

Project Information

Reference Thermic Technology 140240-10
 Date 12/2/20
 Client Timber Frame Solutions
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This 4-page document contains:

- U-value calculation
- Condensation risk analysis
- CAD drawing of wall structure

Construction Type

Element : Wall - 184 - PhotonWrap - 0.040 - PhotonFoil - 0.16

Timber framed wall

Internal surface emissivity : High External surface emissivity : High

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m ² K/W)	Pitch (°)	Bridge details Air gaps (Level, Delta U")
Outside surface resistance	-	-	0.040		
Brick - outer leaf (BRE)	103.0	0.770	0.134		17.332% Mortar (103.0mm)
Cavity	50.0	-	0.665		
(Un-vented cavity - width=562.0mm, hro=5.100, E1=0.050, E2=0.900, horizontal heat flow)					
PhotonWrap reflective breather membrane	0.5	0.030	0.017		L:0 0.000W/m ² K
OSB (BS5250)	9.0	0.130	0.069		L:0 0.000W/m ² K
Earthwool FrameTherm Roll 40	180.0	0.040	4.500		15.000% Prefabricated panels (180.0mm) L:0 0.000W/m ² K
PhotonFoil	33.0	0.034	0.971		6.333% Compressed PhotonFoil and Timber (33.0mm)
50x38mm batten cavity	23.0	-	0.665		6.333% Softwood (~500kg/m ³) (23.0mm)
(Bridged un-vented cavity - width=550.0mm, hro=5.100, E1=0.050, E2=0.900, horizontal heat flow)					
Plasterboard (BS5250)	12.5	0.170	0.074		
Plaster, lightweight (BS5250)	3.0	0.220	0.014		
Inside surface resistance	-	-	0.130		

U-value = 0.16W/m²K

U-value, Combined Method : 0.159W/m²K (upper/lower limit 6.495 / 6.053m²K/W, dUf 0.0000, dUg 0.0000, dUp0.0000, dUr0.0000, dUrc1 0.0000, dUrc2 0.0000)

Correction factors

Air gaps, Delta Ug = 0.000W/m²K

(Based on the combined method for determining U-values of structures containing repeating thermal bridges)

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m ² K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)
Outside surface resistance	-	-	0.040	-	-
Brick - outer leaf (BRE)	103.0	0.770	0.134	50.00	5.15
Cavity	50.0	-	0.665	-	0.26
(Un-vented cavity - width=562.0mm, hro=5.100, E1=0.050, E2=0.900, horizontal heat flow)					
PhotonWrap reflective breather membrane	0.5	0.030	0.017	50.00	0.03
OSB (BS5250)	9.0	0.130	0.069	500.00	4.50
Earthwool FrameTherm Roll 40	180.0	0.040	4.500	5.00	0.90
PhotonFoil	33.0	0.034	0.971	-	192.00
50x38mm batten cavity	23.0	-	0.665	-	0.13
(Bridged un-vented cavity - width=550.0mm, hro=5.100, E1=0.050, E2=0.900, horizontal heat flow)					
Plasterboard (BS5250)	12.5	0.170	0.074	60.00	0.75
Plaster, lightweight (BS5250)	3.0	0.220	0.014	30.00	0.09
Inside surface resistance	-	-	0.130	-	-

