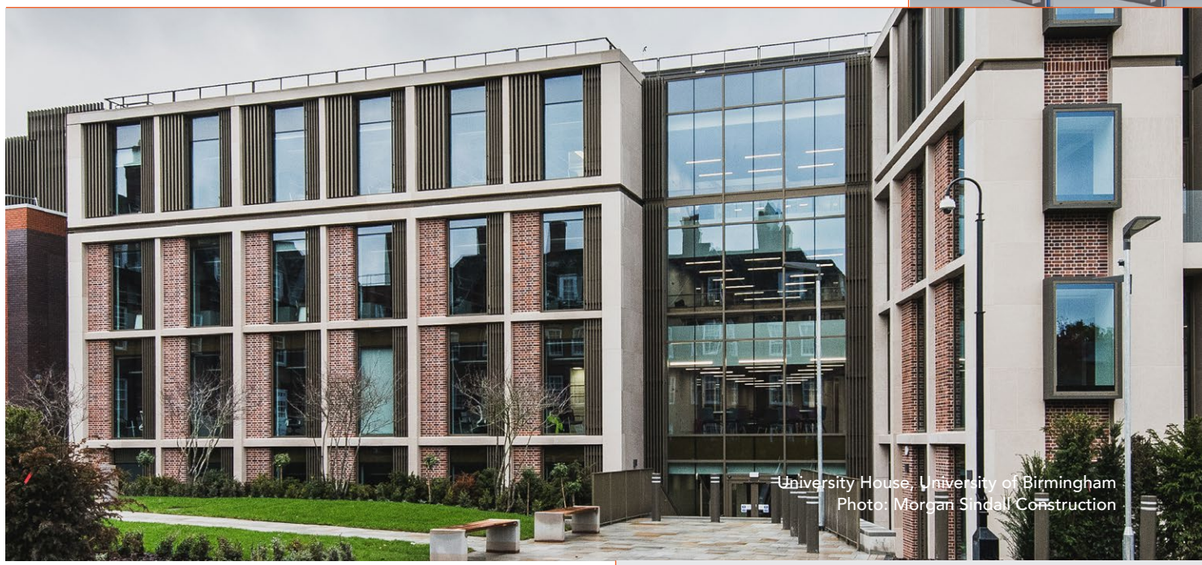
FEATURES

- Construction is crimped or pinned with mechanical corner cleats, together with corner braces
- Pressure equalised system using single and dual durometer, EPDM gaskets for weathering
- Extensive hardware options, including new concealed hinges and barrel hinges as well as extensive handle and locking options to match other Kawneer products
- Glazing and panels up to 56mm thickness enables triple glazing for the very highest thermal and acoustic performance
- Independently tested to PAS 24



Newcastle Girls High School

LouvreShield



University House, University of Birmingham
Photo: Morgan Sindall Construction

Designed to suite with the AA®720 Open-In Windows, LouvreShield offers a simple, aesthetic solution for providing both ventilation and fall protection ideal for educational and student accommodation projects.

Surface mounted onto the outer frame of the window it allows free air movement into the room when the windows are opened in either tilt or turn modes and also acts as a safety barrier. A totally self-contained solution that eliminates the need for additional sub-contractors and does not interface with any other element of the building structure.

FEATURES

- Suites with the AA®720 Open-In Windows
- Louvre spacing to meet specific free area requirements
- Fall protection
- Two blade options available for improved façade aesthetics
- Wide range of paint finishes with up to 30-year guarantees and anodised finishes with up to 25-year guarantees
- Glazing systems and Louvres from one manufacturer offer more design flexibility
- Fully tested in accordance with BS 6180 (Barrier Loading) to 1.5 kN/m Line Load and with BS EN 13049 (Impact Resistance) achieving Class 5

Engineering Best Value

Kawneer has worked on some of the most prestigious projects around. But we're also conscious that, particularly in the Education sector, the main drive is cost efficiency as budgets are often tight.

That's why we specialise in value engineering every project – looking at how we can maximise performance and meet every requirement, while minimising spend. Here are a few examples of what can drive those savings.

