slimlite Self-cleaning Double Glazed Units

Self-cleaning glass the latest permanent Hydrophobic Nanostructure innovation for Slimlite Double Glazed Units
TEN YEAR GUARANTEE

A First Class Quality Product

SLIMLITE CHANGES THE FACE OF DOUBLE GLAZING

Slimlite Self-cleaning has an invisible glass coating which forms a permanent covalent fused bond to the glass at a few atoms thick nanoscale structure which cannot be removed by water cleaning agents or high pressure equipment and is more scratch resistant than ordinary glass and improves Light Transmission by about 2%.

The nanoscale coating is water and dust repellent and dramatically changes the rain water sheeting effect to a small scattered globule effect improving vision and accelerating the downwards action of the globules carrying away most surface dirt, depending on the amount of rain.

The nanoscale coating changes the original glass surface from Hydrophillic (Water Loving) to Hydrophobic (Water Hating) activating a self-cleaning action.

Self-cleaning action

Let nature do the work

City Of Edinburgh - Listed Buildings

Edinburgh City Council, Historic Scotland and Edinburgh World Heritage have approved the use of Slimlite Double Glazed Units for A Listed and B Listed Buildings in Edinburgh which has the largest stock of Listed Buildings of any City in the UK except London.

Slimlite Double Glazed Units are Premier Quality Units with high guaranteed gas content and insulation value. Light Transmission 75% Ultra Violet Transmission 36%, Solar Gain 67% and edge taped for extra protection.

> "It is not often that I get completely blown away by a building product, but I find this absolutely extraordinary, looks like a single pane of glass."
>
> **Kevin McCloud**
> Grand Designs TV 2009

SashGlass
Slimlite Double Glazed Units

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Specialist slimlite double glazed units - reproduction crown sheet

slimlite Self-cleaning Double Glazed Units

slimlite Double Glazing the original patent innovation of the new very slim units with a very small perimeter edge seal of only 5mm for fitting to most existing single glazed windows or new windows to maintain the desired appeal of the slim glazing bar or astragal have now introduced another Self-cleaning aspect to Slimlite for the external glass.

Self-cleaning refers to the ability of a nanostructure invisible coating applied to the glass a few atoms thick which forms a permanent covalent fused bond to the glass. This has the effect of changing the glass surface from Hydrophillic or 'Water Loving' to Hydrophobic or 'Water Hating'

This changes the water sheeting effect of the rain on the glass to a scattered spherical or globule effect from the rain and the 'Water Hating' glass surface encourages the water globules to run downwards, carrying away any dirt or atmospheric contamination leaving the glass reasonably clean. The scattered globule effect over the surface of the glass has the surprising effect of substantially increasing visibility during the rain.

slimlite Self-cleaning Double Glazed units are guaranteed for a period of 10 years. See detail on glazing and cause of unit breakdown.

Incredible Clear Vision During Rainfall

This naturally hydrophobic phenomenon can be seen on the leaf of a Lotus Plant and similarly on a Nasturtium leaf where the rain will form globules or spherical shapes which run off the leaf carrying away dust or dirt.

See simulation on our website at:
www.sashglass.co.uk/self-cleaning-glass.html

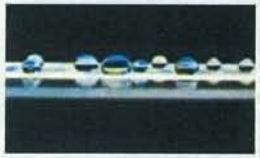
Lotus Leaf

Hydrophobic Glass

Most people assume that normal glass is smooth which is not the case as can be seen from microscopic photograph.

Rough Surface

Coated Glass



The amount of rain will affect the self-cleaning action. Heavy rain will accelerate the self-cleaning and light rain more slowly effective and a fog like atmosphere may provide insufficient moisture to activate the self-cleaning action, or may leave tiny globules of rain water which are too small to drain downwards and will dry off naturally and may occasionally leave small specks if the atmosphere is fairly heavily contaminated.

Whilst the nanostructure coating is also dust resistant, when there are long periods of dry weather and there is atmospheric contamination, the glass because of the Hydrophobic properties, enables the glass to be cleaned easily with a spray of water or hosepipe. Self-cleaning does not mean totally maintenance free particularly when heavy pollution occurs with insufficient rain. Similarly where windows are sheltered from the rain or where the top part of a window is also partly sheltered a spray of water or hosepipe is all that is required to complete the cleaning action.

Where there is sufficient rain the Hydrophobic properties of the glass coating will always ensure reasonably acceptable clean glass other than in sheltered areas.

