Alitherm 400 casement window

Overview

- Energy Rating WER A (Existing dwellings, other windows in existing commercial & new commercial) - (1.2Wm²k centre pane uValue) 4-20–4 Planitherm Total Plus
- Energy Rating 1.5Wm²k (New dwellings, other windows in existing commercial & new commercial) - (1.2Wm²k centre pane uValue) 4-20-4 Planitherm Total Plus
- BFRC Reg No. 6167 WER A rating
- 70mm thermally broken Smart's aluminium
- Crimped frame & sash system

Weather Performance (BS6375-1)

- Air Permeability: Class 4
- Water tightness: E1200
- Resistance to Wind Load: AE2400

Alitherm 400 Window

- Open out internally beaded casements & externally beaded fixed panes as standard
- 70mm thermally broken system with ACET4070 frame foam infill to outerframe
- Stepped outer frame and flat vent as standard
- Square coex bead as standard (frame & sash are push in gaskets)
- 28mm double glazed as standard
- 17mm stack friction hinge
- Espagnolette with bi-directional locking

Features and Options

- For full internally beaded windows, use internally beaded dummy sashes to fixed panes
- Finishes available in KL, RAL, Sensation range and dual colour options
- Optional egress/mega egress hinge with easy clean facility (easy clean subject to sash width)
- Odd leg outer frame available ETC4113 - 20mm leg (long leg sizes required for orders/ quotations) **note:** extended lead time
- Trickle vents available (fitted into 42mm frame extension) not available on odd leg
- French Escape windows available (double handle)
- Triple glazed available 36mm / 38.8mm
- Optional ACET695 Toe & Heel glass adjusters to sashes
- Optional PAS24 or Secure by Design - includes claw locks to sashes and Glaslok secure -clip security clip to externally beaded fixed panes (supplied loose)
  note: check your glazing requirements

Size Restrictions (Outside of these restrictions frames will be subject to **NO** warranty)

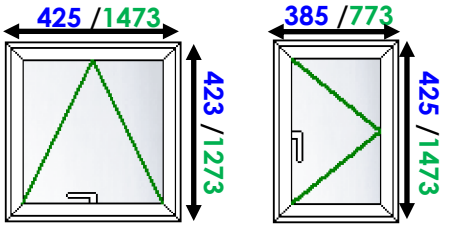
- Large frames with mullions are subject to be split & coupled based on a design wind load of 800pa, ensure sizes/styles meet installation/site conditions. ***(See Wind loading)***

Top Hung Sashes

- Max width: **1435**mm (sash size) (**1473mm** frame size)
- Min width: **385**mm (sash size) (**425**mm frame size)
- Max height: **1235**mm (sash size) (**1273**mm frame size)
- Min height: **383**mm (sash size) (**423**mm frame size)

Side Hung Sashes

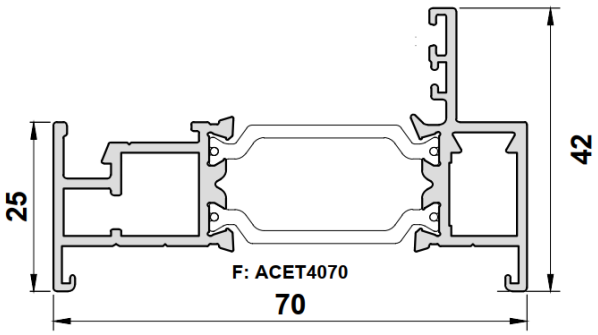
- Max width: **735**mm (sash size) (**773**mmmm frame size)
- Min width: **345**mm (sash size) (**385**mm frame size)
- Max height: **1435**mm (sash size) (**1473**mm frame size)
- Min height: **385**mm (sash size) (**425**mm frame size)



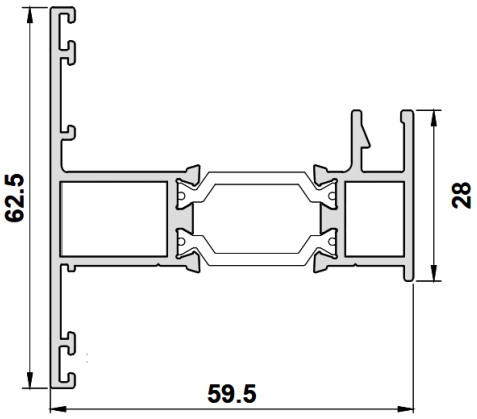
Top hung height & Side hung width are based on standard friction hinges.
Top hung width & Side hung height are based on lock length.
For further max/min information see pages ***(Hinge/Weight)*** , ***(Locks)***

Profile Cross Sectional Drawings

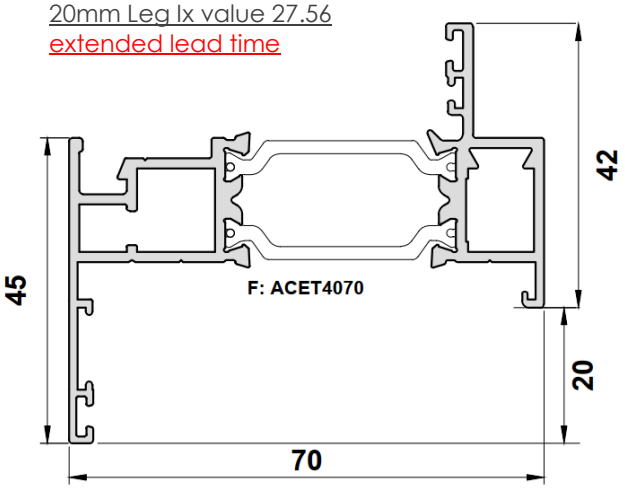
ETC4112 - Stepped outer frame
Ix value 21.54



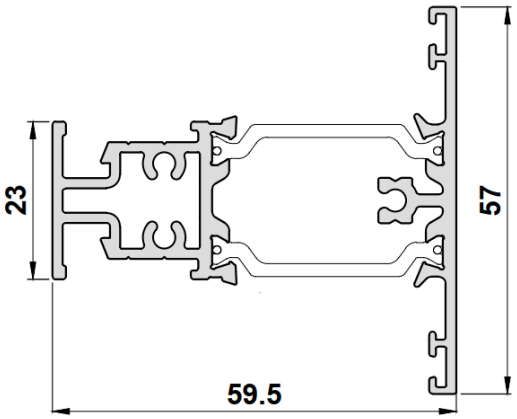
ETC4129 Internally beaded sash
Ix value 19.34



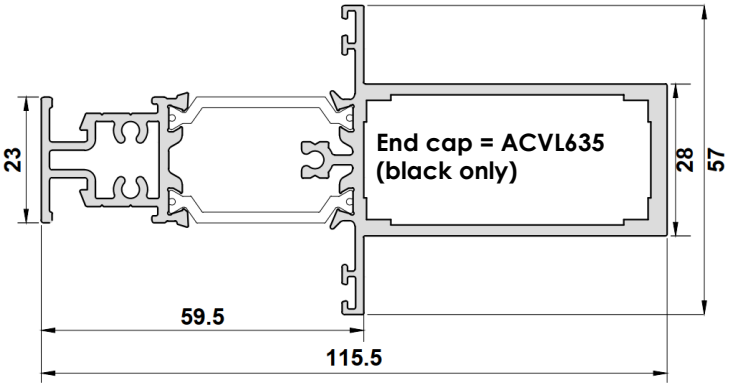
ETC4113 Odd leg outerframe
20mm Leg Ix value 27.56
extended lead time



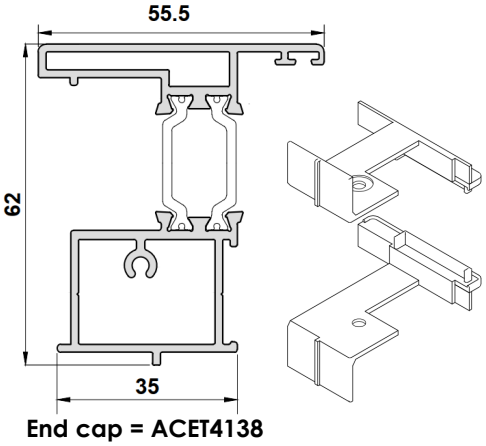
ETC4130 Standard Transom/Mullion
Ix value 19.39



ETC4136 - Reinforced transom/mullion
Ix value 95.03



ETC4138 - French escape mullion
Ix value 20.06

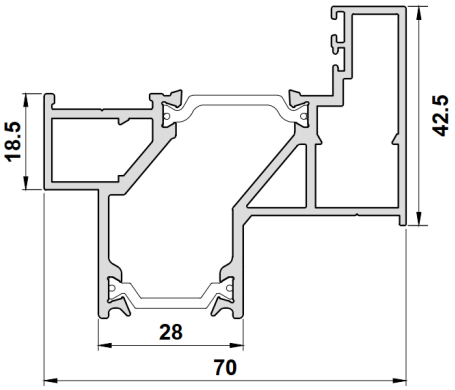


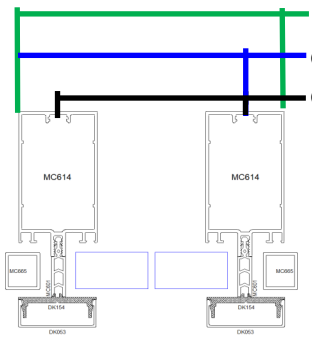
Profile Cross Sectional Drawings

ETC4117 - Curtain wall adaptor

Frames into curtain walling have an odd leg detail to the frame so it can be glazed into the MC600 system.

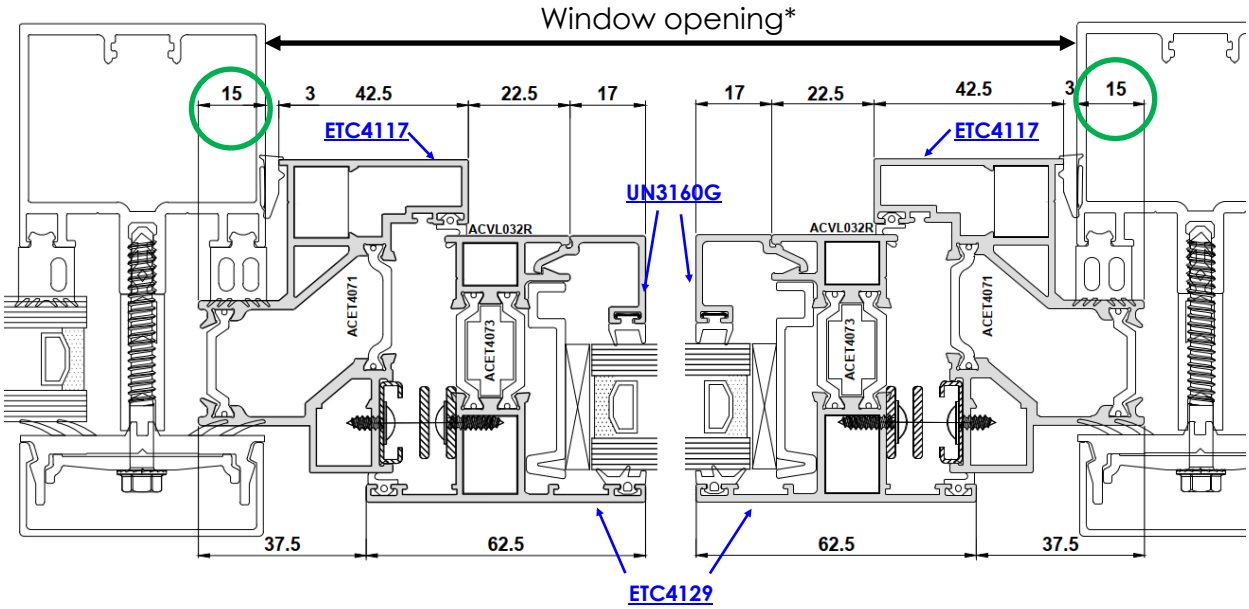
Casement frame size is window opening* plus 15mm each side to width and height (30mm overall) extended lead time





CW frame – CW frame less 80mm
CW frame - CW mull/tran less 52.5mm
CW mull/tran to CW mull/tran less 25mm