Trumpington Meadows Primary School, Cambridge
Photo: Willmott Dixon/ Yellowdoor Studios

DOORS

- Main entrance doors are subject to significant abuse so consider a pre-fabricated welded door built to last, such as the AA®190 TB
- Check the right hardware's specified – often doors are over-specified
- Always use a finger guarded/pivot door for school environments
- Using 451PT to glaze the doors into rather than curtain walling to save on cost
- Specifying door sizes to remove the need for a mid-rail is more cost-effective
- Use door stops to avoid doors being opened beyond 90 degrees and causing potential damage
- With a low threshold door for DDA compliance specify integral drainage to avoid water tracking back under the door in high winds

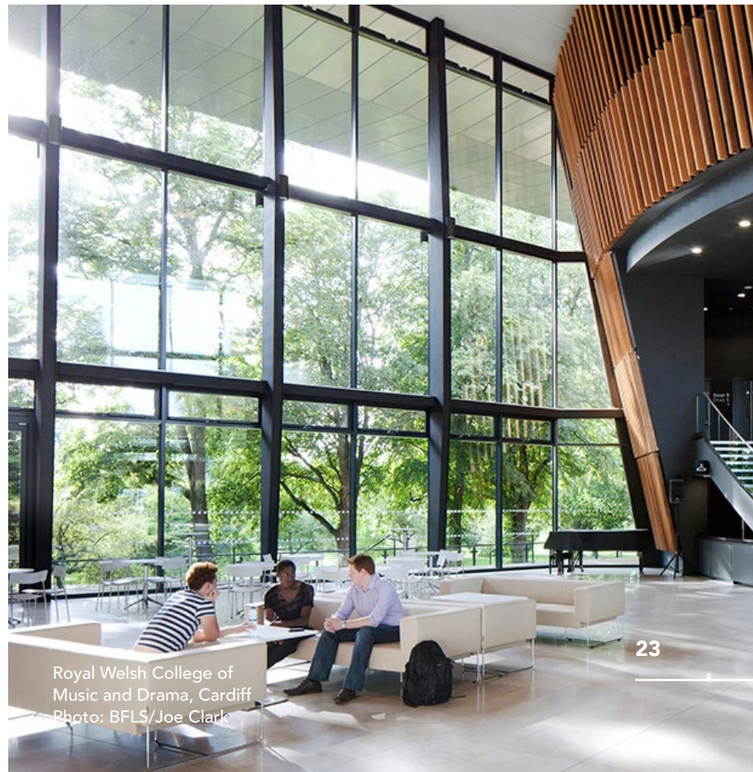
Alsop High School, Liverpool

WINDOWS

- Minimising the number of opening vents and using open-out vents wherever possible also reduces costs
- Check the wind load and select the smallest vent/ outer frame
- Is PAS 24 security really necessary, particularly on the less accessible 2nd floor?
- Do the windows really need subcills?
- Look at alternative methods of natural ventilation, such as parallel opening vents, sliding sash windows and so on
- Improved G value glass delivers solar shading more cost effectively compared with brise soleil
- If you need mechanical ventilation, minimise the louvre area to help drive down costs and improve weatherability

CURTAIN WALLING

- Use zone wind loading to find the most efficient box size and keep costs down
- A zone-drained system allows you to minimise wastage
- Optimised bar lengths further minimise waste – typical extrusion lengths are 6m or 6.4m which can lead to excess waste
- Use steelwork to split the span and minimise the required box size for the curtain wall – it's far cheaper than using a full height box size
- Using 451PT framing instead of curtain walling is around 25% more competitive



Royal Welsh College of Music and Drama, Cardiff
Photo: BFLS/Joe Clark

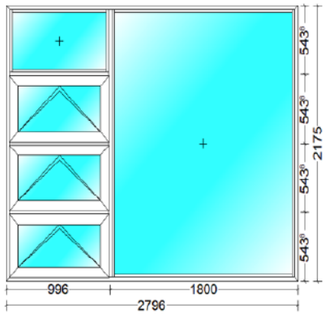
How Value Engineering can Reduce Costs

We've a great deal of experience in helping Main Contractors make sure a project meets its budget requirements through value engineering, and we can offer dedicated help in making the figures work for you.

