LABC Registered Details

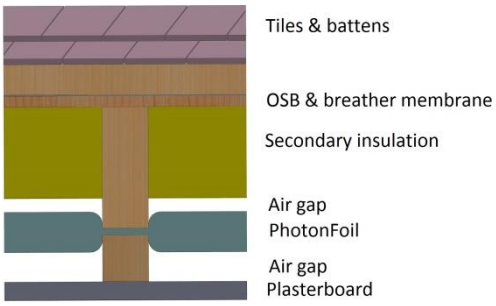
Dormer cheek, U=0.19, 100mm studs @ 600 centres, PhotonFoil across inside, PIR between

WDC_0.19_600_38_P

1 Application

Dormer cheek with tile cladding, 100mm studs at 600mm centres part filled with PIR; PhotonFoil across inside of studs:

- Dormer cheek
- U-Value = 0.19
- 100x38mm stud 600mm spacing
- External tiling
- 70mm PIR λ 0.020 additional insulation between studs
- PhotonFoil across inside
- Plasterboard



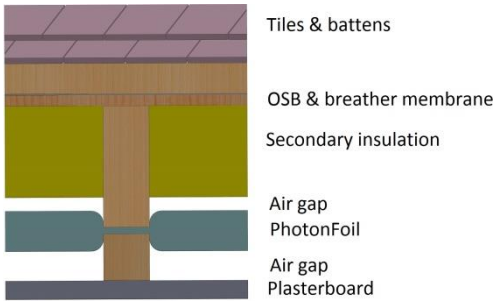
2 Product information

PhotonFoil is a lightweight flexible thin reflective insulation. It is constructed with a high density glasswool core encased in reflective outer layers. In accordance with EN16012 PhotonFoil is classified as a Type 1 reflective insulation product.

It has been designed for and fully tested in accordance with the EN 16012 standard for reflective insulation products, including the application of 90/90. All testing of the product has been carried out by accredited test houses and Notified Bodies. Initial Type Testing to determine the 90/90 fractile has demonstrated that PhotonFoil has a core thermal resistance of 0.97 M^2K/W and an emissivity value of 0.05.

Thermal conductivity ($\lambda_{90/90}$)	0.034	W/m.K
Emissivity	0.05	
Water vapour resistance	192	MN.s/g
Fire performance	Class E	
Product thickness	33	mm
Core R_D value (thermal resistance)	0.97	Km2/W
Core R_D value with 2 air spaces	2.40	Km2/W
Air space thickness	≥ 20	mm
Direction of heat flow	Horizontal	
Width	1.2	M
Weight	0.95	Kg/m2
Roll length	10	lm

3 Installation across inside of studs



Install in line with our general installation instructions:

1. Breather membrane, installed in accordance with manufacturers guidance.
2. Sheathing.
3. Insert secondary insulation between the studs, ensuring a tight fit.
4. Staple PhotonFoil across studs and tape joints.
5. Fit 38x38 mm battens to create service cavity ensuring a ≥16mm unventilated cavity between the PhotonFoil and PIR and a ≥ 20mm unventilated air cavity between the PhotonFoil and plasterboard.
6. Plasterboard and skim.

4 Declared Testing Method

BS EN 16012:2012 states that where a product is already subject to a product specification that describes procedures for the measurement of the aged 90/90 fractile thermal conductivity or thermal resistance of the core insulation material, its guidance should only be used to determine the component of its thermal performance that depends on the emissivity of its external faces; this is the case for PhotonFoil:

1. PhotonFoil is classified under BS EN 16012:2012 as product type 1 and is manufactured by Thermic Technology Ltd; registered under ISO 9001 for the design and manufacture of thin reflective insulation.
2. PhotonFoil is an assembly of three components:
    a. Upper surface: Polyolefin and aluminium composite reflective layer
    b. Core: 33 mm λ0.034 glasswool
    c. Lower surface: Polyolefin and aluminium composite reflective layer

3. The core of PhotonFoil is λ0.034 glasswool manufactured in accordance with BS EN 13162:2012, BS EN 13172:2012 and ISO9001 Quality Management Systems and meets the requirements of Annex ZA

of Harmonised European Product standard EN 13162 with its conformity established according to Harmonised European standard EN 13172.

4. PhotonFoil upper and lower surface has been tested by Notified Body Kiwa in accordance with BS EN 16012:2012 for emissivity and EN 13984:2013, EN 1931:2001 for water vapour transmission.
5. PhotonFoil has been fire tested by Notified Body BTTG to BS EN 11925-2.
6. PhotonFoil has a core R value of 0.97 Km2/W, and an emissivity of 0.05 declared to 90/90.