Casement frame size calculation



Bead Cross Sectional Drawings

28mm / 28.8mm Double glazed

Unit types

4-20-4 = 28mm

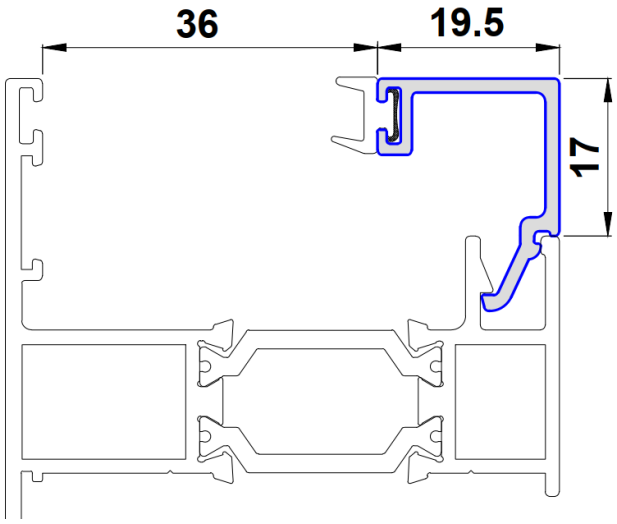
6-16-6 = 28mm

4-18-6 / 6-18-4 = 28mm

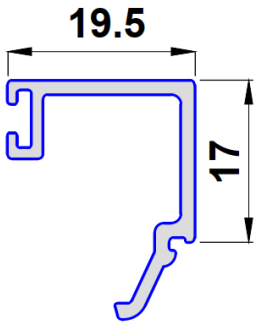
6.8-18-4 / 4-18-6.8 = 28.8mm

6.8-16-6 / 6-16-6.8 = 28.8mm

UN3160 Coextruded



UN3160G non -coextruded



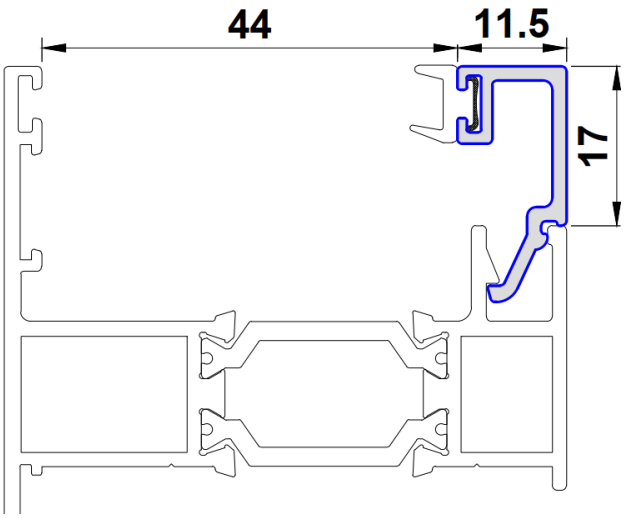
36mm / 38.8mm Triple glazed

Unit types

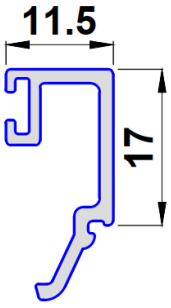
4-12-4-12-4 = 36mm

6.8-12-4-12-4 / 4-12-4-12-6.8 = 38.8mm

ETC4179 coextruded

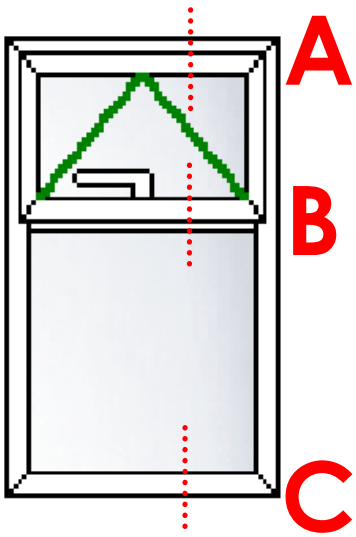


ETC4179G non-coextruded



For full bead & gasket combinations see page 16

Top opener over fixed sash



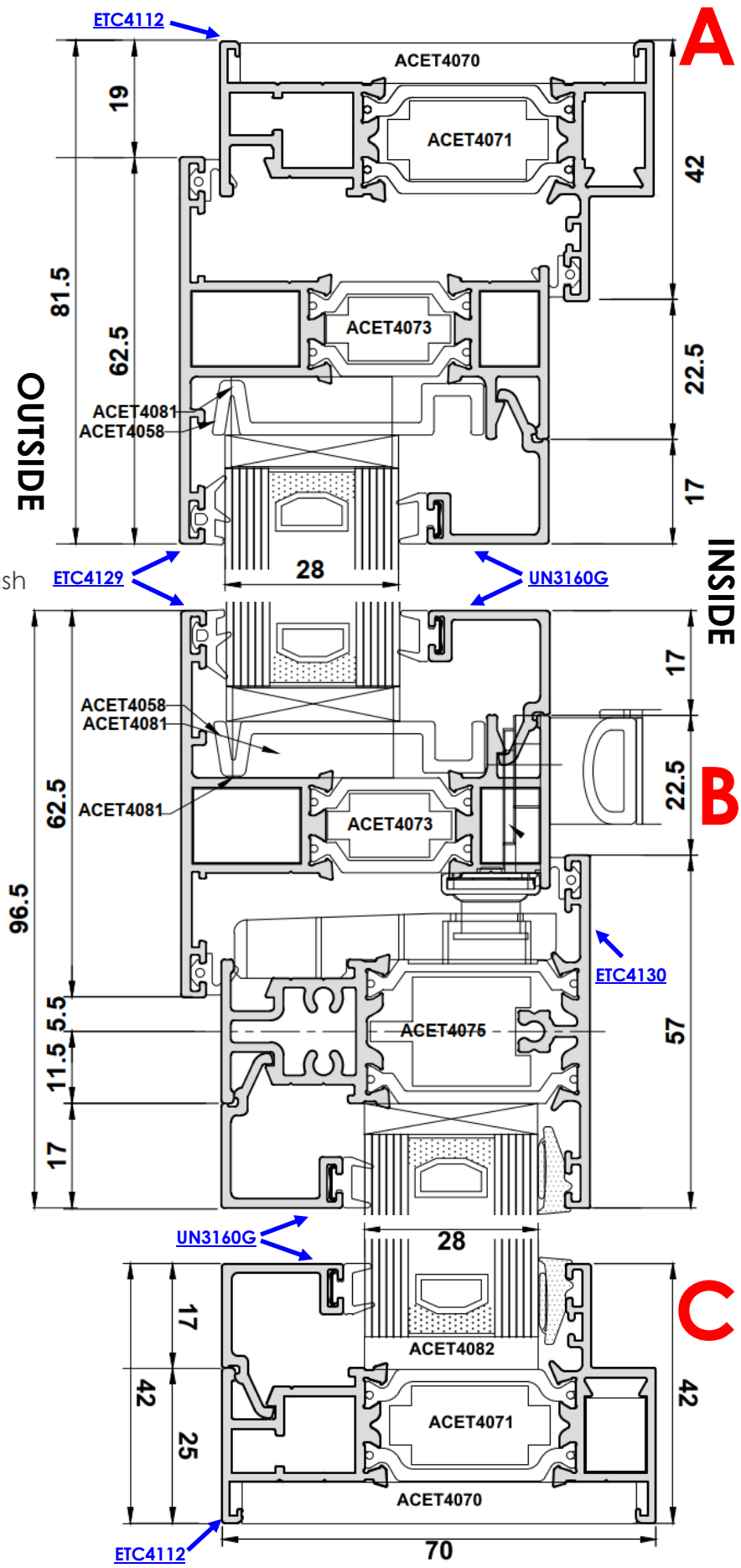
Internally beaded over externally beaded fixed light

Cross section detail of

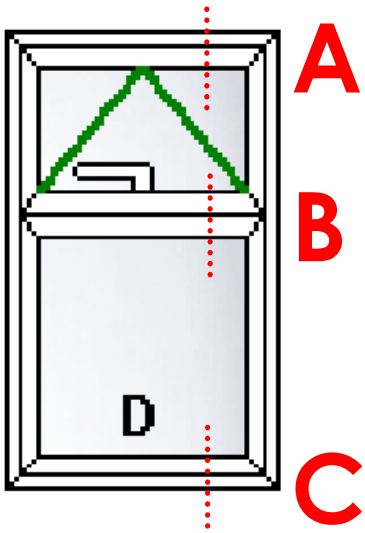
(A) Head - ECT4112 frame, ETC4129 sash, UN3160G Bead

(B) Transom - ETC4130 transom, ETC4129 sash, UN3160G Bead

(C) Cill - ETC4112 frame, ETC4129 sash, UN3160G bead



Top opener over dummy sash



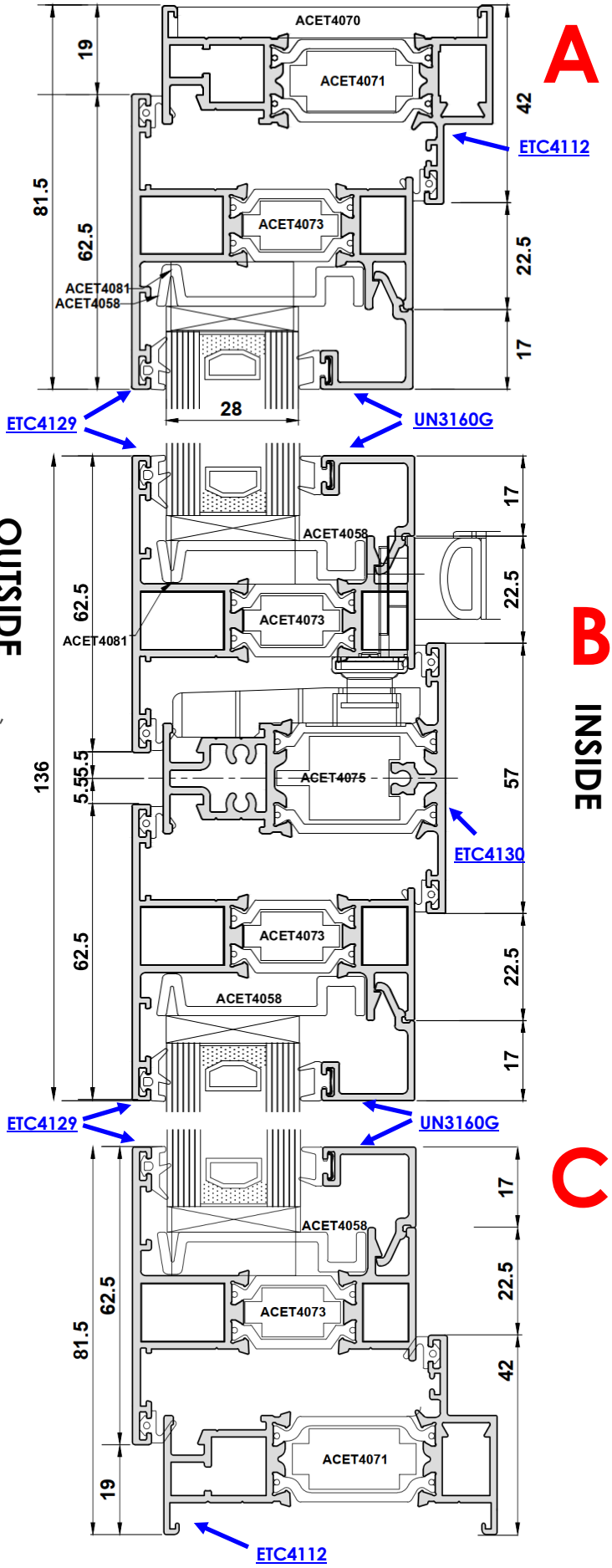
Internally beaded sash over internally beaded dummy sash

Cross section detail of

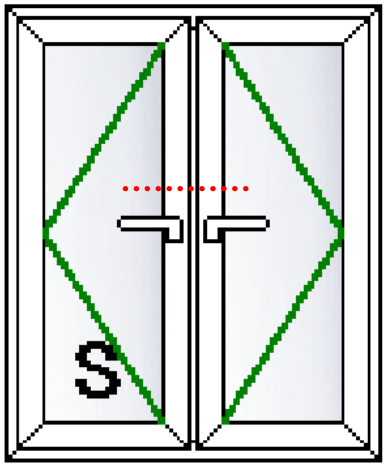
(A) Head - ECT4112 frame, ETC4129 sash, UN3160G Bead

(B) Transom - ETC4130 transom, ETC4129 sash, UN3160G Bead

(C) Cill - ETC4112 frame, ETC4129 sash, UN3160G bead



French escape window



Detail showing sightline across the mullion of a French escape window.

