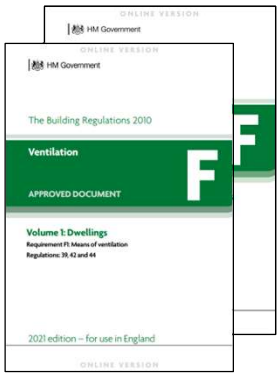
Smart Architectural Aluminium

Building Regulation Updates

Anthony Murray MEng
Technical Manager

1

Building Regulations
2022 Update



https://www.gov.uk/housing-local-and-community/building-regulation

https://www.smartsystems.co.uk/understanding-document-l

2

Building Regulations
Implimentation

15th June 2022 Implementation

Transition Period

Where building work was started before **15th June 2022**, the work may continue as if the amendments in the Amendment Regulations had not been made.

Where a **building notice**, an **initial notice**, a **plans certificate** an **amendment notice** or a public body's notice has been given, or **full plans submitted**, before 15th June 2022, the work may be carried out as if the amendments in the Amendment Regulations had not been made provided that the work begins before **15th June 2023**.

3

Building Regulations
Implimentation

Circular 01/2021

Commencement of work

In the Department's opinion the commencement of work would usually be marked by work such as:

- excavation for strip or trench foundations or for pad footings;
- digging out and preparation of ground for raft foundations;
- vibrofloatation (stone columns) piling, boring for piles or pile driving;
- drainage work specific to the building(s) concerned.

We consider that the following sorts of work would not be likely to constitute the commencement of work:

- removal of vegetation
- demolition of any previous buildings on the site;
- removal of top soil;
- removal or treatment of contaminated soil;
- excavation of trial holes;
- dynamic compaction;
- general site servicing works (e.g. roadways)

https://www.gov.uk/government/publications/building-amendment-regulations-2021-circular-012021

4

Approved Document F
Ventilation

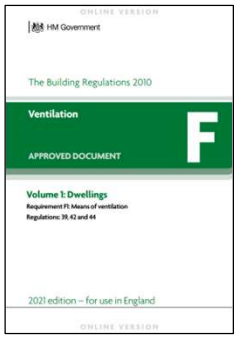
Approved Document F

- Volume 1
  Dwellings

Volume 2
Commercial

5

Approved Document F
Ventilation



Ventilation Trickle Vents

2010

Replacement Windows should be fitted with trickle vents only if the windows being replaced had them.

2022

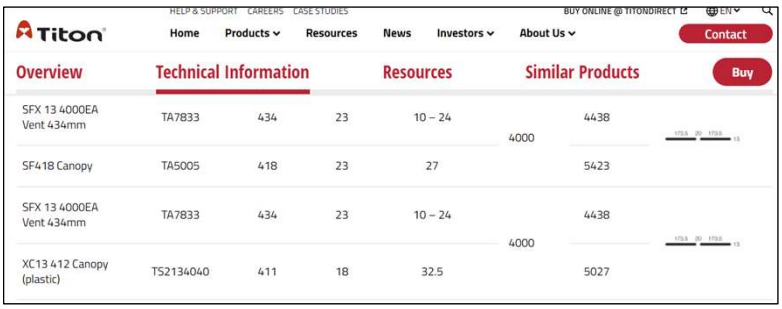
If no background ventilation alternative is being installed then **all replacement** windows should be fitted with trickle vents regardless of whether the windows being replaced had vents in them or not.*

6

Approved Document F
Trickle Vents

Equivalent Areas EA (mm²)

	2010	2022
Habitable Room	5,000	8,000
Kitchens	2,500	8,000
Bathrooms	2,500	4,000



7

Approved Document F
Trickle Vents

Existing windows without background ventilators

3.15 Replacing the windows is likely to increase the airtightness of the dwelling. If ventilation is not provided via a mechanical ventilation with heat recovery system, then increasing the airtightness of the building may reduce beneficial ventilation in the building. In these circumstances, it is necessary to ensure that the ventilation provision in the dwelling is no worse than it was before the work was carried out. This may be demonstrated in any of the following ways.

a. Incorporating background ventilators in the replacement windows equivalent to the following.
   i. Habitable rooms – minimum 8000mm² equivalent area.
   ii. Kitchen – minimum 8000mm² equivalent area.
   iii. Bathroom (with or without a toilet) – minimum 4000mm² equivalent area.

b. If the dwelling will have continuous mechanical extract ventilation, installing background ventilators in any replacement windows which are not in wet rooms, with a minimum equivalent area of 4000mm² in each habitable room.

c. Other ventilation provisions, if it can be demonstrated to a building control body that they comply with the requirements of paragraph 3.2.

NOTE: If it is not technically feasible to adopt the minimum equivalent areas set out in paragraph 3.15, the background ventilators should have equivalent areas as close to the minimum value as is feasible.

8

Approved Document F
Trickle Vents

Existing windows without background ventilators

3.15 Replacing the windows is likely to increase the airtightness of the dwelling. If ventilation is not

3.2 When other building work is carried out that will affect the ventilation of the existing dwelling, for example:

a. replacing a window or door

b. doing energy efficiency work

a. the ventilation of the dwelling should either:

a. meet the standards in the relevant approved document

b. not be less satisfactory than before the work was carried out.

iii. Bathroom (with or without a toilet) – minimum 4000mm² equivalent area.

b. If the dwelling will have continuous mechanical extract ventilation, installing background ventilators in any replacement windows which are not in wet rooms, with a minimum equivalent area of 4000mm² in each habitable room.

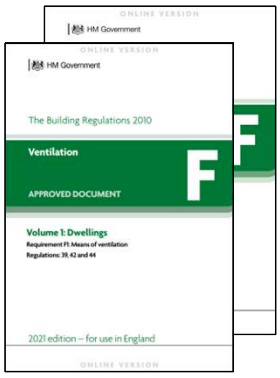
c. Other ventilation provisions, if it can be demonstrated to a building control body that they comply with the requirements of paragraph 3.2.

NOTE: If it is not technically feasible to adopt the minimum equivalent areas set out in paragraph 3.15, the background ventilators should have equivalent areas as close to the minimum value as is feasible.


Approved Document F
VENTILATION
Existing windows with background ventilators
Existing windows without background ventilators
This update to the building regulations is paving the way for the Future Homes and Buildings Standard in 2025, which will aim for all future homes to be net zero ready.

9

Approved Document F
Trickle Vents



Approved Document F

Volume 1
Dwellings

- Volume 2
  Commercial

10

Approved Document F
Trickle Vents

Existing windows without background ventilators

3.6 Replacing the windows is likely to increase the airtightness of the building. If ventilation is not provided via a mechanical ventilation system, then increasing the airtightness of the building may reduce beneficial ventilation in the building. In these circumstances, it is necessary to ensure that the ventilation provision in the building is no worse than it was before the work was carried out. This may be demonstrated in any of the following ways.

a. Incorporating background ventilators in the replacement windows equivalent to the following.

i. Occupiable rooms.

- For floor areas up to 10m² – minimum 2500mm² equivalent area.
- For floor areas greater than 10m² – minimum 250mm² equivalent area per m² of floor area.

ii. Domestic-type kitchen – minimum 8000mm² equivalent area.

iii. Bathroom (with or without a toilet) and shower rooms – minimum 4000mm² equivalent area per bath or shower.

iv. Sanitary accommodation (and/or washing facilities) – minimum 2000mm² equivalent area per WC.

b. Other ventilation provisions, if it can be demonstrated to a building control body that they comply with the requirements of paragraph 3.2.

NOTE: If it is not technically feasible to adopt the minimum equivalent areas set out in paragraph 3.6, the background ventilators should have equivalent areas as close to the minimum value as is feasible.

11

Approved Document F
Trickle Vents

Equivalent Areas EA (mm²)

	2010	2022	
Floor Area <10m²	2,500	2,500	
Floor Area >10m²	250	250	per m²
Kitchen	2,500	**8,000**	
Bathroom	2,500	2,500	per bath/shower
W/C	2,500	2,500	Per W/C

12

Approved Document F
Trickle Vents

Approved Document F

Trickle Vents required for **all** replacement windows

New build need to consult building designer

13

Approved Document F
Trickle Vents

2006

3.4 To comply with Requirement F1, unless the room is ventilated adequately by other installed ventilation provisions, all replacement windows should include trickle ventilators, preferably with accessible controls as described in Table 1.5.

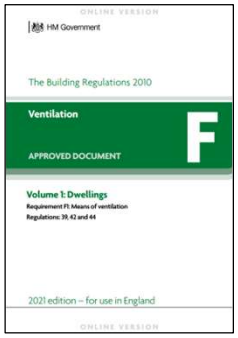
2006 – Amendment

Delete paragraph 3.4 and replace with the following:

'3.4 Where the original windows were fitted with trickle ventilators the replacement windows should include them and they should be sized as set-out in paragraph 3.6. It would be good practice to fit trickle ventilators (or equivalent), with accessible controls, in all replacement windows to help with control of condensation and improve indoor air quality.'

14

Approved Document F
Trickle Vents



Approved Document F

Trickle Vents required for **all** replacement windows
**Or not less satisfactorily then before*

New build need to consult building designer

15

Approved Document O
Overheating

Approved Document O

Overheating
Applies to New Build Domestic

16

Approved Document O
Overheating

Simplified Method

Limiting Solar Gains

Removing Excess Heat

Dynamic Thermal Modelling

CIBSE TM59 Modelling

17

1.7 Buildings or parts of buildings with cross-ventilation should not exceed the maximum glazing areas in Table 1.1.

Table 1.1 Limiting solar gains for buildings or parts of buildings with cross-ventilation[1]

	High risk location		Moderate risk location	
Largest glazed façade orientation	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)
North	15	37	18	37
East	18	37	18	37
South	15	22	15	30
West	18	37	11	22

NOTE:

1. Floor area and floor area of room are as defined in Appendix A.

Sim

Limi

Rem

Dynamic Thermal Modelling

CIBSE TM59 Modelling

18

Sim

- Limi

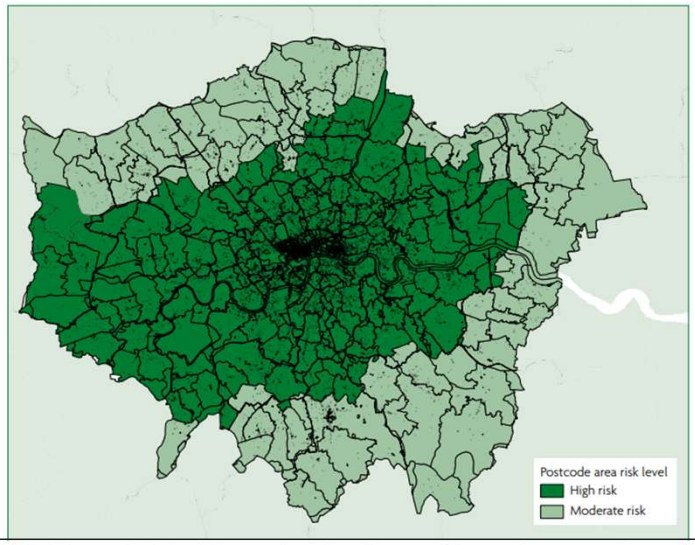
Rem

1.7 Buildings or parts of buildings with cross-ventilat
in Table 1.1.

Table 1.1 Limiting solar gains for buildings or

	High risk location	
Largest glazed façade orientation	Maximum area of glazing (% floor area)	Maximum glazing in glazed (% floor are
North	15	37
East	18	37
South	15	22
West	18	37

NOTE:
1. Floor area and floor area of room are as defined in App



Dynamic Thermal Modelling

CIBSE TM59 Modelling

1.9 Residential buildings in the high risk location should, in addition to following the maximum glazing areas in Table 1.1 and Table 1.2, provide shading for glazed areas between compass points north-east and north-west via the south. Shading should be provided by one of the following means.

a. External shutters with means of ventilation.

b. Glazing with a maximum g-value of 0.4 and a minimum light transmittance of 0.7.

c. Overhangs with 50 degrees altitude cut-off on due south-facing façades only.

19

Sim

- Limi

Rem

1.7 Buildings or parts of buildings with cross-ventilation should not exceed the maximum glazing areas in Table 1.1.

Table 1.1 Limiting solar gains for buildings or parts of buildings with cross-ventilation[1]

	High risk location		Moderate risk location	
Largest glazed façade orientation	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)
North	15	37	18	37
East	18	37	18	37
South	15	22	15	30
West	18	37	11	22

NOTE:
1. Floor area and floor area of room are as defined in Appendix A.

1.8 Buildings or parts of buildings with no cross-ventilation should not exceed the maximum glazing areas in Table 1.2.

Table 1.2 Limiting solar gains for buildings or parts of buildings without cross-ventilation[1]

	High risk location		Moderate risk location	
Largest glazed façade orientation	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)	Maximum area of glazing (% floor area)	Maximum area of glazing in the most glazed room (% floor area of room)
North	15	26	18	26
East	11	18	18	26
South	11	11	15	15
West	11	18	11	11

NOTE:
1. Floor area and floor area of room are as defined in Appendix A.

Dyn

CIBS

Cross-ventilation The ability to ventilate using openings on opposite façades of a dwelling. Having openings on façades that are not opposite is not allowing cross-ventilation, e.g. in a corner flat.

20

Sim

Lim

Mo

- Re

Dy

CIB

Table 1.3 Minimum free areas for buildings or parts of buildings with cross-ventilation

	High risk location	Moderate risk location
Total minimum free area[1]	The greater of the following: a. 6% of the floor area[2] b. 70% of the glazing area[3]	The greater of the following: a. 9% of the floor area[2] b. 55% of the glazing area[3]
Bedroom minimum free area	13% of the floor area of the room[4]	4% of the floor area of the room[4]

NOTES:

1. The total minimum free area is the free area for the whole dwellinghouse, residential unit, shared communal room or common space, including any bedrooms.
2. 'Floor area' is a key term. See Appendix A.
3. 'Glazing area' is a key term. See Appendix A.
4. 'Floor area of the room' is a key term. See Appendix A.

