



Thermal Efficiency Details
For
Camelford Close
Reading
RG2 8AW

Contents

1. Construction Summary
2. Building Regulation compliance
3. Details for Thermal Bridging
4. U value calculations

IMPORTANT: Details of the block strength used should always be checked with a structural engineer

AMENDMENTS: 1.02 Roof build up altered

Construction Summary

Our Reference: RG2 8AW—Camelford Close

Date: Wednesday, 29 July 2020



Drawings used		
Element	Description	U Value (W/m ² K)
Brick External Walls	Brick outer leaf + 150mm cavity with Xtratherm CT/PIR insulation & Celcon Standard Block inner leaf	0.13
Ground Floor	Slab on ground, Celotex XR4150 insulation, 75mm Screed	0.11
Plane Roof	200mm Mineral wool between joists & 200mm on top	0.11
Sloping Roof	150mm rafters with Celotex XR4120 between and Celotex PL4065 insulated plasterboard beneath	0.13
Windows/Doors/Roof Glazing	Windows—max. U value 1.4 min. G value 0.48 , Solid Doors—max. U value 3.0, Roof windows—max. U value 1.4 ALL FROM A BFRC APPROVED SUPPLIER	
Heating & Ventilation		
Main System	Nibe F730 Exhaust air heat pump	
Secondary System	None	
Water Storage	Built into heat pump	
Controls	Time and temperature zone control	
Ventilation	Nibe F730 Exhaust air heat pump. Polypipe Domus rigid ductwork	
Other		
Constr. Details	As per attached list	
Lighting	100% low energy lighting	
Air tightness	Design Air Tightness 3.0 m3/m2 @ 50 pascals	
Renewables	4kwp on East facing roof	



BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Property Reference	Camelford Close	Issued on Date	22/07/2020
Assessment Reference	001	Prop Type Ref	
Property			

SAP Rating	100 A	DER	1.34	TER	25.40
Environmental	100 A	% DER<TER	94.73		
CO ₂ Emissions (t/year)	-0.18	DFEE	43.41	TFEE	59.55
General Requirements Compliance	Pass	% DFEE<TFEE	27.10		

Assessor Details	Mr. Keith Grace, Keith Grace, Tel: 01753 889551, keith@merlinpropertyservices.com	Assessor ID	P744-0001
Client			

SUMMARY FOR INPUT DATA FOR New Build (As Designed)

Criterion 1 – Achieving the TER and TFEE rate

1a TER and DER

Fuel for main heating	Electricity		
Fuel factor	1.55 (electricity)		
Target Carbon Dioxide Emission Rate (TER)	25.40	kgCO ₂ /m ²	
Dwelling Carbon Dioxide Emission Rate (DER)	1.34	kgCO ₂ /m ²	Pass
	-24.06 (-94.7%)	kgCO ₂ /m ²	

1b TFEE and DFEE

Target Fabric Energy Efficiency (TFEE)	59.55	kWh/m ² /yr	
Dwelling Fabric Energy Efficiency (DFEE)	43.41	kWh/m ² /yr	
	-16.2 (-27.2%)	kWh/m ² /yr	Pass

Criterion 2 – Limits on design flexibility

Limiting Fabric Standards

2 Fabric U-values

Element	Average	Highest	
External wall	0.14 (max. 0.30)	0.22 (max. 0.70)	Pass
Floor	0.11 (max. 0.25)	0.11 (max. 0.70)	Pass
Roof	0.14 (max. 0.20)	0.18 (max. 0.35)	Pass
Openings	1.50 (max. 2.00)	2.35 (max. 3.30)	Pass

2a Thermal bridging

Thermal bridging calculated from linear thermal transmittances for each junction

3 Air permeability

Air permeability at 50 pascals	3.00 (design value)	
Maximum	10.0	Pass

Limiting System Efficiencies

4 Heating efficiency

Main heating system	Heat pump with radiators or underfloor - Electric NIBE Fighter 470	
Secondary heating system	None	

5 Cylinder insulation

BASIC COMPLIANCE REPORT

Calculation Type: New Build (As Designed)

Hot water storage

No cylinder

6 Controls

Space heating controls

Time and temperature zone control

Pass

Hot water controls

No cylinder

7 Low energy lights

Percentage of fixed lights with low-energy fittings

100

%

Minimum

75

%

Pass

8 Mechanical ventilation

Continuous extract system

Specific fan power

0.62

Maximum

0.7

Pass

Criterion 3 – Limiting the effects of heat gains in summer

9 Summertime temperature

Overheating risk (Thames Valley)

Not significant

Pass

Based on:

Overshading

Average

Windows facing East

11.31 m², No overhang

Windows facing West

9.48 m², No overhang

Air change rate

8.00 ach

Blinds/curtains

None

Criterion 4 – Building performance consistent with DER and DFEE rate

Air permeability and pressure testing

3 Air permeability

Air permeability at 50 pascals

3.00 (design value)

Maximum

10.0

Pass

10 Key features

External wall U-value

0.13

W/m²K

Roof U-value

0.11

W/m²K

Floor U-value

0.11

W/m²K

Thermal bridging γ -value

0.023

W/m²K

Air permeability

3.0

m³/m²h

Photovoltaic array

4.00

kW

This report has not been submitted through the Elmhurst Energy members' portal, therefore results are subject to change when the dwelling is completed.

