TECHNICAL NOTE 10

U-Values of Elements

A guide to the specification of insulation materials in order to achieve compliance with Approved Document L1B 2010 of the Building Regulations for small domestic works.

LABC
HERTFORDSHIRE

The guidance contained in this document has been prepared by the Hertfordshire Technical Forum for Building Control.

All data relating to specific products has been sourced from the manufacturers at the time of print. They are typical examples and are NOT specifically recommended by Local Authority Building Control. All the listed materials must be installed in strict accordance with manufacturers guidance and with due regard to the need to ensure continuity of insulation and a reasonable standard of airtightness.
The specifications listed are only suggestions as to how the necessary thermal performance can be achieved. Other specifications that can be shown to be compliant with the Building Regulations will be accepted by Building Control.

Introduction

Members of the BBA Competency Scheme for U-value and condensation risk analysis have been pleased to work with Hertfordshire Building Control Technical Forum in updating this Technical Note 10. The scheme members, Knauf Insulation, Kingspan Insulation, Recticel Insulation, Rockwool and Sheffield Insulations Group Technical Services, made the necessary calculations and populated the matrix provided with U-values calculated under the auspices of the competency scheme, using the competent persons at their disposal.

The content of the scheme has been devised in association with TIMSA, the Thermal Insulation Manufacturers and Suppliers Association, which includes the above companies who continue to participate in maintaining its validity with ongoing development. The scheme is however open to non-TIMSA members as well, and provides reassurance that the calculations being provided are supplied by an individual or company that has been subject to a rigorous and ongoing independent assessment process.

The assessment process consists of the following steps,

- an initial screening, based on sample calculations designed to explore understanding of the underlying principles of the key convention documents BR 443,BS EN ISO 6946 and BS EN ISO 13370.
- an office inspection to examine the company's quality system and examples of actual calculations
- issue of a Certificate to the company that employs the Competent Person(s), defining the individual areas of competency
- ongoing surveillance.

Scheme members are required to demonstrate appropriate technical competency and in - house procedural controls to ensure that their declared calculations are reasonable.

The Competent Person is identified within the dedicated scheme logo by the use of a unique number for each individual, an example is shown in the illustration to the right. To access a list of current certificate holders and view the scheme document, please visit the BBA website.

For more information on the scheme, please e-mail competencyscheme@bba.star.co.uk or call 01923 665300.

CONTENTS

Ground Floors	Suspended Timber	4
	Floating Floor	4
	Suspended Beam and Block	5
	Ground Bearing Slab	5
Walls	Masonry Outer Leaf, Timber Frame Inner Leaf	6
	Timber Frame	7
	Solid Wall Construction	8
	Dry Lining Existing Solid Walls	9
	Full Fill Masonry Cavity Walls – Brick Outer Leaf	10
	Full Fill Masonry Cavity Walls – Rendered Block Outer Leaf	11
	Partial Fill Masonry Cavity Walls – Brick Outer Leaf	12
	Partial Fill Masonry Cavity Walls – Rendered Block Outer Leaf	14
	Block Technical Data	15
Roofs	Vented Cold Deck Pitched Roof	17
	Warm Deck Pitched Roof	18
	Cold Deck Flat Roof	19
	Warm Deck Flat Roof	20
	Insulation Technical Data	21
	Insulation from Recyclable or Natural Sources	24
Glazing	Double Glazing	25
	Triple Glazing	26

<u>Note</u> Pages 15 and 21 give information on the thermal properties of many of the building block and insulation products currently on the market. This enables the designer to select alternatives to the listed specifications that have equivalent performance.

HERTS TECHNICAL FORUM TECHNICAL NOTE 10
EXAMPLES OF GROUND FLOOR INSULATION
Compliance with Approved Document L1B 2010

SUSPENDED TIMBER GROUND FLOOR
U-Value achieved maximum 0.22W/m²K

Required thickness of insulation/mm									
Product	**λ-value**	**Perimeter/Area Ratio**							
		1.0	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.3**	**0.2**
Kingspan TF70	0.022	75	75	75	70	70	65	60	50	35
Celotex FR4000	0.022	75	75	75	70	70	65	60	50	35
EcoTherm Eco-Versal	0.022	75	75	75	70	70	65	60	50	35
Recticel Eurothane GP	0.022	75	75	75	70	70	65	60	50	35
Xtratherm XTUF	0.022	75	75	75	70	70	65	60	50	35
Jablite Jabfloor Premium 70	0.030	140	140	130	130	125	120	115	105	80
Jablite Jabfloor 70	0.038	160	160	160	155	150	145	135	120	100
Rockwool Flexi	0.038 0.035*	160	160	160	140	140	140	140	120	90
Rockwool Roll	0.044	200	170	170	170	170	170	150	150	100
Knauf Insulation Earthwool Loft Roll 40	0.040	170	170	170	170	170	150	150	150	100
Knauf Insulation Earthwool Loft Roll 44	0.044	200	200	200	170	170	170	150	150	100

FLOATING FLOOR
U-Value achieved maximum 0.22W/m²K

Required thickness of insulation/mm										
Product	**λ-value**	**Perimeter/Area Ratio**								
		1.0	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.3**	**0.2**
Kingspan* Kooltherm K3	0.020 – 0.023	95	95	90	85	85	75	70	60	35
Kingspan Thermafloor TF70	0.022	75	75	70	70	65	60	55	45	30
Kingspan Thermafloor TF73	0.029	Nm	Nm	Nm	Nm	Nm	98	93	79	58
Celotex GA4000	0.022	75	75	70	70	65	60	55	45	30
Recticel Eurothane GP	0.022	75	75	70	70	65	60	55	45	30
Knauf Insulation Polyfoam Floorboard Standard	0.029	100	115	115	110	110	110	100	85	65

Note: These are calculated figures and should be adjusted to the nearest manufactures thicknesses

Nm: Not Manufactured

*Laid between battens at 600 centres

SUSPENDED BEAM & BLOCK GROUND FLOOR (BLOCK K-VALUE 0.18 W/MK)
U-Value achieved maximum 0.22W/m²K

Required thickness of insulation (mm)											
Product	**λ-value**	**Perimeter/Area Ratio**									
		1.0	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.3**	**0.2**	**0.1**
Kingspan Kooltherm K3	0.020 – 0.023	65	65	65	60	60	55	55	50	40	20
Celotex GA4000	0.022	75	75	70	70	65	65	65	55	40	12
Xtratherm Thin-R	0.022	75	75	70	70	65	65	65	55	40	20
Kingspan TF70	0.022	70	70	70	65	65	60	60	50	40	20
QUINN-therm QF	0.022	70	70	70	65	65	60	60	50	40	25
Recticel Eurothane GP	0.022	70	70	70	65	65	60	60	50	40	25
Knauf Insulation Polyfoam Floorboard Standard	0.029	90	90	90	85	85	80	75	65	50	25
Jablite Jabfloor Premium	0.030	95	95	95	90	90	85	80	70	55	25
Styrofoam Floormate 300A	0.035	100	100	100	100	90	90	90	80	60	50
Rockwool Rockfloor	0.038	130	125	125	125	120	110	100	90	70	25