1.11 Buildings or parts of buildings with no cross-ventilation should equal or exceed the minimum free areas in Table 1.4.

Table 1.4 Minimum free areas for buildings or parts of buildings without cross-ventilation

	High risk location	Moderate risk location
Total minimum free area[1]	The greater of the following: a. 10% of the floor area[2] b. 95% of the glazing area[3]	The greater of the following: a. 12% of the floor area[2] b. 80% of the glazing area[3]
Bedroom minimum free area	13% of the floor area of the room[4]	4% of the floor area of the room[4]

NOTES:

1. The total minimum free area is the free area for the whole dwellinghouse, residential unit, shared communal room or common space, including any bedrooms.
2. 'Floor area' is a key term. See Appendix A.
3. 'Glazing area' is a key term. See Appendix A.
4. 'Floor area of the room' is a key term. See Appendix A.

21

Approved Document O
Overheating

Simplified Method

Limiting Solar Gains

Max glazing area 11% to 15% floor area

Removing Excess Heat

Min openable free area glazing 55% to 95% glass area

Min openable free area glazing 6% to 12% floor area

Dynamic Thermal Modelling

CIBSE TM59 Modelling

22

Approved Document O
Overheating

Simplified Method
Limiting Solar Gains
Max glazing area 18% floor area

Removing Excess Heat
Min openable free area glazing 55% glass area
Min openable free area glazing 9% floor area

Dynamic Thermal Modelling
CIBSE TM59 Modelling

Example 1
Low Risk Location
Largest Façade Glazed North
With Cross Ventilation

23

Approved Document O
Overheating

Simplified Method
Limiting Solar Gains
Max glazing area 11% floor area

Removing Excess Heat
Min openable free area glazing 95% glass area
Min openable free area glazing 10% floor area

Dynamic Thermal Modelling
CIBSE TM59 Modelling

Example 2
High Risk Location
Largest Façade Glazed South
Without Cross Ventilation

24

Approved Document O
Overheating

1.12 Openings should be designed to a
area of the opening should meet
opening should be assessed by eit
a. Measurement of the product t
b. Calculation using Appendix D.

Appendix D: Calculating equivalent area

D1 The free areas in Section 1 of this approved document are geometric open areas that assume a clear sharp-edged orifice with a 0.62 coefficient of discharge (Cd). Different opening types will reduce the amount of air flow by both affecting the way air flows and reducing the physical area. Accounting for these factors gives the equivalent area.

D2 The equivalent area of a window can be calculated using one of the following.

a. The discharge coefficient calculator, available online at: https://www.gov.uk/government/publications/classvent-and-classcool-school-ventilation-design-tool.

b. Tables D1 to D9.

Discharge coefficient calculator
MS Excel Spreadsheet, 27.7 KB

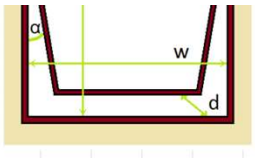
https://www.gov.uk/government/publications/classvent-and-classcool-school-ventilation-design-tool

25

Approved Document O
Overheating

WINDOW DISCHARGE COEFFICIENT CALCULATOR		
Window width, w	1.000	m
Window height, h	1.000	m
Opening angle, α	50	°
Stroke length, d	0.845	m
Orifice Discharge Coefficient, C_{d0}	0.62	-
Equivalent area, A_{eq}	0.787	m^2
Effective area, A_{eff}	0.488	m^2
Free area, A_{free}	**1.000**	**m^2**
Discharge coefficient, C_d	**0.49**	**-**

50° Opening
Equivalent area 78.7%



https://www.gov.uk/government/publications/classvent-and-classcool-school-ventilation-design-tool

26

Approved Document O
Overheating

WINDOW DISCHARGE COEFFICIENT CALCULATOR		
Window width, w	1.000	m
Window height, h	1.000	m
Opening angle, α	90	°
Stroke length, d	1.414	m
Orifice Discharge Coefficient, C_{d0}	0.62	-
Equivalent area, A_{eq}	0.883	m^2
Effective area, A_{eff}	0.548	m^2
Free area, A_{free}	**1.000**	**m^2**
Discharge coefficient, C_d	**0.55**	-

50° Opening
Equivalent area 78.7%

90° Opening
Equivalent area 88.3%

https://www.gov.uk/government/publications/classvent-and-classcool-school-ventilation-design-tool

27

Approved Document O
Overheating

Simplified Method
Limiting Solar Gains
Max glazing area 11% floor area

Removing Excess Heat
Min openable Free area glazing 10% floor area
Min openable Free area glazing 95% Glass area

Dynamic Thermal Modelling
CIBSE TM59 Modelling

Example 2
High Risk Location
Largest Façade Glazed South
Without Cross Ventilation

90° Opening
Equivalent area 88.3%

28

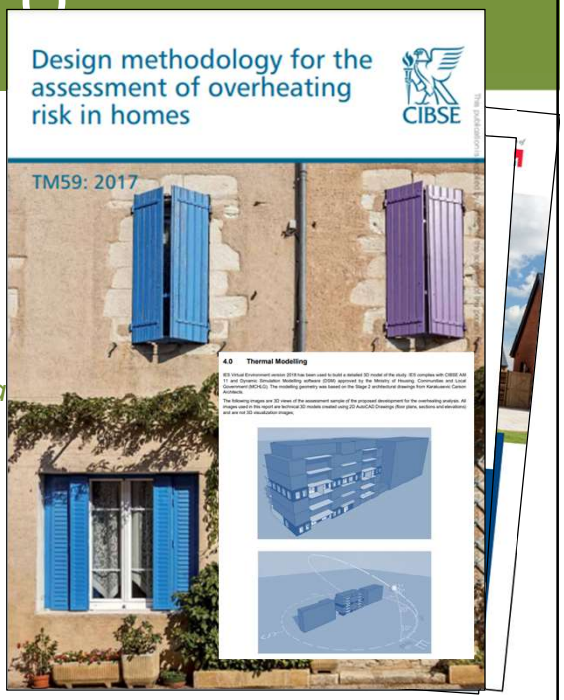
Approved Document O
Overheating

Simplified Method
Limiting Solar Gains
Max glazing area 11% to 15% floor area

Removing Excess Heat
Openable Free area glazing 6% to 12% floor area
Openable Free area glazing 55% to 95% Glass area

Dynamic Thermal Modelling
- CIBSE TM59 Modelling

Dynamic thermal analysis software which complies with the requirements of CIBSE AM11: Building performance modelling



29

Approved Document O
Overheating

Approved Document O

Overheating
Applies to New Build Domestic

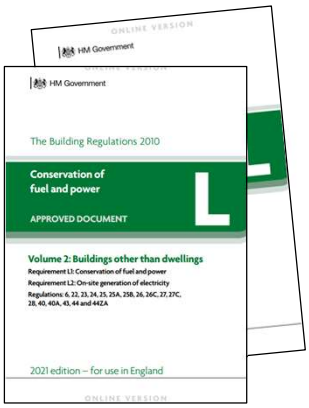
Reduced overall glass areas

Mainly openers for removing heat

Increased use of solar control glass

30

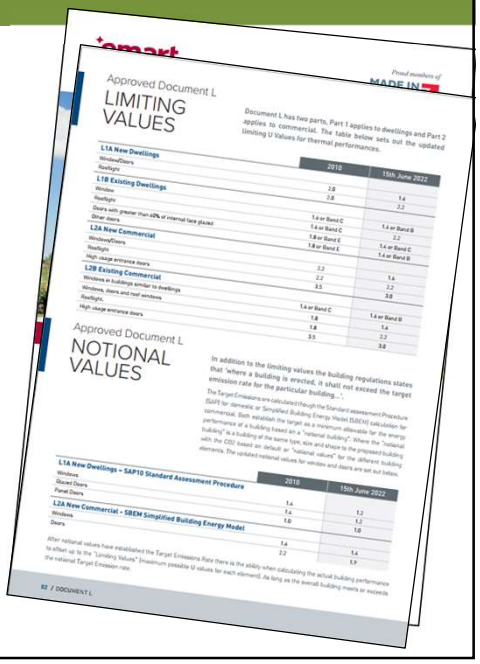
Document L
Thermal Peformance



Approved Document L

Volume 1
L1A New Dwellings
L1B Existing Dwellings

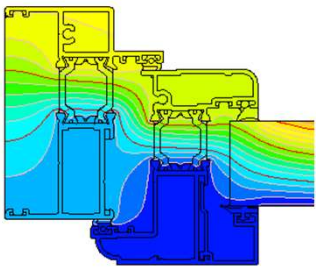
Volume 2
L2A New Commercial
L2B Existing Commercial

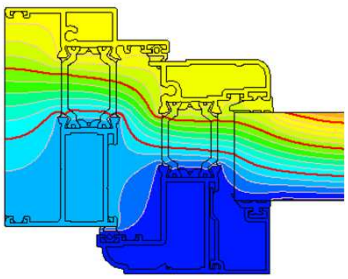


31

Document L
L1 B Existing Dwellings

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	





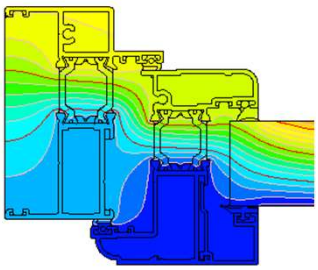
Alitherm 55

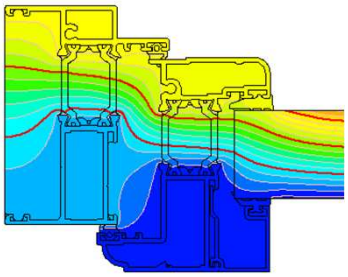
Alitherm 600

32

Document L
L1 B Existing Dwellings

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**





New Systems?

Alitherm 55

Alitherm 600

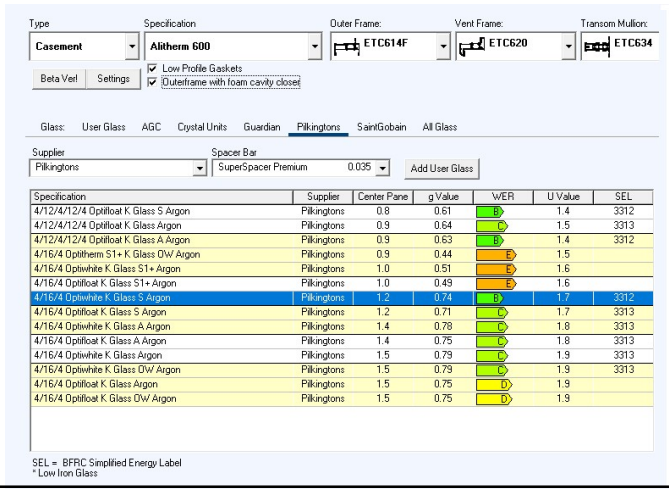
33

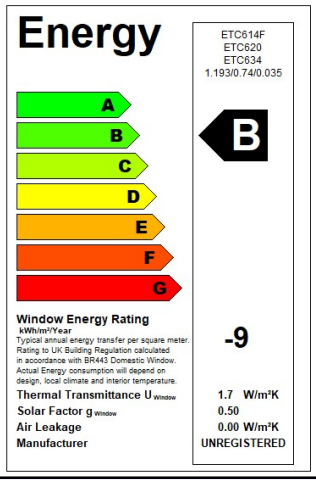
Document L
L1 B Existing Dwellings

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**

Alitherm 600

OF ETC614
VF ETC620
TM ETC634

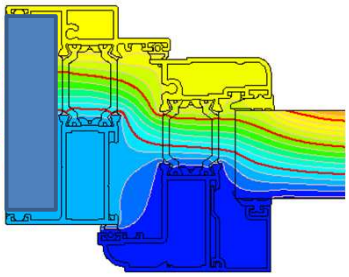


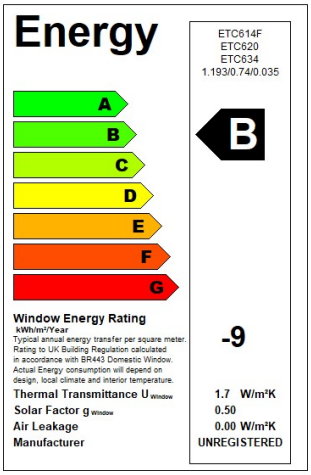


34

Document L
L1 B Existing Dwellings

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**





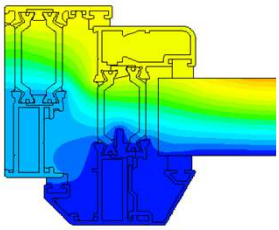
Alitherm 600

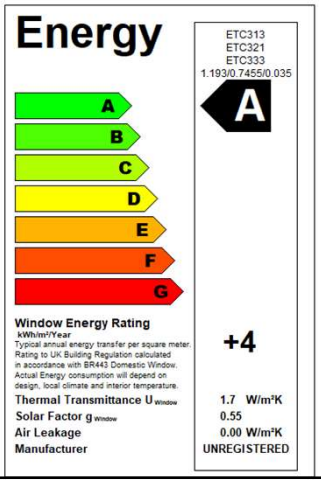
OF **ETC614F**
VF ETC620
TM ETC634

35

Document L
L1 B Existing Dwellings

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**





Alitherm 300

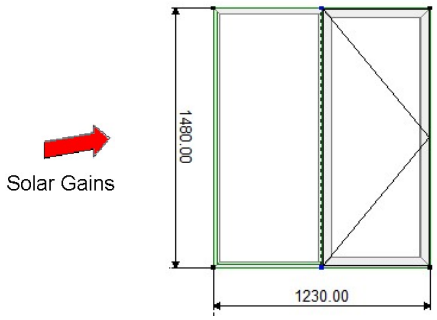
OF ETC313
VF ETC321
TM ETC333

36

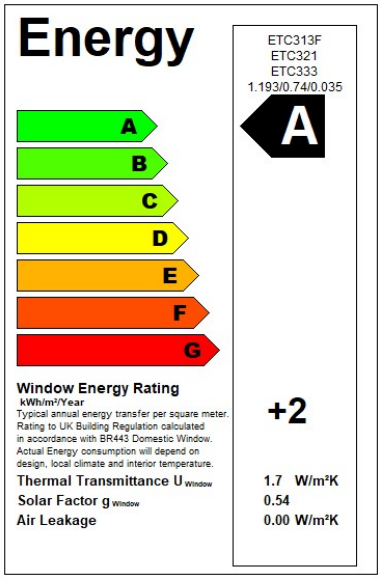
Document L
Window Energy Rating

4.22 The Window Energy Rating (WER) is given by the following equation;

$$WER = 196.7 \times ((1 - f) \times g_{glass}) - 68.5 \times (U + (0.0165 \times AL))$$



CP=1.2 g=0.74

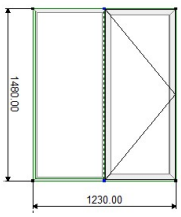


BFRC
Proven Performance.