Existing Glass in Buildings

It is also possible to have the Hydrophobic coating applied to existing glass in windows. As the glass is termed 'old glass' it requires a special cleaning process before application of coating to provide the same invisible permanent covalent fused bond to the glass, to provide the Self-cleaning Action.

Vehicle Windscreen - Incredible Hydrophobic Effect

An application of this Hydrophopic Nanostructure coating to a windscreen improves visibility during rain by 30% and improves driver response by 25%. (Independent Study)

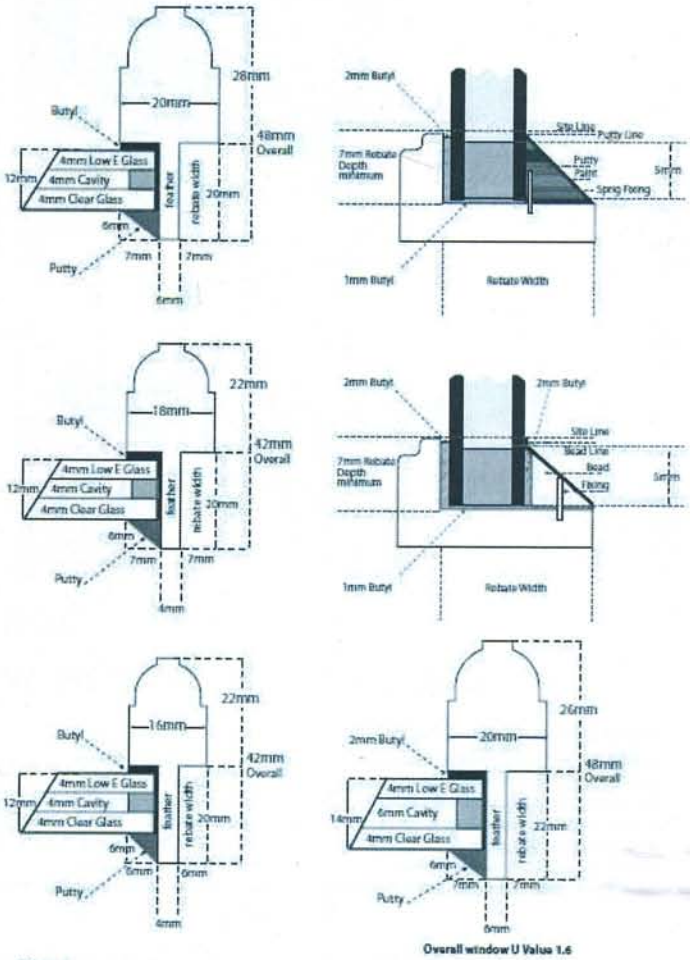
Windscreen Guarantee	2 Years
Side Windows	5 Years

See video on our website at:
www.sashglass.co.uk/self-cleaning-glass.html

slimlite Self-cleaning Double Glazed Units

- Nominal Cavity Widths: 3.0mm - 4.0mm - 5.0mm - 6.0mm - 8.0mm - 10.0mm. Other cavities and triple cavities on application.
- Standard overall Perimeter Seal Depth - 5.0mm (overall tolerances + or - 1mm)
- Minimum timber rebate depth - 7.0mm

Section Standard astragal or glazing bars with Slimlite (not to scale).



Overall window U Value 1.6

Note

Glazing sizes should be less 2 or 3mm from height and 2 or 3mm from width. Allowance should be made where frame sizes are irregular.

Certification CE BSEN1279 APPROVED

To manufacture double glazed units, certification is required for BSEN1279 Part 2, production quality and BSEN1279 Part 3, which relates to gas leakage at less than 1% per annum.

slimlite Certification

Certificate BSEN1279 Part 2 BSI 262/4677672 (Production Quality)
Certificate BSEN1279 Part 3 BSI 371/7758378 (Gas Leakage)
Certificate BSEN673 UKAS Certified U-Value (Insulation)
Certificate BSEN150 8990. National Physical Laboratory Thermal Transmittance