GROUND BEARING SLAB
U-Value achieved maximum 0.22W/m²K

Required thickness of insulation (mm)											
Product	**λ-value**	**Perimeter/Area Ratio**									
		1.0	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.3**	**0.2**	**0.1**
Kingspan Kooltherm K3	0.020 – 0.023	75	70	70	65	65	60	55	45	30	20
Celotex GA4000	0.022	80	75	75	70	70	65	60	50	30	12
Kingspan TF70	0.022	80	75	75	70	70	65	60	50	30	20
Xtratherm Thin – R	0.022	80	75	75	70	70	65	60	50	30	25
QUINN-therm QF	0.022	80	75	75	70	70	65	60	50	30	25
Recticel Eurothane GP	0.022	80	75	75	70	70	65	60	50	30	25
Knauf Insulation Polyfoam Floorboard Standard	0.029	100	100	100	100	90	85	75	65	65	50
Jablite Jabfloor Premium	0.030	105	105	100	95	95	95	80	65	50	20
Sytrofoam Floormate 300A	0.035	110	100	100	100	90	90	80	70	50	50
Rockwool Rockfloor	0.038 (50mm – 100mm) 0.040 (25mm – 40mm)	130	130	125	120	120	110	100	80	50	50

CAVITY WALL - TIMBER FRAME 150 &100x50mm studs at 600 & 400mm centres
U-Value achieved maximum 0.28W/m²K. Wall heights up to max 10M.

Outer Leaf mm		Cavity mm		Inner Leaf mm		Internal Finish mm	
105	Brick	50	Clear Cavity	140	Knauf Insulation Earthwool FrameTherm 38 (150mm Studs)	12.5	P/board & skim
105	Brick	50	Clear Cavity	70	Kingspan Kooltherm K12 Framing board between 150mm studs	12.5	P/board & skim
105	Brick	50	Clear Cavity	80	Kingspan Kooltherm K12 Framing board between 100mm studs	12.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	70	Kingspan Kooltherm K12 Framing board between 150mm studs	12.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	80	Kingspan Kooltherm K12 Framing board between 100mm studs	12.5	P/board & skim
105	Brick	50	Clear Cavity	75	Kingspan Thermawall TW55 between 150mm studs	32.5	P/board & skim
105	Brick	50	Clear Cavity	90	Kingspan Thermawall TW55 between 100mm studs	12.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	75	Kingspan TW55 between 150mm studs	12.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	90	Kingspan TW55 between 100mm studs	12.5	P/board & skim
105	Brick	50	Clear Cavity	75	Eurothane GP between 150mm studs	32.5	P/board & skim
105	Brick	50	Clear Cavity	90	Eurothane GP between 100mm studs	32.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	75	Eurothane GP between 150mm studs	12.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	90	Eurothane GP between 100mm studs	12.5	P/board & skim
105	Brick	50	Clear Cavity	140	Rockwool Flexi	12.5	P/board & skim
105	Brick	50	Clear Cavity	75	Celotex FR4000 between 150mm studs	32.5	P/board & skim
105	Brick	50	Clear Cavity	90	Celotex FR4000 between 100mm studs	32.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	75	Celotex FR4000 between 150mm studs	12.5	P/board & skim
100	Dense Block K value of 1.13 or lower & Render Finish	50	Clear Cavity	90	Celotex FR4000 between 100mm studs	12.5	P/board & skim

TIMBER FRAME WALL
U-Value achieved maximum 0.28W/m²K

External finish	100 x 50 Stud Wall mm		Internal Finish mm	
Tiles, render or cladding on battens	50	Kingspan Kooltherm K12	32.5	Kingspan Kooltherm K18
Tiles, render or cladding on battens	50	Kingspan Thermawall TW55	32.5	Kingspan Kooltherm K18
Tiles, render or cladding on battens	60	Celotex FR4000 between studs	37.5	Celotex PL4000 with lightweight skim
Tiles, render or cladding on battens	60	Eurothane GP between studs	37.5	Eurothane PL with lightweight skim
Tiles & battens / render	100	Knauf Insulation Earthwool Flexible Slab	35	Knauf Insulation Polyfoam Linerboard or Knauf Thermal Laminate Plus

TIMBER FRAME WALL
U-Value achieved maximum 0.28W/m²K

External finish	125 x 50 Stud Wall mm		Internal Finish mm	
Tiles, render or cladding on battens	85	Kingspan Kooltherm K12	12.5	P/board & skim
Tiles, render or cladding on battens	90	Kingspan Thermawall TW55	12.5	P/board & skim
Tiles, render or cladding on battens	90	Celotex FR4000 between studs	12.5	P/board & skim
Tiles, render or cladding on battens	90	Eurothane GP between studs	12.5	P/board & skim
Tiles & battens / render	100	Knauf Insulation Earthwool Flexible Slab	35	Knauf Insulation Polyfoam Linerboard or Knauf Thermal Laminate Plus

TYPICAL SOLID WALL CONSTRUCTION
U-Value achieved minimum 0.28W/m²K

External mm		Block Type mm		Internal Finish mm	
20	Render	215	Celcon Solar λ (0.11)	50	Gyproc Thermaline Super
20	Render	215	Topblock Toplite Standard, Celcon Standard λ (0.15)	60	Gyproc Thermaline Super
20	Render	215	Durox Supablock, Topblock GTI, Thermalite Turbo λ (0.11)	42.5	Kooltherm K18 dry-lining board mechanically fixed to timber battens
20	Render	215	Block λ (0.32) i.e. Plasmor Aglite	62.5	Kooltherm K18 dry-lining board mechanically fixed to timber battens
20	Render	215	Lightweight Block λ (0.11)	50	Knauf Phenolic Laminate board
20	Render	215	Lightweight Block λ (0.11 – 0.15)	75	Knauf Insulation IWI System
20	Render	215	Celcon Solar λ (0.11)	52.5	Celotex PL4000
20	Render	215	215 Block λ (0.15) i.e. Tarmac topblock standard	57.5	Celotex PL 4000
20	Render	215	Block λ (0.32) i.e. Plasmor Aglite	67.5	Celotex PL 4000
20	Render	215	Celcon Solar λ (0.11)	52.5	Recticel PL
20	Render	215	215 Block λ (0.15) i.e. Tarmac topblock standard	57.5	Recticel PL
20	Render	215	Block λ (0.32) i.e. Plasmor Aglite	67.5	Recticel PL

