

Material property table

All Eclipse profiles are manufactured from acrylic high impact modified, unplasticised Polyvinyl Chloride compound (PVC-U) especially formulated to suit either the Central European climate or the 'hot' and 'dry' climatic zones.

Material properties	Test method	Value
Density	DIN 53 479	1.42 kg/m ³
Vicat softening point	BS 2782 Method 120B, ISO 306	80°C
Apparent modulus of elasticity	BS 2782 Method 335 A, ISO 178	
	Rate of strain 5mm/min	2500 MPa
Tensile yield stress at 23°C	BS 2782 Method 320 C, ISO 527	>38 MPa
Tensile impact strength at 23°C	ISO 8526 Method A Specimen type 5	>600 kJ/m ²
Tensile impact strength at 0°C	ISO 8526 Method A Specimen type 5	>400 kJ/m ²
Impact strength	BS 2782 Method 359 Part 3	>14 kJ/m ²
Retention of impact strength after artificial ageing	BS 2782 Method 359 Part 3	original value
Colour fastness	BS 1006 1978 Part AO3, ISO 4892	4/5 Grey scale
Co-efficient of linear expansion (White/colour PVC-U profiles)		0.7mm/10°C/ metre length
Thermal conductivity at 23°C	DIN 52 612	0.15 W/m ² °K
Hardness, Shore table D	DIN 53 505, ISO 868	79
Water absorption after 24 hours	DIN 53 495	>0.1%
Creep strength after 1000 hours	DIN 53 444	15 MPa
Shear modulus G, 23°C	DIN 53 445	1000 MPa
Heat stability	BS 2782 Method 130	>240 min
Heat reversion	BS 7413 Appendix F	>2%
Heat ageing	BS 7413 Appendix H	pass
Low temperature impact resistance at -10°C	BS 7413 Appendix G	pass
Weld ability	BS 7413 Appendix K	>20 MPa
Fire resistance	BS 746 Part 7 1971	Class 1
Limiting Oxygen index	ASTM S2893	~ 45%
Flame spread index	ASTM E162	10 (constant)

Note:

- 1) Verification of BS standard specification: BS and BBA.
- 2) Verification of ASTM and DIN standard specification: PVC resin and/or 'one pack' suppliers.

Air Permeability, Water Tightness and Wind Resistance

Eclipse windows have been tested to BS 5368: Parts 1, 2 and 3 and meet the requirements of the classification for weathertightness BS 6375: Part 1: 1983, as follows:

Exposure categories for Eclipse

	Air Permeability	Water Tightness	Wind Resistance
Casement window	600Pa	300Pa	1200-2400Pa
Tilt & turn window	600Pa	300Pa	1200-2400Pa
Single residential door			
inward	300Pa	200Pa	2200Pa
outward	600Pa	300Pa	2200Pa
In-line patio door	300Pa	300Pa	1200Pa

For Vertical slider, French doors and Tilt & Slide Patio refer to WHS Halo.

Notes

- All values are quoted from BSI/BBA official ratings based on BS 6375 part 1.
 Water Tightness values typically achieved on test are:- Internally Beaded 600Pa
 Externally Beaded 1000Pa
 Wind Resistance values are dependent on size of frame and mullion/transom lengths.



BS7950 KM34442

BS7412 KM13589



PAS 024

PAS 023

ECLIPSE Technical data sheet No 2 – PRODUCT OVERVIEW



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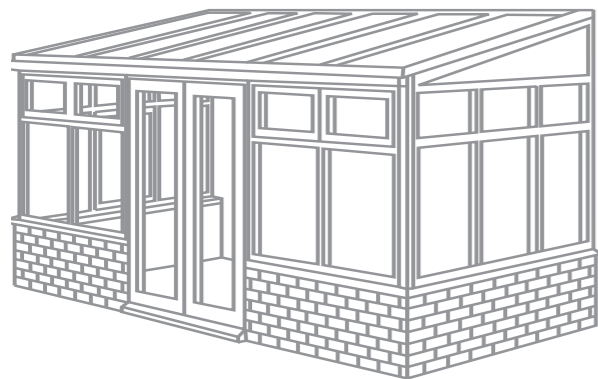
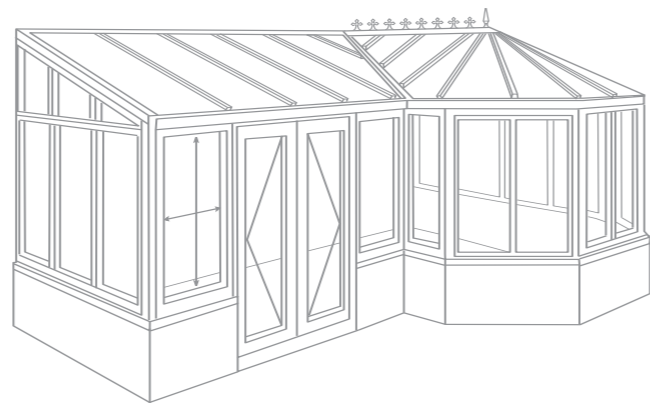
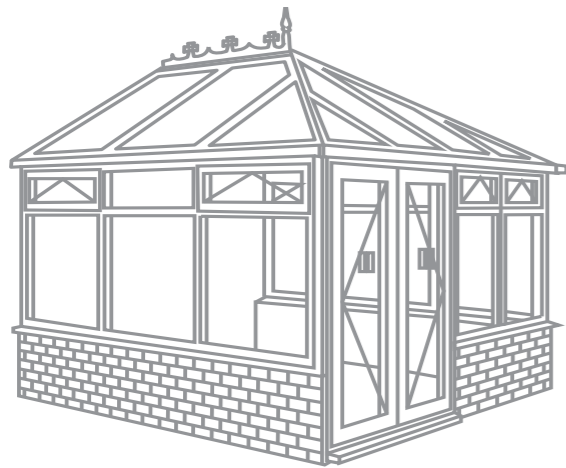
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ECLIPSE Technical data sheet No 9 – CONSERVATORIES