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Technical Services
from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT-E2-MCI-WD-02-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

Proprietary cavity closer

General Construction Specification

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

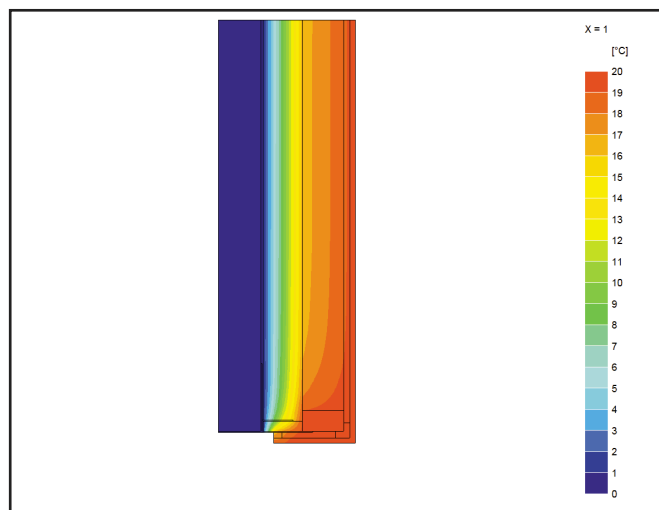
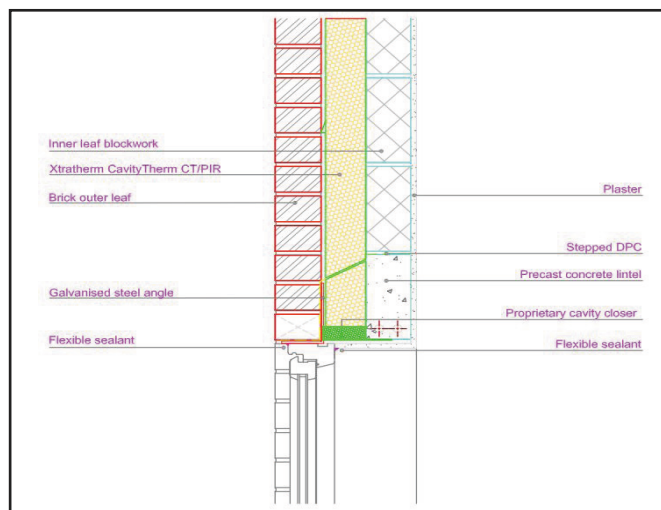
Description

Spierated lintel with proprietary cavity closer

Reference

MCI-WD-02

Junction Detail



Linear Thermal Transmittance W.m.K

$\Psi = 0.03$

Table K1 (Accredited)
0.30

Temperature Factor (for humidity and mould)

$f = 0.92$

IPI/06 default
0.75

Notes

Calculations are based on accredited construction detail MCI-WD-02

Notes:

- Ψ and f are only valid for the detail described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant
- EN ISO 10211 2007

- EN ISO 13370 2007
- EN ISO 6846 2007
- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road, Holmewood
Chesterfield, Derbyshire
S42 5UY

Tel
+ 44 (0) 371 222 1033
Fax
+ 44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co. Meath, Ireland

Tel
+ 353 (46) 906 6000
Fax
+ 353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR_ _mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of _ _ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Technical Services
from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT-E3-MCI-WD-04-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

Proprietary cavity closer

General Construction Specification

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

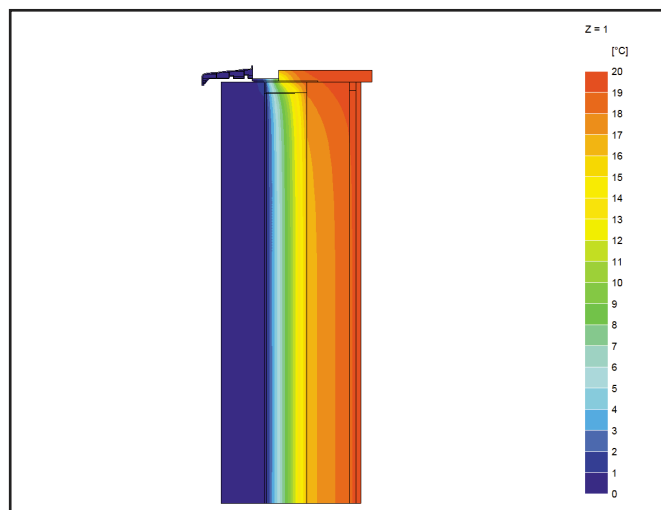
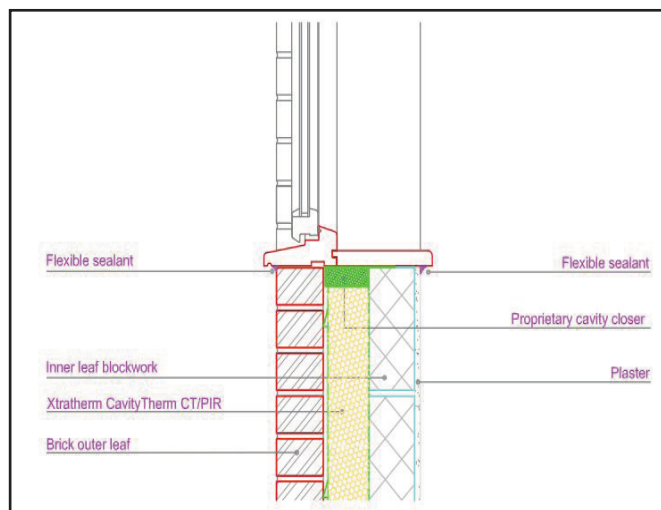
Description