The example below shows a typical configuration we often see on Education projects with 3 separate top hung vents below a fix light. Although this will provide excellent levels of ventilation, it is not the most cost effective way of achieving the ventilation strategy.

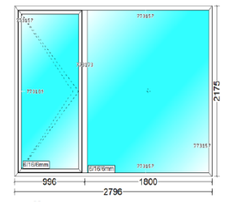
The following examples show how using a larger side hung vent, system or Parallel Opening vent can allow you to still achieve good thermal and ventilation performance at a significantly lower cost.

3 Top hung windows with fixed light

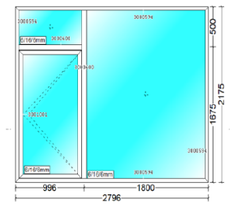
System	Image	Overall Cost	U-Value (Based on centre pane value 1.0w/2k and Psi Value 0.048)	Air Flow (Based on 100mm opening)
AA720		£1,105.10	1.51 w/m2k	0.315m2

The prices shown in the attached examples are just for illustrative purposes only to allow a comparison against alternatives. These prices should not be used for any costing/budget purposes

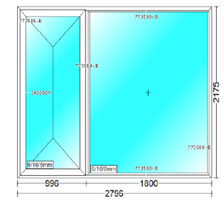
Single full height side hung window with fixed light

System	Image	Overall Cost	U-Value (Based on centre pane value 1.0w/2k and Psi Value 0.048)	Air Flow (Based on 100mm opening)
AA720SL		£486.52	1.38 w/m2k	0.182m2

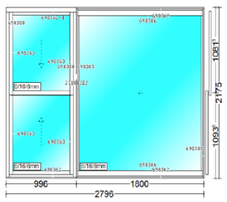
Side hung window with fan light above with fixed light

System	Image	Overall Cost	U-Value (Based on centre pane value 1.0w/2k and Psi Value 0.048)	Air Flow (Based on 100mm opening)
AA540		£737.53	1.329 w/m2k	0.182m2

Parallel opening window with fixed light

System	Image	Overall Cost	U-Value (Based on centre pane value 1.0w/2k and Psi Value 0.048)	Air Flow (Based on 100mm opening)
AA720 POV		£1,006.16	1.28 w/m2k	0.526m2

Link Sash window with fixed light

System	Image	Overall Cost	U-Value (Based on centre pane value 1.0w/2k and Psi Value 0.048)	Air Flow (Based on 100mm opening)
Link Sash		£1,234.10	1.55 w/m2k	Inlet - 0.20827m2 Outlet - 0.0827m2

Longer Lasting – it's Guaranteed

Assessing the value of one type of construction against another isn't just about the initial cost – it has to include ongoing maintenance and the costs across the entire lifecycle.

And Kawneer's aluminium systems score very highly both in terms of life expectancy and warranties. After thorough testing, our product life expectancies are as shown in the table below.

ALUMINIUM PROFILES	**50 YEARS**
GASKET SEALS	**30 YEARS**
POLYAMIDE THERMAL BREAKS	**50 YEARS**
POLYESTER POWDER COATING	**30 YEARS**
FRICTION HINGES	**30,000 CYCLES**
FULLY REVERSIBLE HINGES	**30,000 CYCLES**
TILT & TURN MECHANISMS	**30,000 CYCLES**
HANDLES & OTHER ACCESSORIES	**30,000 CYCLES**
OVERCENTRE CAMSTAYS	**30,000 CYCLES**

Essa Academy, Bolton
Photo: Positive Image Photography

We also offer a comprehensive range of warranties across our entire range of products, giving you peace of mind and added confidence in specifying Kawneer.

PERMACOVER™

Our most basic warranty, this covers our high quality polyester powder paint finish with 30-year gloss and 30-year matt and metallic guarantees, subject to Kawneer acceptance in marine, industrial, swimming pools or other aggressive atmospheres.