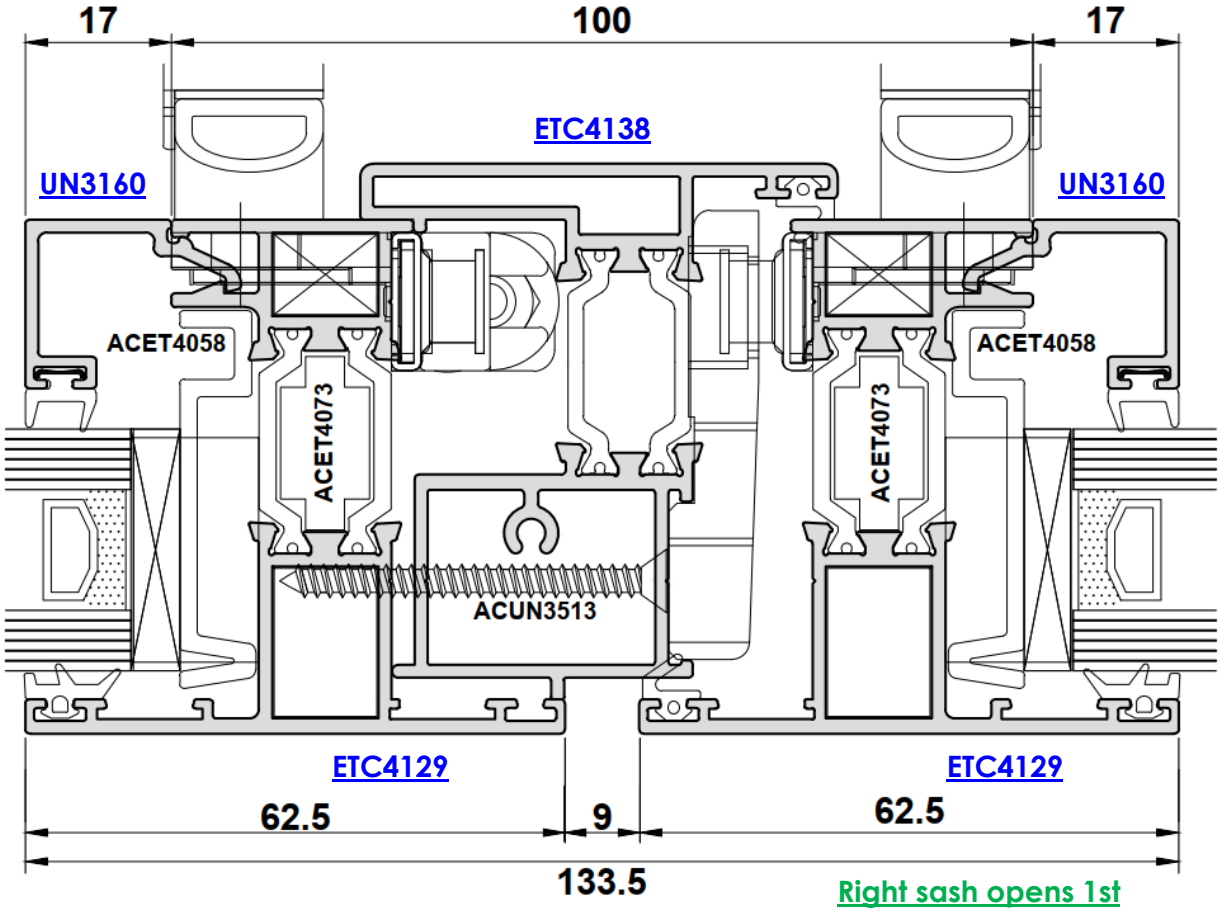
French escape windows are fitted with egress hinge to both sashes as standard.

Reverse Espag to primary sash, shooltbolt locking to 2nd sash.

Handle to both sashes

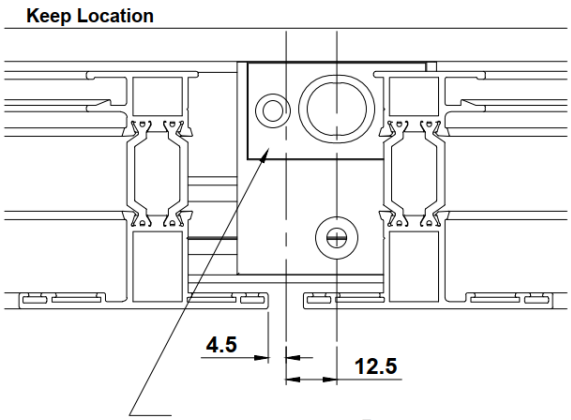
ETC4138 dummy mullion is fitted to secondary opening sash

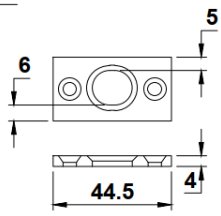
Example shows right hand lead frame.

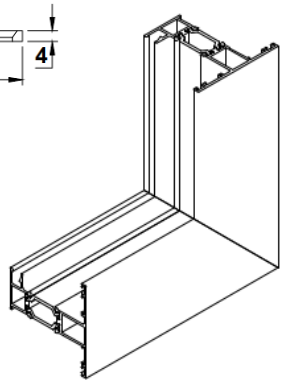


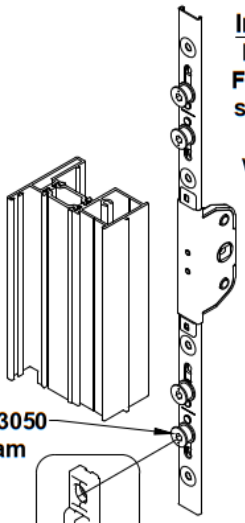
French escape window

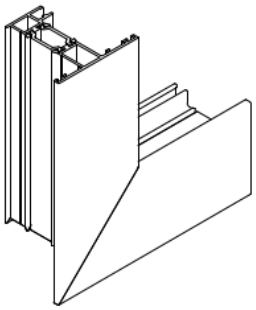
Locking detail for secondary sash

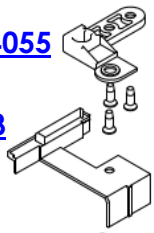


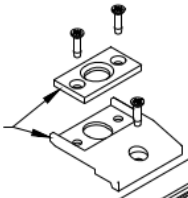


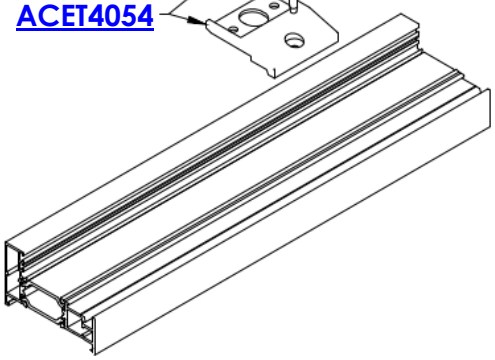




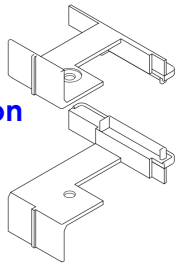




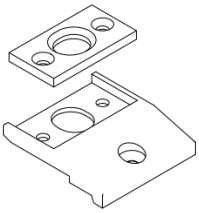




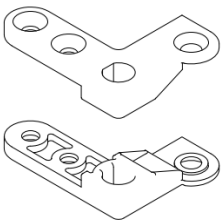
ACET4138
French casement mullion end cap
1 x pair



ACET4054
2 x packers
2 x reversible keeps



ACET4055
French casement shootbolt guide



ACUN3050
French casement shootbolt kit
2 x cam connectors
2 x 180mm SS threaded bar
2 x Stainless steel shootbolt
2 x m8 nuts

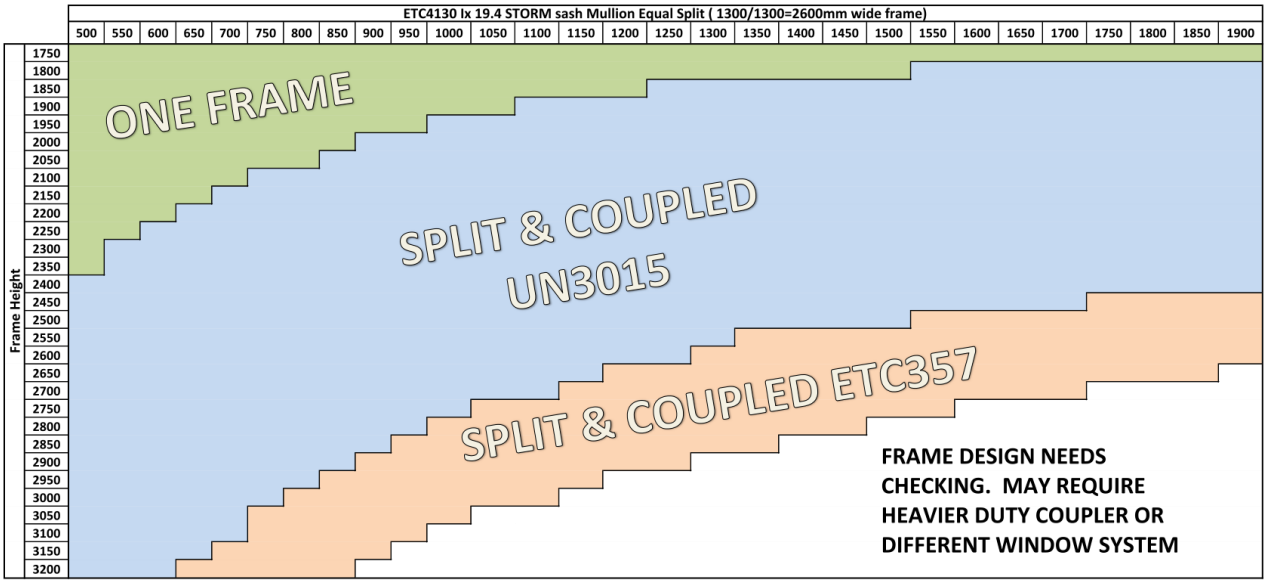
Wind Loading – Based on 800pa & Equal mullion split

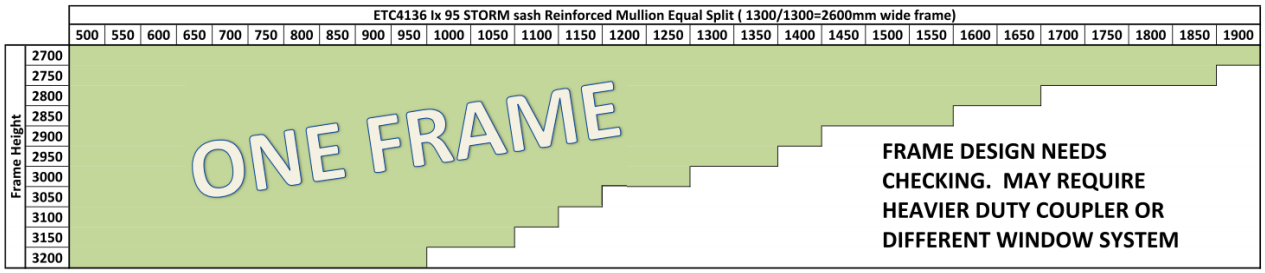
Frames ETC4112/ETC4115 Ix value 21.50, Coupler 15mm UN3015 Ix value 18.1

Coupler and Frame combined Ix value (21.5x2 + 18.1) = **Ix61.18**

Subject to requirements a heavier duty coupler may be required such as the **ETC357** (Ix41.5), coupler and frame combined Ix84.5 or the reinforced mullion **ETC4136 Ix 95.03**.

Ensure profiles meet site/structural requirements, if in doubt seek advise from a structural engineer.



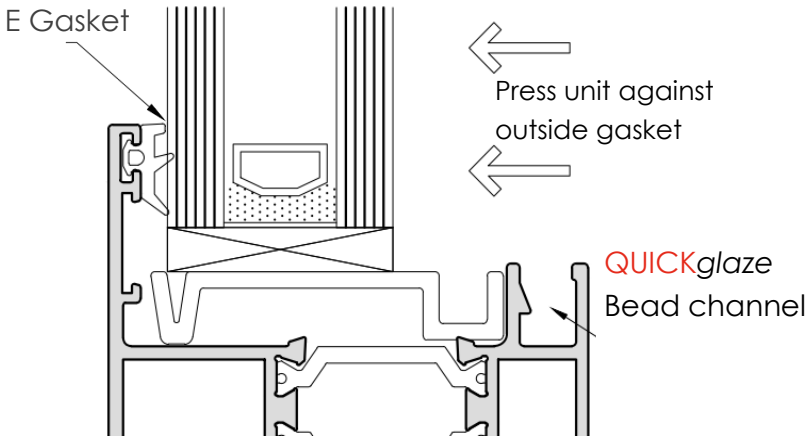


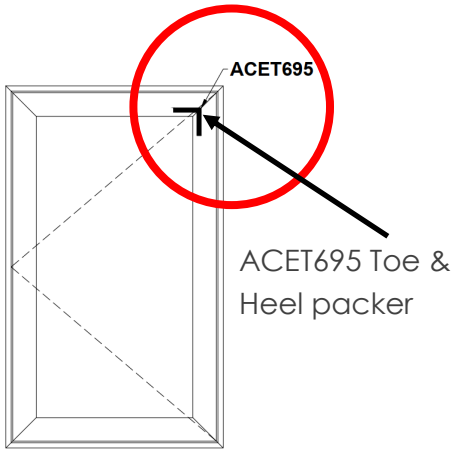
Note both CWCT (Centre for Window & Cladding Technology) & NHBC (National House Building Council) consider all storey height glazing (approx. 4mtrs) to be a curtain wall and therefore should be designed as such. A window or combination of coupled windows shouldn't be used where curtain walling should be. See MC600 Curtain walling - ***Section N***

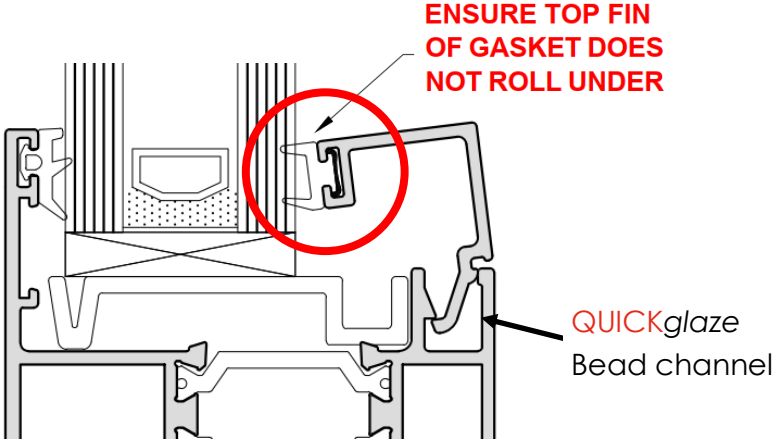
QUICK*glaze* bead installation - UN3160G 28mm & ETC4179G 36mm bead

1. Install the E-Gasket to the frame or sash.
2. Install the glass unit, ensuring it has been pushed forward to engage the compression of the E gasket.
3. Only if ordered Fit ACET695 Toe & Heel kit. (***see Toe & Heeler page for more info***)
4. Beginning with the horizontal beads.
5. Tilt the bead forward so the gasket is against the glass and slide down to locate the bead into the clip channel of sash as shown.
6. Apply firm pressure to the bead to hold it in position.
7. Using a nylon mallet, tap the bead into the channel, working from one end to the other. Take care at the stage to avoid damage to both the glazing unit and the bead.
8. Repeat steps 5-7 to install the vertical beads.
9. Once all the beads are fitted toe & heel the unit by use of the adjustment screw in the ACET695 toe & heel kit.