Sill with Proprietary cavity closer

Reference

MCI-WD-04

Junction Detail



Linear Thermal Transmittance W.m.K

$\Psi = 0.04$

Table K1 (Accredited)
0.04

Temperature Factor (for humidity and mould)

$f = 0.84$

IPI/06 default
0.75

Notes

Calculations are based on accredited construction detail MCI-WD-04

Notes:

- Ψ and f are only valid for the detail described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant
- EN ISO 10211 2007

- EN ISO 13370 2007
- EN ISO 6846 2007
- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road, Holmewood
Chesterfield, Derbyshire
S42 5UY

Tel
+ 44 (0) 371 222 1033
Fax
+ 44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co. Meath, Ireland

Tel
+ 353 (46) 906 6000
Fax
+ 353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Xtratherm[®]
More than insulation

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR_ _mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of _ _ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Linear Thermal Transmittance (Ψ) And Temperature Factor (f)

Technical Services
from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT-E4-MCI-WD-05-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

Proprietary cavity closer

General Construction Specification

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

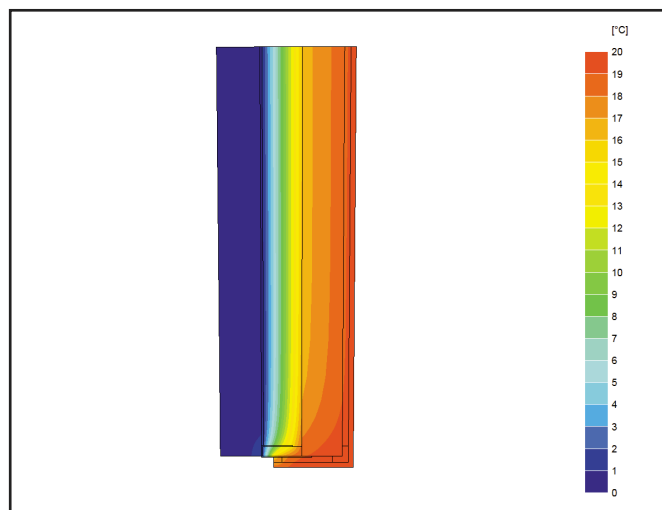
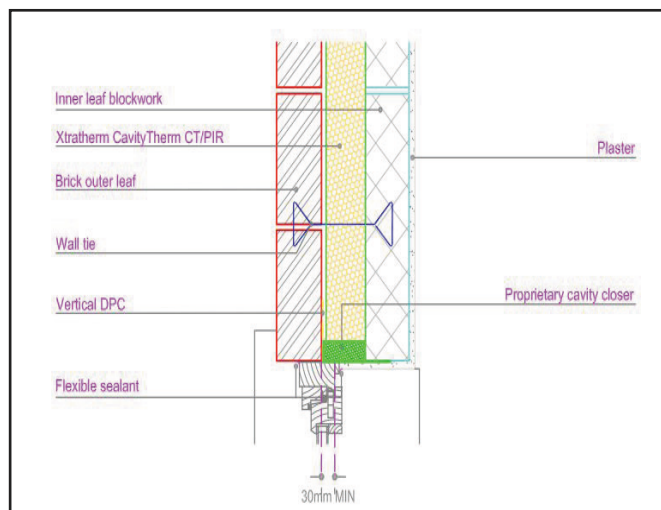
Description

Jamb with Proprietary Cavity Closer

Reference

MCI-WD-05

Junction Detail



Linear Thermal Transmittance W.m.K

$\Psi = 0.02$

Table K1 (Accredited)
0.05

Temperature Factor (for humidity and mould)

$f = 0.92$

IPI/06 default
0.75

Notes

Calculations are based on accredited construction detail MCI-WD-05

Notes:

- Ψ and f are only valid for the detail described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant
- EN ISO 10211 2007
- EN ISO 13370 2007

- EN ISO 6846 2007
- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road Holmewood
Chesterfield Derbyshire
S42 5UY

Tel
+44 (0) 371 222 1033
Fax
+44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co.Meath, Ireland

Tel
+353 (46) 906 6000
Fax
+353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Linear Thermal Transmittance (Ψ) And Temperature Factor (f)

Xtratherm[®]
More than insulation

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR_ _mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of _ _ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Technical Services from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT-E5-MCI-GF-01-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

General Construction Specification

Floor

75mm Screed

Xtratherm Hyfloor (XT/HYF)