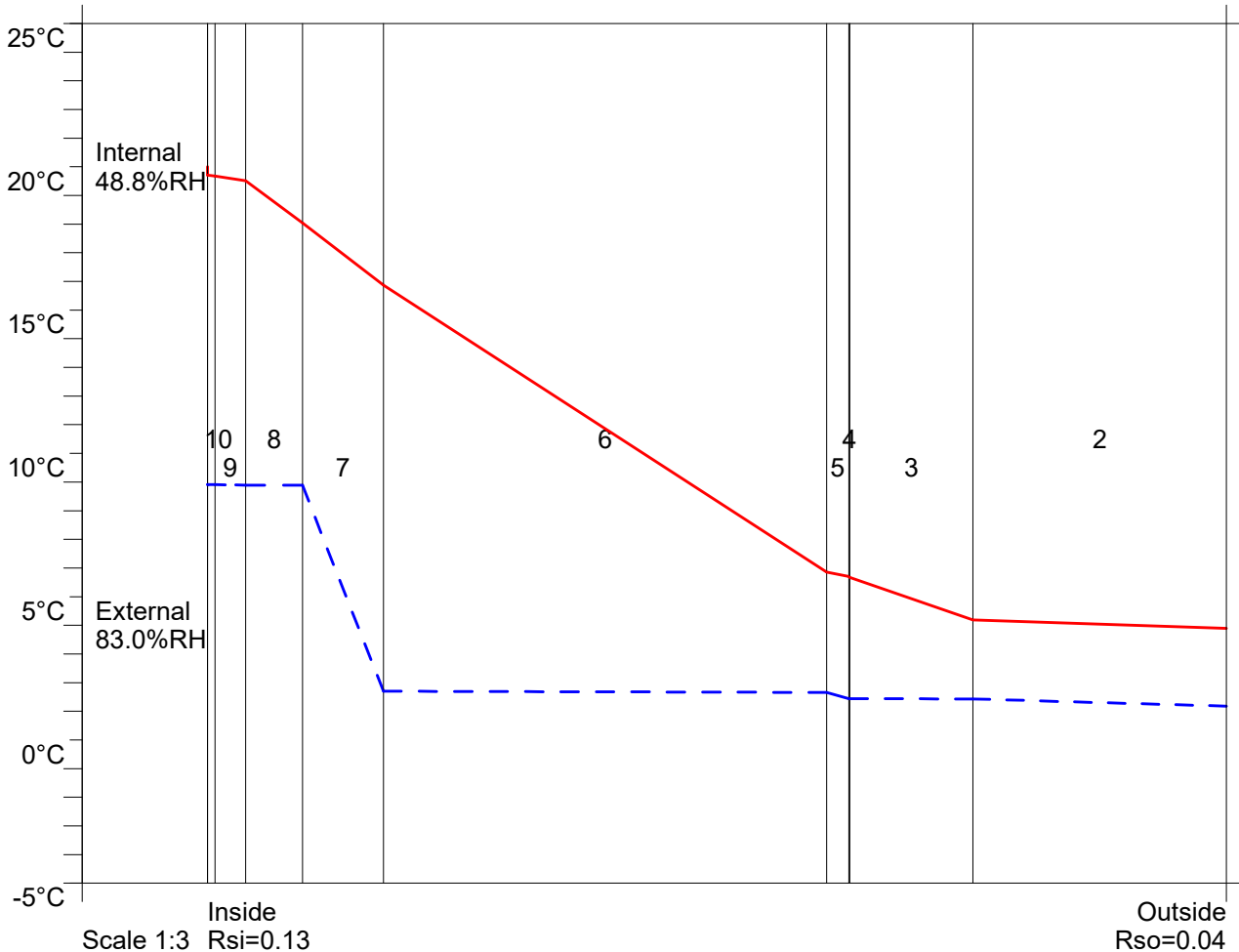
Condensation Risk Analysis (no account taken of thermal bridges)

