

# ADVANTAGES OF WARM EDGE TECHNOLOGY

## Improved Thermal Efficiency

Thermally efficient windows can help to reduce heat loss by up to 94%. Thermobar can contribute towards improving the overall U-value or Window Energy Rating of Windows to help to swing a rating from a 'B' to an 'A', or even from an 'A' to an 'A+' or 'A\*'. Warm edge integral glazing bars and duplex fittings are also available for the complete warm edge unit. When designing zero carbon homes, every point counts.

## Aesthetics and Sight Lines

Thermobar warm edge spacers are available in a range of colours to blend naturally with any window frame. The straight sight line and smooth finish can complement any architectural designs.

## Condensation Resistance

Up to 70% reduced condensation with warm edge glazing. By reducing heat loss and keeping the inner glass pane warmer, windows with warm edge spacer are much less likely to develop condensation. Less condensation will lower the chance of potentially harmful mould and bacteria growth that could trigger health problems such as asthma and dermatitis.

## Glass Surface Temperature

Up to 80% of energy lost through a window occurs at its edge. The extremely low conductivity value of warm edge spacers such as Thermobar means less of a variation in the surface temperature of the glazing unit. See thermal images within this document showing the areas of most heat loss where the glazing bars are located.

## Suitable for Triple Glazing

Thermobar rigid spacer system is structurally sound and is currently available in a range of sizes suitable for use in higher performance triple glazing units.

## Sound Absorption

Windows manufactured including warm edge spacer can absorb more noise than traditional windows. Ideal for incorporation in areas where noise could be an issue.

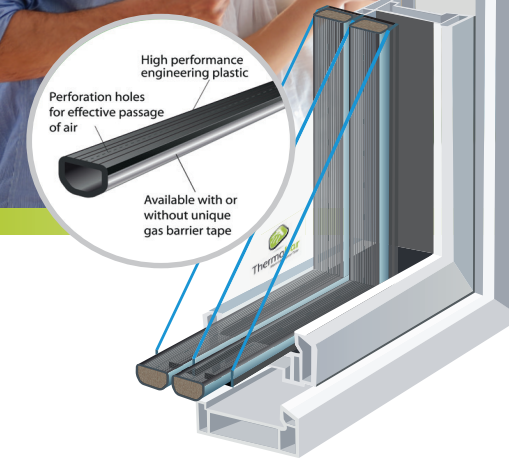
## Gas Retention

Thermobar superior sealed units can easily achieve the European standard EN-1279 Part 3 for minimising gas loss.

## Preferred by Manufacturers

Thermobar is the preferred spacer system of many UK insulated glass sealed unit manufacturers.

A superior technology designed to minimise energy loss through your glass sealed units



**WARM EDGE WINDOW COMPONENTS ENGINEERED FOR SAVINGS**

SAVE energy with the lowest conductivity spacers - **0.14W/mK**

SAVE energy with lowest Psi Values

SAVE energy with reduced overall window U-values

SAVE costs on the best futureproof window components

Helps to achieve A+ and A\* Window Energy Ratings

Our spacers are the result of over 35 years of dedication to insulated glass. We understand the conditions within a glazing unit and how each component performs within the lifetime of the unit. This helps us to ensure that the components we manufacture and supply are second-to-none.



Thermal Conductivity: **0.14 W/mK**

	Plastic window frame	Wood window frame
Double Glazing	0.032	0.031
Triple Glazing	0.030	0.029

Above Psi values based on BF Data Sheet www.bundesverband-flachglas.de Lower Psi values achievable with Hot Melt



**Thermobar™**  
Warm Edge Spacer Tube

**TO DISCOVER MORE ABOUT THERMOBAR OR THERMOFLEX WARM EDGE SPACERS AND OUR 1,500 GLAZING COMPONENTS visit [www.thermosealgroup.com](http://www.thermosealgroup.com) or call 0845 331 3950 Intl. +44 121 3313950**

## Request Further Information

1. Thermobar Product Catalogue
2. Thermobar Insulated Glass Manufacturing Guide
3. Thermobar Manufacturing Tips for producing long-life units
4. Thermobar Saw Blade Guide
5. Thermobar RAL Colour Chart
6. Thermobar Gas Collars and Plugs Guide
7. Thermobar Bending Equipment for a range of spacer bars
8. Thermobar Warm Edge Leaflet
9. Thermobar Window Installers-Fabricators Leaflet
10. Thermobar Architecture-Specifier-Builder Leaflet
11. Thermobar Duplex Systems & Interbar/Muntin
12. Thermobar Technical Data Sheet
13. Thermobar Material Safety Data Sheet
14. Thermobar Bundesverband Flachglas Psi Value Data Sheet
15. Thermobar CE Marking Declaration Letter
16. BFRC details of substitution of in current WER Simulations
17. Thermobar EN1279 Test Reports
18. Thermobar Sample Box
19. Thermobar Sealed Unit Low Tack Glass Stickers