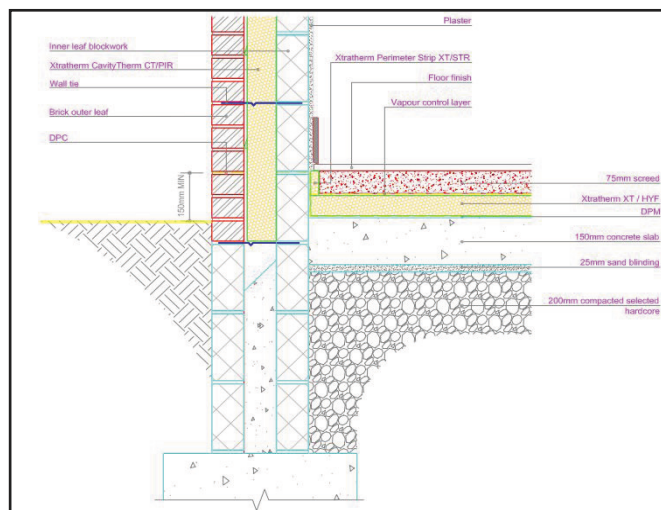
25mm XT/STR (Perimeter insulation)

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

Floor 0.11 W/m² K to 0.15 W/m² K

Junction Detail

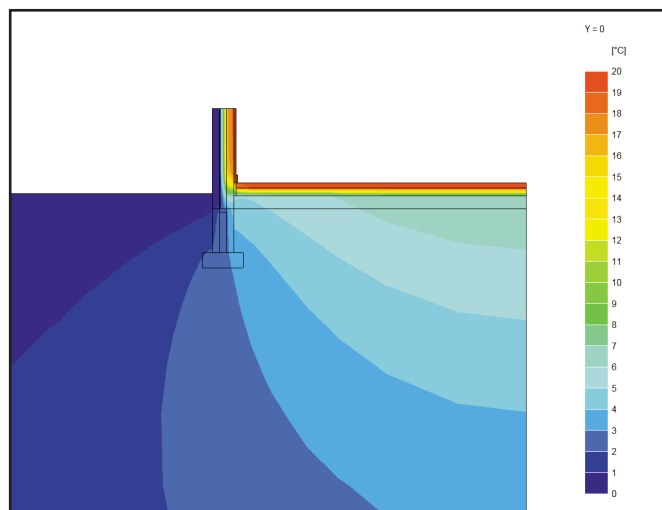


Description

Wall floor junction with insulation under screed

Reference

MCI-GF-01



Linear Thermal Transmittance W.m.K

$\Psi = 0.03$

Table K1 (Accredited)

0.16

Temperature Factor (for humidity and mould)

$f = 0.85$

IPI/06 default

0.75

Notes

Calculations are based on accredited construction detail MCI-GF-01

Notes:

- Ψ and f are only valid for the detail drawn and described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant

- EN ISO 10211 2007
- EN ISO 13370 2007
- EN ISO 6846 2007
- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road, Holmewood
Chesterfield, Derbyshire
S42 5UY

Tel
+ 44 (0) 371 222 1033
Fax
+ 44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co. Meath, Ireland

Tel
+ 353 (46) 906 6000
Fax
+ 353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR ___ mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of ___ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Thin-R XT/HYF Hyfloor Underfloor insulation with T&G Edge Profile for solid and suspended ground floors

The floor insulation shall be Xtratherm Thin-R XT/HYF manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity gas tight facings. The XT/HYF ___ mm with a BBA certified Lambda value of 0.022 W/mK to achieve a U value of ___ W/m²K for the floor element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause E20 200, E20 30

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 08/4613. Issue date: 5 August 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Product reference

Xtratherm Thin-R XT/HYF Under Floor Insulation

Face size

2400 x 1200 mm

Edge Profile

T&G all four edges

Thickness

75 mm / 100 mm / 125 mm / 140mm

Other sizes available dependent on quantity & lead time.

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Specification Clauses

Thin-R XT/STR Perimeter Strip insulation

The perimeter strip insulation shall be Xtratherm Thin-R XT/STR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings pre-cut to effectively minimize thermal bridging at floor and wall junctions. The XT/STR __ mm with a BBA certified Lambda value of 0.022 W/mK to achieve a U value of __ __ W/m²K for the floor element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause E20 200, E20 30

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 08/4613. Issue date: 5 August 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R XT/STR Perimeter Insulation

Face size

1200 mm x 100 mm / 120 mm / 125 mm / 150 mm / 175 mm / 200 mm
225 mm / 250 mm / 300 mm

Edge Profile

Thickness

25mm / 40mm
Other sizes available dependent on quantity & lead time.