DRY LINING TO EXISTING SOLID WALL
U-Value achieved maximum 0.30W/m²K

Existing wall mm	**Dry lining product** mm		**Internal Finish** mm	
215 Brick	62.5	Kingspan Kooltherm K18 insulated dry lining board fixed to 25 x 50mm battens	5	Skim coat
215 Brick or Dense Block (λ 1.13 or lower) & Render	62.5	Kingspan Kooltherm K18 insulated dry lining board fixed to 25 x 50mm battens	5	Skim coat
215 Brick	90	Knauf Insulation IWI System	5	Skim coat
215 Brick	72.5	Celotex PL4000	5	Skim coat
215 Brick or Dense Block (λ 1.13 or lower) & Render	72.5	Celotex PL4000	5	Skim coat
102.5 Brick	77.5	Celotex PL4000	5	Skim coat
215 Brick	72.5	Eurothane PL	5	Skim coat
215 Brick or Dense Block (λ 1.13 or lower) & Render	72.5	Eurothane PL	5	Skim coat
102.5 Brick	77.5	Eurothane PL	5	Skim coat

FULL FILL CAVITY WALL – BLOCK INNER LEAF and BRICK OUTER LEAF
U-Value achieved maximum 0.28W/m²K

Outer Leaf mm		Full Fill Cavity* mm		Inner Leaf mm		Internal finish mm	
102.5	Brick	85	Earthwool DriTherm 32 Ultimate	100	Block λ value of 0.15 or lower e.g. Celcon Standard/ Toplite Standard	12.50	Plasterboard on dabs
102.5	Brick	85	Earthwool DriTherm 34 Super	100	Block λ value of 0.15 or lower e.g. Celcon Solar/ Thermalite Turbo/ Durox Supablock	13	Plasterboard on dabs
102.5	Brick	100	Earthwool DriTherm 37 Standard or Earthwool DriTherm Cavity Slab (Rock)	100	Block λ value of 0.11 or lower, e.g. Celcon Solar/ Thermalite Turbo/ Durox Supablock	12.5	Plasterboard on dabs
102.5	Brick	100	Rockwool Cavity/	100	Block λ value of 0.11 or lower e.g. Celcon Solar/ Thermalite Turbo/ Durox Supablock	13	Lightweight plaster
102.5	Brick	100	Earthwool DriTherm 34 Super	100	Block λ value of 0.32 or lower e.g. Plasmor Aglite or Fibolite.	12.50	Plasterboard on dabs
102.5	Brick	100	Earthwool DriTherm 32 Ultimate	100	Block λ value of 1.13 or lower, e.g. RMC Readyblock Dense	12.5	Plasterboard on dabs
102.5	Brick	100	Earthwool DriTherm 37 Standard	100	Block λ value of 0.51 or lower, e.g. Masterblock GPI	25	Knauf Insulation Polyfoam Linerboard/ Knauf Thermal Laminate Plus
102.5	Brick	100	Earthwool DriTherm 32 Ultimate	100	Block λ value of 0.11 or lower, e.g. Celcon Solar/ Thermalite Turbo/ Durox Supablock	13	Plasterboard on dabs or Dense or lightweight plaster

FULL FILL CAVITY WALL – BLOCK INNER LEAF AND BLOCK OUTER LEAF
U-Value achieved maximum 0.28W/m²K

Outer Leaf mm		Full Fill Cavity* mm		Inner Leaf mm		Internal finish mm	
100	Rendered Block λ value of 0.11 or lower, e.g. Celcon Solar/ Thermalite Turbo/ Durox Supablock	65	Earthwool DriTherm 32 Ultimate	100	Block λ value of 0.11 or lower, e.g. Celcon Solar / Thermalite Turbo / Durox Supablock	13	Lightweight plaster
100	Rendered Block λ value of 0.15 or lower e.g. Celcon Standard/ Toplite Standard	75	Earthwool DriTherm 32 Ultimate	100	Block λ value of 0.15 or lower, e.g. Celcon Standard / Toplite Standard	13	Dense or lightweight plaster
100	Rendered Block λ value of 0.15 or lower, e.g. Celcon Standard/ Toplite Standard	75	Earthwool DriTherm 37 Standard or Earthwool Cavity Slab (Rock)	100	Block λ value of 0.11 or lower, e.g. Celcon Solar / Thermalite Turbo / Durox Supablock	13	Lightweight plaster
100	Rendered Block λ value of 0.15 or lower, e.g. Celcon Standard/ Toplite Standard	80	Rockwool Cavity	100	Block λ value of 0.11 or lower, e.g. Celcon Solar / Thermalite Turbo / Durox Supablock	13	Lightweight plaster
100	Rendered Block λ value of 0.15 or lower, e.g. Celcon Standard/ Toplite Standard	85	Earthwool DriTherm 37 Standard	100	Block λ value of 0.15 or lower, e.g. Celcon Standard / Toplite Standard	13	Lightweight plaster
100	Rendered Aglite Block 7.3N λ value of 0.32	100	Earthwool DriTherm 34 Super or Isover C.W.S.	100	Aglite Block 7.3N λ value of 0.32	13	Lightweight plaster
100	Rendered Block 1500kg/m³ Dense Block	100	Earthwool DriTherm 37 Standard	100	Block λ value of 0.15 or lower, e.g. Celcon Standard / Toplite Standard	13	Lightweight plaster

PARTIAL FILL CAVITY WALL – BLOCK INNER LEAF AND BRICK OUTER LEAF
U-Value achieved maximum 0.28W/m²K

