

# Quinn Building Products

## U-Value Calculator

**QUINN** BUILDING PRODUCTS

U-Value

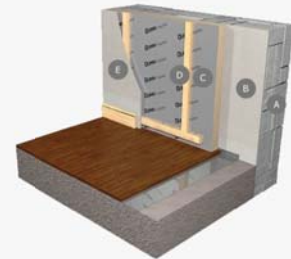
**0.18**

W/m<sup>2</sup>·K

Email my U-Value

Construction Type:	Floors	Walls	Pitched Roof	Flat Roof
Construction Type Layer 2:	Solid walls			
Insulation Solution:	Solid walls: internal dry lining - fixed by battens (Quinn Therm QW)			
Insulation Thickness:	<div><div>25mm</div><div>40mm</div><div>60mm</div><div>70mm</div><div>80mm</div><div>100mm</div><div>110mm</div><div>140mm</div></div>			

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Solid walls: internal dry lining - fixed by battens (Quinn Therm QW)

1. Solid masonry wall
2. Existing plaster finish
3. Quinn Therm QW PIR insulation boards
4. Battens
5. Internal finish

## QUINN Building Products

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Derrylin

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### Project Information

Reference

Date 1 April 2020

### Construction Type

Element : Wall - Solid wall: internal dry lining - fixed by battens (Quinn Therm QW)

Internal surface emissivity : High External surface emissivity : High

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m <sup>2</sup> K/W)	Pitch (°)	Bridge details Air gaps (Level, Delta U")
Outside surface resistance	-	-	0.040		
Solid masonry	215.0	0.770	0.279		17.185% Mortar ext (215.0mm)
Plaster, gypsum (BS5250)	15.0	0.510	0.029		
Quinn Therm QW	100.0	0.022	4.545		L:0 0.000W/m <sup>2</sup> K
Joints taped to create VCL + Air Leakage Barrier	-	-	-		
Cavity (low emissivity) - 25 x 47 battens @ 600 ctrs	25.0	-	0.664		7.833% Timber (25.0mm)
GTEC Standard Board	12.5	0.250	0.050		
Inside surface resistance	-	-	0.130		

### U-value = 0.18W/m<sup>2</sup>K

U-value, Combined Method : 0.177W/m<sup>2</sup>K (upper/lower limit 5.689 / 5.621m<sup>2</sup>K/W, dUf 0.0000, dUg 0.0000, dUp0.0000, dUr0.0000, dUrc1 0.0000, dUrc2 0.0000)

### Correction factors

Mechanical fasteners :-

Alpha : 0.00 per m lambda f : 0.0000W/mK nf : 0.000 per m<sup>2</sup> Af : 0.000mm<sup>2</sup> Recess : 0.0mm

Delta Uf for Quinn Therm QW : 0.0000

nf = fasteners per m<sup>2</sup> Af = fasteners cross-sectional area

Air gaps, Delta Ug = 0.000W/m<sup>2</sup>K

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

## Detailed U-value Calculation Results

Construction includes 2 bridged layers

### Non-bridged layers

Outside surface resistance	0.040 m²K/W
Plaster, gypsum (BS5250)	0.029 m²K/W
Quinn Therm QW	4.545 m²K/W
GTEC Standard Board	0.050 m²K/W
Inside surface resistance	0.130 m²K/W
Resistance of non-bridged layers, $R_{NB}$ =	<u>4.795 m²K/W</u>

### Bridged layers

Solid masonry (L1) bridged by Mortar ext. (B1)  
Cavity (low emissivity) - 25 x 47 battens @ 600 ctrs (L2) bridged by Timber (B2)

Path 1 - Solid maso

Path 2 - Mortar ext

Path 3 - Solid maso

Path 4 - Mortar ext

### Resistance and fraction of heat flow paths

$$R_{P1} = R_{NB} + R_{L1} = 4.795 + 0.943 = 5.738 \text{ m}^2\text{K/W} \quad F_{P1} = 76.328\%$$

$$R_{P2} = R_{NB} + R_{L2} = 4.795 + 0.893 = 5.688 \text{ m}^2\text{K/W} \quad F_{P2} = 15.839\%$$

$$R_{P3} = R_{NB} + R_{L3} = 4.795 + 0.472 = 5.266 \text{ m}^2\text{K/W} \quad F_{P3} = 6.487\%$$

$$R_{P4} = R_{NB} + R_{L4} = 4.795 + 0.421 = 5.216 \text{ m}^2\text{K/W} \quad F_{P4} = 1.346\%$$

### Upper resistance limit

$$R_{upper} = 1 / ( (F_{P1}/R_{P1}) + (F_{P2}/R_{P2}) + (F_{P3}/R_{P3}) + (F_{P4}/R_{P4}) )$$

$$R_{upper} = 1 / ( (0.763/5.738) + (0.158/5.688) + (0.065/5.266) + (0.013/5.216) ) = 5.689 \text{ m}^2\text{K/W}$$

### Lower resistance limit

$$R_{lower} = R_{NB} + 1 / ( (F_{L1}/R_{L1}) + (F_{B1}/R_{B1}) ) + 1 / ( (F_{L2}/R_{L2}) + (F_{B2}/R_{B2}) )$$

$$R_{lower} = 4.795 + 1 / ( (0.828/0.279) + (0.172/0.229) ) + 1 / ( (0.922/0.664) + (0.078/0.192) ) = 5.621 \text{ m}^2\text{K/W}$$

### Total resistance of wall

$$R_T = ( R_{upper} + R_{lower} ) / 2 = ( 5.689 + 5.621 ) / 2 = 5.66 \text{ m}^2\text{K/W}$$

### Mechanical fasteners :-

Calculations to BS EN ISO 6946:2007

Alpha : 0.00 per m    lambda f : 0.0000W/mK    nf : 0.000 per m²    Af : 0.000mm²    Recess : 0.0mm

Delta Uf for Quinn Therm QW : 0.0000

Correction for air gaps, Delta Ug = 0.0000W/m²K

(Delta Uf + Delta Ug + Delta Up + Delta Ur) is less than 3% of (1 / Rt) so  $U = (1 / R_T) + (\Delta U_r) + (\Delta U_{rc}) = 0.18 \text{ W/m}^2\text{K}$