PERMANODIC® WARRANTY

Our Permanodic® warranty covers our anodised products with a 25-year finishes guarantee.

PERMACOVER™ PLUS – FULL PRODUCT WARRANTY

For complex projects over £800k system value (£4m installed glazing value) our unique 10-year full product warranty which encompasses:

- Vetting of project drawings
- Inspection of fabrication during the manufacturing process
- Regular site inspections to review quality of installed system

INSURANCE BACKED WARRANTY

In partnership with Alliance Warranty Management, we can offer a unique 3rd party insurance-backed warranty featuring:

- Periods of 10 or 12 years available (2 years initial installer period, 8/10 years direct to insurer)
- No fault warranty
- Cover for defective design, workmanship and materials
- Protection for the whole installed system
- Fully transferable to future owners
- A-rated insurance company backing
- Costs typically 2.25% of installed glazing value

Similar to Permacover Plus, this includes vetting the design through to checking installation on-site, with documentation released to client only when the works are proven to meet our requirements.

Cardiff and Vale College
Photo: Gareth Gardner

Trained to Reduce Defects

Without the right installation, even the very best products become an expensive liability. So to ensure Kawneer quality continues throughout the process, we created an industry first – the Kawneer Installation Certification Scheme (KIC). It demonstrates that any installer we approve has been comprehensively trained and inspected to the highest standards.

Our training covers all the main topics around installing Kawneer systems, including curtain wall design, fabrication, value engineering techniques, installation site supervision and site toolbox talks. All of our Dealers are trained to our KIC standards, and we carry out regular site inspections to review the quality of workmanship.

The main aim with our KIC Course is to minimise the risk of defects on-site – and to date, we've had over 1400 registrations with an 81% pass rate.

Value Engineering in Action

If you're looking for experience in working on Education sector projects, Kawneer has more than most. Here are just a few examples.


Photo: ©TimCrocker

City Heights Academy, Lambeth

PRODUCTS USED:

AA®100 Curtain Wall, AA®541 Casement Windows, 190 Doors, 451PT Framing System

ARCHITECT:

Jestico + Whiles

MAIN CONTRACTOR:

Carillion

INSTALLER:

Leay

Duns Primary School, Berwickshire

PRODUCTS USED:

GT70 Windows, AA®100 Curtain Wall, AA®720 Doors, AA®3572 Lift/Slide Door System

ARCHITECT:

Aitken Turnbull

MAIN CONTRACTOR:

Graham Construction

INSTALLER:

CMS Window Systems

Photo: Alan McAteer

Penarth Learning Community, Vale of Glamorgan

PRODUCTS USED:

AA®100 Curtain Wall, AA®541 Casement Windows, AA®3110 Horizontal Sliding Windows, 190 and 350 Doors

ARCHITECT:

HLM Architects

MAIN CONTRACTOR:

Bouygues UK

INSTALLER:

AB Glass

Photo: Trevor Burrows

Photo: James Newton

Gateway to the Valleys Secondary School, Bridgend

PRODUCTS USED:

AA®100 Curtain Wall, AA®541 Casement Windows, 190 Doors

ARCHITECT:

Scott Brownrigg

MAIN CONTRACTOR:

Bouygues UK

INSTALLER:

Dudley's Aluminium

Photo: © Hufton+Crow

Smythe Library, Tonbridge School, Tonbridge

PRODUCTS USED:

AA®100 Curtain Wall, AA®541 Concealed Vents, AA®720 Doors

ARCHITECT:

BDP

MAIN CONTRACTOR:

Buxton Building Contractors

INSTALLER:

JPJ Installations

Trumpington Meadows Primary School, Cambridge

PRODUCTS USED:

AA®100 Curtain Wall, AA®541 Casement Windows, 190 Doors

MAIN CONTRACTOR:

Willmott Dixon

INSTALLER:

JPJ Installations

Photo: Willmott Dixon/ Yellowdoor Studios

Alsop High School, Liverpool

PRODUCTS USED:

AA®100 Curtain Wall, Windows, 190 and 350 Doors

ARCHITECT:

