Quinn Building Products
U-Value Calculator

QUINN BUILDING PRODUCTS

U-Value

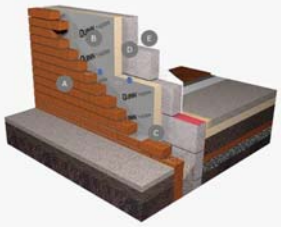
0.17

W/m ^{2}·K

Email my U-Value

Construction Type:	Floors / **Walls** / Pitched Roof / Flat Roof
Construction Type Layer 2:	Cavity walls
Insulation Solution:	Cavity walls: masonry - partial fill (Quinn Therm QW
Cavity Width:	110 mm
Internal Leaf:	Blockwork (medium dense) - 0.45W/mK
Internal Leaf Thickness:	100 mm
Cavity Insulation:	100mm (25mm / 50mm / 65mm / 80mm / 110mm)

Note: minimum residual cavity of 50mm must be left in front of partial fill boards.



Cavity walls: masonry - partial fill (Quinn Therm QW Cavity Wall)

1. External brickwork
2. Quinn Therm QW PIR insulation boards
3. Cavity Tray
4. Internal block-work
5. Internal finish

Whilst the information and/or specification contained here is to the best of our knowledge true and accurate, we specifically exclude any liability for errors, omissions or otherwise arising therefrom. Details, practices, principles, values and calculations should be verified as to accuracy and suitability for the required purpose for use.

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Project Information

Reference
Date 1 April 2020

Construction Type

Element : Wall - Cavity wall: masonry - partial fill (Quinn Therm QW Cavity Wall)
Internal surface emissivity : High External surface emissivity : High

	Thickness (mm)	Thermal Conductivity (W/mK)	Thermal Resistance (m^2K/W)	Pitch (º)	Bridge details Air gaps (Level, Delta U")
Outside surface resistance	-	-	0.040		
Brick - outer leaf	103.0	0.770	0.134		17.332% Mortar (103.0mm)
Cavity >=25mm, Wall. Low E - non vented, cavity	10.0	-	0.664		
Quinn Therm QW	100.0	0.022	4.545		L:0 0.000W/m^2K
Block Work	100.0	0.450	0.222		6.568% Mortar (100.0mm)
Plaster Dabs Cavity	15.0	-	0.170		20.000% Plaster Dabs (15.0mm)
Plasterboard	12.5	-	0.066		
Plaster skim	3.0	0.510	0.006		
Inside surface resistance	-	-	0.130		

U-value = 0.17W/m^2K

U-value, Combined Method : 0.169W/m^2K (upper/lower limit 5.938 / 5.883m^2K/W, dUf 0.0000, dUg 0.0000, dUp0.0000, dUr0.(
dUrc1 0.0000, dUrc2 0.0000)

Correction factors

Air gaps, Delta Ug = 0.000W/m^2K

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

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Detailed U-value Calculation Results

Construction includes 3 bridged layers

Non-bridged layers

Outside surface resistance	0.040 m²K/W
Cavity >=25mm, Wall. Low E - non vented, cavity	0.664 m²K/W
Quinn Therm QW	4.545 m²K/W
Plasterboard	0.066 m²K/W
Plaster skim	0.006 m²K/W
Inside surface resistance	0.130 m²K/W
Resistance of non-bridged layers, R_{NB} =	5.451 m²K/W

Bridged layers

Brick - outer leaf (L1) bridged by Mortar (B1)
Block Work (L2) bridged by Mortar (B2)
Plaster Dabs Cavity (L3) bridged by Plaster Dabs (B3)

Path 1 - Brick - ou
Path 2 - Mortar / B
Path 3 - Brick - ou
Path 4 - Mortar / M
Path 5 - Brick - ou
Path 6 - Mortar / B
Path 7 - Brick - ou
Path 8 - Mortar / M

Resistance and fraction of heat flow paths

$R_{P1} = R_{NB} + R_{L1} = 5.451 + 0.526 = 5.977$ m²K/W $F_{P1} = 61.791\%$
$R_{P2} = R_{NB} + R_{L2} = 5.451 + 0.502 = 5.953$ m²K/W $F_{P2} = 12.955\%$
$R_{P3} = R_{NB} + R_{L3} = 5.451 + 0.410 = 5.861$ m²K/W $F_{P3} = 4.344\%$
$R_{P4} = R_{NB} + R_{L4} = 5.451 + 0.386 = 5.837$ m²K/W $F_{P4} = 0.911\%$
$R_{P5} = R_{NB} + R_{L5} = 5.451 + 0.391 = 5.842$ m²K/W $F_{P5} = 15.448\%$
$R_{P6} = R_{NB} + R_{L6} = 5.451 + 0.367 = 5.818$ m²K/W $F_{P6} = 3.239\%$
$R_{P7} = R_{NB} + R_{L7} = 5.451 + 0.275 = 5.726$ m²K/W $F_{P7} = 1.086\%$
$R_{P8} = R_{NB} + R_{L8} = 5.451 + 0.251 = 5.702$ m²K/W $F_{P8} = 0.228\%$

Upper resistance limit

$R_{upper} = 1 / ((F_{P1}/R_{P1}) + (F_{P2}/R_{P2}) + (F_{P3}/R_{P3}) + (F_{P4}/R_{P4}) + (F_{P5}/R_{P5}) + (F_{P6}/R_{P6}) + (F_{P7}/R_{P7}) + (F_{P8}/R_{P8}))$

$R_{upper} = 1 / ((0.618/5.977) + (0.130/5.953) + (0.043/5.861) + (0.009/5.837) + (0.154/5.842) + (0.032/5.818) + (0.011/5.726) + (0.002/5.702)) = 5.938$m²K/W

Lower resistance limit

$R_{lower} = R_{NB} + 1 / ((F_{L1}/R_{L1}) + (F_{B1}/R_{B1})) + 1 / ((F_{L2}/R_{L2}) + (F_{B2}/R_{B2})) + 1 / ((F_{L3}/R_{L3}) + (F_{B3}/R_{B3}))$

$R_{lower} = 5.451 + 1 / ((0.827/0.134) + (0.173/0.110)) + 1 / ((0.934/0.222) + (0.066/0.106)) + 1 / ((0.800/0.170) + (0.200/0.035))$

5.883m²K/W

Total resistance of wall

$R_T = (R_{upper} + R_{lower}) / 2 = (5.938 + 5.883) / 2 = 5.91$ m²K/W

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 / Rt) + (Delta Ur) + (Delta Urc) = 0.17 W/m²K

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