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Technical Services from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT- E6-MCI-IF-02-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

General Construction Specification

Floor

Timber floor

Timber joists

Plaster

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

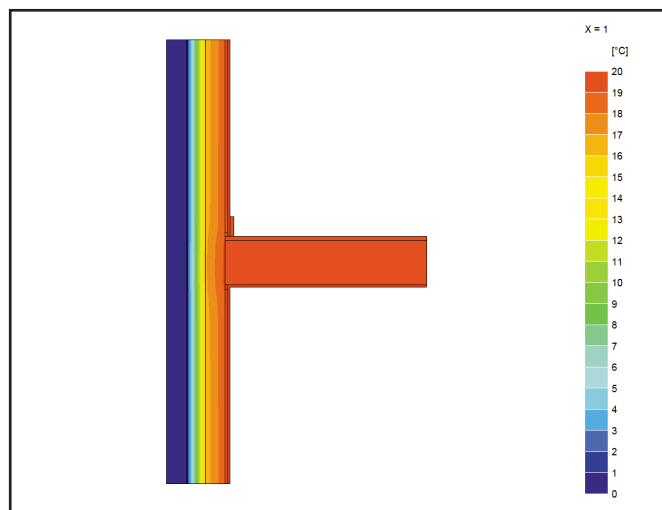
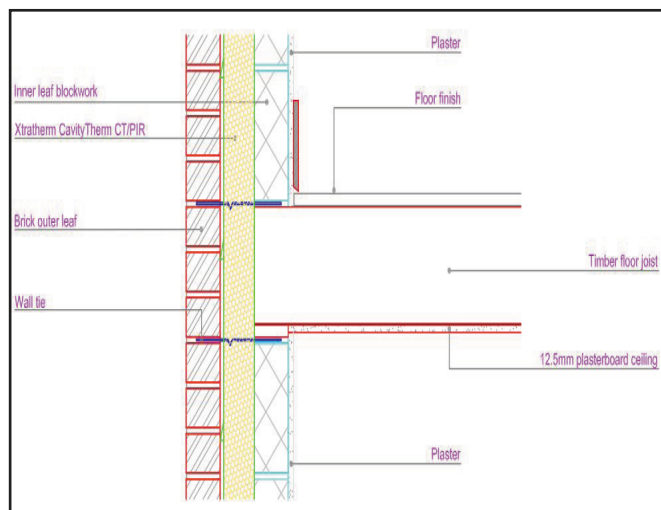
Description

Intermediate timber floor within dwelling

Reference

MCI-IF-02

Junction Detail



Linear Thermal Transmittance W.m.K

$\Psi = 0.00$

Table K1 (Accredited)
0.07

Temperature Factor (for humidity and mould)

$\Psi = 0.98$

IPI/06 default
0.75

Notes

Calculations are based on accredited construction detail MCI-IF-02

Notes:

- Ψ and f are only valid for the detail drawn and described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant

- EN ISO 10211 2007
- EN ISO 13370 2007
- EN ISO 6846 2007
- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road, Holmewood
Chesterfield, Derbyshire
S42 5UY

Tel
+ 44 (0) 371 222 1033
Fax
+ 44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co. Meath, Ireland

Tel
+ 353 (46) 906 6000
Fax
+ 353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Xtratherm[®]
More than insulation

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR ___mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of ___ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Technical Services
from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT-E10-MCI-RE-01-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

General Construction Specification

Ceiling

300mm fibreglass

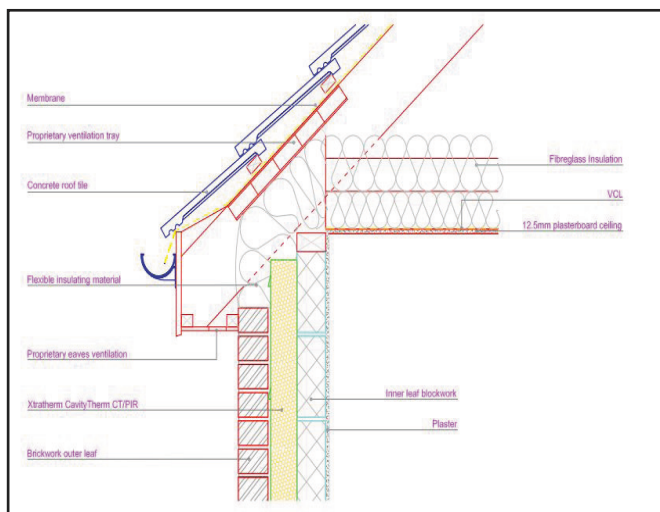
Plasterboard

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

Ceiling 0.15 W/m² K

Junction Detail

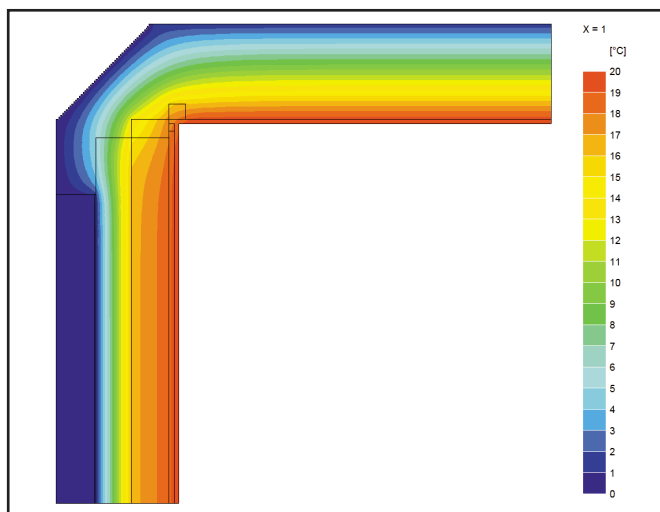


Description

Wall ceiling junction eaves (Insulation at ceiling level)