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Key Features List

- Eclipse 70mm frame depth products can be combined for enhanced aesthetic appearance
- Casement Windows, Tilt & Turn Windows, Residential (single leaf) Doors, French Doors, In-line or Tilt & Slide Patio Doors may be used in combination
- Chamfered product design for slim sightlines
- Internal or External Beading options for casement windows
- Chamfered or sculptured bead designs
- Single Leg or Shuffle Bead options
- Dedicated PVCu screw ports for secure fixing of hardware
- Designed to accept the latest hardware innovations
- Products enable compliance with latest Building Regulations
- 24mm and 28mm sealed unit depths
- Unique coupling nut system enables products to be fixed to each other quickly and securely

Eclipse products, 70mm frame depth and low maintenance requirements ensure the Eclipse system is the perfect choice for beautiful conservatories. Specially design components for conservatories include sculptured bay poles for variable and 90° and 135° fixed angles.

Profile Finishes

Eclipse window and door products are available in the following finishes:

- White
- Rosewood
- Light Oak
- Rosewood on the outside, White on the inside
- Light Oak on the outside, White on the inside

For complimentary white infill panels and finishing trims the recommended colour references are RAL 9010 OR NCS 0502-414R.

Cleaning and Maintenance

PVCu is not affected by airborne pollution, salt, ozone or acid rain. In order to maintain the superior appearance of Eclipse products, frames should be wiped down with a mild liquid detergent as required. Proprietary brands of glass cleaners may also be used. The use of abrasive cleaning agents is not recommended as it may result in damage to the surface finish of the PVCu and/or glass.

On an annual basis lubricate all pivot points sparingly with light machine oil.

Manufacture

The versatile Eclipse range is the perfect system to create beautiful conservatories. Every Eclipse conservatory is unique and designed to complement its surroundings. A conservatory comprises a combination of Eclipse window and door products, which are manufactured or coupled together to form the 'walls' of the conservatory. The conservatory roof is sourced from a dedicated conservatory roof supplier who has developed and tested the roof in a variety of designs and wind and weather loadings. Please request details from your Installer on the particular conservatory roof for an individual installation. WHS Halo recommends that only BBA approved roofs are used with Eclipse products.

Applications

Eclipse conservatories are designed to withstand the vagaries of the UK and Irish climates. The wide range of glazing options, including pre-formed thermally insulated door panels provide for both traditional and modern tastes. The Eclipse system has been successfully used to construct Victorian, Edwardian, and Georgian conservatory styles, as well as 'Lean To' Conservatories and Sun Rooms and combination conservatories (eg P shaped). The slim sightlines of



Eclipse casement windows are made to order to the sizes and sash configurations specified by the customer, subject only to the following size limitations.

All dimensions are shown in mm						
Minimum Width	400	400	400	400	400	400
Minimum Height	400	400	400	800	800	800
Maximum Width	2000	1250	700	1800	1200	700
Maximum Height	2000	1250	1350	2000	2400	2400

All dimensions are shown in mm. All styles shown are as viewed from the OUTSIDE. The hinged side of the vent is designated by the point of contact between the window frame component and the pinnacle of the triangle depicting the vent. Sizes in brackets denote use of 70mm outerframe.

All dimensions are shown in mm							
Minimum Width	800	800	400	400	1200	1200	800
Minimum Height	400	400	800	800	400	400	800
Maximum Width	3600	3600	1200	700	3600	3600	1800
Maximum Height	1250	1350	2400	2400	1250	1350	2000

All dimensions are shown in mm								
Minimum Width	800	800	1200	1200	1200	1200	1200	1200
Minimum Height	800	800	800	800	800	800	800	800
Maximum Width	3600	1980	3600	1650	2250	1650	1650	3000
Maximum Height	1800	1350	1800	2400	1350	2400	2400	1650

Note: The individual friction stay manufactures weight capabilities should be referred to when calculating maximim sash sizes and sealed unit configurations.

