

London Borough of Brent
Building Control



Brent

U-VALUE GUIDE

**FOR DOMESTIC BUILDING WORK INCLUDING EXTENSIONS AND LOFT
CONVERSIONS**

TO ACHIEVE COMPLIANCE WITH APPROVED DOCUMENT L1

Address: Building Control, Brent Civic Centre, Engineers Way, Wembley, HA9 0FJ
Website: www.brent.gov.uk/planning-and-building-control/building-control
Telephone: 0208 937 5210



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ALL PRODUCTS MUST BE INSTALLED AS PER MANUFACTURERS DESIGN

THE INFORMATION BELOW IS A QUICK GUIDE OF INSULATION TYPES TO ACHIEVE THE MINIMUM U-VALUE

Existing and New U-values		
Type of Element	Previous U-values W/m ² K	New U-Values W/m ² K
Floor	0.22	0.18
Wall	0.28	0.18
Pitched Roof - Insulation at rafter level	0.18	0.15
Pitched Roof - Insulation at ceiling level	0.16	0.15
Flat Roof	0.18	0.15
Windows	1.6	1.4
Doors	1.8	1.4

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SECTION 1 - WALL INSULATION

CAVITY WALL - WITH FULL FILL INSULATION & WITHOUT INSULATED PLASTERBOARD (BRICK & BLOCK CONSTRUCTION)

MUST BE INSTALLED AS PER MANUFACTURERS DESIGN

THE INFORMATION BELOW IS A QUICK GUIDE OF INSULATION TYPES TO ACHIEVE THE MINIMUM U-VALUE

U-Value = 0.18W/m²K

Product	Cavity	Outer Leaf	Inner Leaf	Internal Finish
KNAUF Dritherm Cavity Slab 32 or ISOVER CWS 32 or Rockwool NyRock Cavity Batt	150mm	103mm Brickwork	100mm Plasma Fibolite/Celcon Solar (0.11W/mK)	12.5mm Plasterboard w/Dabs
Unlin Insulation CavityTherm 110mm	110mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs
Celotex ThermaClass 21 cavity wall 90mm (10mm residual cavity)	100mm	103mm Brickwork	100mm Aggregate Blockwork (0.21-0.31W/mK)	12.5mm Plasterboard w/Dabs
Unlin Insulation CavityTherm 100mm	100mm	103mm Brickwork	100mm Aggregate Blockwork (0.21-0.31W/mK)	12.5mm Plasterboard w/Dabs
Kingspan Kooltherm K106 board 90mm (10mm residual cavity)	100mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs

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**CAVITY WALL - WITH PARTIAL FILL & WITHOUT INSULATED PLASTERBOARD
(WITH 50mm RESIDUAL CAVITY)
(BRICK/BLOCK CONSTRUCTION)**

U-Value = 0.18W/m²K

Product	Cavity	Outer Leaf	Inner Leaf	Internal Finish
Celotex CW4000 100mm	150mm	103mm Brickwork	100mm Aerated Blockwork (0.11-0.15W/mK)	12.5mm Plasterboard w/Dabs
Unlin Insulation XT/CW 100mm	150mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs
Celotex CW4000 100mm	150mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs
Kingspan Kooltherm K108 90mm	140mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs
Unlin Insulation XT/CWP 90mm	140mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs
Unlin Insulation XT/CW or XT/CWP 80mm	130mm	103mm Brickwork	100mm Aerated Blockwork (0.11-0.15W/mK)	12.5mm Plasterboard w/Dabs
Kingspan Kooltherm K108 80mm	130mm	103mm Brickwork	100mm Aggregate Blockwork (0.21-0.31W/mK)	12.5mm Plasterboard w/Dabs
Kingspan Kooltherm K108 70mm	120mm	103mm Brickwork	100mm Aerated Blockwork (0.11-0.15W/mK)	12.5mm Plasterboard w/Dabs

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**CAVITY WALL - WITH PARTIAL FILL & WITHOUT INSULATED PLASTERBOARD
(WITH 50mm RESIDUAL CAVITY)**

(BLOCK/BLOCK CONSTRUCTION)

