

Generic External Walls - each column represents a possible wall layer											Recommended Minimal	Residential Construction ADoc L1A & L2B
<<< Overall Thickness of the External Wall >>>											U-values	Wall U-value
											W/m2degC	thickness Calculation
												mm Reference & File Name
Dormer	2	0	12	25		80	25	80	25	15	0.13	264 K D-Wall 0.13 10f25c9t100i70i15p.pdf
Dormer	2	0	12	25		75	25	75	25	13	0.14	252 C D-Wall 0.14 2f12t25c75i25c75i25c13p.pdf
Dormer	10	25	9	25		75		60		15	0.15	219 K D-Wall 0.15 10b25c9c25c75i60i15p.pdf
Dormer	10	25	12	40		60		60		13	0.17	220 Q D-Wall 0.17 10f25c12t60i40c60i13p.pdf
Dormer	15	25	18	25	75			75	25	15	0.17	273 X D-Wall 0.17 15f25c18t25c75i75i25c15p.pdf
Dormer	15	25	13			100				15	0.28	193 C D-Wall 0.28 13t100i25c15p
Brick CW			103	10		115				15	0.13	358 K C-Wall 0.13 103b10c115i100b15c15p.pdf
Brick CW			103	10		90				25	0.17	343 K C-Wall 0.17 103b10c90i100b25c15p.pdf
Brick CW			103	10		100				15	0.17	343 Q C-Wall 0.17 103b10c90i100b15c15p.pdf
Brick CW			103	10	50	50				25	0.17	353 X C-Wall 0.17 103b10c50i50i25c15p.pdf
Brick CW			103	50		50				15	0.28	331 C C-Wall 0.28 103b50c50i100b15c13p
Brick CW			103	50		40				15	0.30	321 K C-Wall 0.30 103b50c40i100b.pdf
Brick Soild			215							140	0.13	395 C S-Wall 0.13 215b140i25c13p.pdf
Brick Soild			215				25			90	0.18	345 K S-Wall 0.18 215b25t90i15p.pdf
Brick Soild			215							100	0.18	353 C S-Wall 0.18 215b100i25c13p.pdf
Brick Soild			215							100	0.18	368 Q S-Wall 0.18 215b15p100i25c13p.pdf
Brick Soild			215	25						100	0.17	380 X S-Wall 0.17 215b25c100i25c15p
Brick Soild			215							55	0.28	308 C S-Wall 0.28 215b55i25c13p
external surface	external finish***	cavity*(ventilated)	external skin	cavity* (drained)	insulation	insulation	int skin	internal insulation	service void**	internal finish		
SIPS	10	38			142			50	25	15	0.13	280 K P-Wall 0.13 10f38c142SIPS50i25c13p.pdf
SIPS	10	38			142			25	25	15	0.15	255 K P-Wall 0.15 10f38c142SIPS25i25c13p.pdf
SIPS	10	38			142			20	25	15	0.16	250 K P-Wall 0.16 10f38c142SIPS20i25c13p.pdf
SIPS	10	38			142			25	15	15	0.20	230 K P-Wall 0.20 10f38c142SIPS25c13p.pdf
					142mm SIPS						0.28	Not possible 0.20 is poorest U-value with SIPS
					Load bearing wall replaced by SIPS (Structural Insulated Panel)							
					<< Line of Breather Layer if required							
												<< Line of Vapour Barrier if required

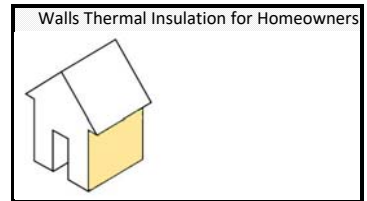
Notes

- *If well ventilated then external layer disregarded - 25mm is normal
- ** 25mm service void recommended for electrics & plumbing
- *** Render or cladding finish does not change U-value result
- # 100mm of mineral wool will give same U-value result as 50mm foil faced insulation

Calculation Sources for foil faced insulation

- Celotex <https://www.celotex.co.uk/member/dashboard>
- Kingspan <https://www.uvalue-calculator.co.uk/calculator/>
- Quinn <https://uvaluecalculator.quinn-buildingproducts.com/>
- YourSpreadsheets <https://www.yourspreadsheets.co.uk/u-value-calculator-to-bs-en-iso-6946.html>
- REF: <https://www.homebuilding.co.uk/internal-wall-insulation/> a vapour barrier to warm side of the insul + service void

Summary
 160mm insulation gives 0.13 U-value
 100mm insulation gives 0.18 U-value
 50mm insulation gives 0.28 U-value
 40mm insulation gives 0.30 U-value



See foot note for pdf File Names/Codes etc...

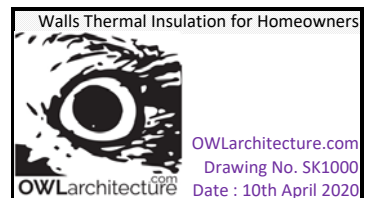
Element or system	Values
Opening areas (windows and doors)	Same as actual dwelling up to a maximum proportion of 25% of total floor area ¹
External walls (including opaque elements of curtain walls)	0.18 W/(m ² K)
Party walls	0.0 W/(m ² K)
Floor	0.13 W/(m ² K)
Roof	0.13 W/(m ² K)
Windows, roof windows, glazed roof-lights and glazed doors	14 W/(m ² K) (whole window U-value) ² g-value = 0.63 ³
Opaque doors	1.0 W/(m ² K)
Semi-glazed doors	1.2 W/(m ² K)
Airtightness	5.0 m ³ /(h.m ²)
Linear thermal transmittance	Standardised psi values – see SAP 2012 Appendix R, except use of $y = 0.05 \text{ W/(m}^2\text{K)}$ if the default value of $y = 0.15 \text{ W/(m}^2\text{K)}$ is used in the actual dwelling
Ventilation type	Natural (with extract fans) ⁴
Air-conditioning	None

<< From Approved Document L1A

<< 0.18 or lower why not 0.13?

<< 0.13 or lower

<< 0.13 or lower



Footnote for pdf filenames - PREFIX: C is Celotex Calculation, K is Kingspan Calc, Q is Quinn Calc, X is Generic Calc, Z is Belt & Braces Calculation

2nd Letter: C is Cavity Wall, D is Dormer Wall, S is Solid Wall, P is a SIPs Wall (Structural Insulated Panel normally 142 mm)

2nd Letter: F is Flat roof, P is Pitched roof insulation at rafters, L is Pitched roof insulation at ceiling joists/Loft

3rd/4th the Letter: A is insulation above, B is insulation between eg. rafters, joist and concrete layers etc..., U is insulation under

Thickness of elements in numbers followed by:

(a) is cavity (may be including space between joists etc...), (b) is brick/block, (c) is concrete, (f) is finish, (i) is insulation, (m) is stone masonry, (p) is plaster, (s) is screed, (t) is timber or board, (c-c) is centre to centre

PA is Perimeter/Area ratio