5 U value calculation and condensation risk

PhotonFoil is a vapour barrier with a defined vapour resistance of 192 MN.s/g and when installed across the inside of the studs risk of condensation calculated in accordance with BS EN ISO 13788 is zero.

The U-Value and condensation risk analysis follow:

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info@thermictechnology.co.uk

Project Information

Reference	PhotonFoil
Date	February 2016
Client	LABC Registered Details
Tel:	0207 091 6877
Email:	rd@labc.co.uk

Construction Type

Element : Wall - WDC_0.19_600_38_P
Timber framed wall
Internal surface emissivity : High External surface emissivity : High

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Pitch (º)	Bridge Details
Outside surface resistance	-	-	0.040		
Tiling including batten space	-	-	0.120		
Breather membrane (BS5250)	-	-	-		
OSB (BS5250)	9.0	0.130	0.069		
Kooltherm K7	70.0	0.020	3.500		6.3% Timber (70.0mm)
Cavity (low emissivity) stud space	16.5	-	0.608		6.3% Timber (16.5mm)
(Bridged un-vented cavity - width=553.0mm, hro=5.100, E1=0.050, E2=0.050, horizontal heat flow)					
PhotonFoil	33.0	0.034	0.971		6.3% Compressed PhotonFoil and Timber (33.0mm)
38x38mm batten cavity	24.5	-	0.665		6.3% Softwood (~500kg/m³) (24.5mm)
(Bridged un-vented cavity - width=562.0mm, 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		

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m²K/W)	Vapour Resistivity (MNs/gm)	Vapour Resistance (MNs/g)
Outside surface resistance	-	-	0.040	-	-
Tiling including batten space	-	-	0.120	-	0.00
Breather membrane (BS5250)	-	-	-	-	0.50
OSB (BS5250)	9.0	0.130	0.069	500.00	4.50
Kooltherm K7	70.0	0.020	3.500	-	100.00
Cavity (low emissivity) stud space	16.5	-	0.608	-	0.00
(Bridged un-vented cavity - width=553.0mm, hro=5.100, E1=0.050, E2=0.050, horizontal heat flow)					
PhotonFoil	33.0	0.034	0.971	-	192.00
38x38mm batten cavity	24.5	-	0.665	-	0.13
(Bridged un-vented cavity - width=562.0mm, 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	-	-

U-value = 0.19W/m²K

U-value, Combined Method : 0.187W/m²K (upper/lower limit 5.728 / 4.992m²K/W, dUf 0.0000, dUg 0.0000, dUp0.0000, dUr0.0000, dUrc0.0000)

(Correction for mechanical fasteners, Delta Uf = 0.000W/m²K)
(Correction for air gaps, Delta Ug = 0.000W/m²K)

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

Condensation Risk Analysis (no account taken of thermal bridges)

4 - Dwellings with high occupancy, sport halls, kitchens, canteens; buildings heated with unflued gas heaters

Jan (worst)	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
20.0C 69.1%	20.0C 68.0%	20.0C 67.0%	20.0C 66.2%	20.0C 68.0%	20.0C 70.7%	20.0C 74.3%	20.0C 75.1%	20.0C 73.4%	20.0C 71.2%	20.0C 69.2%	20.0C 69.3%
2.5C 90.0%	2.8C 86.5%	4.7C 84.0%	7.0C 81.0%	10.3C 81.0%	13.4C 80.0%	15.5C 80.5%	15.1C 82.5%	12.8C 85.5%	9.7C 88.0%	5.4C 89.5%	3.5C 90.5%

	Interface Temp. ºC	Dewpoint Temp. ºC	Vapour Pressure (kPa)	Saturated V.P. (kPa)	Worst Cond. (g/m²)	Peak Buildup (g/m²)	Conden-sation
1 Outside surface resistance	2.6	1.0	0.66	0.74			No
2 Tiling including batten space	3.0	1.0	0.66	0.75			No
3 Breather membrane (BS5250)	3.0	1.1	0.66	0.75			No
4 OSB (BS5250)	3.1	1.4	0.67	0.77			No
5 Kooltherm K7	13.0	6.9	1.00	1.50			No
6 Cavity (low emissivity) stud space	14.8	6.9	1.00	1.68			No
7 PhotonFoil	17.5	14.1	1.61	2.00			No
8 38x38mm batten cavity	19.4	14.2	1.61	2.25			No
9 Plasterboard (BS5250)	19.6	14.2	1.61	2.28			No
10 Plaster, lightweight (BS5250)	19.6	14.2	1.61	2.28			No
11 Inside surface resistance							

Worst case internal / external conditions for graph : 20.0℃ @ 69.1%RH / 2.5℃ @ 90.0%RH