Outer Leaf mm		* mm	Partial Fill Cavity	Inner Leaf mm		Internal finish mm	
102.5	Brick	90	40mm Kingspan Kooltherm K8	100	Block λ value of 0.14 or lower	13	Lightweight plaster
102.5	Brick	95	45mm Kingspan Kooltherm K8	100	Block λ value of 0.39 or lower	13	Lightweight plaster
102.5	Brick	100	50mm Kingspan Kooltherm K8	100	Block λ value of 1.13 or lower	13	Lightweight plaster
102.5	Brick	90	40mm Kingspan Thermawall TW50	100	Block λ value of 0.12 or lower	13	Lightweight plaster
102.5	Brick	95	45mm Kingspan Thermawall TW50	100	Block λ value of 0.19 or lower	13	Lightweight plaster
102.5	Brick	100	50mm Kingspan Thermawall TW50	100	Block λ value of 0.42 or lower	13	Lightweight plaster
102.5	Brick	105	55mm Kingspan Thermawall TW50	100	Block λ value of 1.13 or lower	13	Lightweight plaster
102.5	Brick	90	40mm Celotex CW4000	100	Block λ value of 0.12 or lower	13	Lightweight plaster
102.5	Brick	95	45mm Celotex CW4000	100	Block λ value of 0.19 or lower	13	Lightweight plaster
102.5	Brick	100	50mm Celotex CW4000	100	Block λ value of 0.42 or lower	13	Lightweight plaster
102.5	Brick	105	55mm Celotex CW4000	100	Block λ value of 1.13 or lower	13	Lightweight plaster
102.5	Brick	90	40mm Recticel Eurowall	100	Block λ value of 0.12 or lower	13	Lightweight plaster
102.5	Brick	95	45mm Recticel Eurowall	100	Block λ value of 0.19 or lower	13	Lightweight plaster
102.5	Brick	100	50mm Recticel Eurowall	100	Block λ value of 0.42 or lower	13	Lightweight plaster
102.5	Brick	105	55mm Recticel Eurowall	100	Block λ value of 1.13 or lower	13	Lightweight plaster
102.5	Brick	85	35mm Kingspan Kooltherm K8	100	Block λ value of 0.11 or lower	13	P/Board on dabs & skim
102.5	Brick	90	40mm Kingspan Kooltherm K8	100	Block λ value of 0.19 or lower	13	P/Board on dabs & skim

102.5	Brick	95	45mm Kingspan Kooltherm K8	100	Block λ value of 0.90 or lower	13	P/Board on dabs & skim
102.5	Brick	100	50mm Kingspan Kooltherm K8	100	Block λ value of 1.13 or lower	13	P/Board on dabs & skim
102.5	Brick	90	40mm Kingspan Thermawall TW50	100	Block λ value of 0.15 or lower	13	P/Board on dabs & skim
102.5	Brick	95	45mm Kingspan Thermawall TW50	100	Block λ value of 0.28 or lower	13	P/Board on dabs & skim
102.5	Brick	100	50mm Kingspan Thermawall TW50	100	Block λ value of 1.13 or lower	13	P/Board on dabs & skim
102.5	Brick	90	40mm Celotex CW4000	100	Block λ value of 0.15 or lower	13	P/Board on dabs & skim
102.5	Brick	95	45mm Celotex CW4000	100	Block λ value of 0.28 or lower	13	P/Board on dabs & skim
102.5	Brick	100	50mm Celotex CW4000	100	Block λ value of 1.13 or lower	13	P/Board on dabs & skim
102.5	Brick	90	40mm Recticel Eurowall	100	Block λ value of 0.15 or lower	13	P/Board on dabs & skim
102.5	Brick	95	45mm Recticel Eurowall	100	Block λ value of 0.28 or lower	13	P/Board on dabs & skim
102.5	Brick	100	50mm Recticel Eurowall	100	Block λ value of 1.13 or lower	13	P/Board on dabs & skim

Some products can be used with reduced residual cavity width – a good level of workmanship is essential. Please check with individual manufacturer.

PARTIAL FILL CAVITY WALL – BLOCK INNER LEAF AND BLOCK OUTER LEAF
U-Value achieved maximum 0.28W/m²K

Outer Leaf Mm		**Partial Fill Cavity** mm		**Inner Leaf** mm		**Internal finish** mm	
100	Block (1.13 or lower) + Render	90	40mm Kingspan Kooltherm K8 or 40mm Kingspan Thermawall TW50 or 40mm Celotex CW4000 or 40mm Recticel Eurowall	100	Block λ value of 0.11 e.g. Celcon Solar / Thermalite Turbo	13	Dense or lightweight plaster
100	Rendered Block (λ 0.15 or lower)	85	35mm Kingspan Kooltherm K8 or 35mm Kingspan Thermawall TW50 or 35mm Celotex CW4000 or 35mm Recticel Eurowall or 60mm Knauf Insulation Polyfoam Cavityboard	100	Block λ value of 0.15 or lower, e.g. Thermalite Shield.	13	Lightweight plaster
100	Rendered Dense Block (1.13 or lower)	100 105 105	50mm Kingspan Kooltherm K8 or 55mm Celotex CW4000 or 55mm Recticel Eurowall	100	Dense Block λ value of 1.13 or lower e.g. Monacrete 100S / Plasmor Plascon	15	Plasterboard on dabs

Some products can be used with reduced residual cavity width – a good level of workmanship is essential. Please check with individual manufacturer.

HERTS TECHNICAL FORUM TECHNICAL NOTE 10
BLOCK TECHNICAL DATA
Compliance with Approved Document L1B 2010

Block Manufacturer	Block type	Strength (N)	Density (kg/m³)	λ Value (W/mK)
Armstrong	Light weight	3.6	1350	0.42
	Dense	7.3	1950	1.13
Besblock	Insulite Solid	7	1457	0.47
Celcon	Solar	2.9 / 3.5	460	0.11
	Standard	3.6	600	0.15
	Hi Strength 7	3	750	0.19
Durox	Supablock 400	2.8	420	0.10
	Supablock	3.6	460	0.11
	Supablock 4	4.2	630	0.16
	Supablock 7	7.3	680	0.19
Forticrete	Newlight			0.43
Hanson	Ultralite	3.6	850	0.30
	Superlite	3.6 / 7.3	1000	0.36
	Fenlight	3.6 – 15	1500	0.48
	Evalast	3.6 – 22.5	1900	1.31
Interfuse	Optilyte			0.20
	Interyte			0.47
	Intercrete			1.13
Lignacite	SP	3.6 / 7.3 / 10.4	1450	0.79
	Standard	3.6 / 7.3 / 10.4	1570	0.97
Masterblock	Pumalite			0.44
	Lightweight			0.59
	Dense			1.06
	Fibotherm	3.5		0.25
	Monalight 100S			0.5
	Monacrete 100			0.59
	GPI			0.51
	Monacrete 100S			1.13
Plasmor	Fibolite	3.6 7.3	850 950	0.25 0.28
	Aglite	4.2 7.3 10.4	1050 1050 1150	0.32 0.32 0.32
	Stranlite	4.2 7.3 10.4	1375 1375 1425	0.46 0.46 0.46
	Plascon	7.3 / 10.4	1950	1.06