Safety Glass Standards

Toughened glass, Class 1 BSEN 12150
Laminated glass, Class 2 BSEN 14449

Constructed 3 or 4mm Low E/3.0mm Cavity, gas/3 or 4mm clear float or Reproduction Crown	U Value 2.1	9mm, 10mm, 11mm
Constructed 3 or 4mm Low E/4.0mm Cavity, gas/3 or 4mm clear float or Reproduction Crown	U Value 1.9	10mm, 11mm, 12mm
Constructed 3 or 4mm Low E/5.0mm Cavity, gas/3 or 4mm clear float or Reproduction Crown	U Value 1.7	11mm, 12mm, 13mm
Constructed 3 or 4mm Low E/6.0mm Cavity, gas/3 or 4mm clear float or Reproduction Crown	U Value 1.4	12mm, 13mm, 14mm
Constructed 3 or 4mm Low E/8.0mm Cavity, gas/3 or 4mm clear float or Reproduction Crown	U Value 1.3	14mm, 15mm, 16mm
Constructed 3 or 4mm Low E/10.0mm Cavity, gas/3 or 4mm clear float or Reproduction Crown	U Value 1.2	16mm, 17mm, 18mm

Warm Edge Spacer

It is generally considered that warm edge spacer used in Slimlite Construction will improve current centre pane stated U Values by 0.1 - 0.2.

Triple slim**lite** Double Glazed Units available on application.

slimlite – Gas Content-Gas Leakage Certificate BSI 371/7758378 Krypton/Xenon inert gas

Double Glazed Units have a gas leakage rate and are required to have a gas leakage certificate at a rate less than 1% per annum which is BSEN1279 Part 3. The standard gas fill required is 90%, but Slimlite has an average gas fill of 96.5% and certified average leakage loss at 0.77% per annum. Therefore Slimlite has approximately 7% more gas over a period of 10 years at 89.32% and 20 years at 82.67% compared to a standard unit gas 90% fill with resulting loss at 79.33% at ten years and 74.33% at 20% years. Loss of inert gas will decrease the insulation of a double glazed unit which is important in today's escalating energy costs.

slimlite Double Glazed Units a Certified Quality Product

Low E Glass explained

Low E Glass is short for Low Emissivity glass which is an emissivity coating either forming part of the glass or applied to one face of a glass pane. This reflects part of the long wave radiation or heat back into a room.

Hard Coat Low E Glass

Hard coat is referred to as Pyrolytic which means it is applied during glass manufacturer forming a permanent part of the glass which is hard and therefore referred to as Hard Coat.

Soft Coat Low E Glass

Soft Coat is an emissivity coating applied to glass after manufacture by vacuum deposit, which is soft not forming part of the glass and therefore referred to as Soft Coat.

All Slimlite units are manufactured with Hard Coat Low E unless otherwise requested. All emissivity glasses have a slight tint.

Guarantees

slimlite Hard Coat - 10 year guarantee

slimlite Soft Coat - 5 year guarantee

Reproduction Crown Glass - Historic and Heritage applications (see indicative illustration on back page).

Dummy Glazing Bars or Astragals - See Pilkington UK Technical Bulletin Ref M17 Date 13 October 2011.

Sound Reduction and U-Values

Sound reduction with double glazed units is an increasing concern for clients and specifiers to improve habitations where noise is a problem, generally in heavily populated areas.

Slimlite Double Glazed Unit cavities are filled with a mixture of Krypton and Xenon inert gases which are much heavier than the standard Argon and therefore provide much better sound reduction than standard units. The widths of cavities has little or no effect on sound reduction. Therefore each cavity will have the same effect.

Sound reduction in standard double glazed units 2 panes of 4mm glass with Air Cavity - 25 Decibels.

slimlite Double Glazed Units - Sound Reduction (Acoustic Insulation)

Constructed:

Example: Normal noise reduction RW = 31 Decibels - Traffic C_{tr} = 27 Decibels

4mm Low E/4mm Cavity, gas/4mm clear	31 Decibels,	Traffic 27 Decibels,	U-Value 1.9
4mm Low E/5mm Cavity, gas/4mm clear	31 Decibels,	Traffic 27 Decibels,	U-Value 1.7
4mm Low E/6mm Cavity, gas/4mm clear	31 Decibels,	Traffic 27 Decibels,	U-Value 1.4
4mm Low E/8mm Cavity, gas/4mm clear	31 Decibels,	Traffic 27 Decibels,	U-Value 1.3

Other Constructions - Sound Reduction

Constructed:

6mm Low E/4mm Cavity, gas/4mm clear	33 Decibels,	Traffic 30 Decibels,	U-Value 1.9
4mm Low E/4mm Cavity, gas/6.8 Optiphon	35 Decibels,	Traffic 31 Decibels,	U-Value 1.9
4mm Low E/4mm Cavity, gas/10.8 Optiphon	38 Decibels,	Traffic 34 Decibels,	U-Value 1.9

Sound is measured over a range of frequencies and sound reduction is shown in Decibels, and a 3 Decibel reduction in sound will be very noticeable.