37

Document L
Door Energy Rating

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**



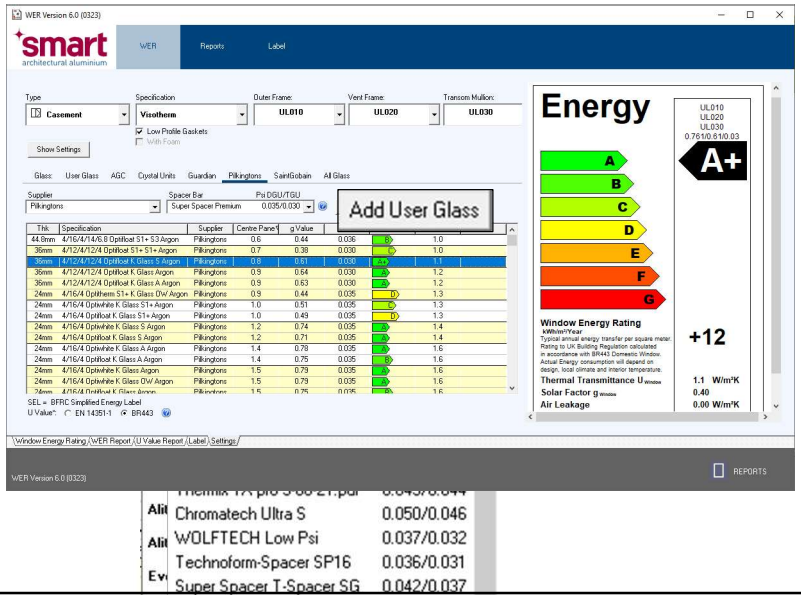
Alitherm 300

OF ETC313
VF ETC321
TM ETC333

Thk	Specification	Supplier	Centre Pane	g Value	Psi	WER	U Value*	SEL
24mm	4/16/4 Optiwhite K Glass S1+ Argor	Pilkingtons	1.0	0.51	0.035	D	1.6	
24mm	4/16/4 Optifloat K Glass S1+ Argon	Pilkingtons	1.0	0.49	0.035	D	1.6	
24mm	4/16/4 Optiwhite K Glass S Argon	Pilkingtons	1.2	0.74	0.035	A	1.7	3308
24mm	4/16/4 Optifloat K Glass S Argon	Pilkingtons	1.2	0.71	0.035	B	1.7	3309
24mm	4/16/4 Optiwhite K Glass A Argon	Pilkingtons	1.4	0.78	0.035	B	1.9	3309
24mm	4/16/4 Optifloat K Glass A Argon	Pilkingtons	1.4	0.75	0.035	B	1.9	3309
24mm	4/16/4 Optiwhite K Glass Argon	Pilkingtons	1.5	0.79	0.035	B	1.9	3309
24mm	4/16/4 Optiwhite K Glass OW Argor	Pilkingtons	1.5	0.79	0.035	B	1.9	3309
24mm	4/16/4 Optifloat K Glass Argon	Pilkingtons	1.5	0.75	0.035	C	1.9	3310
24mm	4/16/4 Optifloat K Glass OW Argon	Pilkingtons	1.5	0.75	0.035	C	1.9	3310

38

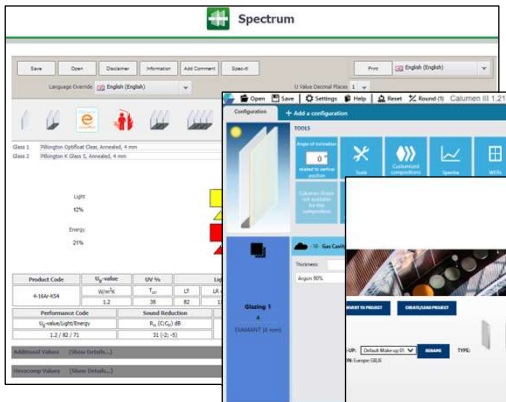
Document L
Window Energy Rating



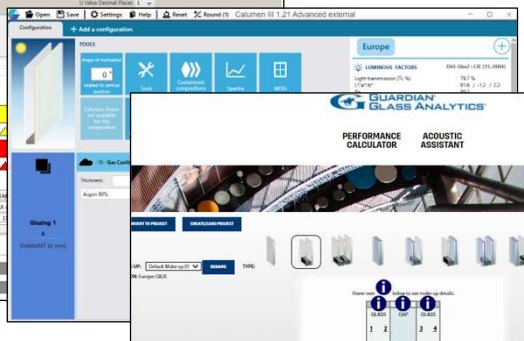
Energy Rating Calculator

39

Document L
Window Energy Rating



Pilkingtons - Spectrum

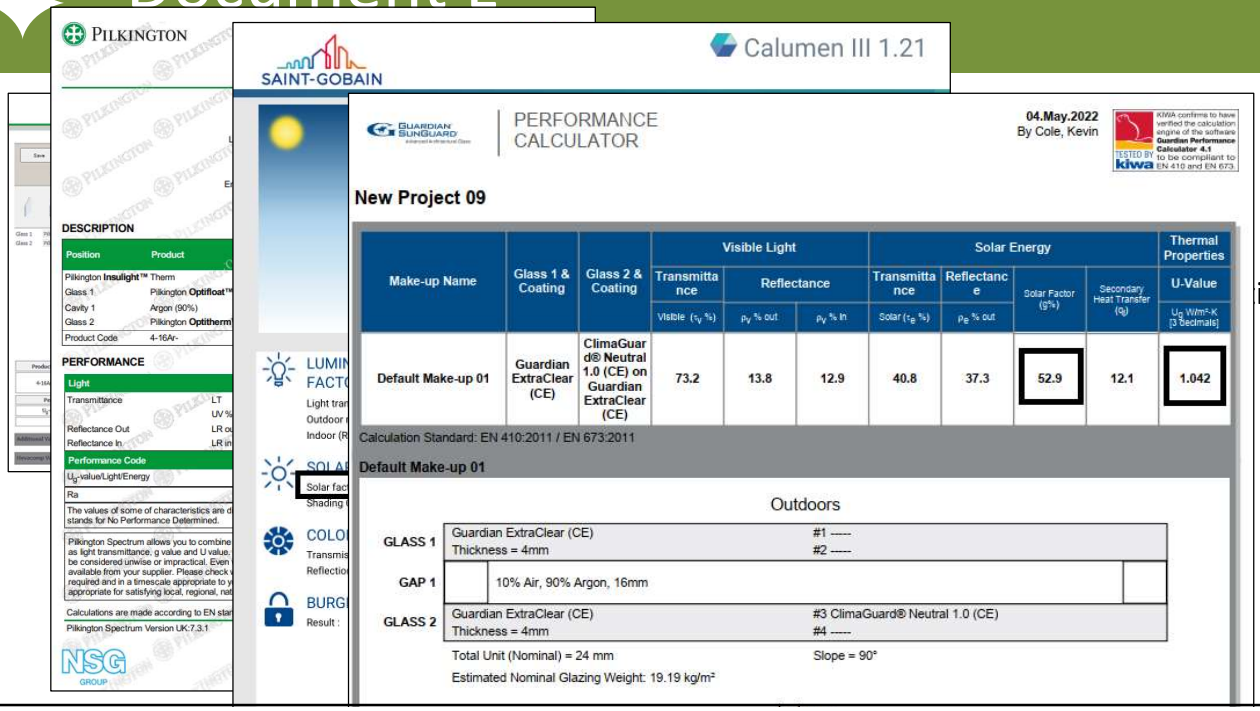


Saint Gobain - Calumen

Guardian – Glass Analytics

40

Document L

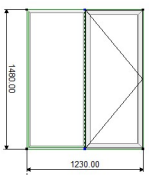


ics

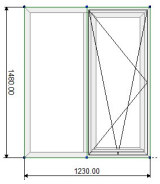
41

Document L
Door Energy Rating

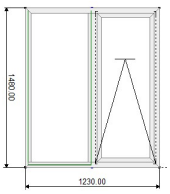
	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**



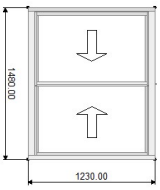
- ☑ Alitherm 300
- ☑ Alitherm 600
- ☒ Alitherm 700
- ☑ Alitherm 800
- ☑ Heritage
- ☑ EcoFutural



- ☑ EcoFutural
- ☒ Heritage T/T
- ☒ Visoline



- ☒ Alitherm 700

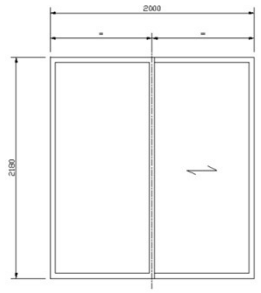


- ☑ VS600

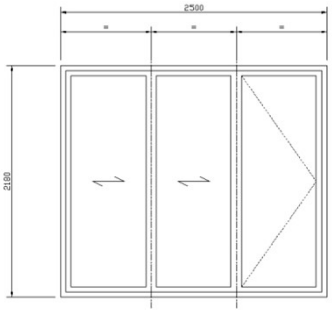
42

Document L
Door Energy Rating

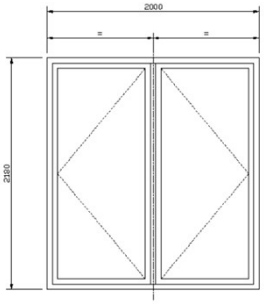
	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**