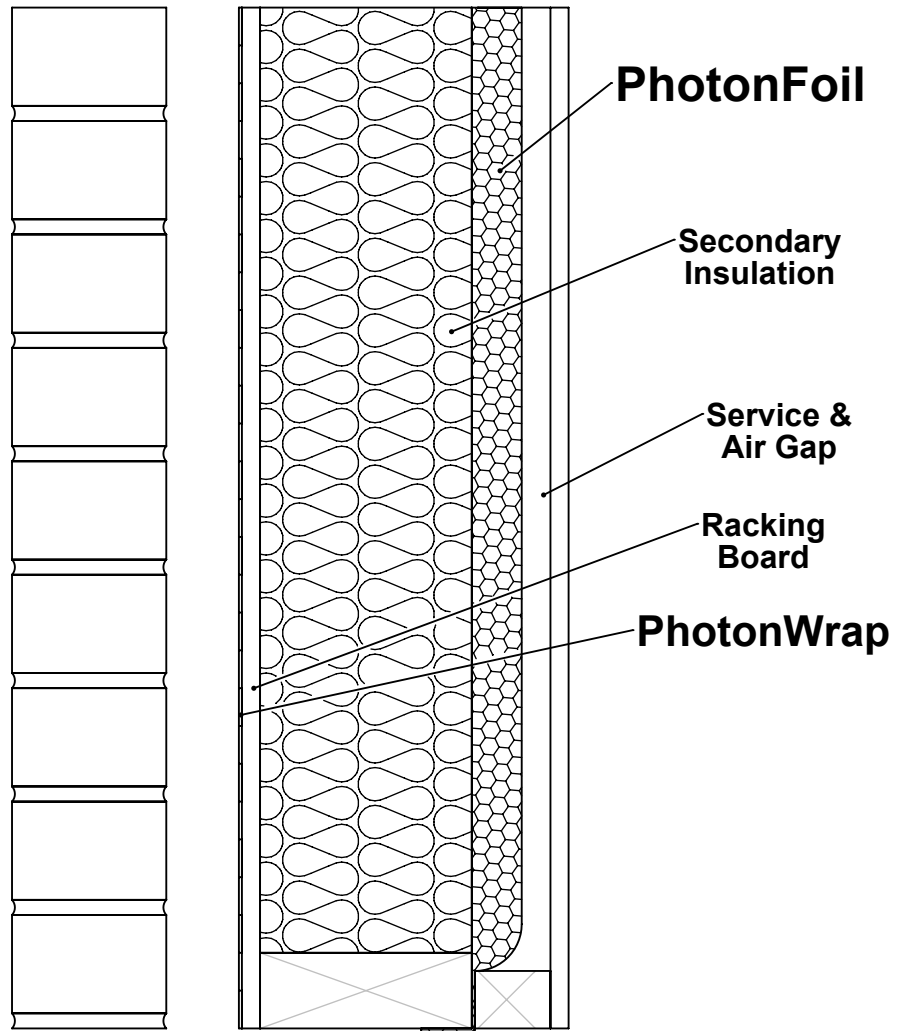
3 - Dwellings with low occupancy

Jan (worst)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
20.0C 48.8%	20.0C 48.9%	20.0C 50.7%	20.0C 52.9%	20.6C 56.3%	22.1C 59.2%	22.9C 60.8%	22.9C 60.7%	21.8C 58.5%	20.3C 55.6%	20.0C 51.3%	20.0C 49.5%
3.8C 83.0%	3.9C 81.0%	5.7C 76.5%	7.9C 74.0%	11.3C 71.5%	14.2C 73.5%	15.8C 75.5%	15.7C 76.5%	13.5C 78.5%	10.6C 81.0%	6.3C 82.5%	4.5C 83.5%

	Interface Temp. °C	Dewpoint Temp. °C	Vapour Pressure (kPa)	Saturated V.P. (kPa)	Worst Cond. (g/m ²)	Peak Buildup (g/m ²)	Condensation
1 Outside surface resistance							
2 Brick - outer leaf (BRE)	3.9	1.2	0.67	0.81			No
3 Cavity	4.2	1.4	0.68	0.82			No
4 PhotonWrap reflective breather membrane	5.7	1.4	0.68	0.91			No
5 OSB (BS5250)	5.7	1.4	0.68	0.92			No
6 Earthwool FrameTherm Roll 40	5.9	1.7	0.69	0.93			No
7 PhotonFoil	15.9	1.7	0.69	1.80			No
8 50x38mm batten cavity	18.0	8.9	1.14	2.07			No
9 Plasterboard (BS5250)	19.5	8.9	1.14	2.27			No
10 Plaster, lightweight (BS5250)	19.7	8.9	1.14	2.29			No
11 Inside surface resistance	19.7	8.9	1.14	2.30			No

Worst case internal / external conditions for graph : 20.0°C @ 48.8%RH / 3.8°C @ 83.0%RH





TF_Brick_PhotonFoil+PhotonWrap

2D CAD

Thermic Technology Ltd
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