ECLIPSE Technical data sheet No 5 – VERTICAL SLIDING SASH



Windows • Doors • Conservatories

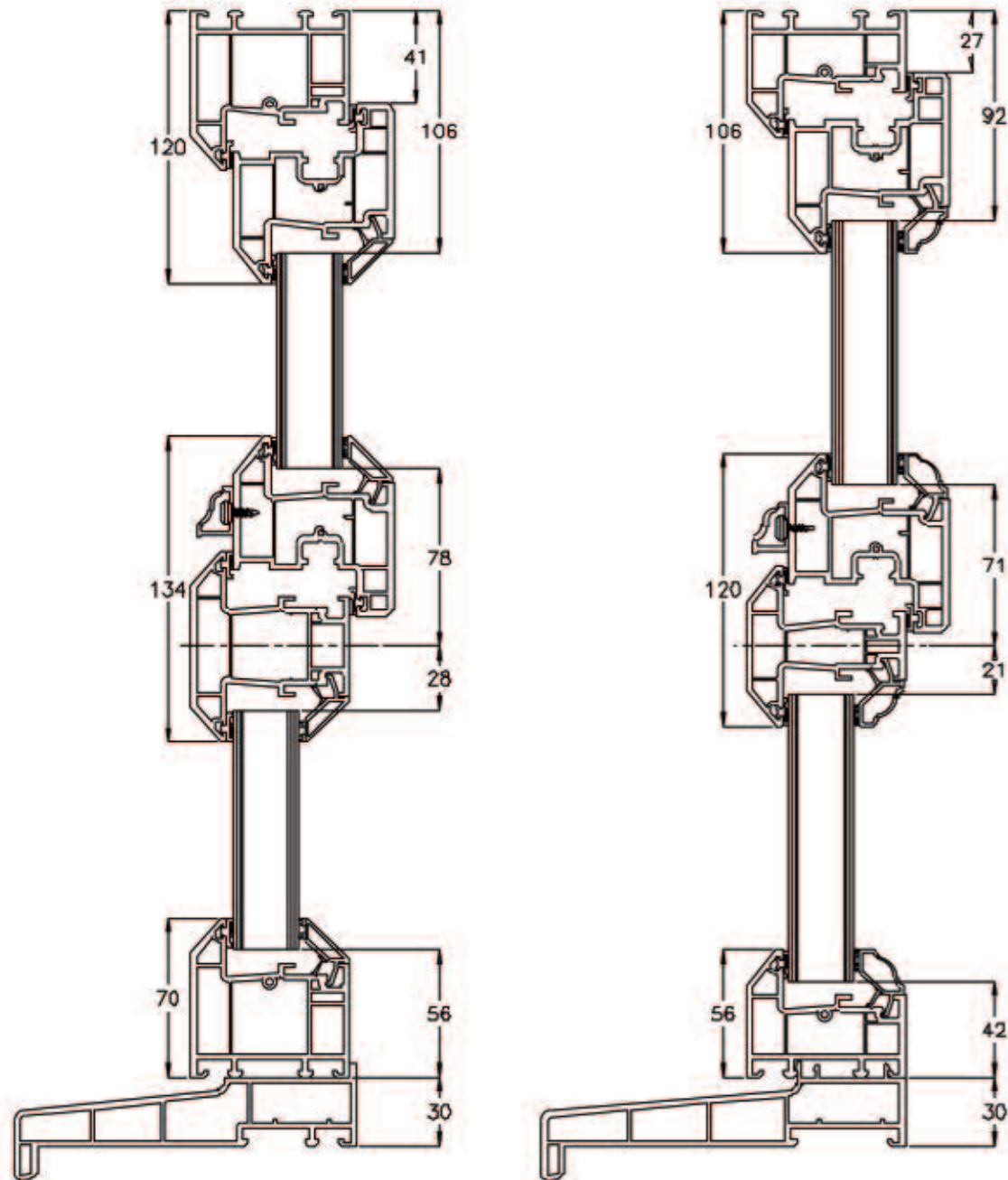
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As part of our policy of continuous improvement we reserve the right to alter specifications without prior notice

Typical cross section

Large and small sashes shown



Key Features List

- 146.5mm or 133mm frame depths to
- match existing box sash applications
- Small and large sashes allow a variety of sightline permutations
- Sculptured design to match traditional aesthetic lines
- Internally beaded
- Deep Bottom Rail option for additional authenticity
- Top and bottom sashes tilt inwards for ease of cleaning, subject to size limitations
- Traditional surface mounted Georgian bar arrangements
- Traditional hardware design and functionality
- Sculptured horn detail
- Optional travel restrictors
- 24mm sealed unit depths
- Installed in conservation areas
- Unique coupling nut system enables products to be fixed to each other quickly and securely

Manufacture

Each frame is designed to fit a specific aperture and is individually fabricated in accordance with the survey instructions and within pre-specified size parameters. The sashes are fusion welded to ensure a strong weather resistant joint. If the Deep Bottom Rail option is used, this is mechanically joined within the sash. The outerframe is fusion welded at the top and mechanically joined to its integral sill at the bottom. Where fusion welds are made, excess weld sprue can be mechanically or manually removed to leave a neat corner finish. Precise fixing of hardware is consistently achieved by the use of precision made jigs. Metal reinforcement is used in accordance with the detailed fabrication manual supplied by WHS Halo.

Applications

The Vertical Sliding Sash is an authentic replacement for traditional timber sash windows. Whilst preserving the aesthetic façade of traditional Georgian buildings, the Vertical Sash Window has the proven benefits and low maintenance appeal of a PVCu window. They are suitable for low and medium rise buildings and have been accepted in conservation areas.

Operation

Sashes are easily raised and lowered by using the sash lift and ring pull handles.

The tilt operation (where applicable) is used by moving the tilt latch knobs on the sash inwards and easing the sash into the tilted position, where it is held in place by a dedicated stay. To return to normal operation, the tilted sash is raised into the vertical position and the tilt latch knobs click into place in the outer frame.

Security

In the closed position the sashes are locked into place by a traditional cam catch arrangement. Cam catches can be key lockable for additional security.

Hardware Options

The old weights and pulleys of timber sash windows are replaced by sophisticated spring and spiral balances for reliable operation and longevity. The cam catches, sash lifts and ring pull hardware are available in gold, chrome and white finishes.

Travel Restrictors are also available. These prevent sashes being raised more than approximately 100mm without deactivation of the Travel Restrictor, which is allen key operated.

Profile Finishes

The Vertical Sliding Sash window is available in White only. For complimentary white infill panels and finishing trims the recommended colour references are RAL 9010 OR NCS 0502-414R.