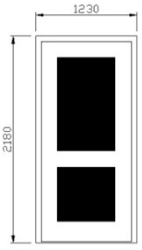
Sliding Patio Door



Sliding / Folding Door



French Door



TYPE 3
FULLY
GLAZED

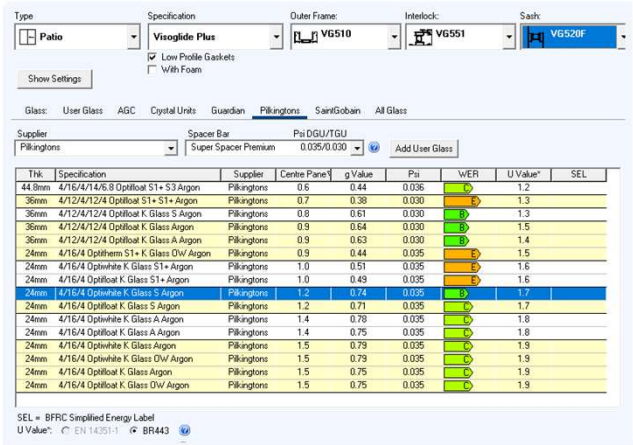
43

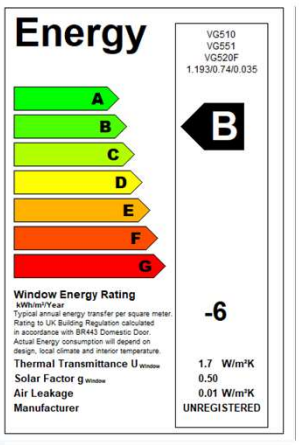
Document L
Door Energy Rating

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**


Sliding Patio Door

☑ Visoglide Plus
☑ Slide 2000



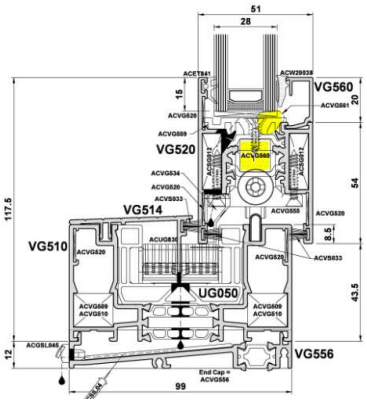


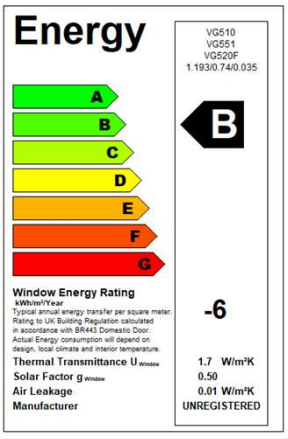
44

Document L
Door Energy Rating

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**

☑ Visoglide Plus
☑ Slide 2000

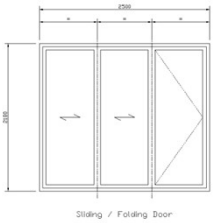




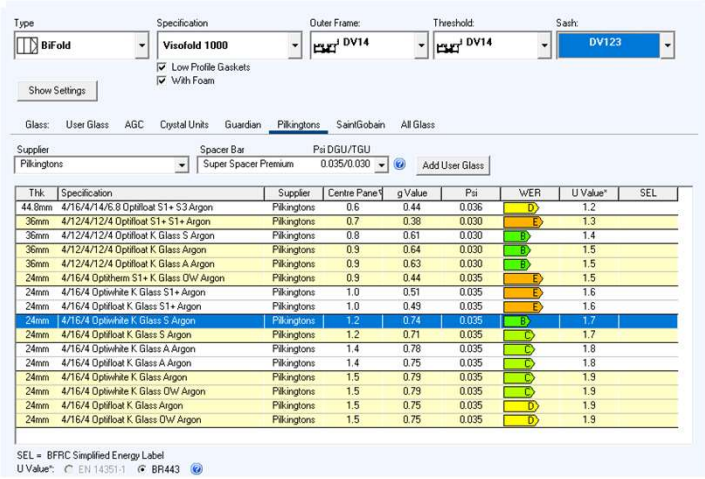
45

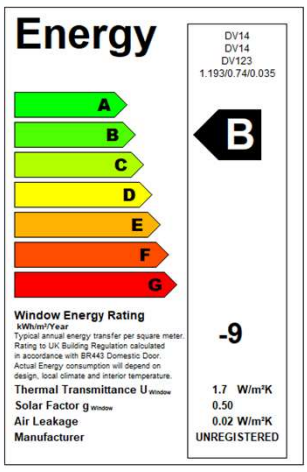
Document L
Door Energy Rating

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**



☑ Visofold 1000
☒ Visofold 2000
☑ Visofold 6000

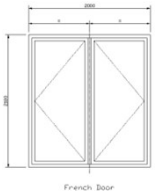




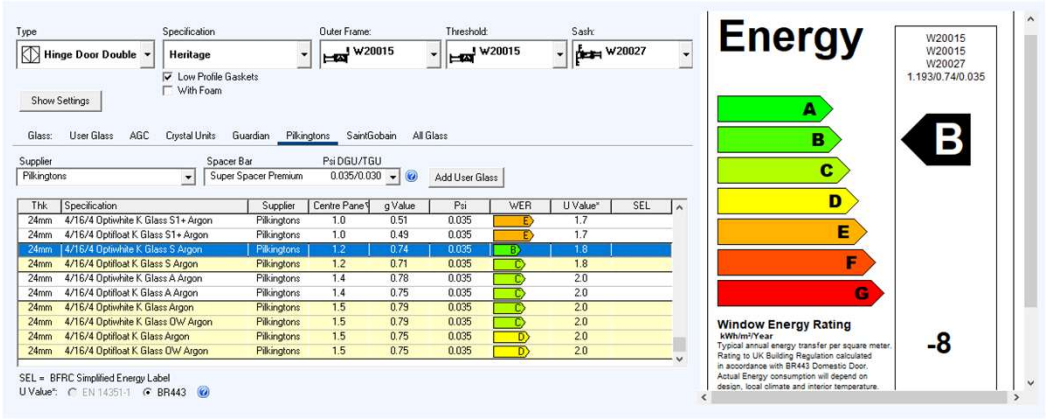
46

Document L
Door Energy Rating

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**



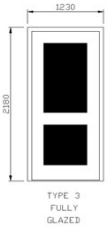
☑ Visofold 1000
☒ Visofold 2000
☑ Visofold 6000
☒ Alitherm Plus
☒ EcoFutural
☑ Heritage Door



47

Document L
Door Energy Rating

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**

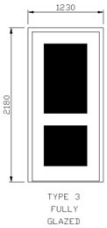


☒ Visofold 1000
☒ Visofold 2000
☒ Visofold 6000
☒ Alitherm Plus
☒ EcoFutural
☒ Heritage Door

4.22 The Window Energy Rating (WER) is given by the following equation;

WER = ~~196.7 × ((1 − t) × g_{glass})~~ − 68.5 × (U + (0.0165 × AL))

~~Solar Gains~~

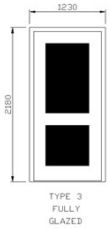


Heat Losses

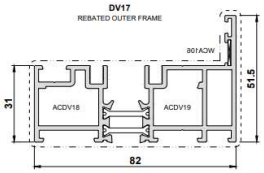
48

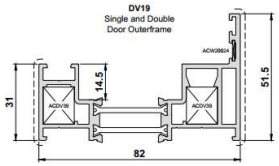
Document L
Door Energy Rating

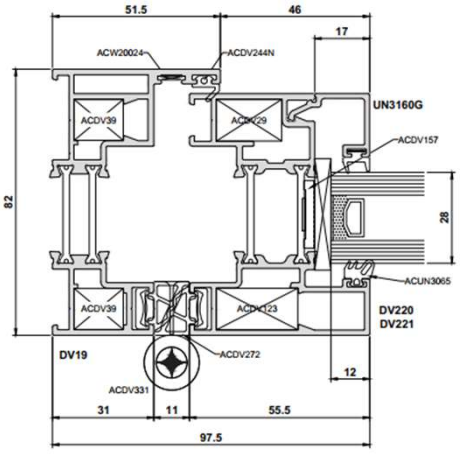
	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**



- ☑ **Visofold 1000 (DV19)**
- ☒ Visofold 2000
- ☑ **Visofold 6000 (DV19)**
- ☒ Alitherm Plus
- ☒ EcoFutural
- ☒ Heritage Door



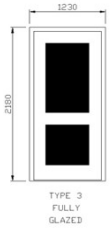




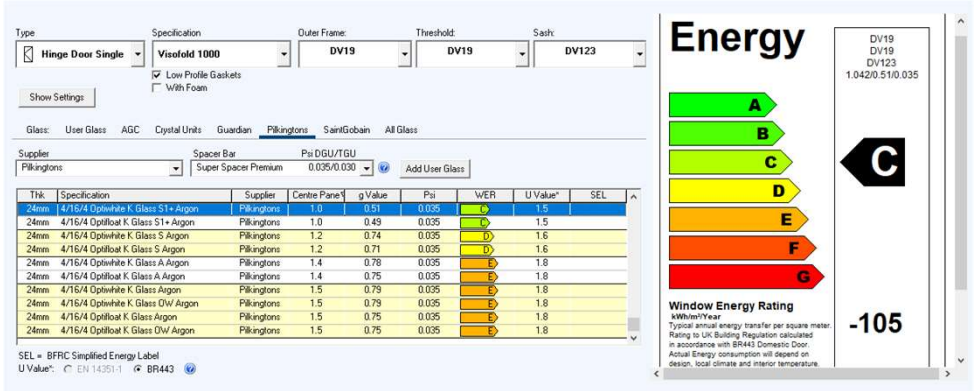
49

Document L
Door Energy Rating

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**



- ☑ Visofold 1000 (DV19)
- ☒ Visofold 2000
- ☑ Visofold 6000 (DV19)
- ☒ Alitherm Plus
- ☒ EcoFutural
- ☒ Heritage Door



50

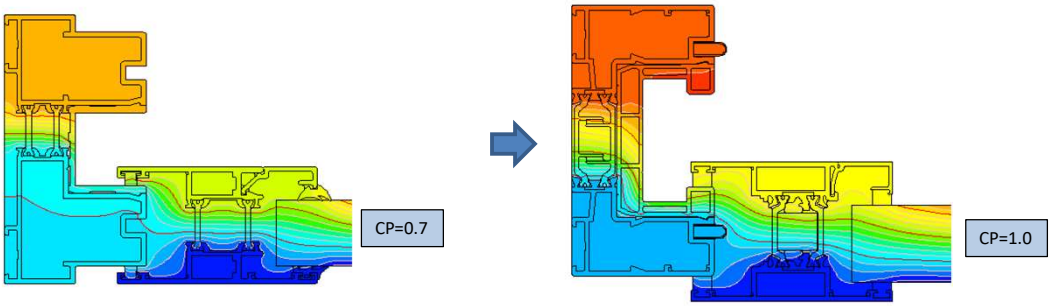
Document L
L2B Existing Commercial

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**
L2B Existing Commercial					
Windows	3.3	2.2	2.2	1.8	**1.6**
Doors	3.3	2.2	2.2	1.8	**1.6**
High usage entrance doors	-	-	6.0	3.5	**3.0**

51

Document L
L2B Existing Commercial

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**
L2B Existing Commercial					
Windows	3.3	2.2	2.2	1.8	**1.6**
Doors	3.3	2.2	2.2	1.8	**1.6**
High usage entrance doors	-	-	6.0	3.5	**3.0**



Visoglide 1.6W/m²K

Visoglide Plus 1.6W/m²K

52

Document L
L2B Existing Commercial

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**
L2B Existing Commercial					
Windows	3.3	2.2	2.2	1.8	**1.6**
Doors	3.3	2.2	2.2	1.8	**1.6**
High usage entrance doors	-	-	6.0	3.5	**3.0**

High-usage entrance door A door to an entrance primarily for people, through which many people are expected to move. Robustness and/or powered operation are the main performance requirements. A high-usage entrance door will have automatic closers and, except where operational requirements preclude it, be protected by a lobby.

53

Document L
L2B Existing Commercial

L1B Existing Dwellings
Window
Doors

L2B Existing Commercial
Windows
Doors
High usage entrance doors

2010

The U-value of glazi
a. the smaller of th
b. the standard win
c. the specific size

2022

U-values

4.1 U-values should be assessed using the methods and conventions set out in the Building Research Establishment's BR 443. U-values should be assessed for the whole thermal element (e.g. in the case of a window, the combined performance of the glazing and the frame).

4.2 The U-value of a window should be assessed using one of the following methods.

a. Calculated using the actual size and configuration of the window.

b. For windows in buildings similar to dwellings, calculated for a standard window 1.23m wide × 1.48m high and one of the following standard configurations. Standard configurations should not be used for commercial windows.

i. For a casement window, a central vertical divider with one opening light and one fixed light.

ii. For a vertical sliding sash window, a central horizontal divider with one opening light and one fixed light.

iii. For a roof window, no divider.

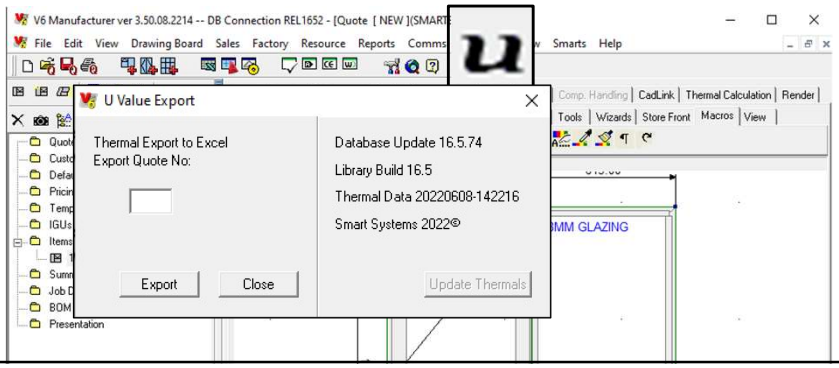
c. Measured using the hot-box method as set out in **BS EN ISO 12567-1** for windows and **BS EN ISO 12567-2** for roof windows.

NOTE: For domestic-type window construction, to be used in buildings similar to dwellings (see Table 4.1), the default value from the Standard Assessment Procedure (Table 6e) may be used if there are no test data or calculated performance values.

54

Document L
L2B Existing Commercial

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**
L2B Existing Commercial					
Windows	3.3	2.2	2.2	1.8	**1.6**
Doors	3.3	2.2	2.2	1.8	**1.6**
High usage entrance doors	-	-	6.0	3.5	**3.0**



55

Document L
L2B Existing Commercial

	1995	2002
L1B Existing Dwellings		
Window	3.3	2.2

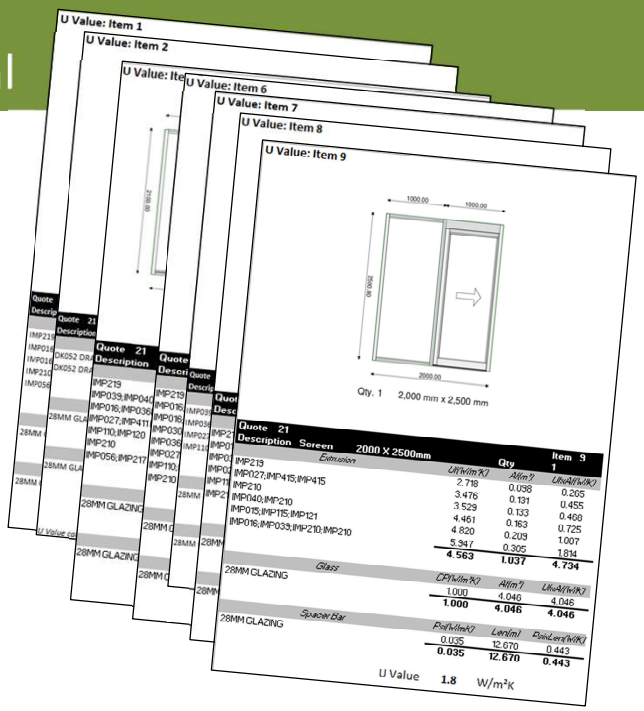
U Value: screens

Quote: 21

Infills	Centre Pane W/m²K	Psi W/mK
28MM GLAZING	1.000	0.035

Item	Qty	Description	Width	Height	U Value W/m²K	Area m²	Heat Loss W/K
1	1	Smart Wall	2000	X 2500 mm	1.4	5.0	7.2
2	1	SC Frame	2000	X 2500 mm	1.2	5.0	5.9
3	1	MC600	2000	X 2500 mm	1.2	5.0	5.9
4	1	MC Wall	2000	X 2500 mm	1.3	5.0	6.4
5	1	Smart Wall + Door	4000	X 2100 mm	1.6	8.4	13.3
6	1	Smart Wall + Door	3000	X 2500 mm	1.5	7.5	11.0
7	1	Screen	1000	X 2100 mm	1.9	2.1	3.9
8	1	Screen	2000	X 2500 mm	1.6	5.0	7.9
9	1	Screen	2000	X 2500 mm	1.8	5.0	9.1
10	1	Screen	2000	X 2500 mm	1.8	5.0	9.2
11	1	Screen	2000	X 2500 mm	1.6	5.0	8.0
				Totals		58.0	87.7
				U Value	1.5	W/m²K	