Block Manufacturer	Block type	Strength (N)	Density (kg/m³)	λ Value (W/mK)
RMC	Readybock 1100			0.34
	Readyblock 1400			0.59
	Readyblock Dense			1.13
Stock Blocks	Ultralite			0.25
	Insulite			0.40
	Lyta			0.56
	Dense Concrete			0.99 – 1.25
Thermalite	Turbo	2.9	470	0.11
	Shield	3.6	600	0.15
	Hi Strength	7.3	730	0.19
Topblock	Supabloc			0.11
	Supabloc 4			0.16
	Supabloc 7			0.19
	Hemelite	3.6 7.3 10.4	1360 1450 1480	0.45 0.47 0.49
	Toplite GTI	2.9	460	0.11
	Toplite Standard	3.6	630	0.15
	Toplite 7	7.3	720	0.19
	Topcrete Fair Face			0.99
	Topcrete Dense			1.28

HERTS TECHNICAL FORUM TECHNICAL NOTE 10
EXAMPLES OF PITCHED ROOF INSULATION
Compliance Approved Document L1B 2010

VENTED COLD DECK PITCHED ROOF - INSULATION BETWEEN RAFTERS
U-Value achieved maximum 0.18W/m²K

Product	λ-Value	Solution/mm
Kingspan Kooltherm K7 with K18 Insulated Dry–lining Board	0.020 – 0.023	100mm K7 between rafters & 42.5mm K18 under rafters
Kingspan Thermapitch TP10 with K18 Insulated Dry–lining Board	0.022 & 0.020–0.023	120mm TP10 between rafters & 32.5mm K18 under rafters
Kingspan Kooltherm K7 with K18 Insulated Dry–lining Board	0.020 – 0.023	100mm K7 between rafters & 37.5mm K18 under rafters*
Kingspan Thermapitch TP10 with K18 Insulated Dry–lining Board	0.022 & 0.020–0.023	100mm TP10 between rafters & 37.5mm K18 under rafters*
Celotex GA4000 between or between and under rafters	0.022	165mm between rafters * or 100mm between rafters & 35mm under rafters* or 50mm between rafters & 70mm under rafters, with plasterboard attached to 25mm deep counter battens to create air space*
Recticel Eurothane GP between rafters	0.022	165mm Recticel Eurothane GP between rafters*
Recticel Eurothane GP between rafters & Eurothane PL under	0.022 0.022 + 0.017	100mm Recticel Eurothane GP between rafters & 42.5mm Eurothane PL*
Recticel Eurothane GP between rafters & Eurothane PL under	0.022 0.022 + 0.017	50mm between rafters & 70mm under rafters, with plasterboard attached to 25mm deep counter battens to create air space then 12.5mm plasterboard and skim*
Rockwool Flexi	0.038	240mm between rafters
Knauf Insulation Earthwool Rafter Roll and 55mm Polyfoam Linerboard	0.032/0.030	140mm between rafters, underlined with 55m Polyfoam Linerboard or Knauf Thermal Laminate Plus
Web Dynamics TLX Silver FB and Insulation with K value of 0.022 or better	(R-value 1.69) 0.022	One layer under rafters with plasterboard attached to 25mm deep counter battens to create air space and 75mm foiled rigid insulation such as Kingspan or Celotex or Recticel Eurothane GP between rafters*
YBS SuperQuilt and Insulation with K value of 0.023 or better	(R value of 2.71 including both airspaces) 0.023	One layer under rafters with plasterboard attached to 25mm deep battens to create air space and 65mm foil face rigid insulation such as Kingspan or Celotex or Recticel Eurothane GP between rafters with a 25mm cavity between the multifoil and the rigid insulation.

* All unvented roofs using vapour permeable underlay.

All specifications assume rafters at 400mm c/c and plaster skimmed 12.5 plasterboard ceiling

VENTED COLD DECK PITCHED ROOF - INSULATION BETWEEN & OVER CEILING JOISTS
U-Value achieved maximum 0.16W/m²K

Product	λ-Value	Solution/mm
Earthwool Loft Roll 44	0.044	100mm between joists and 170mm over joists
Rockwool Roll	0.044	100mm between & 170mm over
Earthwool Loft Roll 44 and Polyfoam Space Board	0.044 0.029	100mm Earthwool Loft Roll 44 between joists and 2 layers of 52.50mm Space Board over joists and overlaid with 18mm chipboard

WARM DECK PITCHED ROOF – INSULATION ABOVE THE RAFTERS
U-Value achieved 0.18W/m²K

Product	λ-Value	Solution/mm
Polyfoam Sarking Board and Polyfoam Raftersqueeze	0.030	50mm over rafters with 125mm between rafters
Kingspan Kooltherm K7	0.020 -0.023	100mm over rafters with breathable membrane, for example Kingspan Nilvent beneath counter battens*
Kingspan Kooltherm K7	0.020 -0.023	90mm over rafters with breathable membrane, for example Kingspan Nilvent above counter battens*
Kingspan Kooltherm K7	0.020 -0.023	50mm between and 55mm over rafters with breathable membrane, for example Kingspan Nilvent beneath counter battens*
Kingspan Kooltherm K7	0.020 -0.023	50mm between and 50mm over rafters with breathable membrane, for example Kingspan Nilvent above counter battens*
Kingspan Thermapitch TP10	0.022	110mm over rafters with breathable membrane, for example Kingspan Nilvent beneath counter battens*
Kingspan Thermapitch TP10	0.022	100mm over rafters with breathable membrane, for example Kingspan Nilvent above counter battens*
Celotex GA4000	0.022	100mm over rafters with breathable membrane*
Celotex GA4000	0.022	60mm between and 60mm over rafters *
Recticel Eurothane GP	0.022	60mm between and 60mm over rafters *
Recticel Eurothane GP	0.022	100mm over rafters with breathable membrane*
Rockwool Overlay System	0.035 & 0.038	140mm Flexi between and 70mm Overlay over rafters

* All unvented roofs using vapour permeable underlay.
All specifications assume rafters at 400mm c/c and plaster skimmed 12.5 plasterboard ceiling

HERTS TECHNICAL FORUM TECHNICAL NOTE 10 - EXAMPLES OF FLAT ROOF INSULATION

Compliance with Approved Document L1B – 2010 Edition

COLD DECK FLAT ROOF – INSULATION BETWEEN AND BETWEEN / UNDER JOISTS
U-Value achieved minimum 0.18W/m²K