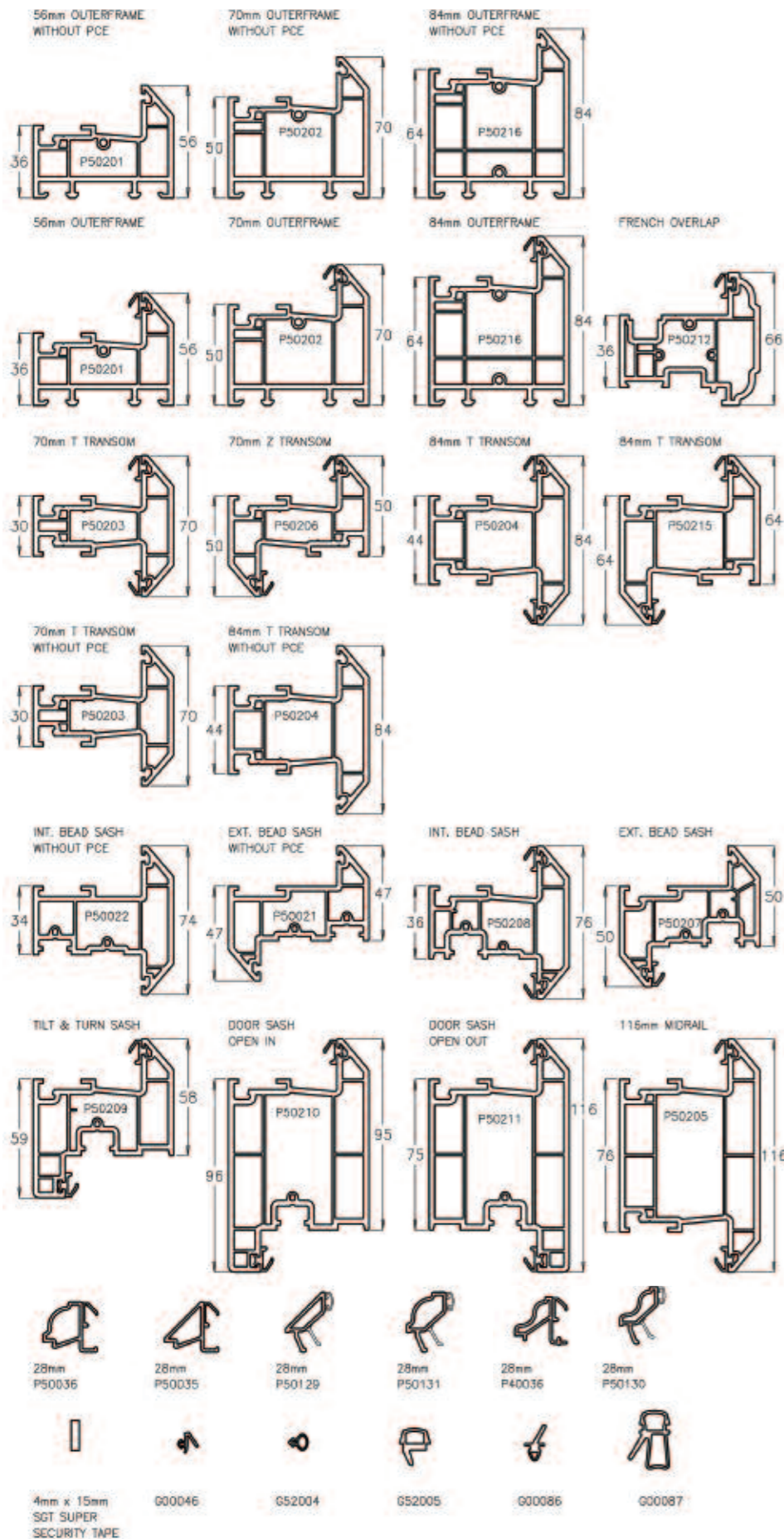
Cleaning and Maintenance

PVCu is not affected by airborne pollution, salt, ozone or acid rain. In order to maintain the superior appearance of Eclipse products, frames should be wiped down with a mild liquid detergent as required.

Proprietary brands of glass cleaners may also be used. The use of abrasive cleaning agents is not recommended as it may result in damage to the surface finish of the PVCu and/or the glass. On an annual basis lubricate all pivot points sparingly with light machine oil. In coastal areas it is also recommended that grease is regularly applied to the spiral balances to prevent corrosion and staining of PVCu profiles.



Typical cross section



Technical and Material Specifications

Eclipse window and door products offer true aesthetic appeal with compact profile designs that mirror the slim sightlines of traditional wooden windows, with the addition of 3 or 4 fully enclosed chambers for product strength and thermal performance. One of these chambers may be used to fit metal reinforcement if required by the installation specification. All Eclipse profiles are manufactured from acrylic high impact modified, unplasticised Polyvinyl Chloride compound (PVCu) especially formulated to suit the Central European climate.

Eclipse profiles measure 70mm front to back*, equivalent to the standard depth of timber products found in most British homes. The vast majority of PVCu installations can therefore be made with a minimum amount of 'making good' after the removal of old timber frames, or the replacement of first generation PVCu or aluminium windows.

*with the exception of In-line Patio Door and Vertical Sliding Sash profiles.

In addition to the outer packaging that provides protection during transportation, Eclipse PVCu profiles are delivered to fabricators with a layer of protective film on 2 faces of the profile. This protective film is normally left in position until product installation, after which it should be completely removed.

Product Performance and Accreditations
Independent product accreditation and testing provide a tangible means of demonstrating product suitability and reliability in practice. Eclipse products have been independently assessed and achieved accreditation from both the British Standards Institute and the British Board of Agrément. Products are tested in terms of Weather Performance and Security.

Environmental Concerns

WHS Halo fully accepts its environmental responsibilities and takes a lead in addressing environmental issues within the PVCu window industry. WHS Halo was one of the first companies to achieve ISO 14001 Environmental Management System and has pioneered a unique partnership to recycle post consumer windows of all material types.

In line with the requirements of Building Regulations, all Eclipse products are designed for energy efficiency and comply

with Part L of the Building Regulations when installed by FENSA registered installers or approved by Building Control.