Reference

MCI-RE-01



Linear Thermal Transmittance W.m.K

$\Psi = 0.05$

Table K1 (Accredited)
0.06

Temperature Factor (for humidity and mould)

$f = 0.93$

IPI/06 Default
0.75

Notes

Calculations are based on accredited construction detail MCI-RE-01

Notes:

- Ψ and f are only valid for the detail described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant
- EN ISO 10211 2007

- EN ISO 13370 2007
- EN ISO 6846 2007
- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road, Holmewood
Chesterfield, Derbyshire
S42 5UY

Tel
+ 44 (0) 371 222 1033
Fax
+ 44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co. Meath, Ireland

Tel
+ 353 (46) 906 6000
Fax
+ 353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR_ _mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of _ _ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Technical Services
from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT-E12-MCI-RG-01-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

General Construction Specification

Ceiling

300mm fibreglass

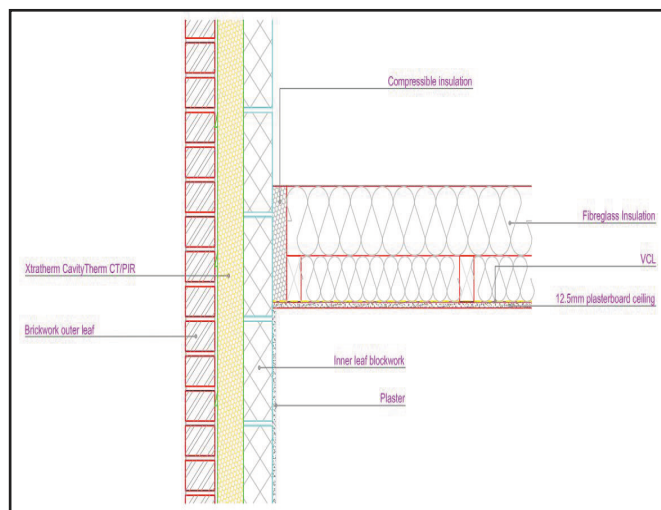
Plasterboard

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

Ceiling 0.15 W/m² K

Junction Detail

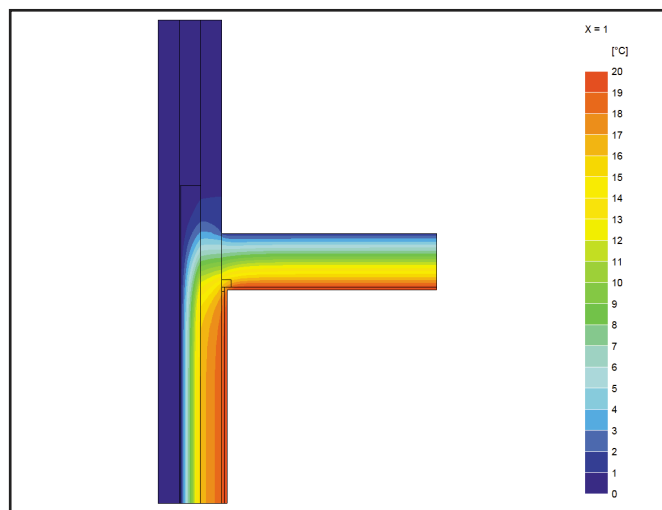


Description

Wall ceiling junction gable (Insulation at ceiling level)

Reference

MCI-RG-01



Linear Thermal Transmittance W.m.K

$\Psi = 0.05$

Table K1 (Accredited)
0.24

Temperature Factor (for humidity and mould)

$f = 0.91$

IPI/06 Default
0.75

Notes

Calculations are based on accredited construction detail MCI-RG-01

Notes:

- Ψ and f are only valid for the detail described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant
- EN ISO 10211 2007

- EN ISO 13370 2007
- EN ISO 6846 2007
- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road, Holmewood
Chesterfield, Derbyshire
S42 5UY

Tel
+ 44 (0) 371 222 1033
Fax
+ 44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co. Meath, Ireland

Tel
+ 353 (46) 906 6000
Fax
+ 353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Xtratherm[®]
More than insulation

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR_ _mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of _ _ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Technical Services
from **Xtratherm**

Technical competency

The PSI value analysis has been undertaken by fully accredited BRE competent persons to EN 10211: 2007 and BR497. Our Xtratherm Technical team are qualified under the BBA calculation competency scheme CS/1006 to produce thermal and condensation calculations.