The higher decibel figure reflects increased sound reduction.

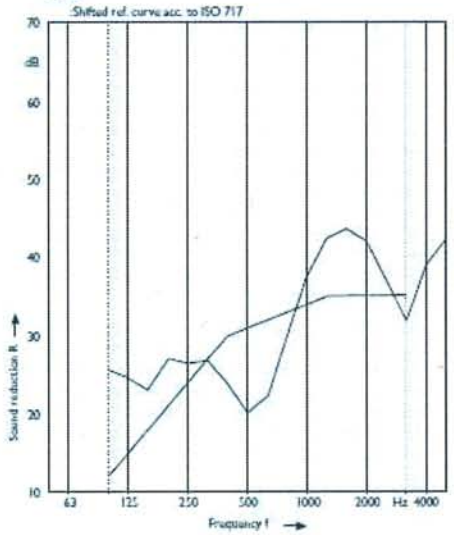
Sound Insulation ISO 717 (1982) Issued by University of Salford (Acoustics Test Laboratory) UKAS ACCREDITED TEST LABORATORY NO. 1262

Client: Slimlite Double Glazing **Test specimen mounted by:** Client **Description of the specimen:** 4mm/4mm, cavity gas/4mm
Product identification: Double Glazed Unit **Test room identification:** Small Reverberation Room / Large Reverberation **Date of test:** 08-07-09

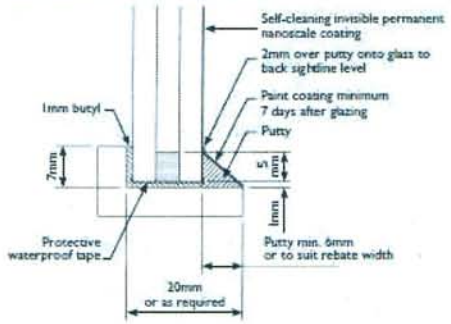
Size: 0.589 m² **Mass per unit:** 18 kg/m²
Temperature [°C]: 21.9 **Humidity [%]:** 50.4
Source room Volume: 136 m³ **Receiving room Volume:** 220m³

Frequency [Hz]	R 1/3 oct. [dB]
50	--
63	--
80	--
100	25.7
125	24.6
160	23.1
200	27.1
250	26.5
315	26.7
400	24.0
500	20.1
630	22.4
800	30.7
1000	37.9
1250	42.3
1600	43.7
2000	41.9
2500	37.3
3150	32.2
4000	39.1
5000	42.2

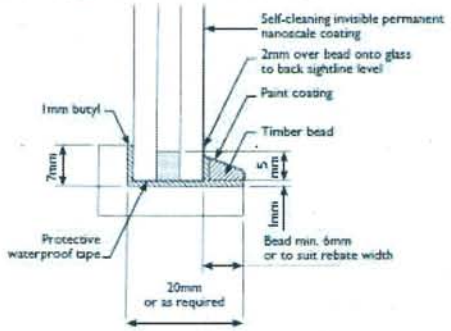
FREQUENCIES 50, 63 & 80 Hz ARE NOT UKAS ACCREDITED