To aid the stopping of gaskets folding over when glazing use a washing up liquid type substance or a silicon spray around the face of the edge of the glass units.





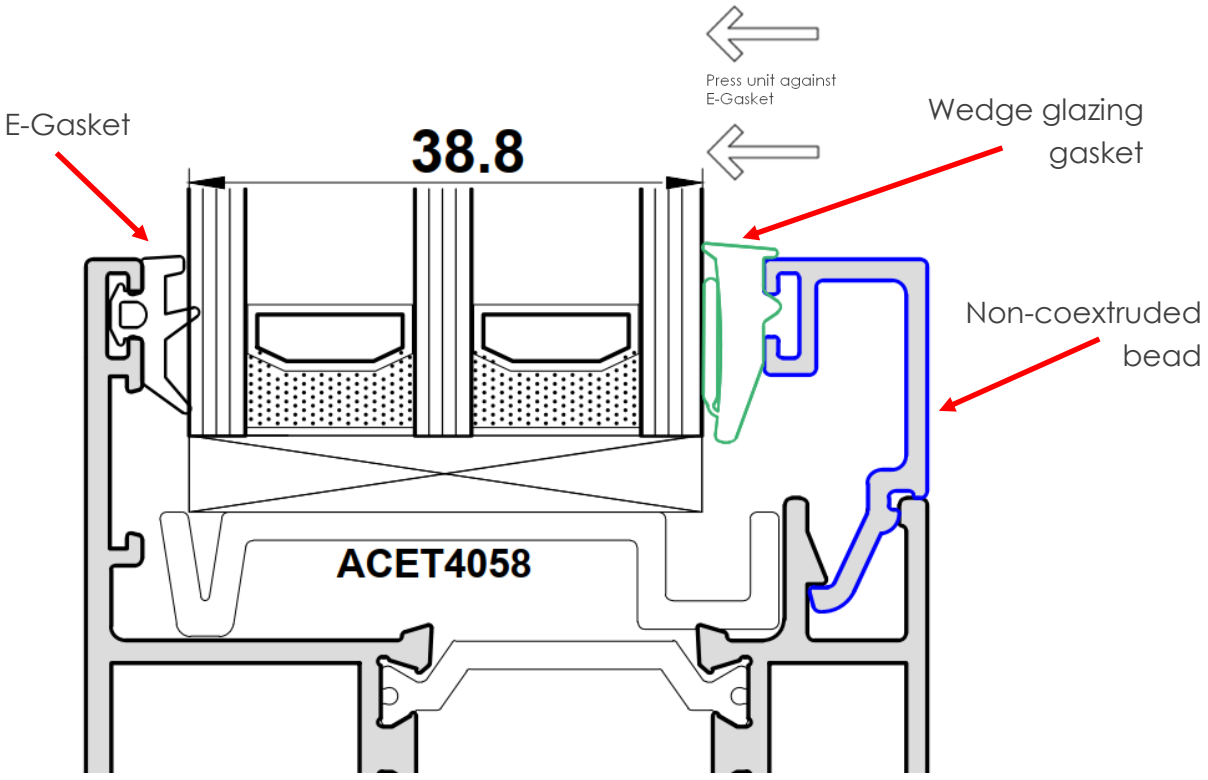


See Video for how to glaze - HERE

Non-coextruded bead installation - UN3160 & ETC4179

Glazing with non coextruded bead UN3160 or ETC4179, this is done in using E-gasket and push in glazing wedge gasket.

1. Install the E-Gasket to the frame or sash.
2. Install the glass unit, ensuring it has been pushed forward to engage the compression of the E gasket.
3. Only if ordered Fit ACET Toe & Heel packer (ensure ACET695 toe & heel kit is fitted)
4. Beginning with the horizontal beads.
5. Locate the bead into the clip channel of sash as shown.
6. Insert wedge gasket into corner push gasket in while also push it back towards your start point this will stop the gasket being stretched and shrinking back over time
7. Repeat steps 5-7 to install the vertical beads.
8. Once all the beads are fitted toe & heel the unit by use of the adjustment screw in the ACET695 toe & heel kit.



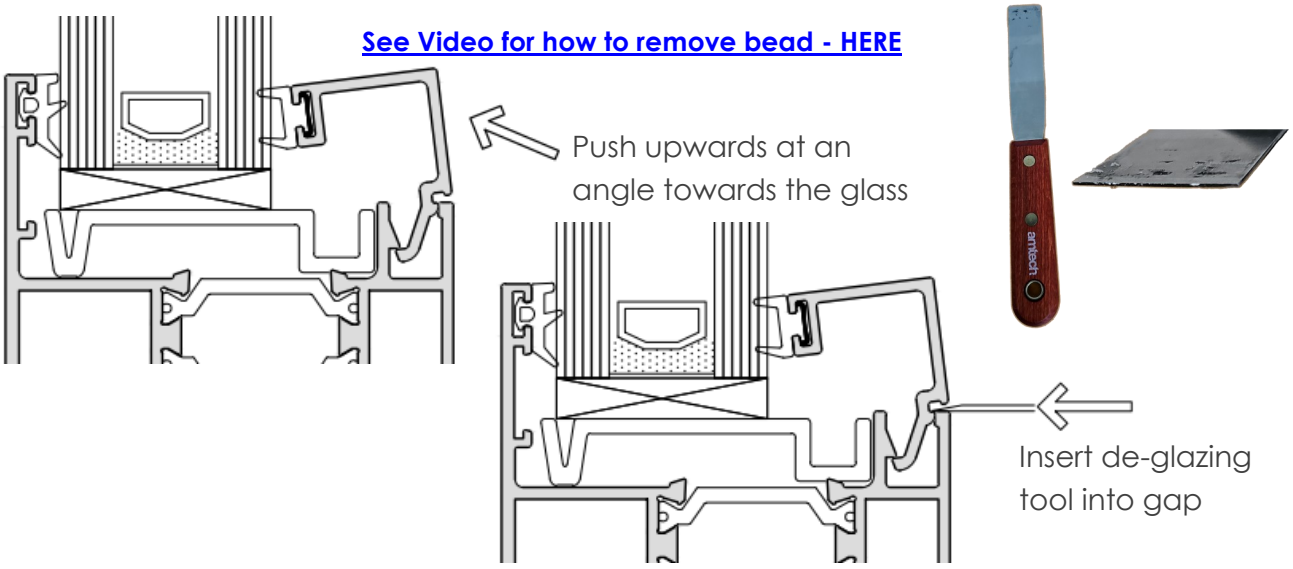
QUICK*glaze* bead removal

Keeping the integrated bead gasket, preferred method.

1. Starting on the vertical beads, apply pressure to bead in the direction show below in order to create a small gap between the sash and frame.
2. Gently insert de-glazing tool into the gap. Take care not to damage the profile.
3. Slowly prise the bead away from the sash.
4. The bead should now be easily removable from the QUICK*glaze* bead channel.

Note: If beads are being re-used make note of the position they are removed from as they need to be put back in the same position

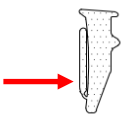
[See Video for how to remove bead - HERE]



Optional method only if needed. This requires the integrated bead gasket removal. Gasket is replaced using a standard push in glazing wedge gasket.

1. Using a de-glazing tool or similar, wedge tip between co-extruded bead gasket and the aluminium bead.
2. In a levering motion prise the gasket away from the aluminium, care should be taken not to damage the glass unit or the aluminium.
3. Complete this at several locations along the length of the bead.
4. Remove the gasket and discard.
5. The bead should now be easily removable from the tap in bead channel.
6. When reglazing you will now have to use a standard wedge gasket suitable for the thickness of your glass unit. (this gasket must be requested)

[See Video for how to remove gasket - HERE]

ACW20038 3-4mm gasket 

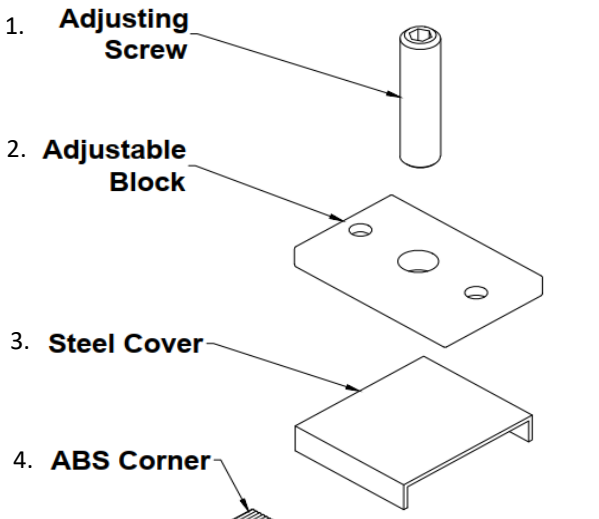
Note: If beads are being re-used make note of the position they are removed from as they need to be put back in the same position.

Toe & Heeler adjustment kit - ACET695 (Optional)

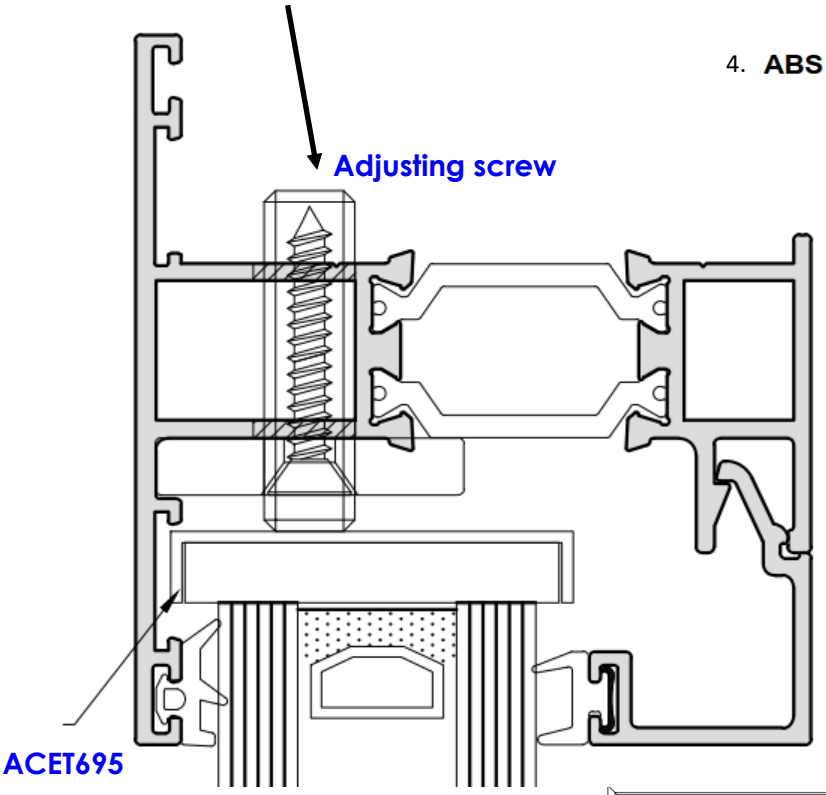
The use of the ACET695 glass adjuster will remove the need to remove the beads in order to adjust the glass position. It comprises of 4 components:

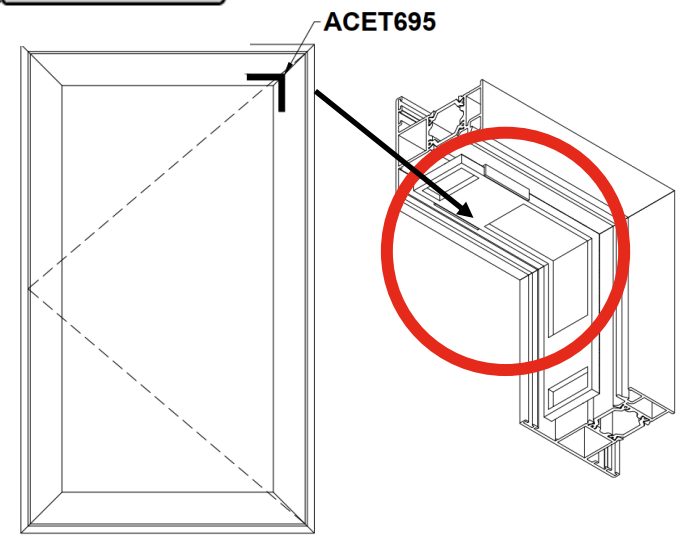
1. Adjusting screw (supplied loose)
2. Adjustable block (fitted)
3. Steel cover (supplied loose)
4. ABS Corner packer (supplied loose)

4mm allen key required to adjust screw



IMPORTANT: Do not over tighten the adjusting screw 1. As it can lead to cracked units.