Product	λ-Value	Notes	Solution - o/all thickness in mm
Jablite Premium Board	0.030	Based on timber roof with 50mm wide joists at 400mm centres	220 between joists or 150 between joists and 50 under
Knauf Insulation Earthwool Universal Slab RS45 Polyfoam Linerboard	0.035 and 0.030	Based on timber roof with 50mm wide joists at 400mm centres	160mm between joists and 55mm Polyfoam Linerboard or Knauf Thermal Laminate Plus under
Xtratherm Thin - R	0.022	Based on timber roof with 50mm wide joists at 400mm centres	185mm between joists or 125mm between and 25mm under
Ecotherm	0.022	Based on timber roof with 50mm wide joists at 400mm centres	185mm between joists or 125mm between and 25mm under
Quintherm	0.022	Based on timber roof with 50mm wide joists at 400mm centres	185mm between joists or 125mm between and 25mm under
Recticel Eurothane GP	0.022	Based on timber roof with 50mm wide joists at 400mm centres	185mm between joists or 125mm between and 25mm under
Recticel Eurothane GP & Eurothane PL	0.022	Based on timber roof with 50mm wide joists at 400mm centres	120mm between joists and 37.5mm Eurothane PL under joists.
Kingspan Kooltherm K7 & K18	0.020 - 0.023	Based on timber roof with 50mm wide joists at 400mm centres	175mm (100+75mm) Kooltherm K7 between joists, or 100mm Kooltherm K7 between joists & 42.5mm Kooltherm K18 beneath
Kingspan Thermapitch TP10 & Kooltherm K18	0.022 & 0.022 – 0.023	Based on timber roof with 50mm wide joists at 400mm centres	185mm (105+80mm) Thermapitch TP10 between joists, or 120mm TP10 between joists & 37.5mm K18 beneath
Celotex XR 4000	0.022	Based on timber roof with 50mm wide joists at 400mm centres	185mm between joists or 125mm between and 25mm under
Celotex XR4000 and PL4000 Under-layer	0.022	Based on timber roof with 50mm wide joists at 400mm centres	120mm XR4000 between joists and 37.5mm PL4000 under joists.

WARM DECK FLAT ROOF – INSULATION ABOVE JOISTS OR ABOVE AND BETWEEN JOISTS
U-Value achieved maximum 0.18W/m²K

NB *– Where composite deck insulation is to be used with a Single Ply Membrane – ensure the conditions of use of the membrane are met. It may be necessary to use an additional layer of 12mm Ply above the insulation to meet the conditions of use.*

Product	λ-Value	Notes	Solution
Celotex TD4000	0.022	Mechanical Fix *Single Ply Membrane or Built up felt. (12mm additional ply required for single ply membrane)*	126mm Celotex TD4000
Celotex XR4000	0.022	Balconies – Weatherproof layer on 19mm ply, on Celotex, on 1000g polythene on 19mm Ply on Joists.	120mm Celotex XR4000
Recticel Plylok (composite deck)	0.022	Mechanical Fix *Single Ply Membrane or Built up felt. (12mm additional ply required for single ply membrane)*	126mm Recticel Plylok
Recticel Eurodeck	0.022	For use with mechanically fixed single ply membranes	110mm (Using thermally broken fasteners)
Recticel Eurothane Silver BBA/LPC/FM	0.023	For use with mechanically fixed single ply membranes and approved liquid applied systems.	120mm (Using thermally broken fasteners)
Recticel Powerdeck F LPC/FM	0.024 – 0.026	Use with bonded or mechanically fixed to substrate - finish with 3 layer partially bonded built up felt, mastic asphalt or single ply membrane	120mm
Recticel Powerdeck B	0.024 – 0.026	Use with torch on bituminous waterproofing systems	120mm
Kingspan Thermaroof TR31 (composite deck)	0.022	For use with 3 layer Built up felt. 2 Layer felt or heat bonded mastic asphalt to be used with 13mm fibre board.	126mm Kingspan TR31 or 96 plus 30mm of TP10 between joists.
Kingspan Thermaroof TR26 LPC/FM	0.022	For use with mechanically fixed single ply membranes	110mm (Using Telescopic tube fixings)
Kingspan Thermaroof TR27 LPC/FM	0.024 - 0.026	Use with bonded or mechanically fixed to substrate - finish with 3 layer partially bonded built up felt, mastic asphalt or single ply membrane and approved liquid applied systems.	120mm
Knauf Insulation Polyfoam Roofboard Standard	0.029	(Single Ply membranes only) Timber deck, with a 12.5mm plasterboard ceiling.	150mm
Knauf Insulation Rocksilk Krimpact Flat Roof Slab	0.038	Use with bonded fixing over a plywood deck – finish with 3 layer built up felt, mastic asphalt or single ply membrane	185mm
Jablite Jabdec	0.035	Ditto	183mm (with mech fixing) 163mm (without)
Rockwool Duorock	0.038	Available plain, tissue faced or SPA for mechanical or adhered membranes	190mm

Company	Product	λ-Value W/mK	Available Thickness (mm)	Use
Knauf Insulation	Earthwool DriTherm Cavity Slab 37 Standard	0.035 0.037	50, 65, 75, 85, 100, 125, 150	Cavity wall
	Earthwool DriTherm Cavity Slab 34 Super	0.034	65, 75, 85, 100, 125, 150	Cavity wall
	Earthwool DriTherm Cavity Slab 32 Ultimate	0.032	50, 65, 75, 85, 100, 125	Cavity wall
	Earthwool FrameTherm 32	0.032	90, 140 roll and slab	Timber frame,
	Earthwool FrameTherm 35	0.035	90, 140 roll and slab	Timber frame
	Earthwool FrameTherm 38	0.038	90, 140 slab	Timber frame
	Earthwool FrameTherm 40	0.040	90, 140 roll	Timber frame
	Earthwool Universal Slab RS45	0.035	30, 40, 50, 60, 75, 100	Walls, roof, floors
	Earthwool Flexible Slab	0.035 and 0.037	50, 60, 70, 90, 100, 140	Walls, roof, floors
	Internal Wall Insulation System	0.032 and 0.035	60, 75, 90 incorporating EcoStud and EcoBatt	Walls
	Earthwool Loft Roll 40	0.040	100, 150, 170, 200	Roofs
	Earthwool Loft Roll 44	0.044	100, 150, 170, 200	Roofs
	Earthwool Rafter Roll	0.032 and 0.036	50, 65, 75, 85, 100, 125, 140, 175, 200	Rafters
Knauf Insulation Polyfoam	Cavityboard	0.029	25, 30, 35, 40, 50, 60, 75	Cavity wall
	Roofboard Standard	0.029	35, 50, 60, 75	Warm deck roof
	Sarkingboard	0.030	75	Over rafters
	Raftersqueeze	0.030	50, 65, 75	Inter rafter
	Floorboard Standard	0.029	25, 35, 50, 65, 70, 100	Floor
	Linerboard	0.030	25, 35, 40, 45, 55	Lining
	Space Board	0.029	2 x 52.50 overlaid with 18mm chipboard	Loft decking