Certificate No	Date Issued
XT-E16-XT-CRN-01-0001	15/2/2012

Calculation Prepared By	Mark Magennis
Source	www.xtratherm.com

General Construction Specification

Wall

Plasterboard on dabs

Lightweight block 0.15 W/m K

CavityTherm (CT/PIR)

102.5mm Brick 0.77 W/m K

General Construction Specification

U value Range

Wall 0.12 W/m² K to 0.18 W/m² K

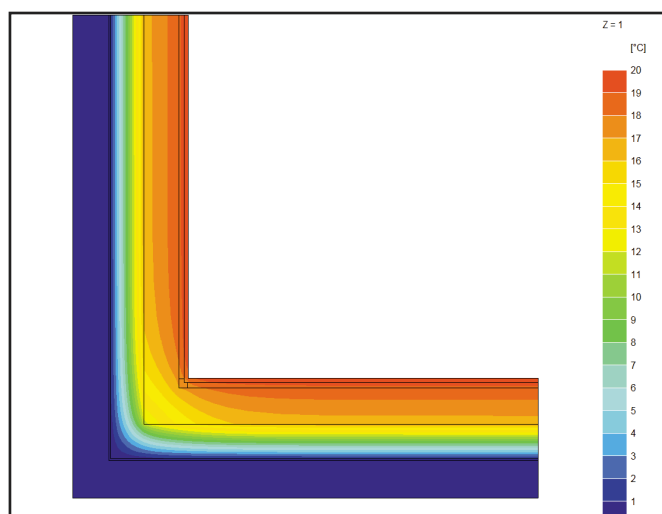
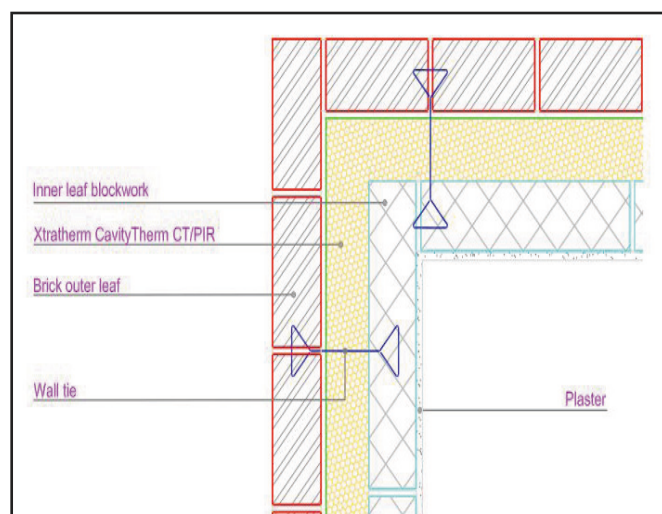
Description

External corner

Reference

N/A

Junction Detail



Linear Thermal Transmittance W.m.K

$\Psi = 0.04$

Table K1 (Accredited)
0.09

Temperature Factor (for humidity and mould)

$f = 0.92$

IPI/06 default
0.75

Notes

Notes:

- Ψ and f are only valid for the detail described above
- Calculations have been carried out in accordance with the following standards and guidance documents where relevant
- EN ISO 10211 2007
- EN ISO 13370 2007
- EN ISO 6846 2007

- BR 497
- BR 443
- BRE IP1/06

Xtratherm UK Limited
Park Road Holmewood
Chesterfield Derbyshire
S42 5UY

Tel
+ 44 (0) 371 222 1033
Fax
+ 44 (0) 371 222 1044

Xtratherm Limited
Liscarton Industrial Estate
Kells Road, Navan
Co.Meath, Ireland

Tel
+ 353 (46) 906 6000
Fax
+ 353 (46) 906 6090

Contact
info@xtratherm.com

www.xtratherm.com

Linear Thermal Transmittance (Ψ) and Temperature Factor (f)

Xtratherm[®]
More than insulation

Specification Clauses

Thin-R CT/PIR Full Fill Cavity-Wall

The built in full fill cavity wall insulation shall be Xtratherm Thin-R CT/PIR manufactured to BS EN 13165:2008 by Xtratherm, comprising a CFC/HCFC free rigid Polyisocyanurate (PIR) core between low emissivity foil facings with engineered HIPS outer skin. The CT/PIR_ _mm with a BBA certified Lambda value of 0.021 W/mK to achieve a U value of _ _ W/m²K for the wall element. To be installed in accordance with instructions issued by Xtratherm.

Xtratherm PIR achieves an A+ rating under the BRE Green Guide.

Refer to NBS clause F30 151, F30 12

Insulation

Polyisocyanurate Rigid foam

Standard

BS EN 13165:2008

Certification

BBA Certification No. 10/4786. Issue date: 31 March 2011
BS EN ISO 9001 Quality Management System
BS EN ISO 14001 Environmental Management System
BS OHSAS 18001 Health and Safety Management System

Manufacturer UK

Xtratherm UK Limited, Holmewood Industrial Park,
Holmewood Chesterfield, Derbyshire, S42 5UY.
Tel: 0371 222 1033 Fax: 0371 222 1044
Email: info@xtratherm.com Web: www.xtratherm.com

Product reference

Xtratherm Thin-R CT/PIR Full Fill Cavity Wall Insulation

Face size

1200 x 450 mm

Edge Profile

Rebated all four edges

Thickness

75 mm / 90 mm / 100 mm / 125 mm / 150mm

Manufacturer Ireland:

Xtratherm Limited, Kells Road, Navan,
County Meath, Ireland.
Tel: 04690 66000 Fax: 04690 66090
Email: info@xtratherm.com Web: www.xtratherm.com

The above calculations relate to the use of specific Xtratherm materials and specification only, any deviation from performances or jointing methods will effect the result.