NOTE :

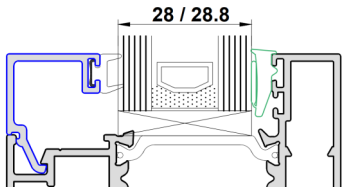
ACET695 is an optional product. This is not supplied as standard and must be requested at time of quotation/order.

Bead & Gasket combinations

28mm / 28.8mm Double glazed units

Externally beaded fixed panes	Internally beaded sash / dummy sash

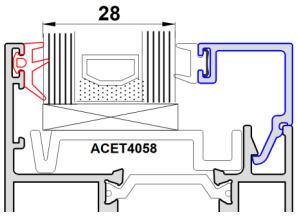
UN3160G bead Coextruded gasket



ACW20038 4mm-3mm Tear off wedge gasket

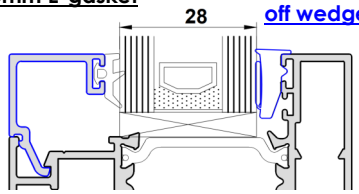
For laminated 28.8mm unit remove tear off strip

ACET841 4mm E-gasket



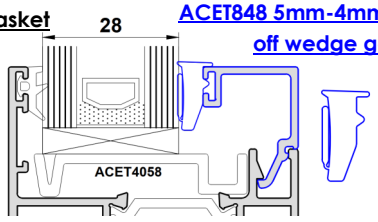
UN3160 Non coextruded gasket - E gasket & push in glazing wedge gasket

ACET842 3mm E-gasket



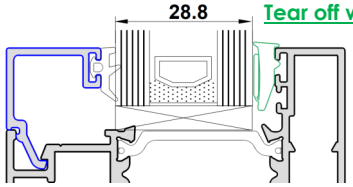
ACET848 5mm-4mm tear off wedge gasket

ACET842 3mm E-gasket



ACET848 5mm-4mm tear off wedge gasket

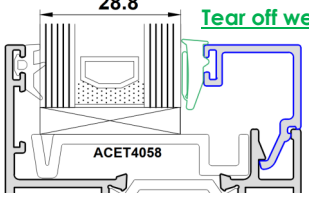
ACET842 3mm E-gasket



ACW20038 4mm-3mm Tear off wedge gasket

For laminated 28.8mm unit

ACET842 3mm E-gasket



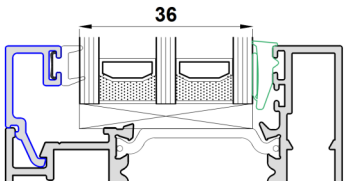
ACW20038 4mm-3mm Tear off wedge gasket

For laminated 28.8mm unit

36mm / 38.8mm Triple glazed units

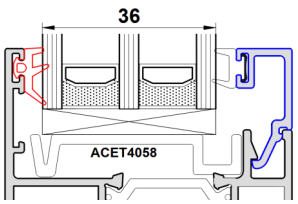
Externally beaded fixed panes	Internally beaded sash / dummy sash

ETC4179G bead Coextruded gasket



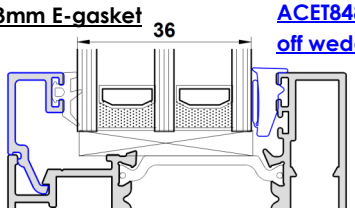
ACW20038 4mm-3mm Tear off wedge gasket

ACET841 4mm E-gasket



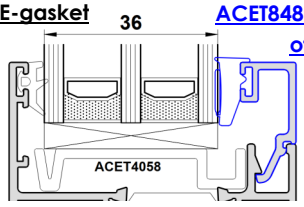
ETC4179 Non coextruded gasket - E gasket & push in glazing wedge gasket

ACET842 3mm E-gasket



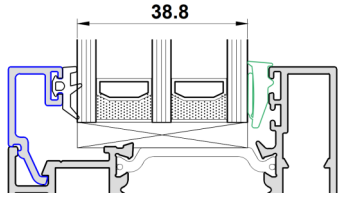
ACET848 5mm-4mm tear off wedge gasket

ACET842 3mm E-gasket



ACET848 5mm-4mm tear off wedge gasket

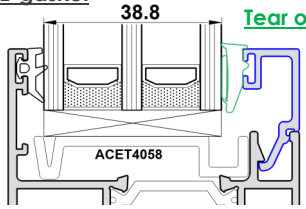
ACET842 3mm E-gasket



ACW20038 4mm-3mm

For laminated 38.8mm unit

ACET842 3mm E-gasket



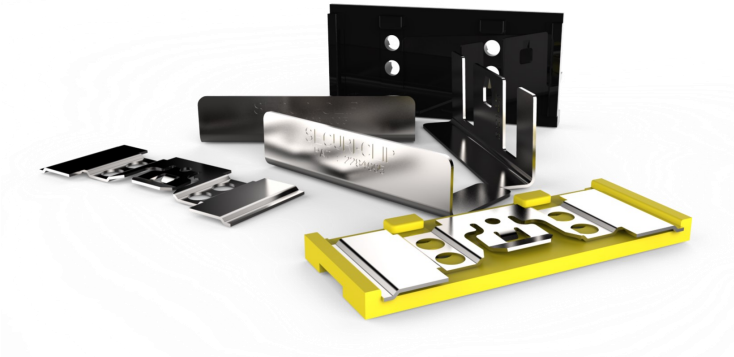
ACW20038 4mm-3mm Tear off wedge gasket

For laminated 38.8mm unit

Glaslok Security glazing clip - externally beaded fixed panes

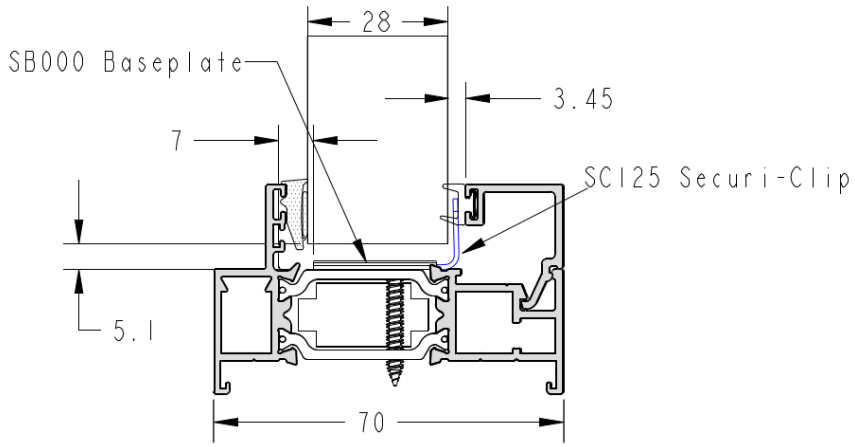
To comply with PAS24/SBD all fixed panes need to be glazed with a glazing security clip.

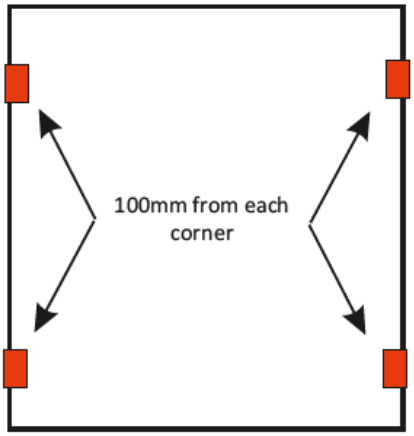
The clip set assembly is comprised of a baseplate, clip to suit the sealed unit thickness and a buffer to prevent contact between glass and clip.



SECURI-CLIP - 28mm & 28.8mm double glazed
Clip SC125

SB000 Base Plate



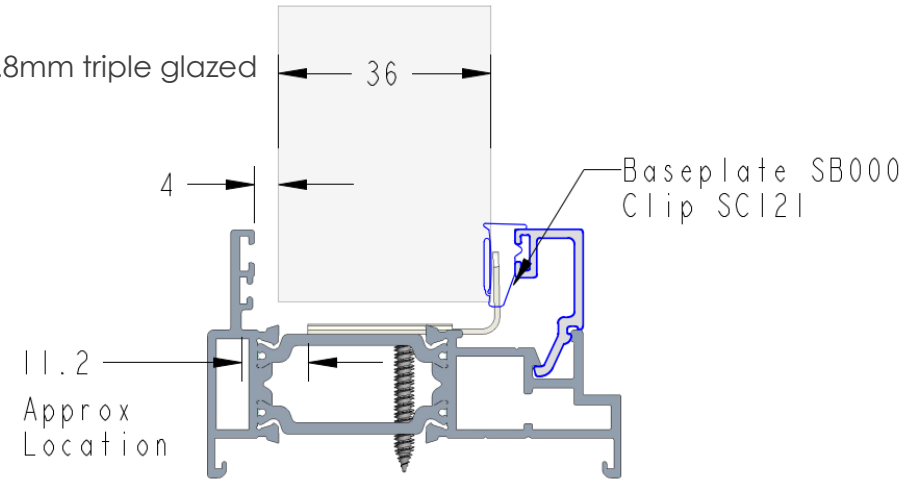


Use same combination for all transoms and mullions with
fixed glazed units.
When fixing into Polyamide use a double helix thread screw

Note: security clips are supplied loose

SECURI-CLIP - 36mm & 38.8mm triple glazed
Clip SC121

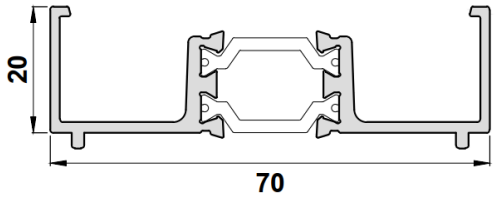
SB000 Base Plate



Ancillaries

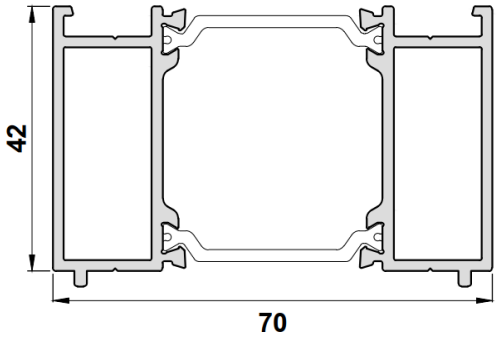
UN3020 - 20mm Frame extension

Ix value 14.8



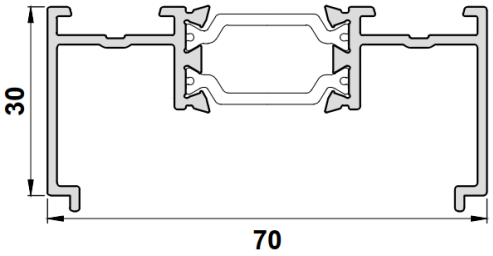
UN3042 - 42mm Frame extension

Ix value 31.2



UN3370 - 30mm Frame extension

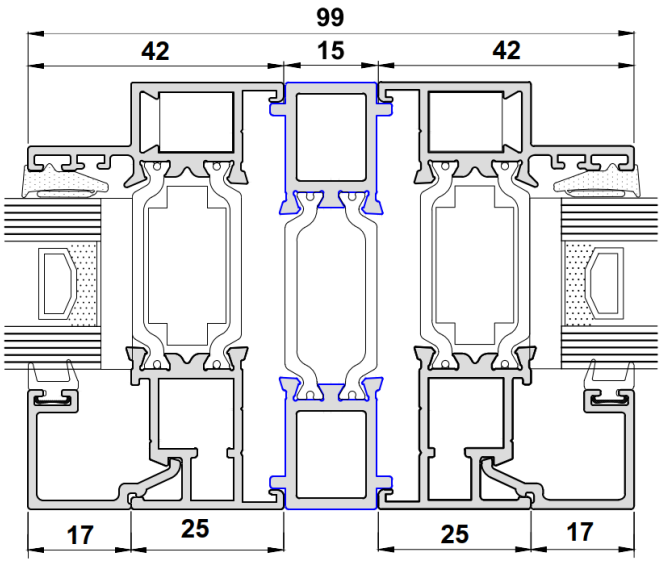
Ix value 18.4



If frames require trickle vents then these will be routed into the UN3042 frame extension not the head of the frame nor the sash.