Celotex	TB4000	0.022	12,20,25,30,35,40,45	Floors, walls, Roof
	GA4000	0.022	50,60,70,80,90,100	Floors, walls, Roof
	XR4000	0.022	110,120,130,140,150,200	Floors, walls, Roof
	CW4000	0.022	25,40,50,60,70,80,90,100	Cavity walls
	FR4000	0.022	25,50,60,70,80,90,100,150	Walls & pitched roof
	CG4000	0.022	40,50,60,70,74,80	Cavity walls
	PL4000	0.022	25,40,55,65	Thermal plasterboard
	FF4000	0.022	50,70,90,100,125,150	Underfloor heating
	TD4000	0.022	70,80,90,100,120,150	Flat roof
	EL3000	0.027 0.026 0.025	50 80, 90, 100, 110 120,140,150,165,200	Flat roof
	TA4000	0.022	50,75,90,100,125,150,200	Flat roof
	LG3000	0.023	25,30,40,50	Lining
Rockwool	Flexi	0.035*–0.038	50,60,70,90,100,120,140*	Floors, Walls, Roof
	Rockwool Roll	0.044	100,150, 170, 200	Timber frame/floor
	Cavity wall batt	0.037	50,80,100,110,130,150	Cavity wall
	Rockfloor	0.038* – 0.040	25*,30*,40*,50,60,70,80,90,100	Concrete floor
	Rockwool Roll	0.044	100,150,170,200	Pitched roof, floor
	Duorock	0.038	50,85,95,105,135,145,165,180	Flat Roof
Recticel	Eurothane Eurowall (BBA)	0.022	25,30,35,40,45,50,55,60,65,70,75,80,85,90,100	Cavity Walls
	Eurothane GP (BBA)	0.022	20,25,30,35,40,45,50,55,60,65,70,75,80,85,90, 100,110,120,130,140,150	Framed Walls, Floors & Pitched Roofs
	Eurothane PL	0.022/0.17	25,40,45,50,55,65 – all +12.5mm Plasterboard	Thermal Laminate
	Powerdeck F LPS 1181	0.024-0.026	25,30,40,45,50,60,70,75,80,85,90,100,110, 120,130,140,150	Adhesively Fixed Single Ply
	Powerdeck B	0.024-0.026	30,40,50,60,70,80,90,100,110,120,130,140,150	
	Eurothane Eurodeck	0.022	25,30,40,45,50,60,70,80,85,90,100,110,120, 130,140,150	Mechanically Fixed Single Ply
	Eurothane Silver LPS 1181 + (BBA) + FM	0.023	25,30,40,45, 50,60, 70, 75, 80,85,90,100,110,120,130,140	Liquid Applied Systems
	Eurothane Bi3 (BBA)	0.027	30,40,50,60,70,75,80,90,100	Flat Roofing
	Powerline			Lining
	Plylok	0.022	56,76,81,86,96,106,116,126 Inc. 6mm Ply	Flat Roofing

HERTS TECHNICAL FORUM TECHNICAL NOTE 10
INSULATION TECHNICAL DATA CONTINUED
Compliance with Approved Document L1B 2010

Company	Product	λ-Value W/mK	Available Thickness (mm)	Use
Jablite	Jabfloor Premium	0.030	25,40,50,75,100,150,200	Floor
	Jabfloor 70	0.038	25,40,50,75,100,150,200	Floor
	Jabwall & Jablok	0.038	40,50,60,75	Cavity wall
	Jabwall Premium	0.030	40,50,60,75	Cavity wall
	Jabfill Premium	0.030	75,100	Cavity wall
	Jablite Board	0.038	25,40,50,75,100,150,200	Wall lining, roof
	Jabroof Slim fix	0.037 0.031 0.027 0.024 0.020 0.016	79 97 113 131 157 195	Pitched roof
	Jabsqueeze	0.038		
	Jabdec	0.036 0.035	33 -100 in 5mm increments 100 + in 5mm increments	Flat roof
	Jabtherm	0.036 0.035	20 -100 in 5mm increments 100 + in 5mm increments	Flat roof
	Jabroll	0.036 0.035	50,65,95 135	Flat roof
Kingspan Insulation Ltd	Kooltherm K7	0.020 – 0.022	25 – 140mm	Pitched Roof
	Kooltherm K18	0.020 – 0.022	32.5 – 92.5mm	Dry lining
	Kooltherm K8	0.020 – 0.022	40 -75mm	Cavity wall
	Kooltherm K12	0.020 – 0.022	40 -120mm	Timber frame
	Kooltherm K3	0.020 – 0.022	20 -100mm	Floor
	ThermapitchTP10	0.022	20 -150mm	Pitched Roof
	Thermaroof TR26 LPC / FM	0.025	25 -150mm	Flat roof
	Thermaroof TR27 LPC / FM	0.022	25 -145mm	Flat Roof
	ThermawallTW50	0.022	25 -100mm	Cavity Wall
	ThermawallTW55	0.022	20 -150mm	Timber Frame Wall
	ThermafloorTF70	0.022	20 – 150mm	Floor
	Thermaroof TR31	0.022	56-126mm	Flat roof
Dow Styrofoam	Floormate 200-X	0.029	25,35,50,60,70,80,100,120	Floors
	Roofmate SL-X	0.029 0.031	25,35,50,70,80,100,120 130,140,150	Flat roof`
	Roofmate RL-X	0.029	25,35,50,60,70,80,90,100,120	Flat roof
	Styrofoam IB-X	0.029	25,35,50,60,70,80,100,120	Wall lining
	Wallmate CW-X	0.029	25,35,50,60,70,80,100,120	Cavity wall
Web Dynamics	Thinsulex (multifoil)	0.53	30	Pitched roof

HERTS TECHNICAL FORUM TECHNICAL NOTE 10
INSULATION FROM RECYCLABLE OR NATURAL SOURCES
Compliance with Approved Document L1B 2010

VENTED COLD DECK PITCHED ROOF – insulation between and over joists
U- Value achieved maximum 0.16 W/m²K

Product	Source	λ-Value (w/mK)	Solution
Warmcel 300	Recycled Newspaper	0.040	250mm
Thermafleece	80% Sheepswool blend	0.038	240mm (100mm between, 140mm over joists)
Thermafleece PB20	60% Sheepswool blend	0.039	240mm (100mm between, 140mm over joists)
YBS Non-Itch	85% Recycled plastic bottles	0.0425	270mm (100mm between + 170 over)
Rockwool Rockprime	Rock Mineral Wool Granulate	0.045	270mm (100mm between & 170mm over)

VENTED COLD DECK PITCHED ROOF – insulation between and under rafters
U- Value achieved maximum 0.18 W/m²K

Product	Source	λ-Value	Solution
Thermafleece	80% Sheepswool	0.038	100mm between rafters + 165mm under. *(50mm Ventilated space required with F1 felts)*
Thermafleece PB20	60% Sheepswool	0.039	100mm between rafters + 165mm under. *(50mm Ventilated space required with F1 felts)*