Profile Finishes

The diversity of installation settings creates a need for various window and doors finishes. Eclipse offers a wide choice of finishes across its product range:

- White
- Rosewood
- Light Oak
- Rosewood on the outside, White on the inside
- Light Oak on the outside, White on the inside

NB Vertical Sliding Sash Windows are available in white only

For complimentary white infill panels and finishing trims the recommended colour references are RAL 9010 or NCR0502-414R.

Beads and Glazing

Eclipse PVCu windows and doors are designed to accept 24mm or 28mm sealed units. The profiles can be fitted with either single leg or shuffle beads, which are available in a choice of chamfered, convex and concave designs. Consideration must be given to the safety requirement of BS6262: 1982 when specifying the type of glass to be used. Include Bead diagram on page 9 of Spec Tech Guide

Installation

Products should be surveyed and installed in accordance with current British Plastics Federation/Glass & Glazing Federation Codes of Practice, relating to the survey and installation of high impact modified PVCu windows. Consideration must be given to the safety requirement of BS6262: 1982 when specifying the type of glass to be used.

In line with the requirements of all Building Regulations, Eclipse products are designed for energy efficiency and comply with Part L when fitted by FENSA registered installers or approved by Building Control.

The wide variety of ancillary profiles available to the Installer provides almost limitless scope for product design and installation. Carefully engineered, the ancillary profiles suite with the main profiles and greatly enhance both structure and appearance of installations.

Cleaning and Maintenance

PVCu is not affected by airborne pollution, salt, ozone or acid rain. In order to maintain the superior appearance of Eclipse products, frames should be wiped down with a mild liquid detergent as required. Proprietary brands of glass cleaners may also be used. The use of abrasive cleaning agents is not recommended as it may result in damage to the surface finish of the PVCu and/or the glass.

On an annual basis lubricate all pivot points sparingly with light machine oil.

BS7412 – Licence No KM 13589
– Windows manufactured by WHS Halo

BS7412 – BS7950 – License no KM 34442
– 'Improved Security Windows' Windows manufactured by WHS Halo

BBA – Certificate for Windows 99/3579
– Windows manufactured by WHS Halo

BBA – Certificate for Doors 89/2297
– Doors manufactured by WHS Halo

BBA - Enhanced Resistance to Intrusion
– Windows manufactured by WHS Halo

PAS 23 – Licence no KM61041
Performance standard. Doors manufactured by WHS Halo

PAS 24 – Licence no KM61042 Enhanced security standard. Doors manufactured by WHS Halo



ECLIPSE Technical data sheet No 8 – PATIO DOORS



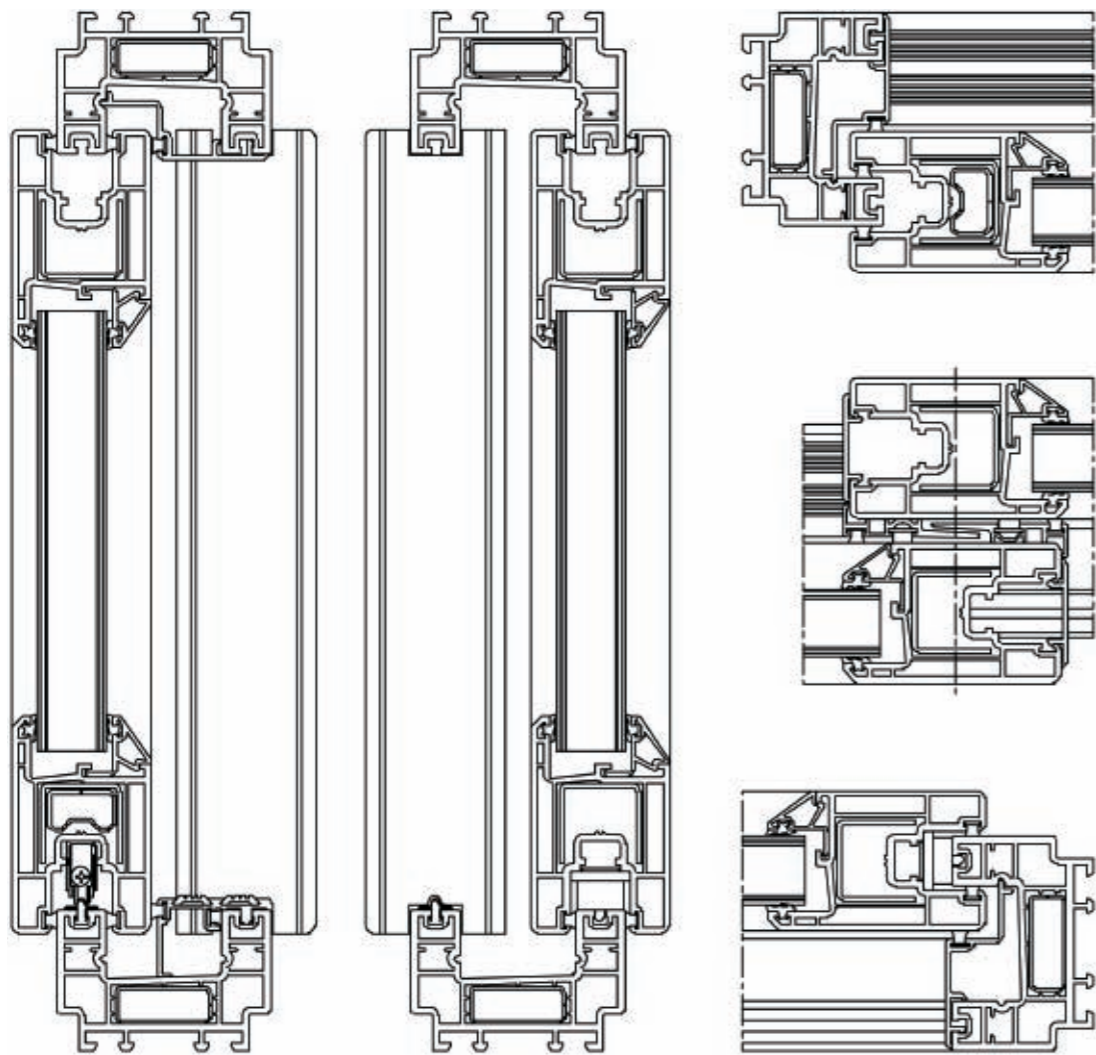
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Typical cross section