U Value calculation in accordance with BR 443, BS EN 10077-1 and BS EN 10077-2



56

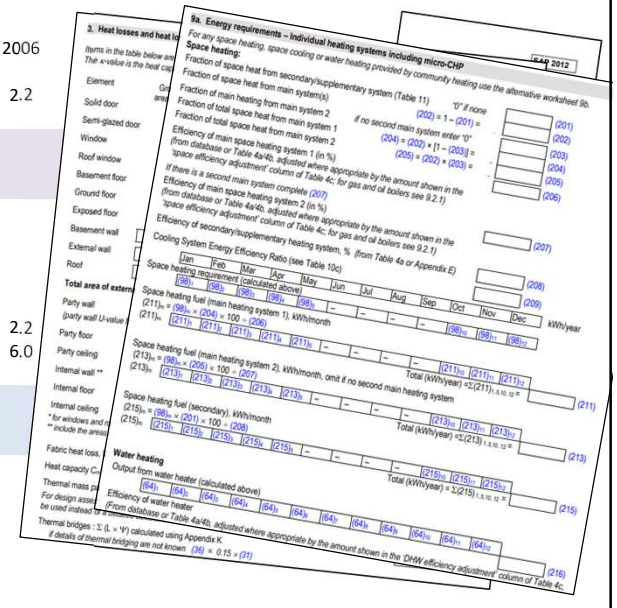
Document L
Limiting Values

	1995	2002	2006	2010	**2022**
L1A New Dwellings					
Window / Doors	3.3	2.2	2.2	2.0	**1.6**
L2A New Commercial					
Windows/Doors	3.3	2.2	2.2	2.2	**1.6**
High usage entrance doors	-	-	6.0	3.5	**3.0**

57

Document L
Notional Values

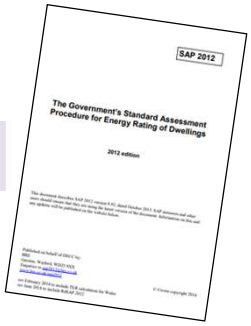
	1995	2002	2006
L1A New Dwellings			
Window / Doors	3.3	2.2	2.2
+			
SAP Standard Assessment Procedure			
Windows			
Doors			
L2A New Commercial			
Windows/Doors	3.3	2.2	2.2
High usage entrance doors	-	-	6.0
+			
SBEM Simplified Building Energy Model			
Window			
Doors			



58

Document L
Notional Values

	1995	2002	2006	2010	**2022**
L1A New Dwellings					
Window / Doors	3.3	2.2	2.2	2.0	**1.6**
+					
SAP Standard Assessment Procedure					
Windows				1.4	**1.2**
Doors				1.2	1.2
L2A New Commercial					
Windows/Doors	3.3	2.2	2.2	2.2	**1.6**
High usage entrance doors	-	-	6.0	3.5	**3.0**
+					
SBEM Simplified Building Energy Model					
Window				1.6	**1.4**
Doors				2.2	**1.9**



59

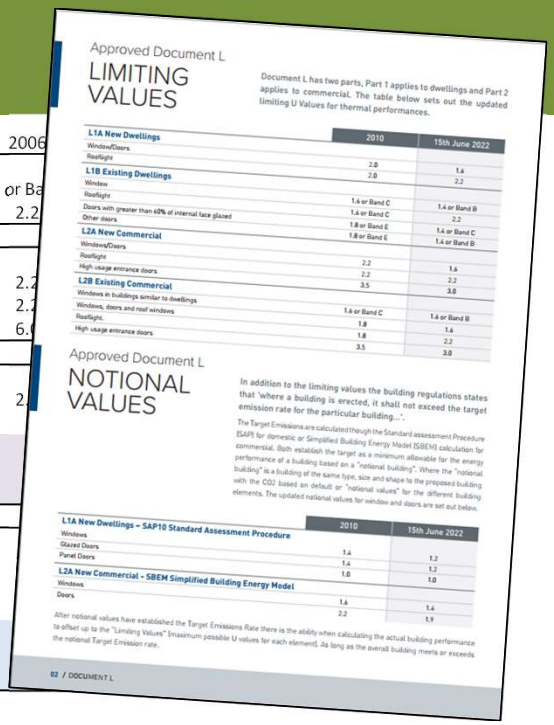
Document L
Notional Values

	1995	2002	2006	2010	**2022**
L1B Existing Dwellings					
Window	3.3	2.2	1.8 or Band E	1.6 or Band C	**1.4 or Band B**
Doors	3.3	2.2	2.2	1.8 or Band E	**1.4 or Band C**
L2B Existing Commercial					
Windows	3.3	2.2	2.2	1.8	**1.6**
Doors	3.3	2.2	2.2	1.8	**1.4**
High usage entrance doors	-	-	6.0	3.5	**3.0**
L1A New Dwellings					
Window / Doors	3.3	2.2	2.2	2.0	**1.6**
+					
SAP Standard Assessment Procedure					
Windows				1.4	**1.2**
Doors				1.2	1.0
L2A New Commercial					
Windows/Doors	3.3	2.2	2.2	2.2	**1.6**
High usage entrance doors	-	-	6.0	3.5	**3.0**
+					
SBEM Simplified Building Energy Model					
Window				1.6	**1.4**
Doors				2.2	**1.9**

60

Document L
Notional Values

	1995	2002	2006
L1B Existing Dwellings			
Window	3.3	2.2	1.8 or Ba
Doors	3.3	2.2	2.2
L2B Existing Commercial			
Windows	3.3	2.2	2.2
Doors	3.3	2.2	2.2
High usage entrance doors	-	-	6.0
L1A New Dwellings			
Window / Doors	3.3	2.2	2.2
+			
SAP Standard Assessment Procedure			
Windows			
Doors			
L2A New Commercial			
Windows/Doors	3.3	2.2	
High usage entrance doors	-	-	
+			
SBEM Simplified Building Energy Model			
Window			
Doors			



Approved Document L

LIMITING VALUES

Document L has two parts, Part 1 applies to dwellings and Part 2 applies to commercial. The table below sets out the updated limiting U Values for thermal performances.

	2010	15th June 2022
L1A New Dwellings		
Window/Doors	2.0	1.6
Rooflight	2.0	2.2
L1B Existing Dwellings		
Window	1.6 or Band C	1.4 or Band B
Rooflight	1.6 or Band C	2.2
Doors with greater than 60% of internal face glazed	1.8 or Band E	1.4 or Band C
Other doors	1.8 or Band E	1.4 or Band B
L2A New Commercial		
Windows/Doors	2.2	1.6
Rooflight	2.2	2.2
High usage entrance doors	3.5	3.0
L2B Existing Commercial		
Windows in buildings similar to dwellings	1.6 or Band C	1.6 or Band B
Windows, doors and roof windows	1.8	1.6
Rooflight,	1.8	2.2
High usage entrance doors	3.5	3.0

Approved Document L

NOTIONAL VALUES

In addition to the limiting values the building regulations states that 'where a building is erected, it shall not exceed the target emission rate for the particular building...'.

The Target Emissions are calculated though the Standard assessment Procedure (SAP) for domestic or Simplified Building Energy Model (SBEM) calculation for commercial. Both establish the target as a minimum allowable for the energy performance of a building based on a "notional building". Where the "notional building" is a building of the same type, size and shape to the proposed building with the CO2 based on default or "notional values" for the different building elements. The updated notional values for window and doors are set out below.

	2010	15th June 2022
L1A New Dwellings – SAP10 Standard Assessment Procedure		
Windows	1.4	1.2
Glazed Doors	1.4	1.2
Panel Doors	1.0	1.0
L2A New Commercial – SBEM Simplified Building Energy Model		
Windows	1.6	1.4
Doors	2.2	1.9

After notional values have established the Target Emissions Rate there is the ability when calculating the actual building performance to offset up to the "Limiting Values" (maximum possible U values for each element). As long as the overall building meets or exceeds the notional Target Emission rate.

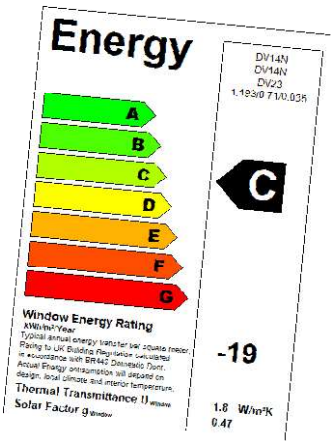
02 / DOCUMENT L

61

Document L
Summary

- Implementation 15th June 2022
  12 Month "Transition Period" 15th June 2023

- Existing Domestic Double Glaze
  - Windows 1.4 or **B rating**
  - Doors 1.4 or **C rating**



62

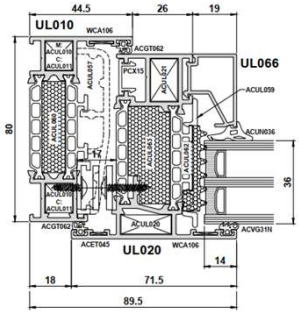
Document L
Summary

- Implementation 15th June 2022
  12 Month "Transition Period" 15th June 2023

- Existing Domestic Double Glaze
  - Windows 1.4 or **B rating**
  - Doors 1.4 or **C rating**

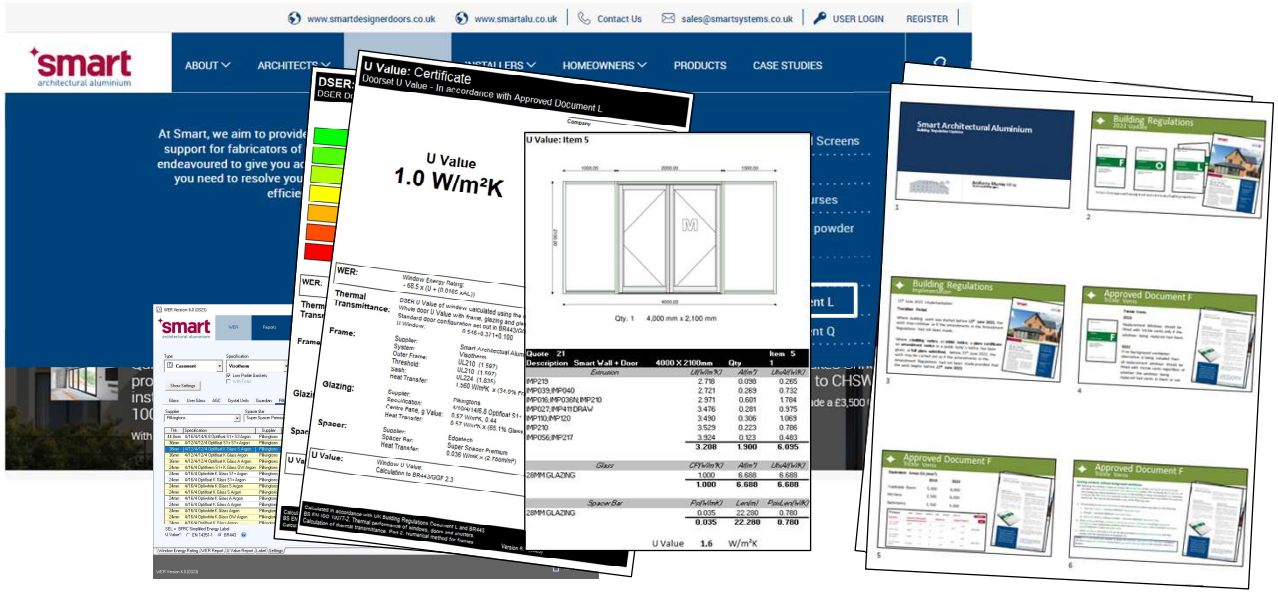
- New Build **<u>Limiting Values</u>** Double Glaze
  - Window/Door 1.6

- New Build **<u>Notional Values</u>** Triple Glaze
  - Window Domestic 1.2 Commercial 1.4
  - Door Domestic 1.2 Commercial 1.9



63

Building Regulations
2022 Update



64

Building Regulations
2022 Update

https://www.gov.uk/housing-local-and-community/building-regulation

65

Product Development
New Systems

Façade Systems:

Visofold Door
DV19 Outerframe
New Sashes DV220 and DV221
New Bead DV162

Alitherm 400 Door
Flush Door ETD4203 and ETD4204
Stepped Door ETD4204 and ETD4205

Alitherm 400 Window
Sash ETC4120 and ETC4129

Visoglide Plus
New Sash VG920

Visotherm Door
Sash UL224 UL225

Visotherm Window
Sash UL020 UL023

Heritage 60 Door
Sash W20XXX and W20XXXX

Internal Systems:

AluSpace
Internal screen system

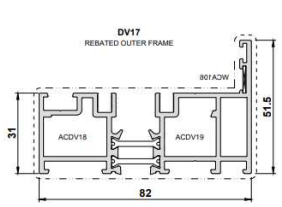
External Systems:

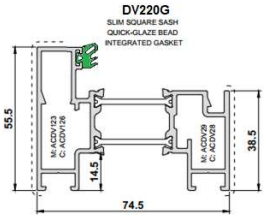
Decking System
Aluminium decking

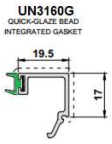
SolUmbra
Pergola

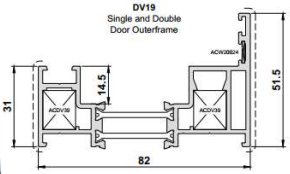
66

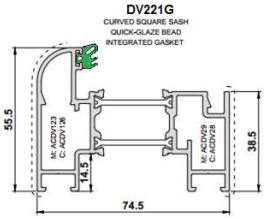
Product Development
Visofold Door

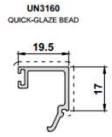










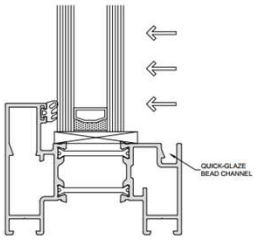


67

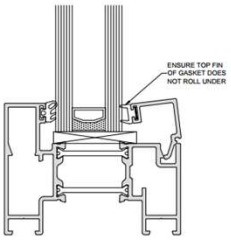
Product Development
Visofold Door – Quick Glaze Bead

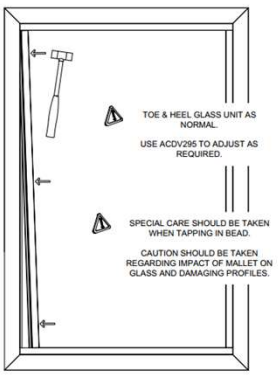
QUICK-GLAZE BEAD INSTALLATION

1. INSTALL GLASS UNIT, ENSURING IT HAS BEEN PUSHED FORWARD TO ENGAGE COMPRESSION OF E GASKET.
2. BEGINNING WITH HORIZONTAL BEADS, LOCATE BEAD IN CLIP CHANNEL OF SASH AS SHOWN. INTEGRATED GASKET MAY REST AGAINST GLASS UNIT.
3. APPLY FIRM PRESSURE TO THE BEAD TO HOLD IN POSITION. THIS MAY CAUSE THE BEAD TO FULLY LOCK INTO POSITION.
4. USING A NYLON MALLET, TAP BEAD INTO CHANNEL WORKING FROM ONE END TO THE OTHER. PLEASE TAKE CARE AT THIS STAGE TO AVOID DAMAGE TO BOTH THE GLAZING UNIT AND THE BEAD.
5. REPEAT STEPS 2 - 4 TO INSTALL VERTICAL BEADS.