Product	Cavity	Outer Leaf	Inner Leaf	Internal Finish
Celotex CW4000 or Unlin Insulation XT/CW 100mm	150mm	103mm Dense Blockwork and 20mm render	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs
Kingspan ThermaWall TW50 100mm	150mm	103mm Dense Blockwork and 20mm render	100mm Plasma Fibolite (0.11W/mK)	12.5mm Plasterboard w/Dabs
Unlin Insulation XT/CW or XT/CWP 90mm	140mm	103mm Dense Blockwork and 20mm render	100mm Aggregate Blockwork (0.21-0.31W/mK)	12.5mm Plasterboard w/Dabs
Kingspan Kooltherm K108 90mm	140mm	103mm Dense Blockwork and 20mm render	100mm Dense Blockwork (1.13W/mK)	12.5mm Plasterboard w/Dabs
Unlin Insulation XT/CW or XT/CWP 80mm	130mm	103mm Dense Blockwork and 20mm render	100mm Aerated Blockwork (0.11-0.15W/mK)	12.5mm Plasterboard w/Dabs
Kingspan Kooltherm K108 70mm	120mm	103mm Dense Blockwork and 20mm render	100mm Aerated Blockwork (0.11-0.15W/mK)	12.5mm Plasterboard w/Dabs

**CAVITY WALL - WITH FULL FILL & WITH INSULATED PLASTERBOARD
(BRICK/BLOCK CONSTRUCTION)**

Product	Cavity	Outer Leaf	Inner Leaf	Internal Finish
KNAUF Dritherm Cavity Slab 32 or ISOVER CWS 32 or Rockwool NyRock Cavity Batt	100mm	103mm Brickwork	100mm Aerated Blockwork (0.11-0.15W/mK)	47.5mm dry-lined insulated plasterboard w/Dabs
KNAUF Dritherm Cavity Slab 32	125mm	103mm Brickwork	100mm Plasma Fibolite/Celcon Solar (0.11W/mK)	32.5mm dry-lined insulated plasterboard w/Dabs
Rockwool NyRock Cavity Batt 115mm	115mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	47.5mm dry-lined insulated plasterboard w/Dabs
Rockwool Full Fill Cavity Batt 130mm	130mm	103mm Brickwork	100mm Dense Blockwork (1.13W/mK)	47.5mm dry-lined insulated plasterboard w/Dabs

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**CAVITY WALL - WITH FULL FILL & WITH INSULATED PLASTERBOARD
(BLOCK/BLOCK CONSTRUCTION)**

Product	Cavity	Outer Leaf	Inner Leaf	Internal Finish
ISOVER CWS 32 100mm	100mm	103mm Dense Blockwork and 20mm render	100mm Aerated Blockwork (0.11-0.15W/mK)	62.5mm dry-lined insulated plasterboard w/Dabs
Rockwool NyRock Cavity Batt 100mm	100mm	103mm Dense Blockwork and 20mm render	100mm Aerated Blockwork	62.5mm dry-lined insulated plasterboard w/Dabs
ISOVER CWS 32 100mm	100mm	103mm Dense Blockwork and 20mm render	100mm Aggregate Blockwork (0.21-0.31W/mK)	62.5mm dry-lined insulated plasterboard w/Dabs
Rockwool Full Fill Cavity Batt 150mm	150mm	103mm Dense Blockwork and 20mm render	100mm Dense Blockwork (1.13W/mK)	47.5mm dry-lined insulated plasterboard w/Dabs

SOLID WALL

U-Value = 0.18W/m²K

Product	Outer Leaf	Internal Finish
Celotex GA4000 100mm	215mm Brickwork/Blockwork	12.5mm Plasterboard w/Dabs
Kingspan K118 87.5mm	215mm Solar Grade Blockwork	Any Finish
Kingspan K5 75mm (external insulation)	215mm Solar Grade Blockwork	12.5mm Plasterboard w/Dabs