slimlite glazed with putty & butyl



slimlite glazed with beads & butyl



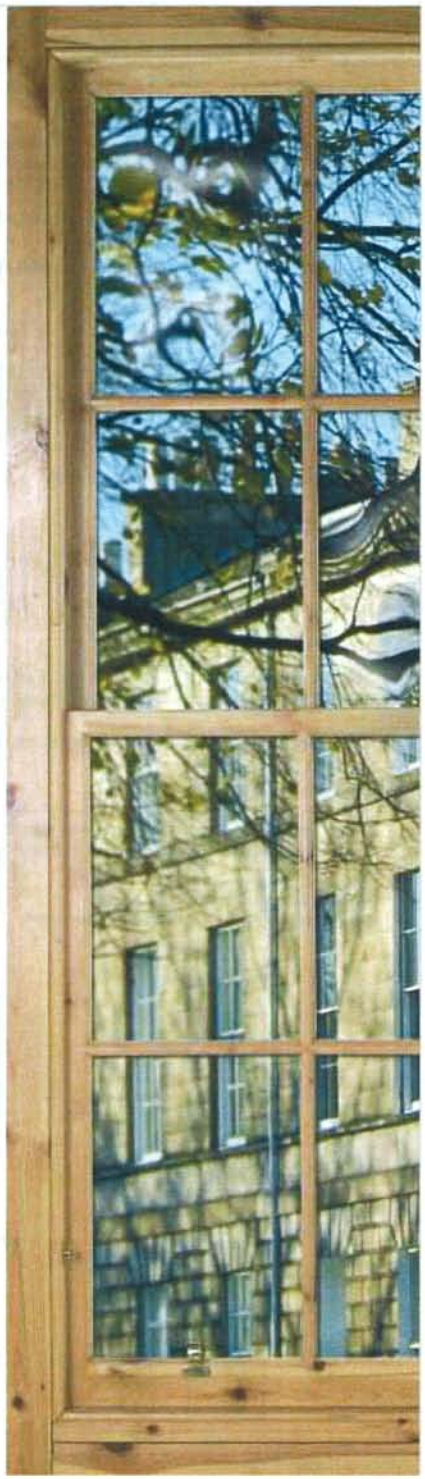
Double Glazing Breakdown or Misting

This is caused by failure of the glazing method which must protect the unit seal from the ingress of water or moisture. All double glazing sealants used in the manufacture of double glazing units have a moisture vapour transmission rate when exposed to water or moisture, which will cause misting or breakdown eventually over a period of time. Where units are foreputtied, the putty must be painted and on to the glass to provide a seal to protect the putty from moisture ingress. Foreputty should be left for 7 to 10 days before painting and within 28 days. Similarly when glazed with beads and non hardening compound, paint or protective coating should be applied over the bead and on to the glass. Where timber preservative has been used, Manufacturer's instructions should be followed to prevent reaction with glazing compound. All Slimlite Self Cleaning Unit are edge taped with a strong adhesive aluminium foil which helps to avoid damage during handling, but most importantly provides some extra protection should glazing failure occur allowing ingress of water or moisture.

It is recommended that timber windows should be painted every five years Inland areas and three years Coastal areas. However it is recommended that the paint protection of the glazing including the overlap on to the glass face, should be repainted every three years to maintain the required protection particularly with putty fronting as a minimum. However more frequent 'spot painting' may be necessary to maintain the required standard of protection.

BS6262 Section 9.3.2.4.2

BS6262 Section 9.3.3.2



Construction Materials of Slimlite Double Glazed Units

Slim**lite** is probably the most innovative product to arrive in the Double Glazing Industry for many years and was achieved by utilising the very latest technology and best products available.

Glass

There are two types of emissivity glass referred to as (Low E). Soft Coat and Hard Coat. Soft coat is applied to one face of the glass often manufactured by vacuum deposit. The other hard coat is applied to the glass during manufacture and forms part of the glass. Hard Coat is the selected Low Emissivity glass for Slimlite and should provide long term stability.

Spacer

Super Spacer is a North American, structural foam spacer with integral drying agent and is referred to as warm edge technology. This ensures there is no significant thermal difference around perimeter edge of unit, with significant advantages over other spacers, and is considered to reduce the calculated U Value by 0.1-0.2.

Sealant - Bostik 5000 Insulating Glass Sealant (Approx.) Typical Performance

Moisture Vapour: <0.1g/m² per day for 2mm film
Transmission Rate: at 25°C (77°F), 100% RH.
(ASTM method E96)

Inert Gases

Krypton and Xenon are the best inert gases on the market, particularly for small cavities. They are also heavy gases, which is reflected in the superior sound reduction figures for Slim**lite** and additionally provide very good thermal insulation but are more expensive than Argon used in standard units.
Most manufacturers use Argon, a very light inexpensive gas which has little or no effect on sound reduction.

Solar Gain

Everyone knows that when the sun shines through a window, the room heats up from solar gain. This solar gain now forms part of the energy calculations to improve window energy ratings. There is therefore a desire to improve the solar gain through a double glazed unit by using glass with good solar gain, to increase the overall window rating.

However double glazed units in general are now providing much better insulation which substantially reduces heat loss and therefore any lengthy exposure to solar gain from large areas of double glazing can cause a room to become extremely hot as evidenced in conservatories requiring blinds, as heat cannot escape fast enough. A very important factor when choosing double glazing.