WE STRONGLY RECOMMEND INSTALLING ACDV295 GLASS ADJUSTERS WHEN USING QUICK-GLAZE BEADS. THIS WILL REMOVE THE NEED TO REMOVE BEADS IN ORDER TO ADJUST GLASS POSITION.





68

Product Development
Visofold Door – Quick Glaze Bead

KEEP INTEGRATED GASKET

QUICK-GLAZE BEAD REMOVAL

1. STARTING ON VERTICAL BEADS, APPLY PRESSURE TO BEAD IN DIRECTION SHOWN IN ORDER TO CREATE SMALL GAP BETWEEN SASH AND BEAD.
2. GENTLY INSERT DE-GLAZING TOOL TAKING PARTICULAR CARE AS NOT TO DAMAGE PAINT FINISH.
3. SLOWLY PRISE THE BEAD UP AND AWAY FROM THE SASH.
4. THE BEAD SHOULD NOW BE EASILY REMOVABLE FROM QUICK-GLAZE BEAD CHANNEL IN SASH

BEAD AND INTEGRATED GASKET CAN BE REUSED.

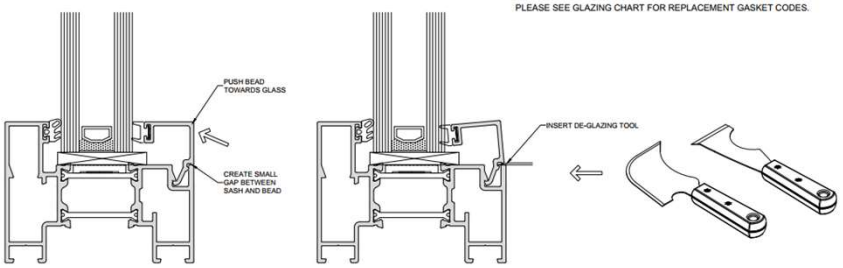
OR

REPLACE INTEGRATED GASKET

QUICK-GLAZE BEAD REMOVAL

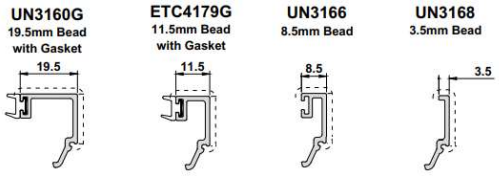
1. USING SMALL FLAT HEADED SCREWDRIVER OR SIMILAR, WEDGE TIP BETWEEN CO EXTRUDED GASKET AND ALUMINIUM.
2. IN A LEVERING MOTION, PRISE THE GASKET AWAY FROM THE ALUMINIUM. PARTICULAR CARE SHOULD BE TAKEN NOT TO DAMAGE THE GLASS UNIT AND ALUMINIUM.
3. COMPLETE THIS AT SEVERAL LOCATIONS ALONG THE LENGTH OF THE BEAD.
4. REMOVE GASKET AND DISCARD. THIS GASKET CAN NO LONGER BE USED.
5. THE BEAD SHOULD NOW BE EASILY REMOVABLE FROM TAP IN BEAD CHANNEL IN SASH

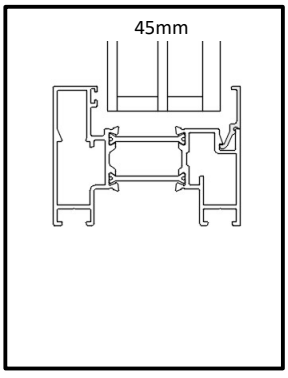
PLEASE SEE GLAZING CHART FOR REPLACEMENT GASKET CODES.



69

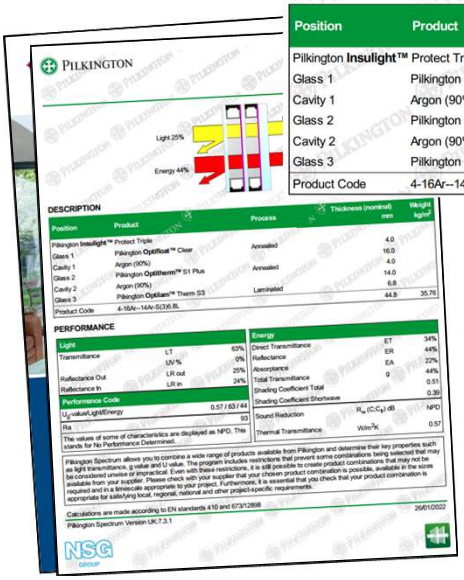
Product Development
Visofold Door





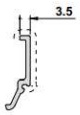
70

Product Development
Visofold Door

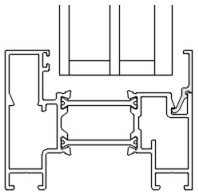


Position	Product	Process	Thickness (nominal) mm	Weight kg/m²
Pilkington **Insulight™** Protect Triple				
Glass 1	Pilkington **Optifloat™** Clear	Annealed	4.0	
Cavity 1	Argon (90%)		16.0	
Glass 2	Pilkington **Optitherm™** S1 Plus	Annealed	4.0	
Cavity 2	Argon (90%)		14.0	
Glass 3	Pilkington **Optilam™** Therm S3	Laminated	6.8	
Product Code	4-16Ar--14Ar-S(3)6.8L		44.8	35.76

UN3168
3.5mm Bead



45mm



0.57 Centre Pane
1.2W/m²K

71

Product Development
Visofold Door – Quick Glaze Bead

Tests: Impact,Security,Weather,UV (96 hours), Hot & Cold,shock testing (for shrinkage)

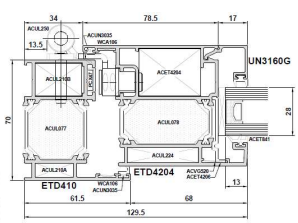
72

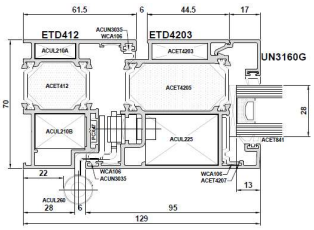
Product Development
Alitherm 400 Door

73

Product Development
Alitherm 400 Door

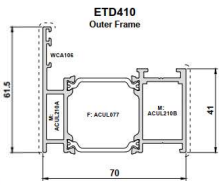
- Open in, Open out, Single & Double door options
- Quick Glaze Bead (with integrated gasket)
- Kitemarked
- Lock Key operated, Auto engage or Lift lever
- Will accommodate 40mm infill panel
- Stepped or Flush finish

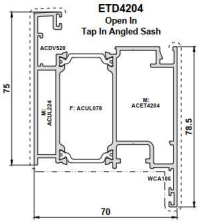


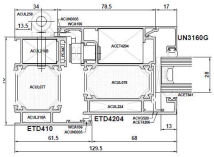


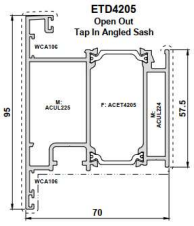
74

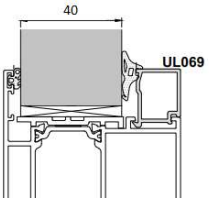
Product Development
Alitherm 400 Door Stepped







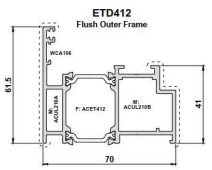


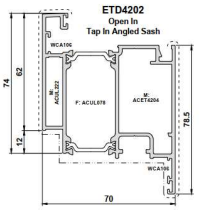


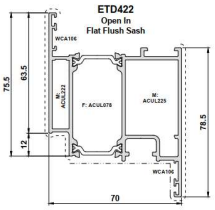
0.8 Centre Pane
1.2W/m²K

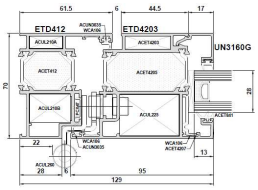
75

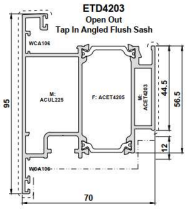
Product Development
Alitherm 400 Door - Flush











76

Product Development
Alitherm 400 Window

FEATURES SMART'S NEW
QUICK GLAZE *BEAD*

For installers, Alitherm 400's new, Quick-Glaze Bead is simply tapped in on site with the gasket already in place (rather than beading followed by inserting wedge gaskets), making the installation and glazing process faster, more straightforward and more cost effective.

Smart Quick-Glaze Bead is available in Naturals colours White (WP), Black (BL) and Anthracite Grey (KL005).

Window Type	Maximum Width (mm)	Maximum Height (mm)	Frame Depth (mm)	Maximum Perimeter (mm)	Glazing Units	Security Standard	Typical U Value[1]	WER[2]	Air Permability Classification	Water Tightness Classification	Resistance to Wind Classification
Sash dimensions for windows with approved sash profiles:											
Side Hung	864	1400	70	–	24, 28, 32, 36, 40 & 45	PAS 24:2016	1.4 W/m²K	Band A	Class 4	AE2400	2000+
Top Hung	1400	1500	70	–	24, 28, 32, 36, 40 & 45	PAS 24:2016	1.4 W/m²K	Band A	Class 4	AE2400	2000+
Fixed	2100	2100	70	42	24, 28, 32, 36, 40 & 45	PAS 24:2016	1.4 W/m²K	Band A	Class 4	AE2400	2000+

(For sizes outside these parameters, contact the Smart Technical Support team)

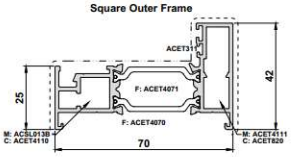
Typical Values different glass, profiles and door configurations will vary U Value and Window Energy Rating

1. U Value based on opener next to fixed 1230 x 1480 using glass Centre Pane 1.0
2. WER based on opener next to fixed 1230 x 1480 using glass Centre Pane 1.2 and g value 0.74

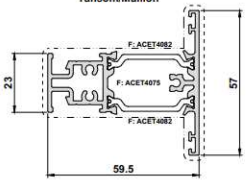
77

Product Development
Alitherm 400 Window

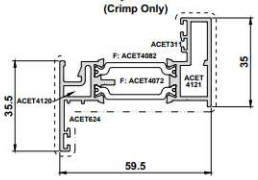
ETC4110
Square Outer Frame



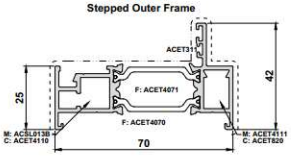
ETC4130
Transom/Mullion



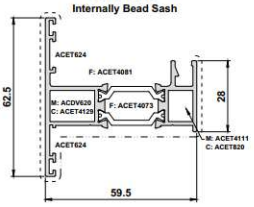
ETC4120
Externally Beaded Sash
(Crimp Only)



ETC4112
Stepped Outer Frame

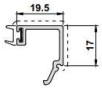


ETC4129
Internally Bead Sash



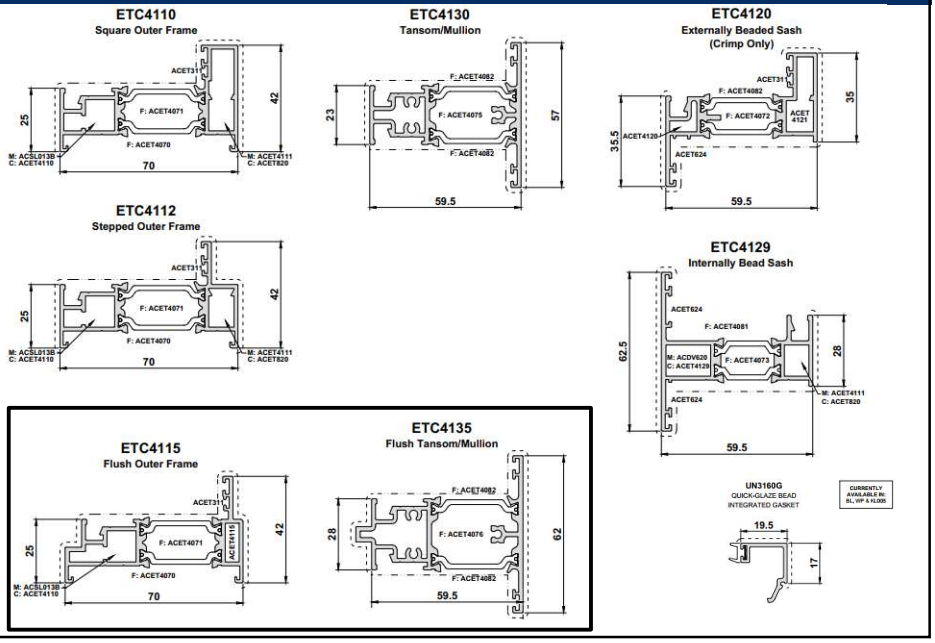
UN3160G
QUICK-GLAZE BEAD INTEGRATED GASKET