TIMBER FRAME WALL

U-Value = 0.18W/m²K

Product	External Finish	Stud Wall 47x100mm or 47x125mm	Internal Finish
Celotex GA4000	Tile/Render	90mm Insulation	50mm Celotex GA4000 + 12.5mm Plasterboard
Kingspan Kooltherm K112	Tile/Render	90mm Insulation	50mm Kingspan Kooltherm K112 & 12.5mm Plasterboard
Xtratherm XT/TF	Tile/Render	90mm Insulation	50mm Xtratherm XT/TF & 12.5mm Plasterboard
ISOVER Timber Frame Roll/Batt 32	Tile/Render	90mm Insulation	Celotex PL400 77.5mm

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SECTION 2 - ROOF INSULATION

PITCHED ROOF (INSULATION BETWEEN AND UNDER RAFTERS)

U-Value = 0.15W/m²K - (50mm air gap to be applied above insulation – cold deck roof)
– for loft conversions

Product	Size of Rafters	Thickness	λ-value (W/mK)
Celotex GA4000	47x125mm @400mm c/c	75mm between, 90mm under + 12.5mm plasterboard	0.022
Xtratherm Thin R- XT/PR	47x125mm @400mm c/c	75mm between, 90mm under + 12.5mm plasterboard	0.022
Kingspan Thermopitch TP10	47x125mm @400mm c/c	75mm between, 90mm under + 12.5mm plasterboard	0.022
Celotex GA4000	47x147mm @400mm c/c	100mm between, 70mm under + 12.5mm plasterboard	0.022
Xtratherm Thin R- XT/PR	47x147mm @400mm c/c	100mm between, 70mm under + 12.5mm plasterboard	0.022
Kingspan Thermopitch TP10	47x147mm @400mm c/c	100mm between, 70mm under + 12.5mm plasterboard	0.022

PITCHED ROOF (INSULATION BETWEEN AND UNDER RAFTERS)

U-Value = 0.15W/m²K - (including breathable felt)

Product	Size of rafters	Thickness	λ-value (W/mK)
Celotex GA4000	47x175mm @400mm c/c	125mm between, 50mm under + 12.5mm plasterboard	0.022
Xtratherm Thin R- XT/PR	47x175mm @400mm c/c	125mm between, 50mm under + 12.5mm plasterboard	0.022
Kingspan Thermopitch TP10	47x175mm @400mm c/c	125mm between, 50mm under + 12.5mm plasterboard	0.022

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PITCHED ROOF (INSULATION OVER CEILING JOISTS)

U-Value = 0.15W/m²K - (CEILING SPACE)

Product	Thickness	λ-value (W/mK)
Celotex XR4000 + PL4000	130mm between XR4000 + 62.5mm PL4000 under (50mm + 12.5mm insulated plasterboard)	0.022
Rockwool Roll	150mm between + 150mm under	0.044
Thermafleece Cosywool	150mm between + 150mm under	0.039
Knauf insulation Loft Roll 44	150mm between + 150mm under	0.044
Actis Multifoils HYBRIS + HCONTROL HYBRIS	140mm between + 45mm underneath	0.044

PITCHED ROOF WARM DECK ROOF (INSULATION BETWEEN AND OVER RAFTERS)

U-Value = 0.15W/m²K - (no ventilation required)

Product	Size of Rafters	Thickness	λ-value (W/mK)
Celotex GA4000	@400mm c/c	75mm between 75mm over	0.022

FLAT ROOF WARM DECK ROOF (INSULATION ABOVE JOISTS)

U-Value = 0.15W/m²K - (no ventilation required)

Product	Thickness	λ-value (W/mK)
Celotex GA4000	150mm	0.022
Xtratherm FR-LU	150mm	0.022
Kingspan Thermaroof TR26	150mm	0.022
Ecotherm Eco-Versal	150mm	0.022
Recticel Eurothane Power deck	150mm	0.022
Kingspan Thermaroof TR27	2 X 80mm	0.024

Please note that this is based on a conventional warm deck build-up consisting of furrings, 18mm plywood or OSB, an insulation layer, and flat roof membrane.

