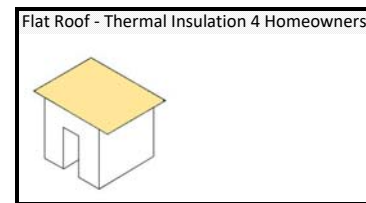


Generic Roof - each column represents a possible roof layer										Recommended Minimal	Residential Construction ADoc L1A & L2B	
<<< Overall Thickness of the External Roof >>>										U-values	Roof U-value	
<<< Line of water proof membrane										W/m2degC	thickness Calculation	
Above	2	12	160	19	175				13	0.13	381 X F-B-Roof 0.13 3f12t160i18t175c15p.pdf	
	2		120	19	175				13	0.18	329 Q F-A-Roof 0.18 2f120i19t175c13p.pdf	
	2		110	19	175				13	0.20	319 Q F-A-Roof 0.20 2f110i19t175c13p.pdf	
	1	18	120	18	150				15	0.18	322 K F-A-Roof 0.18 1f18t120i18t150c15p.pdf	
	2	18	110	18	150				15	0.20	313 K F-A-Roof 0.2 2f100i10t150c15p.pdf	
Under	2	18	***		175			175	25	15	0.13	410 Not a practical solution
	2	18	***		175			120	25	15	0.18	355 Not a practical solution
	2	18	***		175			110	25	15	0.20	345 Not a practical solution
Between & Under	3	18	***		75	100		70	13		0.13	279 K F-BU-Roof 0.13 18t75c100i70i13p 400c-c.pd
	3	18	***		85	90		90	13		0.13	299 Q F-BU-Roof 0.13 50c90i90i13p 600c-c.pdf
	3	18	***		50	100		75	25	13	0.13	284 C F-BU-Roof 0.13 12f18b50c100i75i25c13p 40
	3	18	***		50	75		75	25	13	0.16	259 C F-BU-Roof 0.16 12f18t50c75i75i25c13p 400c
	3	18	***		50	75		50	25	13	0.18	234 C F-BU-Roof 0.18 3f18t50c75i50i25c13p.pdf
	3	18	***		50	60		50	25	13	0.20	219 C F-BU-Roof 0.20 3f18r50c60i50i25c13p.pdf
Between	3	18	***		50	200		25	13		0.13	309 X F-B-Roof 0.13 3f18t50c200i25c15p.pdf
	3	18	***		50	200		25	13		0.18	309 C F-B-Roof 0.18 3f18t50c200i13p.pdf

Summary
 - 175mm insulation gives 0.13 U-value ____
 - 150mm insulation gives 0.16 U-value ____
 - 125mm insulation gives 0.18 U-value ____
 - 110mm insulation gives 0.20 U-value ____

Not recommend to have all insulation between joists
 309 X F-B-Roof 0.13 3f18t50c200i25c15p.pdf
 309 C F-B-Roof 0.18 3f18t50c200i13p.pdf



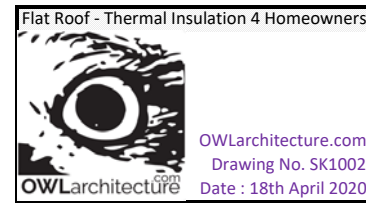
See foot note for pdf File Names/Codes etc...

Notes
 *If well ventilated then external layer disregarded - 50mm is normal
 ** 25mm service void recommended for electrics & plumbing
 *** Condensation risk (see *** below) :- thus ensure double vapour barriers are used

- Calculation Sources
- 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/insulating-roofs/>
 - *** <https://www.energuide.be/en/questions-answers/can-a-flat-roof-be-insulated-from-inside-from-the-ceiling-of-the-area-below/101>

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	1.4 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 ³)
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 - Walls
- << 0.13 or lower - Floors
- << 0.13 or lower - Roofs



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 Calculator
 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 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