Tilt 'n' Slide Patio Doors

All dimensions are shown in mm.				
Minimum Width	1200	1200	1950	1950
Minimum Height	1800	1800	1800	1800
Maximum Width	2590	2590	3880	3880
Maximum Height	2500	2500	2500	2500

Eloquence In-Line patio doors and Tilt & Slide patio doors are made-to-order to the sizes and sash configurations specified by the customer, subject only to the following size limitations. All styles shown are as viewed from the OUTSIDE. The hinged side of the vent is designated by the point of contact between the window frame component and the pinnacle of the triangle depicting the vent.

In-Line Patio Doors ('Eloquence')

All dimensions are shown in mm.								
Minimum Width	1000	1000	1000	1000	2400	2400	2400	2400
Minimum Height	2000	2000	2000	2000	2000	2000	2000	2000
Maximum Width	3000	3000	3000	3000	4000	4000	4000	4000
Maximum Height	2400	2400	2400	2400	2400	2400	2400	2400

All dimensions are shown in mm.			
Minimum Width	3000	3000	3000
Minimum Height	2000	2000	2000
Maximum Width	5000	5000	5000
Maximum Height	2400	2400	2400

Key Features List

- 24mm and 28mm sealed units
- Chamfered sash and outerframe design for slim sightlines
- Option to have sculptured sash
- Dedicated PVCu screw ports for secure fixing of hardware
- Designed to accept the latest hardware innovations
- In-line and Tilt & Slide patios available
- Internal Beading
- Chamfered or sculptured bead designs
- Products enable compliance with latest Building Regulations
- Unique coupling nut system enables products to be fixed to each other quickly and securely

In-line Patios - Key Features

- Aluminium threshold with PVC inserts
- Available in 2, 3 and 4 panel configurations
- Profile reduces to 70mm frame depth enabling it to be effectively configured with other Eclipse products
- Aluminium interlockers
- Anti-lift devices fitted as standard

Tilt & Slide Patios - Key Features

- Tilt & Slide: 70mm frame depth ensuring aesthetically pleasing installations
- Tilt & Slide: Available in 2 and 3 panel versions
- Tilt & Slide: Single Leg or Shuffle Bead options

Manufacture

Each patio door set is designed to fit a specific aperture and is individually fabricated in accordance with the survey instructions and within pre-specified size parameters. Fabricated frames are fusion welded to ensure a strong weather resistant joint. Transoms and mullions are either welded or mechanically joined. The outerframe for the In-line Patio may be either welded or mechanically joined. Excess weld sprue can be mechanically or manually removed to leave a neat corner finish. Precise fixing of hardware is consistently achieved by the use of precision made jigs. Metal reinforcement is used in accordance with the detailed fabrication manual supplied by WHS Halo.

Applications

The 2 Eclipse Patio Door styles, In-line and Tilt & Slide offer different features to the specifier and homeowner. The In-line Patio Door is more traditionally used, However, the continental style of the Tilt & Slide Patio Door has gained a certain niche in the market. Both patio door formats can be designed to include a wide range of glazing options, which may be combined in an extensive series of configurations. They are suitable for low or medium rise buildings. Their slim sightlines and low maintenance

requirements make them ideally suited for private or public sector housing, new build and refurbishment projects.

Operation

Eclipse In-Line Patio Door – The cylinder lock is key operated and can only be activated when the locking lever is in the closed position and the strikers are located into their respective keeps/striker plates. When the locking lever is in the open position the door can slide open; a pre-positioned door stop prevents the sliding leaf from being opened too wide.

Eclipse Tilt & Slide Patio Door – These doors feature a similar locking system to the Eclipse Tilt & Turn Windows. A sophisticated hinge and locking mechanism enable the door to be opened into a Tilt position only or into a normal opening position. A turn of the operating handle releases the top of the door leaf to tilt inwards to a ventilation position, and is retained by a cantilevered stay. On closing the leaf and further rotating the handle, the hinge mechanism is engaged allowing the leaf to swing open inwards for access.

Security

Patio Doors must be locked with a key or thumb turn cylinder to fully activate the security features of the lock.

Hardware Options

Handles are available in a choice of finishes. For Tilt & Slide Patio Doors a handle set is usually fitted to the internal face of the door only.

Profile Finishes

Eclipse Patio Door products are available in the following finishes:

- White
- Rosewood
- Light Oak

For complimentary white infill panels and finishing trims the recommended colour references are RAL 9010 OR NCS 0502-414R.

