Triple Layer System Step by Step Guide & U-value Calculation for Building Regulations

Guide to be used alongside following video - https://youtu.be/FphXekEr48M
YouTube Title – **Triple Layer 0.18 Re-Roof System – By Ecohome Insulation**

1. **First Layer (BreatherQuilt Over Rafter)** – Start at the bottom of the roof, roll out BreatherQuilt across the rafters, ensuring the product is fully draped below the rafter line, and overlapping the eaves carrier
2. Staple BreatherQuilt to the rafters at minimum internals of 300mm. Heavy Duty Staple Guns & 5,000 14mm Staples can be purchased on our website – Click Link
3. Cut BreatherQuilt so it finishes in the centre of the last rafter. Butt joint the next roll at the end of the first roll. Tape and seal the butt joint using Thermaseal Weatherproof Tape. Link to purchase this on our website – Click Link
4. Prepare the next layer of BreatherQuilt, ensuring a minimum overlap of 100mm
5. Staple the second run of BreatherQuilt to the rafters at minimum intervals of 300mm, ensuring the product is fully draped below the rafter line
6. Remove the easy peel tape backing on the installed layer below, and apply pressure so stick the two layers together
7. Roll over the ridge, maintaining a minimum 100mm overlap and seal
8. Seal the vertical perimeter joints using our Thermaseal Weatherproof Tape.
9. Apply tile battens and tiles (maintaining a 10mm gap between the batten and draped BreatherQuilt)
10. **Second Layer (SuperQuilt Recessed Under Rafter)** – Prepare the SuperQuilt and staple to the rafters at minimum intervals of 300mm. Recess the SuperQuilt into the rafter void, ensuring there is still a clear cavity between SuperQuilt and BreatherQuilt above. Staple to the front and sides of the rafters, at min internals at 300mm.
11. Prepare the next run of SuperQuilt, ensuring a minimum overlap of 50mm.
12. Recess SuperQuilt into the rafter void, and staple to the rafters at minimum internals of 300mm. You also have the option to use Saddle Clips to save installation time! These can be found at the following link – Click Link
13. Seal all overlaps and the perimeter of SuperQuilt using Thermaseal Foil Joining Tape. This can be found at the following link – Click Link
14. **Third Layer (SuperQuilt Under Rafter)** – Prepare the second layer of SuperQuilt and staple to the rafters at minimum intervals of 300mm. You will be stapling through the first layer of installed SuperQuilt.
15. Prepare the next layer of SuperQuilt, ensuring a minimum overlap of 50mm
16. Staple the SuperQuilt to the rafters, at minimum intervals of 300mm.
17. Seal all overlaps and the perimeter of SuperQuilt using Thermaseal Foil Joining Tape.
18. Apply a layer of timber battens (min 25mm depth) perpendicular to the rafters at min intervals of 400mm
19. Finally apply the internal finish in accordance with the manufacturer's certification, fixing instructions and good building practise.

U-value Calculation – To be passed on to building control for acceptance

Element type: Roof - Pitched roof - insulated slope, sloping ceiling
Calculation Method: BS EN ISO 6946

Triple Layer 0.18 Pitched Roof Detail
1 Layer BreatherQuilt External
1 Layer SuperQuilt Recessed
1 Layer SuperQuilt Internal
BASED ON 100mm DEPTH RAFTERS

Layer	d (mm)	l layer	l bridge	Fraction	R layer	R bridge	Description
					0.100		Rsi
1	12.5	0.210			0.060		Plasterboard (standard wallboard)
2	25	R-value[1]	0.130	0.0630	0.490	0.192	25mm Battens
3	7	R-value	R-value	0.0120	1.520	0.670	SuperQuilt
4	25	R-value[2]	0.130	0.117	0.490	0.192	25mm Rafters / Cavity
5	40	R-value	R-value	0.117	1.520	0.670	40mm Rafters / SuperQuilt Recessed
6	35	R-value[3]	0.130	0.117	0.490	0.269	35mm Rafters / Cavity
7	7	R-value	R-value	0.0120	1.170	0.670	BreatherQuilt (Draped)
8	25	R-value					25mm Battens
9	15	1.000					Tiles (clay)
					0.100 #		Rse
	192 mm (total roof thickness)				5.940		

[1]Calculated with specified emissivity of 0.02
[2]Calculated with specified emissivity of 0.02
[3]Calculated with specified emissivity of 0.02
this resistance substitutes for Rse and the resistance of layers 8-9 because of the ventilated air layer (layer 8)

Total resistance: Upper limit: 5.700 Lower limit: 5.548 Ratio: 1.027 Average: 5.624 m^2K/W

U-value (uncorrected) 0.178

U-value (corrected) 0.178
U-value (rounded) 0.18 W/m^2K