CURRENTLY AVAILABLE IN: BL, WP & KL000



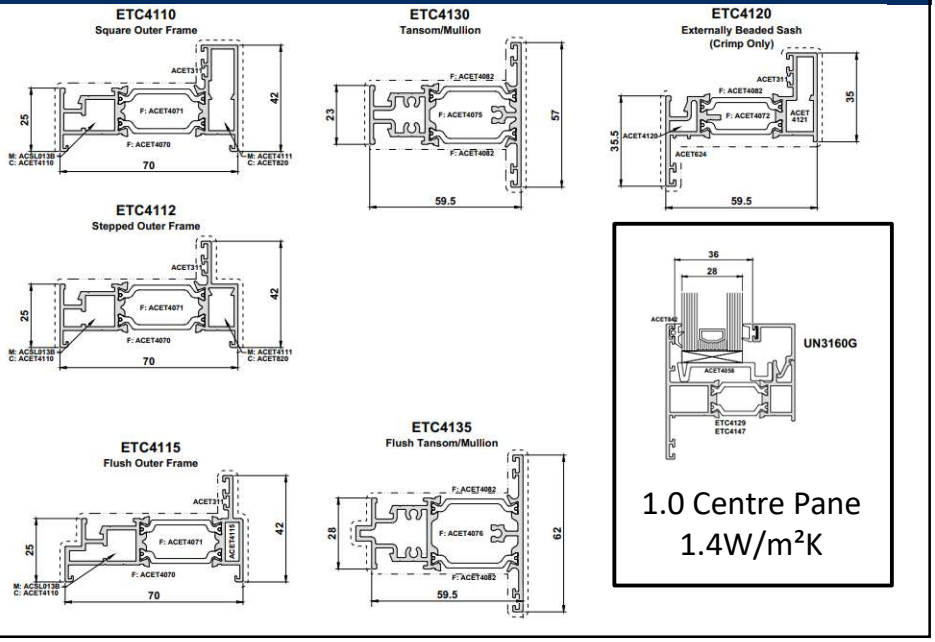
78

Product Development
Alitherm 400 - Flush Window



79

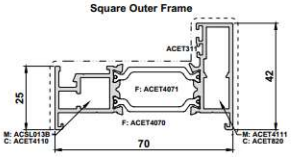
Product Development
Alitherm 400 - Flush Window



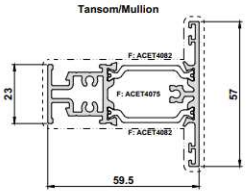
80

Product Development
Alitherm 400 - Flush Window

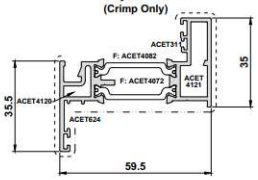
ETC4110
Square Outer Frame



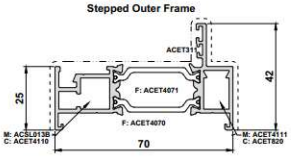
ETC4130
Tansom/Mullion

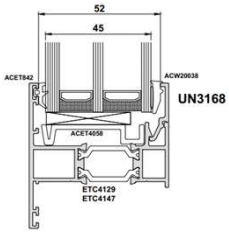


ETC4120
Externally Beaded Sash
(Crimp Only)



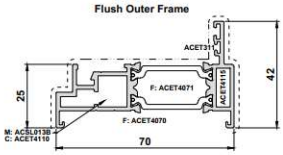
ETC4112
Stepped Outer Frame



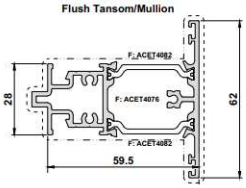


0.6 Centre Pane
1.1W/m²K

ETC4115
Flush Outer Frame

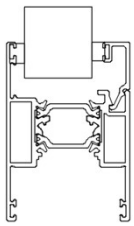


ETC4135
Flush Tansom/Mullion



81

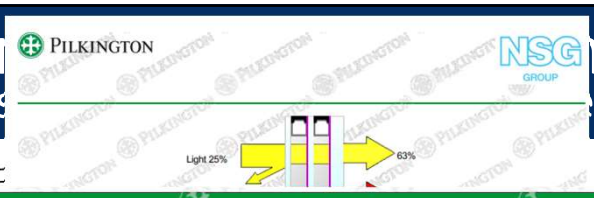
Product Development
Visoglide Plus – Quick Glaze Bead



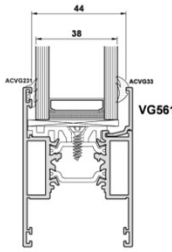
VG920 Sash Quick Glaze Bead

82

Pr…t
Vis…ead



Position	Product	Process	Thickness (nominal) mm	Weight kg/m²
Pilkington **Insulight™** Protect Triple				
Glass 1	Pilkington **Optifloat™** Clear	Annealed	4.0	
Cavity 1	Argon (90%)		12.0	
Glass 2	Pilkington **Optitherm™** S1 Plus	Annealed	4.0	
Cavity 2	Argon (90%)		12.0	
Glass 3	Pilkington **Optilam™** Therm S3	Laminated	6.8	
Product Code	4-12Ar--12Ar-S(3)6.8L		38.8	35.76