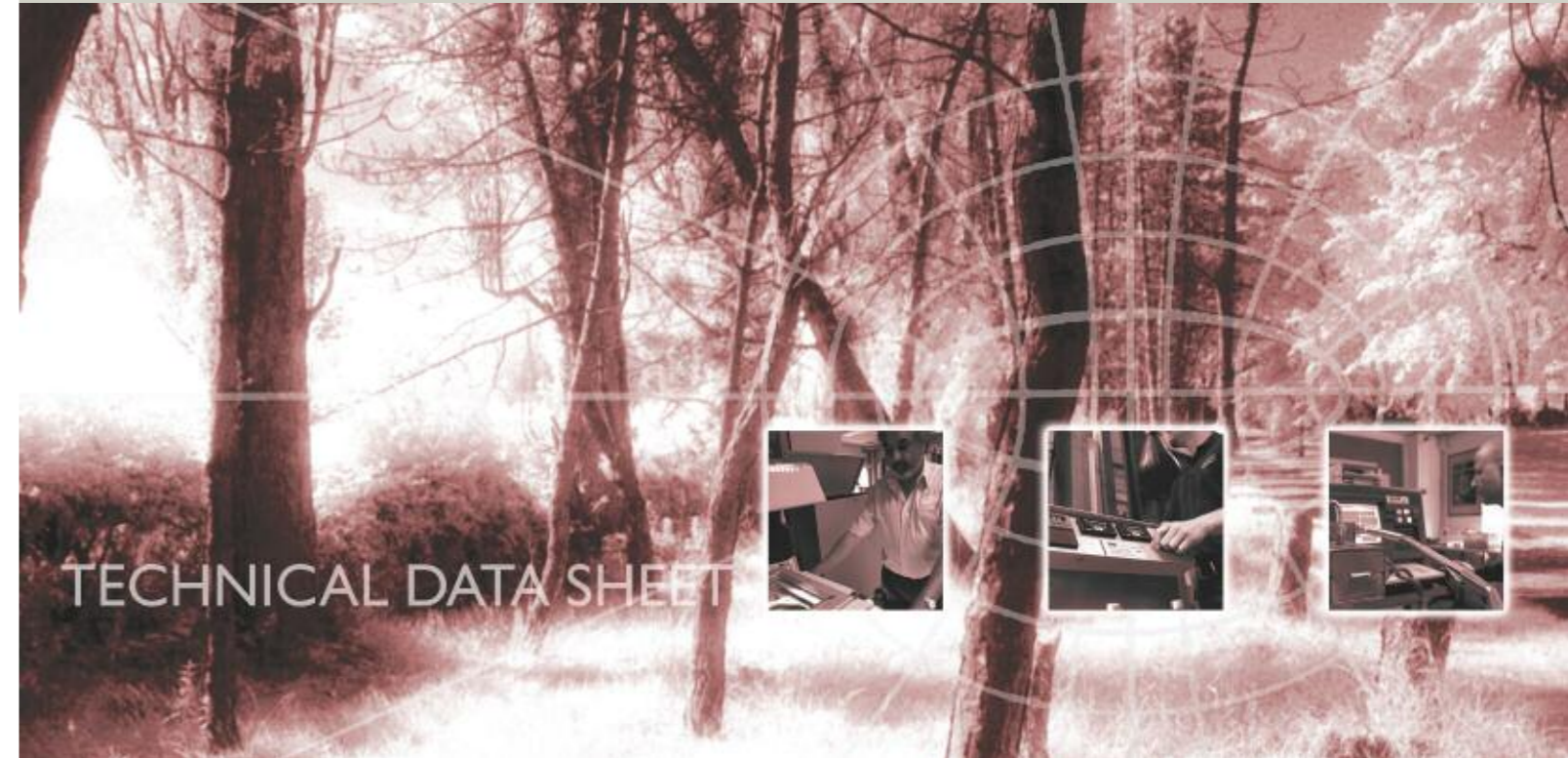
Cleaning and Maintenance

PVCu is not affected by airborne pollution, salt, ozone or acid rain. In order to maintain the superior appearance of Eclipse products, frames should be wiped down with a mild liquid detergent as required. Proprietary brands of glass cleaners may also be used. The use of abrasive cleaning agents is not recommended as it may result in damage to the surface finish of the PVCu and/or the glass.

On an annual basis lubricate all pivot points sparingly with light machine oil.



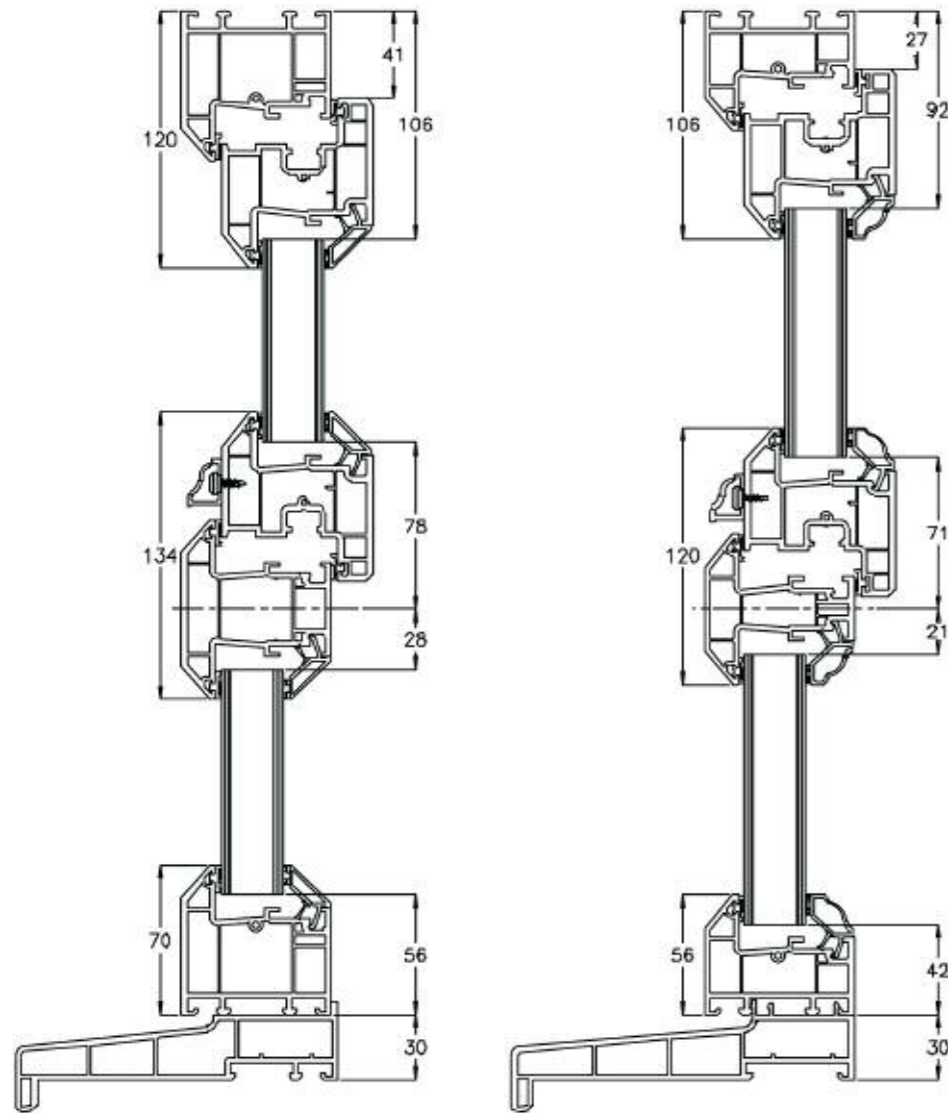
ECLIPSE Technical data sheet No 4 – TILT & TURN WINDOWS