Documentation can be downloaded at [thermosealgroup.com](http://thermosealgroup.com). Request password details from [marketing@thermosealgroup.com](mailto:marketing@thermosealgroup.com)

**THERMOSEAL GROUP**

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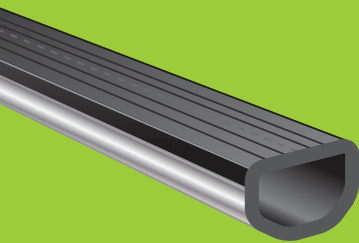
**Thermobar**  
Warm Edge Spacer Tube



Manufactured in the UK

For more information you can find us at:  
[www.thermobarwarmedge.com](http://www.thermobarwarmedge.com)

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## WHY THERMOBAR IS THE WARM EDGE SPACER OF CHOICE

### THERMOBAR

Has the best thermal conductivity values available on the market - **0.14W/mK**

Can be substituted into Window Energy Ratings (WERs)

Helps to virtually eliminate condensation on the inner edge of a sealed unit

Is manufactured in the UK by Thermoseal Group, a UK leading manufacturer and distributor

Can be used in the manufacture of sealed units using standard equipment with no costly investment required

Is made of high performance engineering plastic suitable for bending or key insertion – request our cost-effective bending equipment or bend on Lisec equipment

Can be supplied with straight connectors pre-inserted

Has a unique gas/moisture barrier tape to ensure the longevity of sealed units

Perforation holes are effective in allowing desiccant to breath and tapered to prevent dust ingress

Is available in a range of colours (black, grey or white) and sizes (4mm and 7.5mm–19.5mm) - see TABLE 1 for full range details

Can be shaped for arches for Georgian application

Staple fittings can be easily applied with no cracking or splitting of the bar

Is available in boxes or stillages which have been developed to meet our customers purchasing requirements

Can be supplied inkjet printed with company details for free

Can be used with edge sealants: Hot Melt, Polyurethane and Polysulphide

Is available with a bespoke range of fittings which are injection-moulded and quality controlled by Thermoseal Group. Fittings are available in black, grey or white to match the Thermobar range – see TABLE 1 for full range details

Can be delivered from depots nationwide with a selection of over 1,500 insulated glass components available from Thermoseal Group

#### Please Note:

Thermobar complies with all EN1279 and ASTM standards and relevant reports can be supplied on request.

## THERMOBAR AND ACCESSORIES RANGE INFORMATION

Thermobar Black, Grey and White with colour-matched accessories as below:

TABLE 1

Dimensions	Thermobar	Thermobar LITE	Corner Keys	Flexi Keys	Gas Keys	Gas Sleeves & Plugs	Straight Connectors	Duplex Fittings	Interbar & Fittings
4mm	N/A	✓ BLACK ONLY	✓ BLACK ONLY	N/A	N/A	N/A	N/A	N/A	N/A
7.5mm	✓	N/A	✓	✓	✓	✓	N/A	✓	N/A
9.5mm	✓	N/A	✓	✓	✓	✓	N/A	✓	N/A
11.5mm	✓	✓	✓	✓	✓	✓	✓	✓	✓
13.5mm	✓	✓	✓	✓	✓	✓	✓	N/A	N/A
15.5mm	✓	✓	✓	✓	✓	✓	✓	✓	✓
17.5mm	✓	✓	✓	✓	✓	✓	✓	N/A	N/A
19.5mm	✓	✓	✓	✓	✓	✓	✓	N/A	N/A