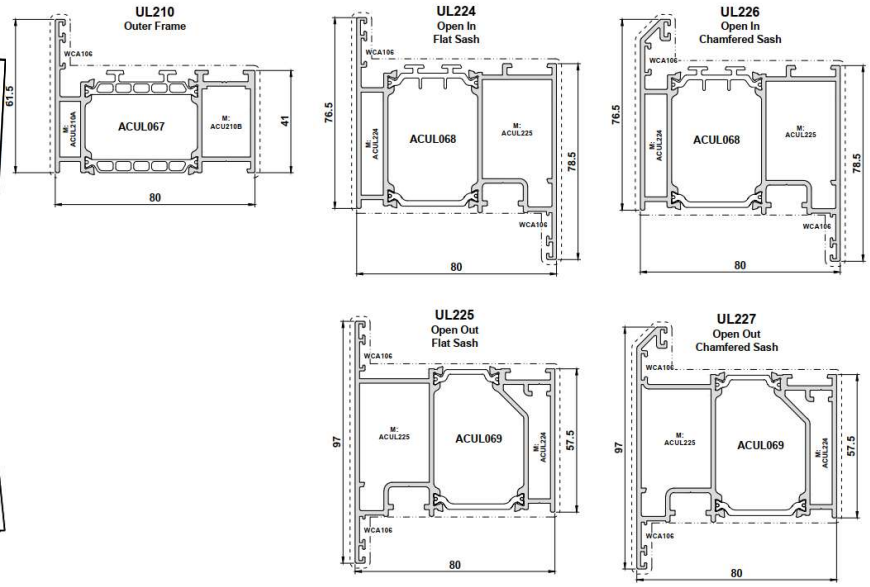
0.69 Centre Pane
1.3W/m²K

83

Product Development
Visotherm Door

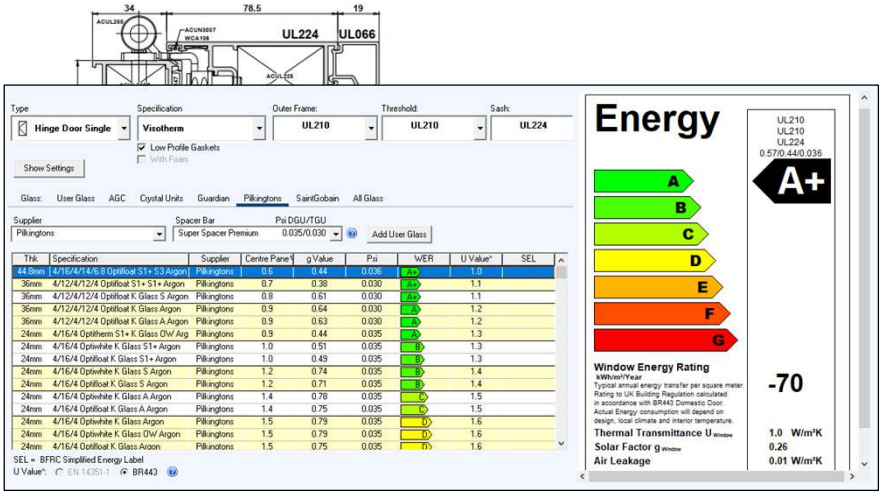
84

Product Development
Visotherm Door



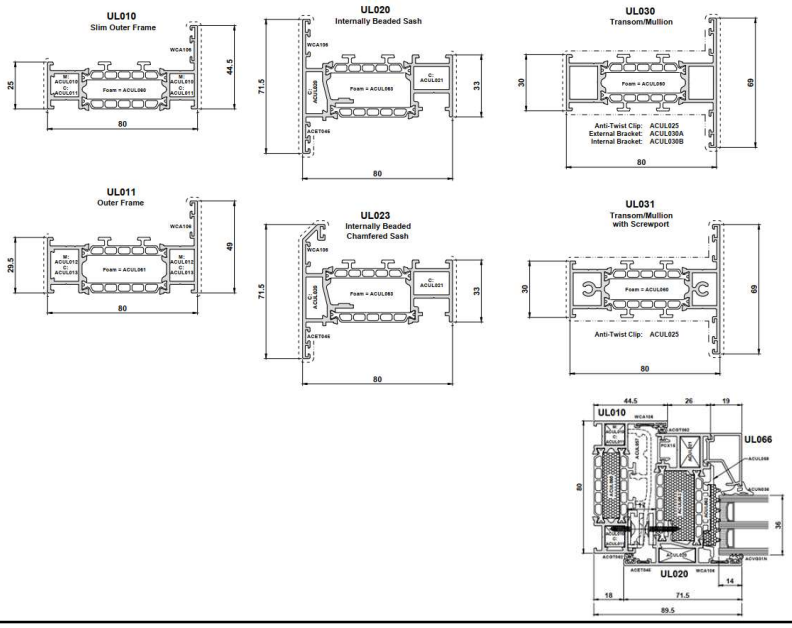
85

Product Development
Visotherm Door



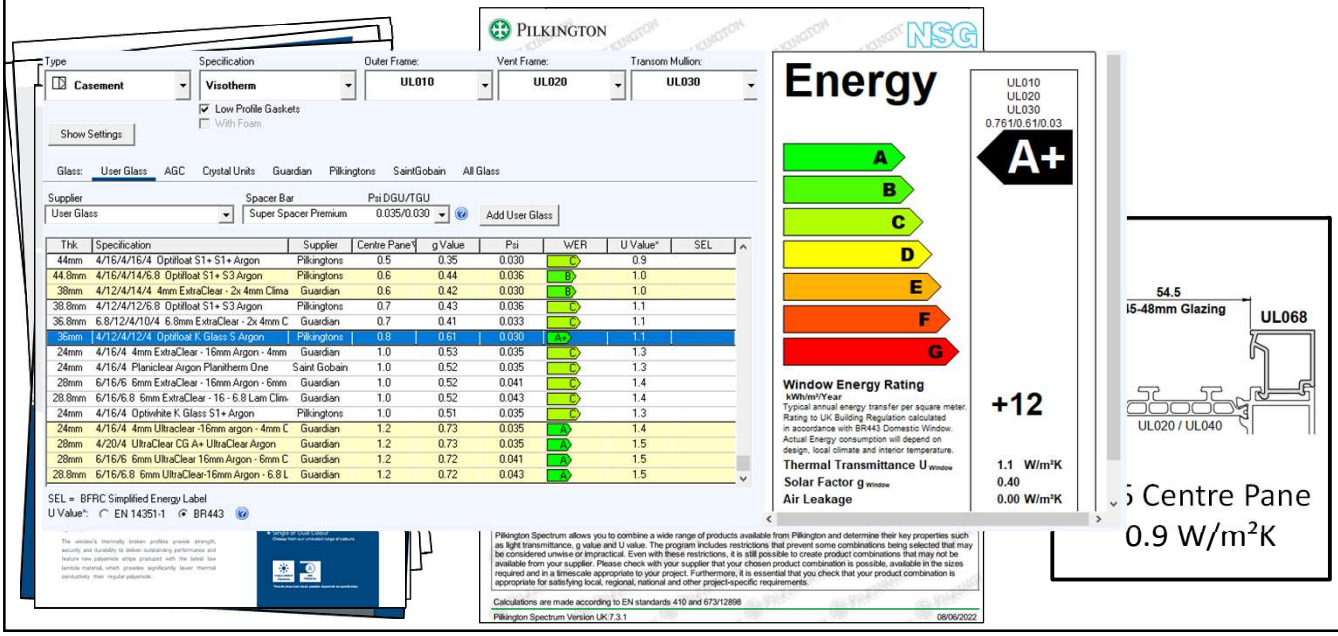
86

Product Development
Visotherm Window



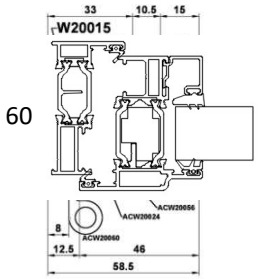
87

Product Development
Visotherm Window

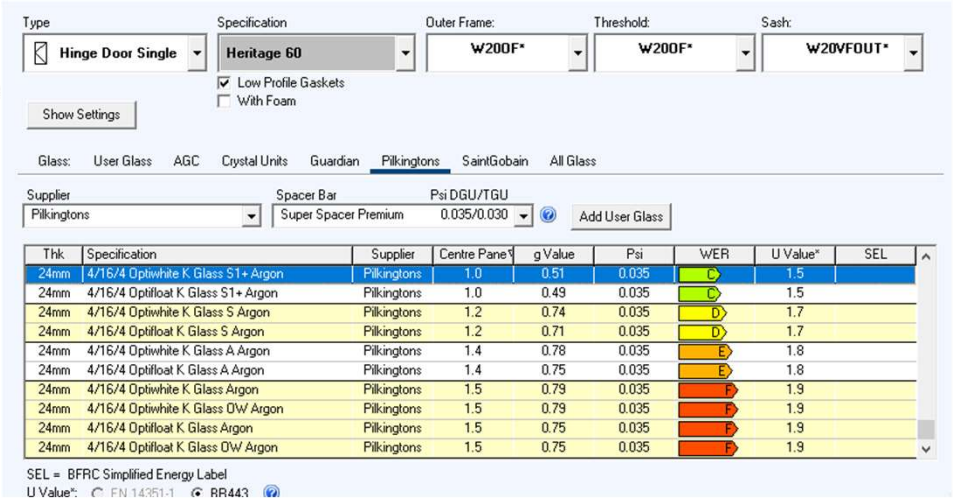


88

Product Development
Heritage 60 Door

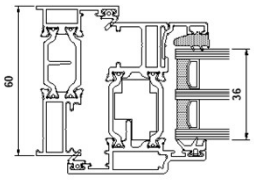


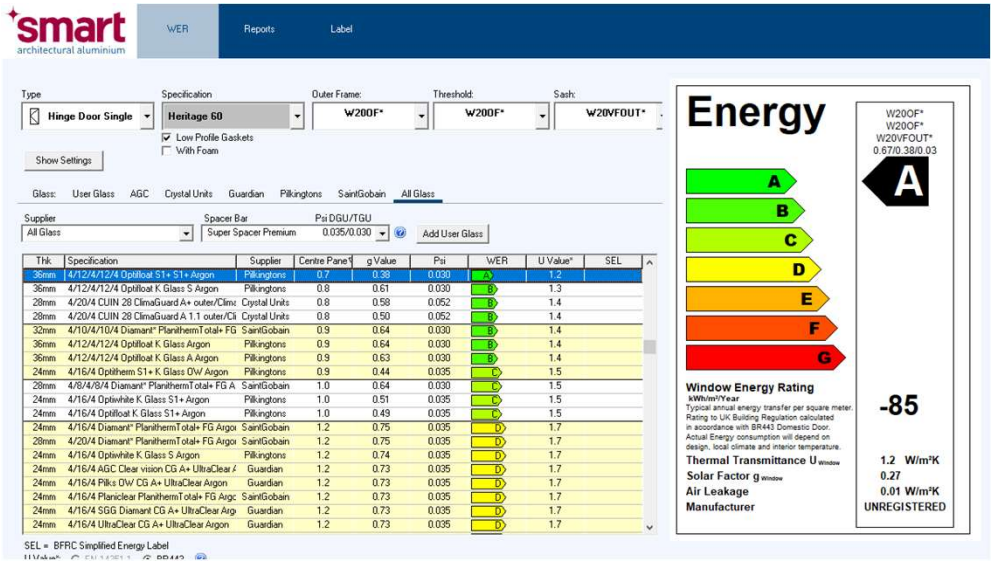
60



89

Product Development
Heritage 60 Door





90

Product Development
New Systems

Façade Systems:

Visofold Door
DV19 Outerframe
New Sashes DV220 and DV221

Alitherm 400 Door
Flush Door ETD4203 and ETD4204
Stepped Door ETD4204 and ETD4205

Alitherm 400 Window
Sash ETC4120 and ETC4129

Visotherm Door
Sash UL224 UL225

Visotherm Window
Sash UL020 UL023

Heritage 60 Door
Sash W20XXX and W20XXXX

Internal Systems:

AluSpace
Internal screen system

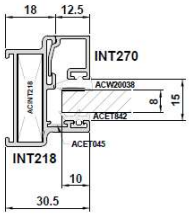
External Systems:

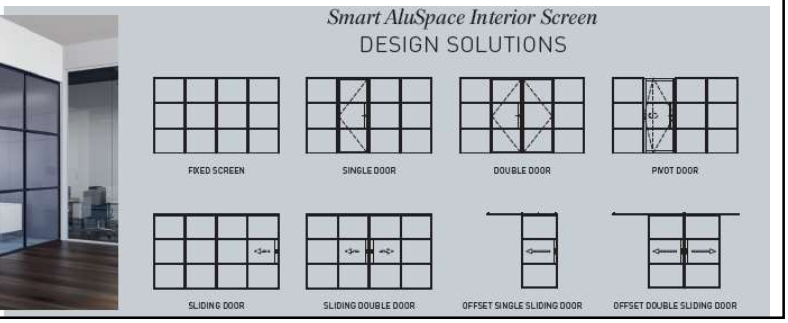
Decking System
Aluminium decking

SolUmbra
Pergola

91

Product Development
AluSpace - Internal Screen and Door





92

Product Development
AluSpace - Internal Screen and Door

Hinged Doors

With a range of width, glazing, hinge and furniture options, our doors can be configured to suit any design theme, from traditional to minimalist and contemporary to industrial..

DOOR SASH SPECIFICATIONS	
Maximum Width	900mm
Minimum Width	400mm
Maximum Height	2200mm
Maximum Weight	60kg
Door	Single or double
Glazing	6mm, 8mm or 18mm
Colour	Various powder coating colours available with a 25 year guarantee


HEAD DETAIL


SASH DETAIL


THRESHOLD DETAIL

93

Product Development
AluSpace - Internal Screen and Door

Pivot Doors

Our pivot door options provides the flexibility to instantly change the way the internal space is configured. Available up to 2 metres wide and with adjustable closer.

DOOR SASH SPECIFICATIONS	
Maximum Width	2000mm
Minimum Width	400mm
Maximum Height	2500mm
Maximum Weight	100kg
Door	Single or double
Glazing	6mm, 8mm or 18mm
Colour	Various powder coating colours available with a 25 year guarantee

HEAD DETAIL

THRESHOLD DETAIL

Pivot door – single – with or without outer frame

94

Product Development
AluSpace - Internal Screen and Door

Sliding Doors

Sliding doors provide the option to close or partially open the internal screen, with a choice of a contemporary or vintage rail options to echoe the overall design.

DOOR SASH SPECIFICATIONS	
Maximum Width	1200mm
Minimum Width	400mm
Maximum Height	2500mm
Maximum Weight	100kg (with CENT 2G Rollers)
Door	Single or double
Glazing	6mm, 8mm or 18mm
Colour	Various powder coating colours available with a 25 year guarantee


HEAD DETAIL


SASH DETAIL


THRESHOLD DETAIL

95

Product Development
AluSpace - Internal Screen and Door

Aluspace Screen Acoustic Laminates

6.8mm **Rw upto 36 dB**

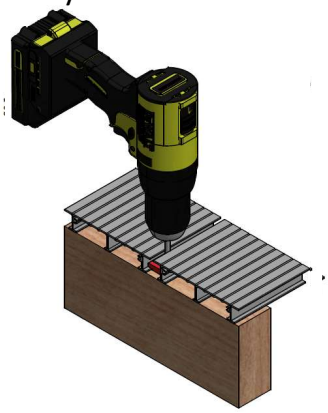
8.8mm **Rw upto 38 dB**

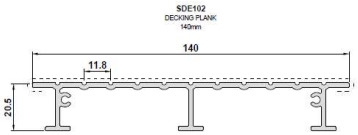
10.8mm **Rw upto 40 dB**

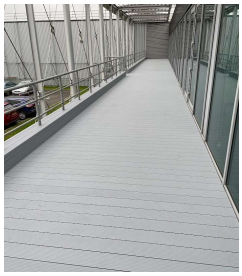
96

Product Development
SolDeck - Aluminium Decking

- Low maintenance
- Anti-slip powder coat finish
- None Combustible
- Easy to install

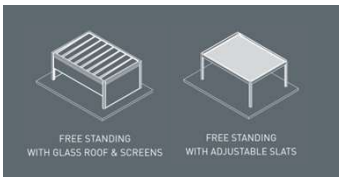






97

Product Development
SolUmbra - Pergola



SolUmbra - Pergola

Made to Measure
– Free standing or attached to a building
– Available with slats, glass roof and/or screens
– Maximum dimensions: 6m x 4.5m x 3m
– Minimalist, elegant design
– Single or double wall slats

Optimal Comfort
– Operation via Somfi control
– Slots rotate up to 120 degrees
– Waterproof construction with integrated gutter

Custom
– Integrated windproof screens
– Optional built in LED lighting
– Infinite choice of colours
– Rain, wind or snow sensor

98

Product Development
New Systems

Façade Systems:

Visofold Door
DV19 Outerframe
New Sashes DV220 and DV221
New Bead DV162

Alitherm 400 Door
Flush Door ETD4203 and ETD4204
Stepped Door ETD4204 and ETD4205

Alitherm 400 Window
Sash ETC4120 and ETC4129

Visoglide Plus
New Sash VG920

Visotherm Door
Sash UL224 UL225

Visotherm Window
Sash UL020 UL023

Heritage 60 Door
Sash W20XXX and W20XXXX

Internal Systems:

AluSpace
Internal screen system

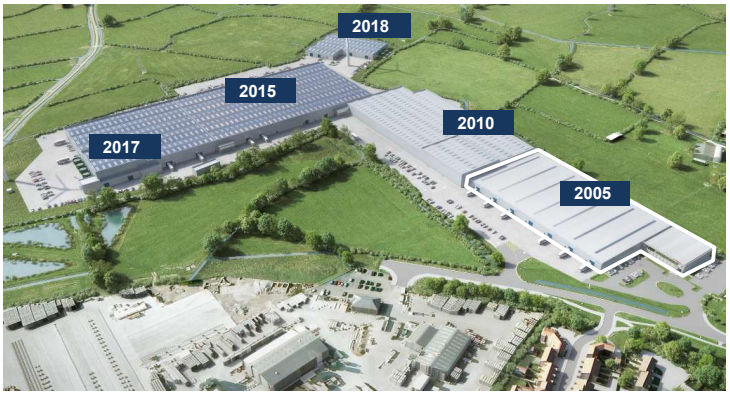
External Systems:

Decking System
Aluminium decking

SolUmbra
Pergola

99

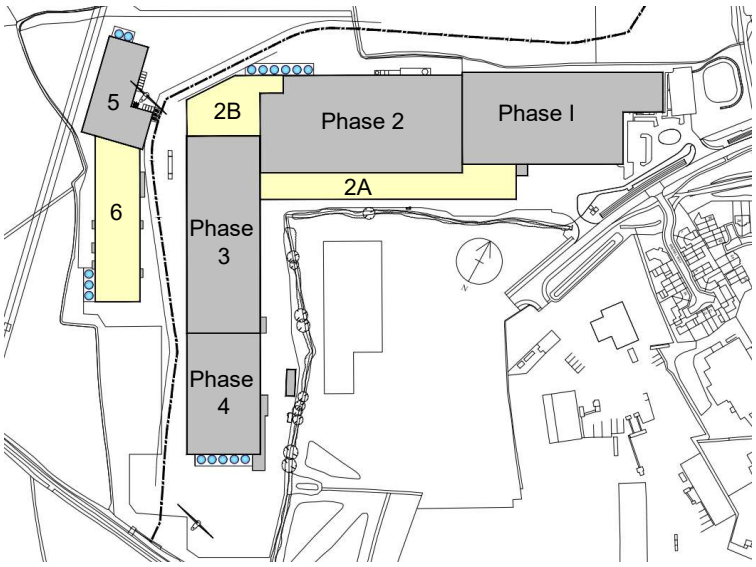
Smart Developments
Smart Expansion



	Phase	
2005	**I**	Offices and Warehouse
2010	**2**	Two Extrusion Presses + Horizontal Paint
2015	**3**	Third Press + Vertical Paint Plant
2017	**4**	Secondary Vertical Paint and storage
2018	**5**	Tooling and Doors

100

Smart Developments
Smart Expansion



	Phase	
2005	I	Offices and Warehouse
2010	2	Two Extrusion Presses + Horizontal Paint
2015	3	Third Press + Vertical Paint Plant
2017	4	Secondary Vertical Paint and storage
2018	5	Tooling and Doors
2022	6	Panel Paint Line
	2A/2B	Forth Extrusion Press

101

Product Development
New Systems

Façade Systems:

Visofold Door
DV19 Outerframe
New Sashes DV220 and DV221
New Bead DV162

Alitherm 400 Door
Flush Door ETD4203 and ETD4204
Stepped Door ETD4204 and ETD4205

Alitherm 400 Window
Sash ETC4120 and ETC4129

Visoglide Plus
New Sash VG920

Visotherm Door
Sash UL224 UL225

Visotherm Window
Sash UL020 UL023

Heritage 60 Door
Sash W20XXX and W20XXXX

Internal Systems:

AluSpace
Internal screen system

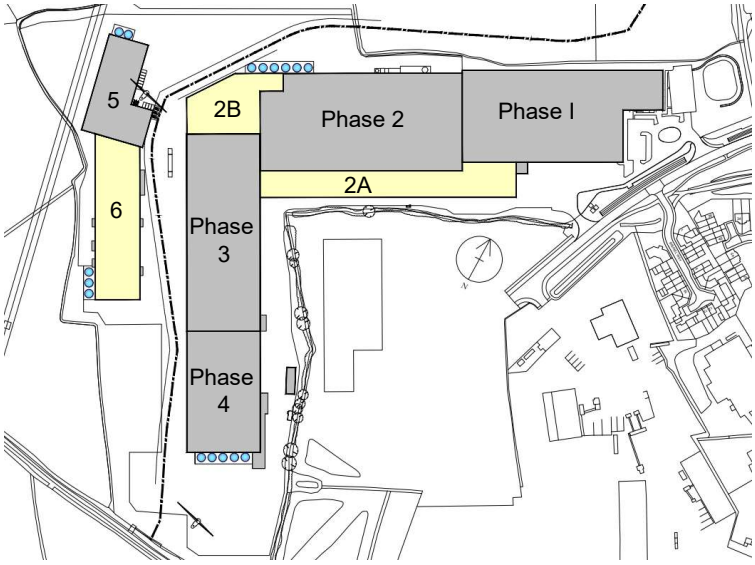
External Systems:

Decking System
Aluminium decking

SolUmbra
Pergola

102

Smart Developments
Smart Expansion



	Phase	
2005	**I**	Offices and Warehouse
2010	**2**	Two Extrusion Presses + Horizontal Paint
2015	**3**	Third Press + Vertical Paint Plant
2017	**4**	Secondary Vertical Paint and storage
2018	**5**	Tooling and Doors
2022	**6**	Panel Paint Line
	2A/2B	Forth Extrusion Press

103