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Typical cross section



All dimensions are shown in mm

Tilt & Turn windows are made-to-order to the sizes and sash configurations specified by the customer, subject only to the following size limitations.

All dimensions are shown in mm.			
Minimum Width	600	1600	1000
Minimum Height	600	1000	600
Maximum Width	1500	1500	3000
Maximum Height	1500	3000	1500

All dimensions are shown in mm.			
Minimum Width	1200	1600	1400
Minimum Height	600	600	600
Maximum Width	3000	3000	3000
Maximum Height	1500	1500	1500

Note:
- Also A41147 / P10175 can be used to strengthen the mullion. This page must be read in conjunction with page 3.6.01, detailing the height and width relationship of sash, and weight carrying capacity of gearing.

It is possible to fabricate frames where the height greatly exceeds the width if hardware restrictions permit.

Key Features List

- 70mm frame depth ensuring aesthetically pleasing installations
- Inward opening
- Chamfered product design for slim sightlines
- Internal Beading
- Chamfered or sculptured bead designs
- Single Leg or Shuffle Bead options
- Dedicated PVCu screw ports for secure fixing of hardware
- Designed to accept the latest hardware innovations
- Products enable compliance with latest Building Regulations
- 24mm and 28mm sealed unit depths
- Unique coupling nut system enables products to be fixed to each other quickly and securely
- Products tested to meet or exceed the performance requirements of BS7412 Wind and Water Testing – Classification Severe
- Products tested to meet or exceed the latest security standards, BS7950
- Products tested to BBA Weather Performance and Enhanced Resistance to Intrusion standards

Manufacture

Each frame is designed to fit a specific aperture and is individually fabricated in accordance with the survey instructions and within pre-specified size parameters. Fabricated frames are fusion welded to ensure a strong weather resistant joint. Transoms and mullions are either welded or mechanically joined. Excess weld sprue can be mechanically or manually removed to leave a neat corner finish. Precise fixing of hardware is consistently achieved by the use of precision made jigs. Metal reinforcement is used in accordance with the detailed fabrication manual supplied by WHS Halo.

Applications

The Eclipse Tilt & Turn window range was originally designed for continental Europe to complement the typical housing designs that have historically been built there. It has become popular in the British Market where an inward opening window is required. Tilt & Turn windows can be combined in an extensive series of configurations, with or without fixed lights and are suitable for low, medium and high rise buildings. The slim sightlines, 70mm frame depth and low maintenance

requirements make them ideally suited for private or public sector housing, new build, refurbishment projects and for many commercial and industrial applications.

Operation

Eclipse Tilt & Turn windows feature a sophisticated hinge and locking mechanism which provides excellent security, and versatility in sash opening formats.

A turn of the operating handle releases the top of the sash to tilt inwards to a ventilation position that is retained by a cantilevered stay. On closing the sash and further rotating the handle, the hinge mechanism is engaged allowing the sash to swing inwards for glass cleaning. A 'Turn' before 'Tilt' option is also available.

Security

In the closed position the sash is held securely against the frame by espagnolette locks around its perimeter. This provides high security and an even distribution of closing pressure that pulls the weatherseal tight against the frame, providing an effective seal and superior weather performance.

Hardware Options

Handles are available in a wide choice of finishes and as either locking or non-locking versions. 'Press to operate' handles provide a further safety feature when required.

Profile Finishes

Eclipse Tilt & Turn products are

available in the following finishes:

- White
- Rosewood
- Light Oak
- Rosewood on the outside, White on the inside
- Light Oak on the outside, White on the inside

For complimentary white infill panels and finishing trims the recommended colour references are RAL 9010 OR NCS 0502-414R.

Cleaning and Maintenance

PVCu is not affected by airborne pollution, salt, ozone or acid rain. In order to maintain the superior appearance of Eclipse products, frames should be wiped down with a mild liquid detergent as required. Proprietary brands of glass cleaners may also be used. The use of abrasive cleaning agents is not recommended as it may result in damage to the surface finish of the PVCu and/or the glass. On an annual basis lubricate all pivot points sparingly with light machine oil.