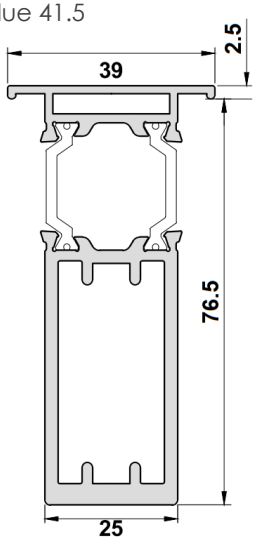
UN3015 15mm vertical coupler

Ix value 18.1



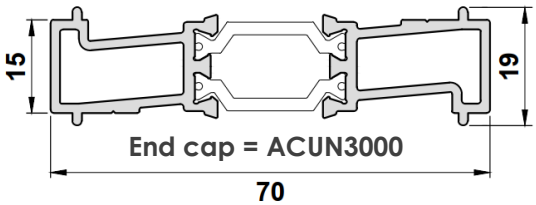
ETC357 - 25mm Coupler

Ix value 41.5



UN3000 - 15mm Flush horizontal coupler

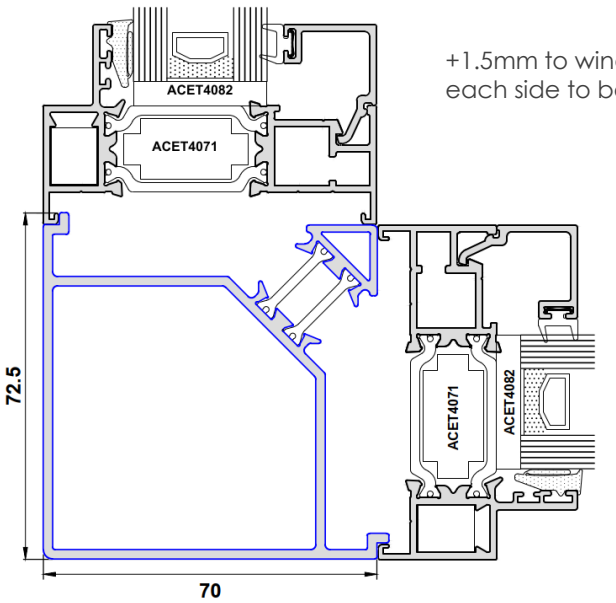
Ix value 15.8 Iy value 0.79



Note: For coupler, corner post and variable bay pole suitable for bay pole jacks see section J page J04

Note: All joints must be adequately sealed

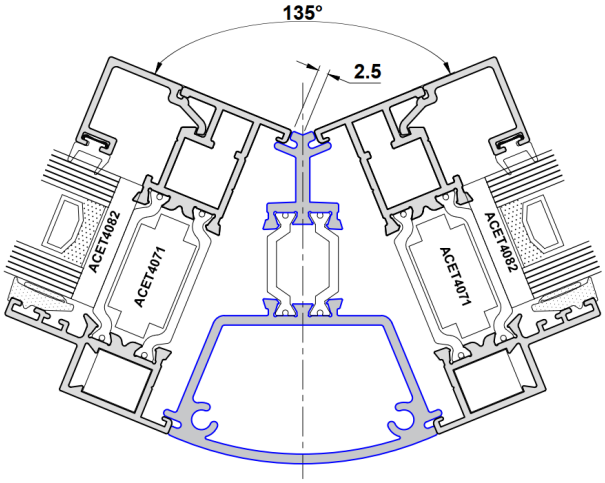
UN3010 90° Corner Post



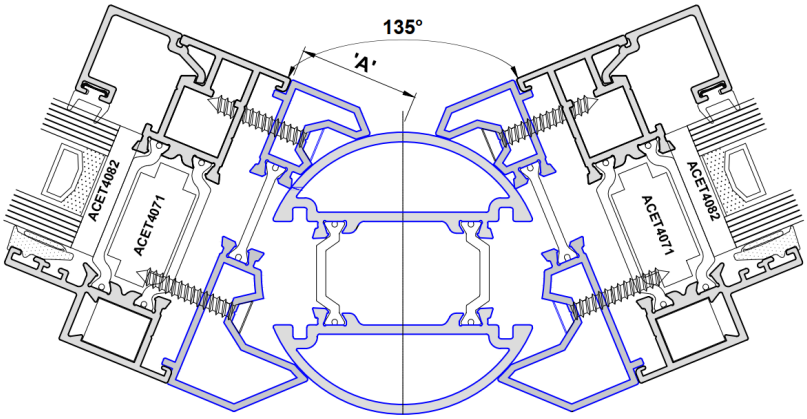
+1.5mm to window width each side to be joined

UN3011 135° fixed bay pole

2.55mm deduction each side

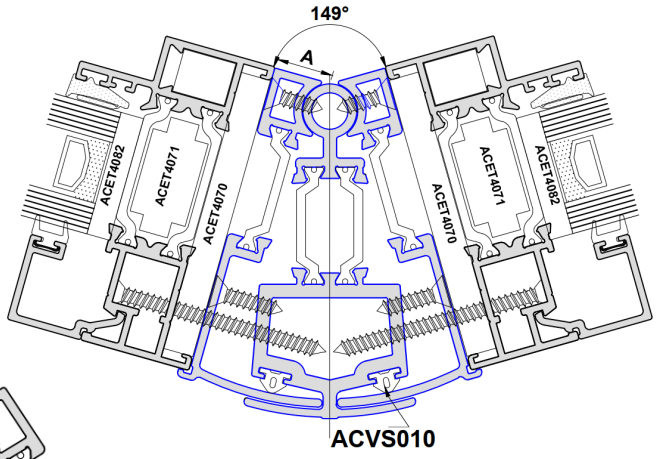


ETC869 variable bay pole with Qty 2 UN3012 adaptors



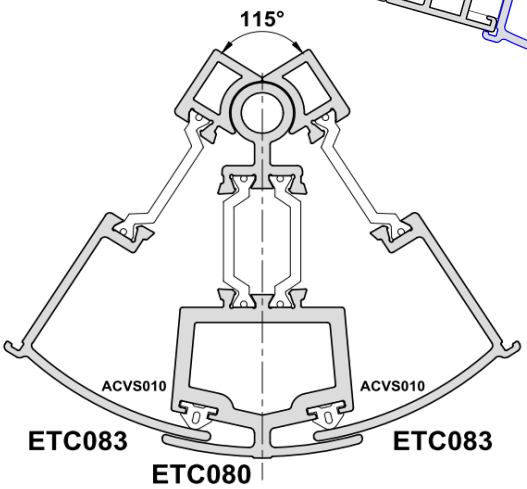
ANGLE	DEDUCTION 'A'
135°	25.5
140°	27
145°	28.5
150°	30
155°	31
160°	32.5
165°	33.5
170°	35
175°	36
180°	37.5

Variable Bay pole 115° - 169°



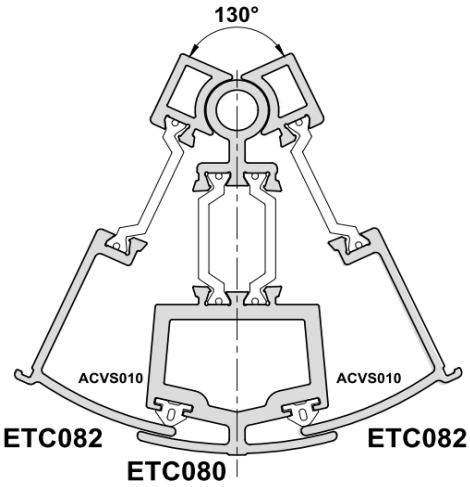
Note:

All joints must be adequately sealed



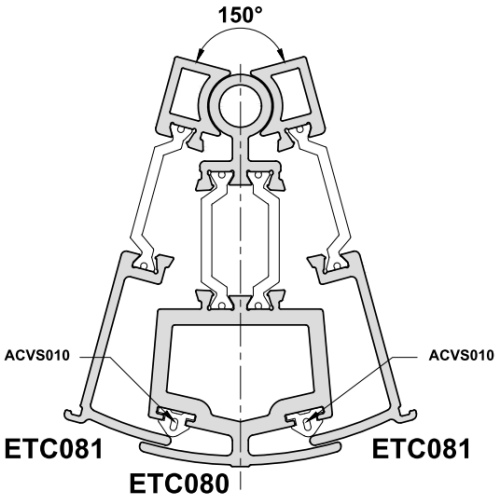
ANGLE	DEDUCTION 'A'
115°	10.5
120°	11
125°	11.5
129°	11.5

Parts
ETC080 Qty 1
ETC083 Qty 2
ACVS010 x 2



ANGLE	DEDUCTION 'A'
130°	11.5
135°	12
140°	12
145°	12.5
149°	12.5

Parts
ETC080 Qty 1
ETC082 Qty 2
ACVS010 x 2



ANGLE	DEDUCTION 'A'
150°	13
155°	13
160°	13.5
165°	13.5
169°	14

Parts
ETC080 Qty 1
ETC081 Qty 2
ACVS010 x 2

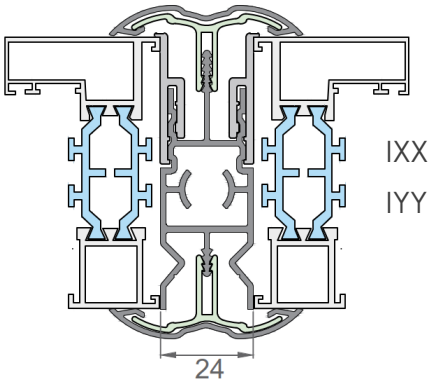
Note: For coupler, corner post and variable bay pole suitable for bay pole jacks see section J page 20

Aluminium Couplers / Bay poles & Corner post (Load bearing options)

The sections following are only suitable for 70mm profile sections

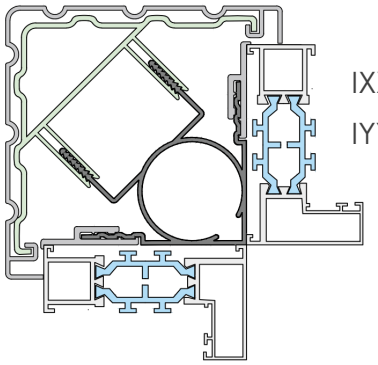
Alitherm 400 windows
Alitherm 400 doors
Bifold Doors
Designer Doors

WWL164: 24mm Inline coupler



IXX (cm⁴) 9.2
IYY (cm⁴) 2.28

WWL163: Corner Post

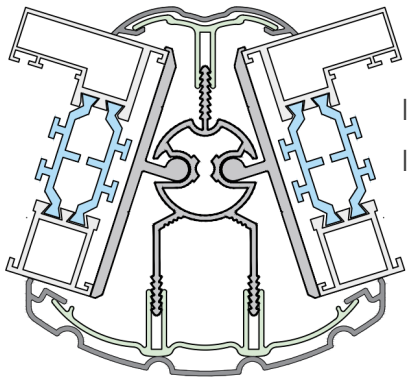


IXX (cm⁴) 16.78
IYY (cm⁴) 12.41

24mm deduction	
1 x WWL164 reinforcing	
2 x DBI pvc covers	2 x WWL162 Ali cover
2 x TB163 thermal break	Jack available Jack 19
Height	Load Bearing
900 - 1500	2 Tonnes
1800	1.8 Tonnes
2100	1.2 Tonnes
2400	1 Tonne

Corner Post	
1 x WWL163 reinforcing	
1 x 90 pvc covers	1 x WWL160 Ali cover
2 x TB163 thermal break	Jack available Jack 3
Height	Load Bearing
900 - 2100	Capped at 2 Tonnes
2400	1.8 Tonnes

482055: Variable Bay Pole (deductions see below)



IXX (cm⁴) 8.2
IYY (cm⁴) 2.9

1 x 482055	
1 x DBI internal pvc cover	1 x DBO external pvc cover
1 x WWL162 internal Ali cover	1 x WWL161 external Ali cover
2 x TB164 thermal break adaptors	Jack available Jack 19
Height	Load Bearing
900 - 1200	2 Tonnes
1500	1.9 Tonnes
1800	1.7 Tonnes
2100	1.4 Tonnes
2400	0.9 Tonnes