TIMBER FRAME WALL (Non-breathing structure)
U- Value achieved maximum 0.28 W/m²K

External Finish	Insulation between studs	Internal Finish
102mm Brick, 50mm vented cavity, breather membrane, 9mm OSB or 12.5mm Ply.	150mm of Warmcel 500 **dry-injection.** *(Assumes 12.5% Timber Fraction)*	9mm OSB, 500 gauge vapour check, 25mm service cavity, 12.5mm plasterboard
102mm Brick, 50mm vented cavity, breather membrane, 9mm OSB or 12.5mm Ply.	150mm Warmcel - **damp spray.** *(Assumes 12.5% Timber Fraction.)*	500 gauge vapour check, 12.5mm plasterboard.
Brick / Tile / or Timber Clad Finish, 50mm vented cavity, breather membrane, 9mm OSB	150mm Thermafleece or Thermafleece PB20.	Accredited low emissivity membrane, 25mm service void, 12.5mm plasterboard.
Brick / Tile / or Timber Clad Finish, 50mm vented cavity, breather membrane, 9mm OSB	160mm Thermafleece or 170mm Thermafleece PB20.	500 gauge vapour check, 12.5mm plasterboard.
Brick / Tile / or Timber Clad Finish, 50mm vented cavity, breather membrane, 9mm OSB	140mm YBS Non-Itch **0.039W/mK** grade.*	500 gauge vapour check and 12.5mm plasterboard.

*Non-Itch is available in two grades of thermal conductivity. 0.043W/mK and 0.039W/mK.

HERTS TECHNICAL FORUM TECHNICAL NOTE 10
INDICATIVE U VALUES FOR WINDOWS & DOORS
Compliance with revised Approved Document L1B 2010

Introduction:

- Any PVC-U or timber framed window (installed vertically) or fully glazed door should have a Window Energy Rating (WER) of band C or better.
- Alternatively, the window should have a U-value of 1.6W/m²k or better.
- All doors should have a U-Value of 1.8W/m^2k or better.
- Doors with > 50% of their internal face area glazed should have an overall U-value of 1.8W/m²k.

(See paragraph at the top of next page)

When available, manufacturers' certified U-values should be used in preference to the data in these tables. Further information can be obtained from CERTass, FENSA or the Glass & Glazing Federation.

DOUBLE GLAZING

U-Value required minimum 1.6 W/m²K (Windows)
1.8 W/m²K (Doors)

Pilkington Glass	*Outer Pane*	*Cavity / Spacer / Gas*	*Inner Pane*	*U-value*
Typical IGU	4mm Optifloat	16mm air	4mm K-Glass	1.7
energiKare Classic	4mm Optiwhite	16mm argon with Aluminium spacer bar	4mm K-Glass	1.5
	4mm Optiwhite		4mm K-Glass OW	1.5
energiKare Plus	4mm Optiwhite	16mm argon plus warm edge spacer bar	4mm K-Glass	1.5
	4mm Optiwhite		4mm K-Glass OW	1.5
Saint-Gobain Glass	***Outer Pane***	***Cavity / Spacer / Gas***	***Inner Pane***	***U-Value***
SGG Planitherm	4mm Float Glass	16mm air plus warm edge spacer bar	4mm Total +	1.4
SGG Planitherm	4mm Float Glass	16mm argon plus warm edge spacer bar	4mm Total +	1.1
SGG Planitherm	4mm Float Glass	20mm air plus warm edge spacer bar	4mm Total +	1.4
SGG Planitherm	4mm Float Glass	20mm argon plus warm edge spacer bar	4mm Total +	1.1

Rooflights and Roof Windows:

- **Where windows and rooflights area installed within a sloping roof, the standard U-values will need to be adjusted as per table below**

Inclination Of Roof	**U-value Adjustment (W/m^2K)**	
	Twin skin or double glazed	**Triple skin or triple glazed**
70° or more (treated as vertical)	= 0.0	= 0.0
<70° and >60°	+ 0.2	+ 0.1
≤60° and >40°	+ 0.3	+ 0.2
≤40° and >20°	+ 0.4	+ 0.2
≤20° (treated as horizontal)	+ 0.5	+ 0.3

INDICATIVE U VALUES FOR GLAZED/PARTIALLY GLAZED DOORS

Where doors are fully glazed, the above table for U-values for windows and roof lights should be used. Where doors have more than 50% glazed area (approximately) the u-value of the door is the average of the appropriate window u-value and that of the non glazed part.

Given that there is a calculation procedure provided within the approved document, information on the actual U-Value should be given to the Building Control Section to assess the suitability of any door of this nature.

Further information can be obtained from CERTass, FENSA or the Glass & Glazing Federation.

TRIPLE GLAZING

Pilkington 'energiKare' Glazing:

Outer Pane	Cavity	Middle Pane	Cavity	Inner Pane	U-value
Optiwhite	12mm argon	**K Glass T**	12mm argon	**K Glass**	1.0
Optiwhite	16mm argon	**K Glass T**	16mm argon	**K Glass**	0.8
Optiwhite	12mm argon	**K Glass OW T**	12mm argon	**K Glass OW**	1.0
Optiwhite	16mm argon	**K Glass OW T**	16mm argon	**K Glass OW**	0.8
Optiwhite	12mm krypton	**K Glass OW T**	12mm krypton	**K Glass OW**	0.7

DEFAULT U-VALUES GIVEN IN SAP 2009 VERSION 9.90 (MARCH 2010)
(TABLE 6e FOR TRIPLE GLAZED PVC-U AND WOODEN WINDOW FRAMES FOR GLASS MANUFACTURERED BY COMPANIES OTHER THAN PILKINGTON)

Triple Glazing	Wood / PVC-U Frame	
	12mm gap	16mm gap or more
Triple glazing (low-E, ε^n =0.2, Air filled, hard coat)	1.7	1.6
Triple glazing (low-E, ε^n =0.15, Air filled, hard coat)	1.7	1.6
Triple glazing (low-E, ε^n =0.1, Air filled, soft coat)	1.6	1.5
Triple glazing (low-E, ε^n =0.05, Air filled, soft coat)	1.5	1.4
Triple glazing (low-E, ε^n =0.2, Argon filled, hard coat)	1.6	1.5
Triple glazing (low-E, ε^n =0.15, Argon filled, hard coat)	1.5	1.4
Triple glazing (low-E, ε^n =0.1, Argon filled, soft coat)	1.5	1.4
Triple glazing (low-E, ε^n =0.05, Argon filled, soft coat)	1.4	1.3