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FLAT ROOF COLD DECK ROOF (INSULATION BETWEEN AND UNDER JOISTS)
U-Value = 0.15W/m²K - (50mm air gap to be applied above insulation) – for loft conversions

- **Size of joists 47x147mm @400mm ctrs**

Product	Thickness	λ-value (W/mK)
Celotex GA4000	100mm between, Celotex PL4000 77.5mm under	0.022
Xtratherm FR-LU	100mm between, 70mm under + 12.5mm plasterboard	0.022
Kingspan Thermapitch TP10	100mm between, 70mm under + 12.5mm plasterboard	0.022
Ecotherm Eco-Versal	100mm between, 70mm under + 12.5mm plasterboard	0.022
Recticel Eurothane Power deck	100mm between, 75mm under + 12.5mm plasterboard	0.022

- **Size of joists 47x195mm @400mm ctrs**

Product	Thickness	λ-value (W/mK)
Celotex GA4000	150mm between, 40mm under + 12.5mm plasterboard	0.022
Xtratherm FR-LU	150mm between, 40mm under + 12.5mm plasterboard	0.022
Kingspan Thermapitch TP10	150mm between, 40mm under + 12.5mm plasterboard	0.022
Ecotherm Eco-Versal	150mm between, 40mm under + 12.5mm plasterboard	0.022
Recticel Eurothane Power deck	150mm between, 50mm under + 12.5mm plasterboard	0.022

Please note that this is based on a conventional cold deck roof build-up of insulation, which includes joists, furring, 18mm plywood or OSB, insulation layer, and flat roof membrane. Without the requirement for an OSB layer, the flat roof membrane is applied directly over the insulation

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SECTION 3 - FLOOR INSULATION

THE GUIDE BELOW GIVES EXAMPLES OF THICKNESSES OF INSULATION TO FLOORS HOWEVER, YOU SHOULD ALWAYS DO A P/A (PERIMETER OVER AREA) CALCULATION TO JUSTIFY FLOOR.

Examples below are for P/A ratio @ 1.0

Most manufacturers and the Building Regulations require a minimum of a 25mm insulated upstand to the perimeter walls.

SOLID CONCRETE SLAB

U-Value = 0.18W/m²K

Product	Thickness
Celotex GA4000	100mm
Kingspan Kooltherm K103	100mm
Kingspan Thermafloor TF70	100mm
Xtratherm Thin-R XT/UF	100mm
Recticel Eurothane GP	100mm
Ecotherm Eco-Versal	100mm

SUSPENDED BEAM AND BLOCK

U-Value = 0.18W/m²K

Product	Thickness
Celotex GA4000	100mm
Kingspan Kooltherm K103	100mm
Kingspan Thermafloor TF70	100mm
Xtratherm Thin-R XT/UF	100mm
Recticel Eurothane GP	100mm
Ecotherm Eco-Versal	100mm

SUSPENDED TIMBER FLOOR

U-Value = 0.18W/m²K

Product	Thickness
Celotex GA4000	140mm
Kingspan Kooltherm K103	140mm
Kingspan Thermafloor TF70	170mm
Xtratherm Thin-R XT/UF	140mm
Recticel Eurothane GP	160mm
Rockwool Flexi	260mm
Ecotherm Eco-Versal	140mm
Actis Hybrid Combined with Boost R Hybrid	140mm

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SECTION 4 - U-VALUE FOR DOORS AND WINDOWS

DOUBLE GLAZING

U-Value = 1.4W/m²K

Pilkington Glass	Outer Pane	Inner Pane	Cavity/Spacer/Gas
K Glass Range	4mm Optifloat	K Glass A or S	16mm Argon

Saint Gobain Glass	Outer Pane	Inner Pane	Cavity/Spacer/Gas
SGG Planitherm	6mm Planitherm ULTRA N	6mm Planitherm ULTRA N	16mm void

TRIPLE GLAZING

Outer Pane	Cavity	Middle Pane	Cavity	Inner Pane	Thickness
Optiwhite E	12mm Argon	K Glass T	12mm Argon	K Glass	36mm
Optiwhite E	16mm Argon	K Glass T	16mm Argon	K Glass	44mm
Optiwhite E	12mm Krypton	K Glass OW T	12mm Krypton	K Glass OW	36mm
Optiwhite E	12mm Krypton	K Glass S T	12mm Krypton	K Glass S	36mm

KEY:

- T = toughened
- OW = hard coat options
- S = soft coat options

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