Angle	Deduction	Angle (reversed)	Deduction
145	10	206	28
147	11	208	29
149	11	210	30
151	12	212	31
153	12	214	32
155	13	216	33

All jacks are tested to 9 tonnes and are CE approved No. 0086-CPR-614908

Friction Hinges

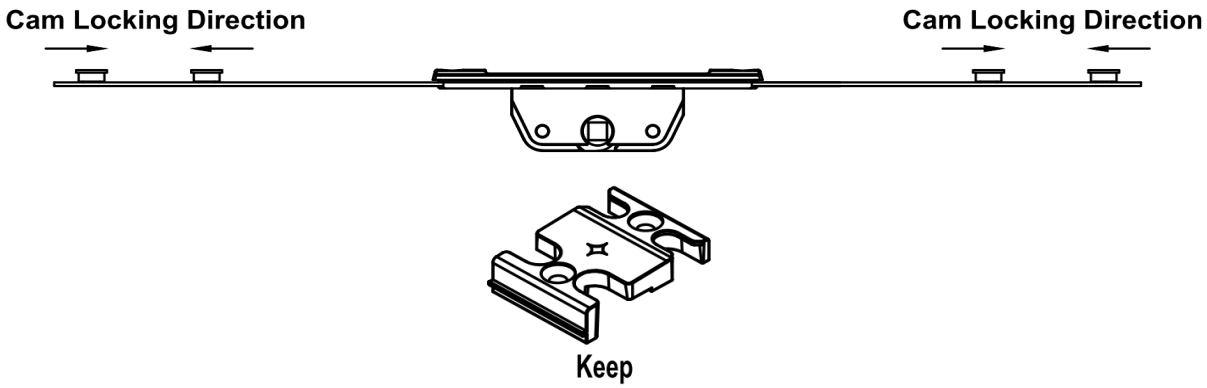
Hinge size inches	Supplier Code	Stock code	Min sash mm	Max sash mm	Weight max kg	Open Angle (+/- 2.5°)	
Top hung							
8	YU8-H	HG2102	235	385	12	60°	
10	YT10-H	HG2103	300	435	16	58°	
12	YU12-H	HG2100	385	585	20	65°	
16	YT16-H	HG2105	535	815	21	52°	
20	YT20-H	HG2106	735	1035	24	42°	
24	YT24-H	HG2107	885	1235	35	38°	
Top Hung Heavy Duty							
24	EDTH24H7	HG2087	885	1535	50	32°	Restricted opening Angle (+/- 2.5°)
Top Hung Restrictor Hinge							
12	EDTR12H7	HG2081	385	585	20	65°	14°
16	EDTR16H7	HG2082	535	815	21	59°	10°
20	EDTR20H7	HG2083	735	1135	26	50°	8°
24	EDTR24H7	HG2084	885	1335	40	37.5°	7°
Side hung hinge							
12	YU12-H	HG2100	345	441	22	65°	
16	YS16-H	HG2101	442	735	24	60°	Restricted opening angle (+/- 2.5°)
Side Hung restrictor hinge							
12	EDSR12H7-PL	HG2085	345	635	22	58°	13°
	EDSR12H7-PR	HG2086	345	635	22	58°	
16	EDSR16H7-PL	HG2288	435	735	24	58°	11°
	EDSR16H7-PR	HG2289	435	735	24	58°	
Side Hung heavy duty							
16	EDSH16H6A		435	1035	40	60°	
Egress							
12	YEC12-H7	HG2114	345	635	22	81	
16	YEC16-H7	HG2115	435	735	24	84	
Mega Egress							
13.5	QEGE17	RS4030	400	900	40	90°	
Top hung hinge for fire escape opening - clear opening 735mm wide x 450mm projection							
Min sash width **793mm**. Min height shown is to achieve 450mm projection			Min height	Max height	Weight max kg	Open Angle (+/- 2.5°)	
16	YT16-H	HG2105	773	853	21	52°	
20	YT20-H	HG2106	854	1040	24	42°	
24	YT24-H	HG2107	1041	1240	35	38°	

Note: As with all types of friction hinges, friction cannot be provided until the slider moves, therefore when opening top hung vents to angles of 10° or less due to the weight of the product the window may close.

Friction Hinges

Casement locks are espagnolette with bi-directional cams, with keeps that have a night vent facility (night vent facility does not replace head vent requirements).

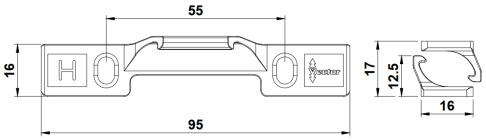
Locking espag					Keep Qty
Supplier code	Stock Code	Lock length	Min sash size	Max sash size	
ACET4001L		335	375	540	2
ACET4001R					
ACET4002L		500	541	790	
ACET4002R					
ACET4003L		750	791	1040	
ACET4003R					
ACET4004L		1000	1041	1290	4
ACET4004R					
ACET4005L		1250	1291	1435	
ACET4005R					
Locks are handed, for replacements ensure you select the correct one					
Left hand, side hung vent & top hung vent with right hand handle = Right hand lock					
Right hand, side hung vent & top hung vent with left hand handle = Left hand lock					



Claw locks (ACET516)

Extra security is available by the use of claw lock (hinge protectors), these are required if the frame needs to meet the requirements of PAS24 and or Secure By Design.

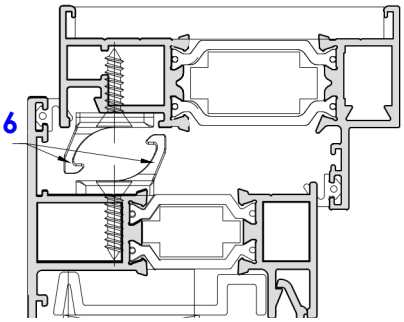
Two pairs per sash fitted to the hinge side of the window. One part to the sash and the other to the outerframe.

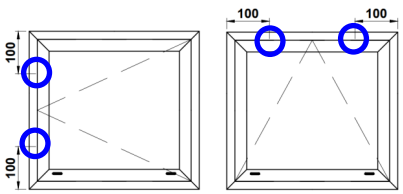


Each pair must be fitted with the hook centre within 100mm of each hinge.

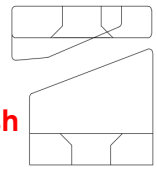
Fixed using No.8x16 S/S self tapping pan head screw.

Note: If window is to meet PAS24 and/or Secure By Design Claw locks must be requested.





Pull in Blocks (ACET652)



Pull in blocks are fitted as standard .

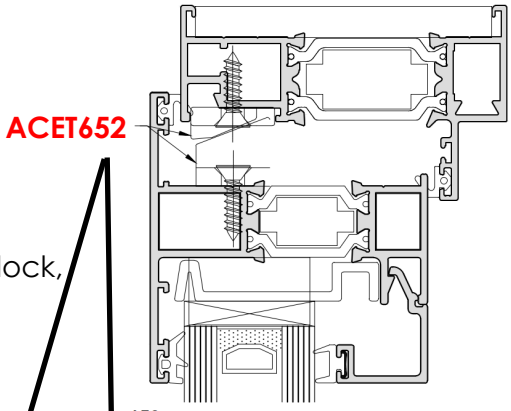
2 pairs per sash to be fitted to the hinged side of window. As shown in images below.

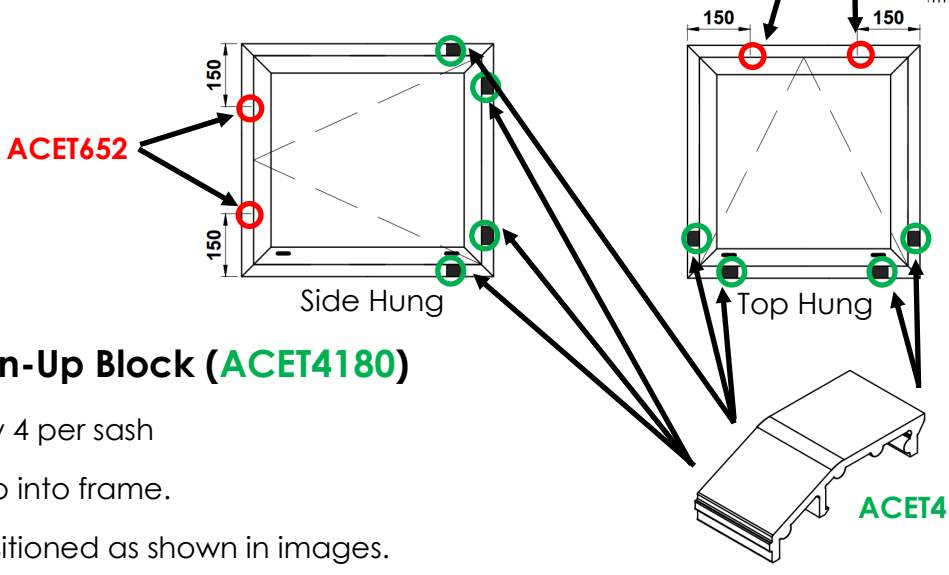
One port to the sash and the other to the outerframe.

Each pair must be fitted within 150mm of each hinge and in the centre of the window when sash height or width is greater than 800mm.

Security takes priority so when used with ACET516 Claw lock, install ACET652 centre within 200mm of hinge.

Fixed using No.8x16 S/S self tapping pan head screw.





Run-Up Block (ACET4180)

Qty 4 per sash

Clip into frame.

Positioned as shown in images.

Egress hinges (Fire escape opening Dwellings)

Egress hinges are required to meet Approved Document B of the building regulations.

Extract from document B - Section 2 General provisions 2.10.

For full information on requirements see ***Fire safety: Approved Document B - GOV.UK (www.gov.uk)***

A. Window should have an unobstructed openable area that complies with all of the following.

i. A minimum area of 0.33m^2

ii. A minimum height of 450mm and minimum width of 450mm (the route through the window may be at an angle rather than straight through). (450x734 / 734x450) = 0.33m^2

iii. The bottom of the openable area is a maximum of 1100mm above the floor.

B. People escaping should be able to reach a place free from danger from fire. Courtyards or inaccessible back gardens should comply with diagram 2.5.

C. Locks (with or without removable keys) and opening stays (child-resistant release catches) may be fitted to escape windows.

D. Windows should be capable of remaining open without being held.

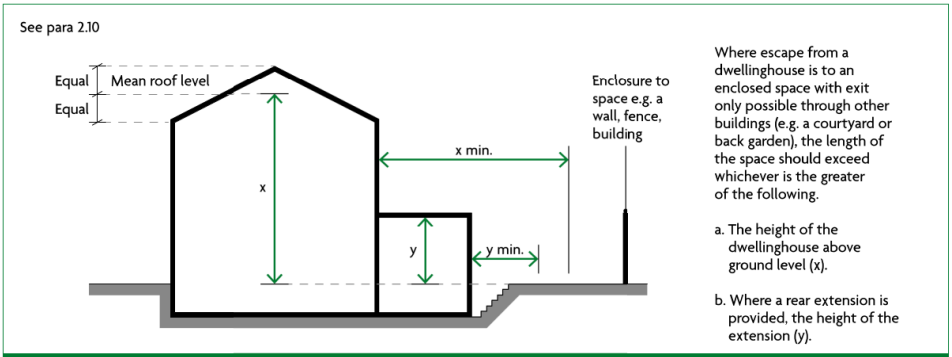
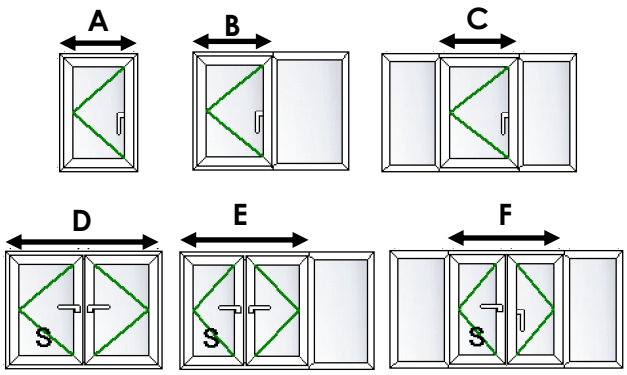


Diagram 2.5 Ground or basement storey exit into an enclosed space

The following give the minimum frame sizes to achieve the 0.33m2 clear opening using standard egress & mega egress hinges.

Height	**818mm**	
Width	Egress	Mega Egress
A	613	570
B	602	559
C	591	548
French Escape windows		
D	820	605
E	807	594
F	798	583



Note: under these sizes the clear opening will not comply with building regulations for doc B.