2020 Liverpool

MAIN CONTRACTOR:

Morgan Sindall

INSTALLER:

Anaco Systems

University House, University of Birmingham, Birmingham

PRODUCTS USED:

AA®100 Curtain Wall, AA®110 Curtain Wall, 350 Doors, AA®720 Doors, AA®720 Windows

ARCHITECT:

Glancy Nicholls Architects

MAIN CONTRACTOR:

Morgan Sindall

INSTALLER:

Duplus Architectural Systems

Photo: Morgan Sindall Construction

Photo: Atkins

Poole Gateway Building, Bournemouth University, Poole

PRODUCTS USED:

AA®100 Curtain Wall, AA®720 Doors, AA®190 TB Doors, AA®541 Fixed-Light Windows, AA®543 Tilturn Windows

ARCHITECT:

Atkins

MAIN CONTRACTOR:

Willmott Dixon

INSTALLER:

Leay

London Screen Academy, Islington, London

PRODUCTS USED:

GT70S Windows, AA®100 Curtain Wall, AA®190 TB Doors

ARCHITECT:

Architecture Initiative

MAIN CONTRACTOR:

Willmott Dixon

INSTALLER:

JPJ Installations

Templeman Library, University of Kent, Canterbury

PRODUCTS USED:

AA®100 Curtain Wall, AA®100 Concealed Window Vents, AA®541 Casement Windows, AA®3572 Lift/Slide Doors, AA®3610 Vertical Sliding Windows

ARCHITECT:

Penoyre & Prasad

MAIN CONTRACTOR:

Kier Construction

INSTALLER:

Leay

Canolfan S4C Yr Egin, University of Wales, Carmarthen

PRODUCTS USED:

AA®110 Curtain Wall, AA®720 Doors, 190 Doors, AA®720 Window Vents

ARCHITECT:

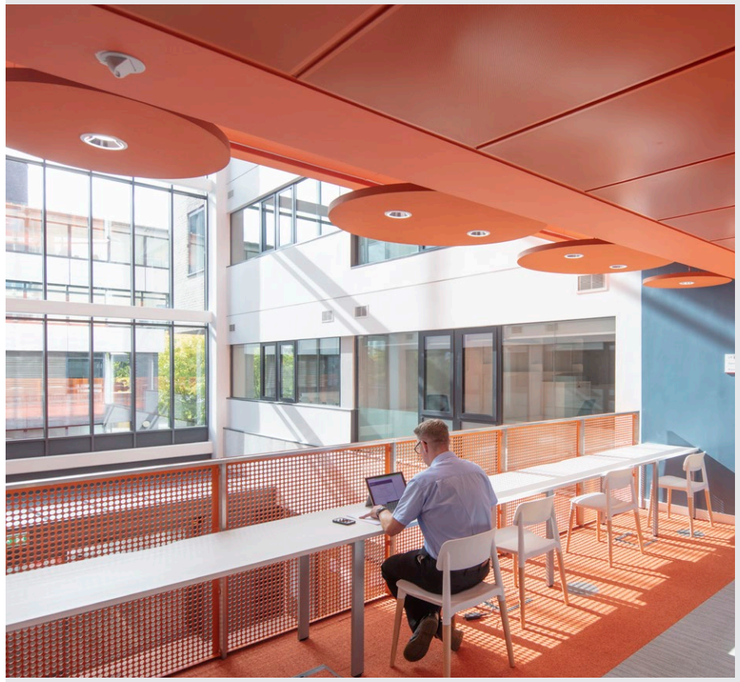
BDP

MAIN CONTRACTOR:

Kier Construction

INSTALLER:

APiC UK



Mathematical Sciences Building, Warwick University, Coventry

PRODUCTS USED:

AA®100 Curtain Wall, AA®541 Casement Windows, AA®720 Doors, 190 Doors, AA®100 Slope Glazing

ARCHITECT:

Associated Architects

MAIN CONTRACTOR:

Morgan Sindall

INSTALLER:

APiC UK

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Tonbridge School
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