### THERMOBAR WINDOW THERMAL PERFORMANCE FIGURES

THERMOBAR - Thermal performance in various window types						
Spacer System	DOUBLE GLAZING			TRIPLE GLAZING		
	Aluminium	Stainless Steel	Thermobar	Aluminium	Stainless Steel	Thermobar
WOODEN WINDOWS:	Frame value: $U_f = 1.4 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 1.1 \text{ W/m}^2\text{K}$			Frame value: $U_f = 1.3 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 0.7 \text{ W/m}^2\text{K}$		
Psi value [W/mK]	0.082	0.053	0.031	0.089	0.054	0.029
Window, $U_w$ 1-pane [W/m <sup>2</sup> K]	1.40	1.32	1.27	1.10	1.02	0.95
Window, $U_w$ 2-pane [W/m <sup>2</sup> K]	1.52	1.41	1.33	1.26	1.13	1.04
Minimal surface temperature* [°C]	4.1	7.3	9.7	6	9.6	12.1
PVC WINDOWS:	Frame value: $U_f = 1.2 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 1.1 \text{ W/m}^2\text{K}$			Frame value: $U_f = 1.2 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 0.7 \text{ W/m}^2\text{K}$		
Psi value [W/mK]	0.076	0.051	0.032	0.078	0.050	0.030
Window, $U_w$ 1-pane [W/m <sup>2</sup> K]	1.32	1.26	1.21	1.05	0.98	0.93
Window, $U_w$ 2-pane [W/m <sup>2</sup> K]	1.42	1.33	1.26	1.19	1.08	1.01
Minimal surface temperature* [°C]	5.3	8.3	10.4	6.7	9.9	12.0
WOOD ALUMINIUM WINDOWS:	Frame value: $U_f = 1.4 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 1.1 \text{ W/m}^2\text{K}$			Frame value: $U_f = 1.4 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 0.7 \text{ W/m}^2\text{K}$		
Psi value [W/mK]	0.094	0.059	0.032	0.100	0.060	0.030
Window, $U_w$ 1-pane [W/m <sup>2</sup> K]	1.43	1.34	1.28	1.17	1.08	1.00
Window, $U_w$ 2-pane [W/m <sup>2</sup> K]	1.57	1.44	1.34	1.35	1.21	1.10
Minimal surface temperature* [°C]	2.2	6.1	8.8	4.4	8.6	11.3
ALUMINIUM WINDOWS:	Frame value: $U_f = 1.6 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 1.1 \text{ W/m}^2\text{K}$			Frame value: $U_f = 1.6 \text{ W/m}^2\text{K}$ ; Glass value: $U_g = 0.7 \text{ W/m}^2\text{K}$		
Psi value [W/mK]	0.110	0.068	0.036	0.120	0.064	0.031
Window, $U_w$ 1-pane [W/m <sup>2</sup> K]	1.54	1.44	1.36	1.30	1.17	1.09
Window, $U_w$ 2-pane [W/m <sup>2</sup> K]	1.72	1.56	1.45	1.53	1.32	1.21
Minimal surface temperature* [°C]	4.7	8.4	10.8	6.8	10.6	12.9

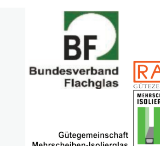
The equivalent heat conductivity was calculated as per the ift WA-17/1 guidelines. The representative Psi values were calculated under the conditions laid down in the ift WA-08/2 guidelines.

Psi value: linear heat throughput at edge of glass [W/mK] as per EN ISO 10077-2:2012-06

\* corresponds to conditions in DIN 4108-3

External temperature  $T_a$ : -10°C  
Internal temperature  $T_i$ : +20°C

Geometry	Wood	PVC	Wood-Aluminium	Aluminium
Total Area: (1.23 x 1.48m) $A_w$ in m <sup>2</sup>	1.82	1.82	1.82	1.82
Frame width $b_f$ in mm:	110	117	120	130
Frame area $A_f$ in m <sup>2</sup> (1-pane/2-pane):	0.548/0.686	0.579/0.725	0.593/0.742	0.637/0.796
Length of glass edge $l_g$ in m (1-pane/2-pane)	4.540/6.840	4.484/6.742	4.460/6.700	4.380/6.560



### What is Warm Edge Technology?

The term 'Warm Edge' within double or triple glazing refers to the spacer used to separate the panes of glass. If the spacer material is less conductive than traditional aluminium spacer, it is termed warm edge. Non-metal spacers generally have a lower thermal conductivity value.

### What is Thermobar?

Thermobar warm edge spacer is a rigid tube which is made from high performance engineering plastic with a gas diffusion barrier to minimise gas loss from the edge of the unit. The composition of Thermobar ensures that the glazing unit is structurally sound while helping to reduce heat loss at the edge of the glazing.



Thermal photograph showing standard cold edge windows - red signifies area of heat loss.



Warm Edge Windows showing virtually no heat loss.

Visit [www.thermobarwarmedge.com](http://www.thermobarwarmedge.com) for further information