U Value & Energy ratings

To comply with Document L

Suitable for only

New dwellings (based on Uvalue)

Existing Dwellings (based on WER)

Existing Commercial*

New commercial*

***only to windows in buildings similar to dwellings (based on Uvalue or WER)**

Double Glazed Units

- 28mm double glazed units
- 4mm Planilux clear /4mm Planitherm +
- 90% argon gas filled cavity
- 20mm black super spacer bar
- 20kg per m²

Outer Frame ETC4112F

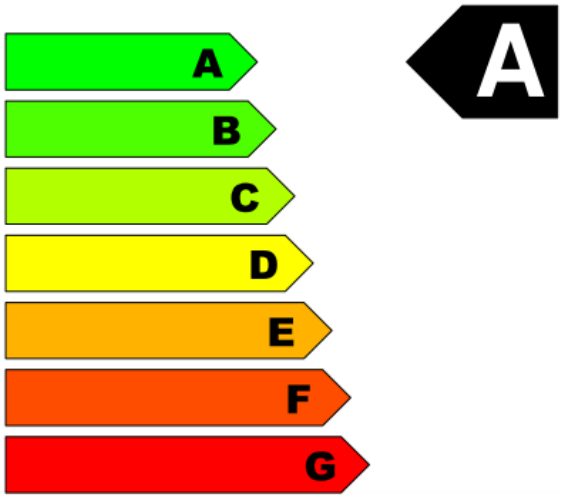
with Sash ETC4129F and Mullion ETC4130F

Average WER 'A' (U Value 1.5W/m²K)

Unit centre pane U-value of 1.2 W/m²K , G-Value 0.71

WER: Window Energy Performance Certificate

WER Window Energy Rating - In accordance with Approved Document L



Company

Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date

12 Feb 2024

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**0.1 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.906+0.127	**1.537 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 4/20/4 28mm 4mm/20/4mm Planitherm Total Plus 1.20 W/m²K, 0.71 CP 1.20 W/m²K x (75.5% Glass)	**0.906 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.031 W/mK x (4.092m/m²)	**0.127 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.5 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0430)

U Value & Energy ratings

To comply with Document L

Suitable for only

New & Existing dwellings

New & Existing Commercial*

***only to windows in buildings similar to dwellings**

(all based on U value)

Double Glazed Units

- 28mm double glazed units
- 4mm Planilux clear /4mm Planitherm One
- 90% argon gas filled cavity
- 20mm black super spacer bar
- 20kg per m^2

Outer Frame ETC4112F

with Sash ETC4129F and Mullion ETC4130F

Average U-Value 1.4 W/M²k

Unit centre pane U-value of 1.1 W/m²K , G-Value 0.49

U Value: Certificate

Window U Value - In accordance with Approved Document L

Company

Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date

12 Feb 2024

U Value

1.4 W/m²K

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**-27.4 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.830+0.127	**1.462 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 4/20/4 28mm 4mm/20/4mm Planitherm One 1.10 W/m²K, 0.49 CP 1.10 W/m²K x (75.5% Glass)	**0.830 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.031 W/mK x (4.092m/m²)	**0.127 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.4 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0430)

U Value & Energy ratings

To comply with Document L

Suitable for only

New dwellings (based on Uvalue)

Existing Dwellings (based on WER)

New & Existing Commercial*

***only to windows in buildings similar to dwellings (based on Uvalue or WER)**

Laminated Double Glazed Units

- 28.8mm double glazed units
- 6.8mm Std Laminated / 4mm Planitherm +
- 90% argon gas filled cavity
- 18mm black super spacer bar
- 27kg per m²

Outer Frame ETC4112F

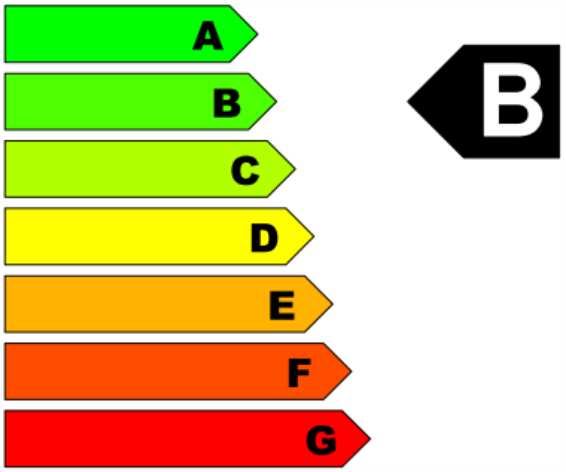
with Sash ETC4129F and Mullion ETC4130F

Average WER 'B' (U Value 1.5W/m²K)

Unit centre pane U-value of 1.2 W/m²K , G-Value 0.70

WER: Window Energy Performance Certificate

WER Window Energy Rating - In accordance with Approved Document L



Company

Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date

12 Feb 2024

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**-2.2 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.906+0.139	**1.549 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 6.8/18/4 28.8mm 6.8mm Std Lam/18/4mm Planitherm Total Plus 1.20 W/m²K, 0.70 CP 1.20 W/m²K x (75.5% Glass)	**0.906 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.034 W/mK x (4.092m/m²)	**0.139 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.5 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0430)

U Value & Energy ratings

To comply with Document L

Suitable for only

New & Existing dwellings

New & Existing Commercial*

***only to windows in buildings similar to dwellings**

(all based on U value)

Laminated Double Glazed Units

- 28.8mm double glazed units
- 6.8mm Std Laminated /4mm Planitherm One
- 90% argon gas filled cavity
- 18mm black super spacer bar
- 27kg per m²

Outer Frame ETC4112F

with Sash ETC4129F and Mullion ETC4130F

Average U-Value 1.3 W/M²k

Unit centre pane U-value of 1.0 W/m²K, G-Value 0.46

U Value: Certificate

Window U Value - In accordance with Approved Document L

Company

Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date

12 Feb 2024

U Value

1.3 W/m²K

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**-27.5 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.755+0.139	**1.398 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 6.8/18/4 28.8mm 6.8mm Std Lam/18/4mm Planitherm One 1.00 W/m²K, 0.46 CP 1.00 W/m²K x (75.5% Glass)	**0.755 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.034 W/mK x (4.092m/m²)	**0.139 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.3 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0430)

U Value & Energy ratings

To comply with Document L

Suitable for only

New & Existing dwellings

New & Existing Commercial*

***only to windows in buildings similar to dwellings**

(based on Uvalue or WER)

BFRC License 6167

Triple Glazed Units

- 36mm triple glazed units
- 4mm Planilux clear /4mm Planitherm +/ Planitherm +
- 90% argon gas filled cavity
- Qty 2 x 12mm black super spacer bar
- 30kg per m²

Outer Frame ETC4112F

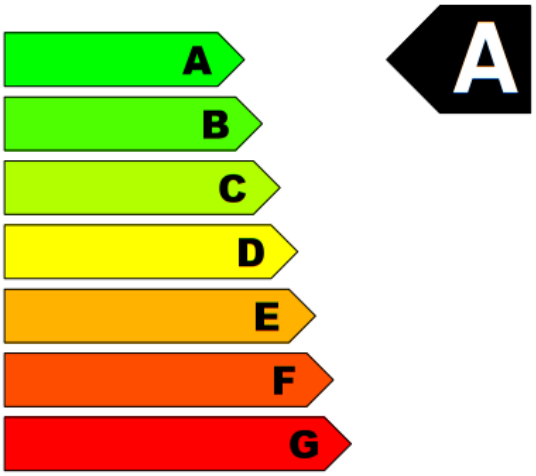
with Sash ETC4129F and Mullion ETC4130F

Average WER 'A' (U Value 1.2W/m²K)

Unit centre pane U-value of 0.8 W/m²K , G-Value 0.61

WER: Window Energy Performance Certificate

WER Window Energy Rating - In accordance with Approved Document L



Company

Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date

12 Feb 2024

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**7.4 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.604+0.106	**1.215 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 4/12/4/12/4 36mm Planitherm Total Plus x 2 0.80 W/m²K, 0.61 CP 0.80 W/m²K x (75.5% Glass)	**0.604 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.026 W/mK x (4.092m/m²)	**0.106 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.2 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0430)

U Value & Energy ratings

To comply with Document L

Suitable for only

New & Existing dwellings

New & Existing Commercial*

***only to windows in buildings similar to dwellings**

(based on Uvalue or WER)

BFRC License 6167

Triple Glazed Units

- 36mm triple glazed units
- 4mm Planilux clear /4mm Planitherm One / Planitherm One
- 90% argon gas filled cavity
- Qty 2 x 12mm black super spacer bar
- 30kg per m²

Outer Frame ETC4112F

with Sash ETC4129F and Mullion ETC4130F

Average U Value 1.1W/m²K)

Unit centre pane U-value of 0.7 W/m²K , G-Value 0.37

U Value: Certificate

Window U Value - In accordance with Approved Document L

Company

Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date

12 Feb 2024

U Value

1.1 W/m²K

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**-23.1 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.528+0.106	**1.139 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 4/12/4/12/4 36mm Planitherm One X 2 0.70 W/m²K, 0.37 CP 0.70 W/m²K x (75.5% Glass)	**0.528 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.026 W/mK x (4.092m/m²)	**0.106 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.1 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0430)

U Value & Energy ratings

To comply with Document L

Suitable for only

New & Existing dwellings

New & Existing Commercial*

***only to windows in buildings similar to dwellings**

(based on Uvalue or WER)

BFRC License 6167

Laminated Triple Glazed Units

- 38.8mm triple glazed units
- 6.8mm Laminated /4mm Planitherm +/ Planitherm +
- 90% argon gas filled cavity
- Qty 2 x 12mm black super spacer bar
- 37kg per m²

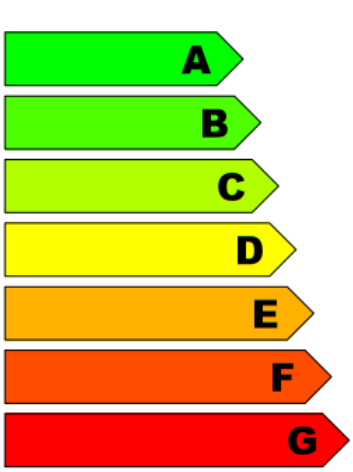
Outer Frame ETC4112F

with Sash ETC4129F and Mullion ETC4130F

Average WER 'A' (U Value 1.2W/m²K)

Unit centre pane U-value of 0.8 W/m²K , G-Value 0.57

WER: Window Energy Performance Certificate
WER Window Energy Rating - In accordance with Approved Document L



Company
Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date
12 Feb 2024

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**0.6 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.604+0.119	**1.227 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 6.8/12/4/12/4 38.8mm 6.8mm Laminated - 4mm Plan - 4mm Plan 0.80 W/m²K, 0.57 CP 0.80 W/m²K x (75.5% Glass)	**0.604 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.029 W/mK x (4.092m/m²)	**0.119 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.2 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0430)

U Value & Energy ratings

To comply with Document L

Suitable for only

New & Existing dwellings

New & Existing Commercial*

***only to windows in buildings similar to dwellings**

(based on Uvalue or WER)

Laminated Triple Glazed Units

- 38.8mm triple glazed units
- 6.8mm Laminated /4mm Planitherm One/ Planitherm One
- 90% argon gas filled cavity
- Qty 2 x 12mm black super spacer bar
- 37kg per m²

Outer Frame ETC4112F

with Sash ETC4129F and Mullion ETC4130F

Average U Value 1.1W/m²K)

Unit centre pane U-value of 0.7 W/m²K , G-Value 0.35

U Value: Certificate

Window U Value - In accordance with Approved Document L

Company

Starglaze Windows & Conservatories also T/A Sternfenster Window Systems

Project

Date

12 Feb 2024

U Value

1.1 W/m²K

WER:	Window Energy Rating: 196.74((1-f)xgglass) - 68.5 x (U + (0.0165 xAL))		**-26.9 kWHr/m²/Year**
Thermal Transmittance:	WER U Value of Window calculated using the methods and conventions set out in BR443 Whole Window U Value with frame, glazing and glass spacer bar combined. Standard Window configuration set out in BR443/GGF 2.3 U Window:	0.504+0.528+0.119	**1.151 W/m²K**
Frame:	Supplier: System: Outer Frame: Vent Frame: Transom Mullion: Heat Transfer:	Smart Architectual Aluminium Alitherm 400 ETC4112F (1.610) ETC4129F (2.264) ETC4130F (2.112) Uf 2.058 W/m²K x (24.5% Frame)	**0.504 W/m²K**
Glazing:	Supplier: Specification: Centre Pane, g Value: Heat Transfer:	SG 6.8/12/4/12/4 6.8mm Lam - 4mm Plan One - 4mm Plan One 0.70 W/m²K, 0.35 CP 0.70 W/m²K x (75.5% Glass)	**0.528 W/m²K**
Spacer:	Supplier: Spacer Bar: Heat Transfer:	Thermoseal Thermobar Psi 0.029 W/mK x (4.092m/m²)	**0.119 W/m²K**
U Value:	Window U Value: Calculation to Document L 2021 1.23m(±25%)x1.48m(-25%)		**1.1 W/m²K**

Calculated in accordance with UK Building Regulations Document L and BR443
BS EN ISO 10077-2. Thermal performance of windows, doors and shutters.
Calculation of thermal transmittance. Part 2. Numerical method for frames Version:20240202 (Build 0435)