U-value calculation

by BRE U-value Calculator version 2.04g

Printed on 22 Jul 2020 at 15:01

Filename: Z:\Work in Progress\Ridge\U values\ashlar walls.uva (File saved: 22 Jul 2020 12:16)

Element type: Wall - Timber framed - insulation between studs

Calculation Method: BS EN ISO 6946

ashlar walls

Layer	d (mm)	λ layer	λ bridge	Fraction	Density	Sp. heat	R layer	R bridge	Description
1	12.5	0.210			700	1000	0.130		Rsi
2							0.060		Plasterboard
3	140	0.022	0.120	0.150	12	1030	6.364	1.167	Vapour control layer Celotex XR4140 / timber
frame									
4		R-value ¹			1	1000	0.500		Roof space
							<u>0.040</u>		Rse
	<u>153 mm</u>	(total wall thickness)					7.093		

¹Space behind insulated room-in-roof

Total resistance: Upper limit: 5.027 Lower limit: 4.544 Ratio: 1.106 Average: 4.785 m²K/W

U-value (uncorrected) 0.209

U-value corrections

Air gaps in layer 3 $\Delta U = 0.008$ (Level 1)

Total ΔU 0.008

U-value (corrected) 0.217

U-value (rounded) 0.22 W/m²K

Heat capacity per m² (κ) 8.8 kJ/m²K

Calculated by:

447821128660

U-value calculation

by BRE U-value Calculator version 2.04g

Printed on 22 Jul 2020 at 12:18

Filename: Z:\Work in Progress\Ridge\U values\external walls.uva (File saved: 22 Jul 2020 12:18)

Element type: Wall - Masonry - full cavity fill: slabs

Calculation Method: BS EN ISO 6946

external walls

<u>Layer</u>	<u>d (mm)</u>	<u>λ layer</u>	<u>λ bridge</u>	<u>Fraction</u>	<u>Density</u>	<u>Sp. heat</u>	<u>R layer</u>	<u>R bridge</u>	<u>Description</u>
1	13	0.400			1000	1000	0.130		Rsi
kg/m ³)							0.032		Gypsum plaster (1000
2	100	0.150			2000	1000	0.667		Celcon Standard Blocks
3	150	0.021			30	1030	7.143		Xtratherm CT/PIR
4	105	0.770			1700	800	0.136		Brick outer leaf
							<u>0.040</u>		Rse
	<u>368 mm</u>	(total wall thickness)					8.148		

Total resistance: Upper limit: 8.148 Lower limit: 8.148 Ratio: 1.000 Average: 8.148 m²K/W

U-value (uncorrected) 0.123

U-value correctionsAir gaps in layer 3 $\Delta U = 0.0077$ (Level 1)Wall ties in layer 3 $\Delta U = 0.0005$ (2.50 per m², 3.0 mm² cross-section, $\lambda = 17.0$)Total ΔU 0.008

U-value (corrected) 0.131

U-value (rounded) 0.13 W/m²KHeat capacity per m² (κ) 187.0 kJ/m²K

Calculated by:

447821128660

U-value calculation

by BRE U-value Calculator version 2.04g

Printed on 21 Jul 2020 at 14:23

Filename: Z:\Work in Progress\Ridge\U values\ground floor.uva (File saved: 06 Jun 2020 14:46)

Element type: Floor - Suspended beam-and-block floor

Calculation Method: BS EN ISO 6946, BS EN ISO 13370

ground floor

U-value of floor construction:

Layer	d (mm)	λ layer	λ bridge	Fraction	Density	Sp. heat	R layer	R bridge	Description
1	65	1.150			1800	1000	0.170		Rsi
2	150	R-value			20	1400	0.057		Screed75
3	100	0.180	1.350	0.137	600	1000	6.800		Celotex XR4150
kg/m ³ /concrete beams							0.556	0.074	AAC (600
							<u>0.170</u>		Rs (underfloor)
<u>315 mm</u>							7.752		

Total resistance: Upper limit: 7.682 Lower limit: 7.490 Ratio: 1.026 Average: 7.586 m²K/W

U-value of floor construction: 0.132 W/m²K

Ground parameters:

Perimeter P: 18.35 m

Area A: 41.79 m²

P/A: 0.439

Resistance on solum R_g:

Depth of underfloor space below ground:

Floor height above ground:

Mean wind speed:

Wind shielding factor:

Ventilation openings per metre length:

Wall thickness: 300 mm

Ground type: Clay/silt ($\lambda = 1.5$ W/m·K)

R_{se}: 0.04 m²K/W

0.000 m²K/W

0.200 m

0.000 m

5.00 m/s

0.050

0.0015 m²/m

U-value for ground (U_g) 0.641

U-value of floor deck (U_f) 0.132

Ventilation equivalent U-value (U_x) 0.119

U-value overall 0.112

U-value (rounded) 0.11 W/m²K

Heat capacity per m² (κ) 117.0 kJ/m²K

Calculated by:

447821128660

U-value calculation

by BRE U-value Calculator version 2.04g

Printed on 22 Jul 2020 at 15:00

Filename: Z:\Work in Progress\Ridge\U values\plane roof.uva (File saved: 06 Jun 2020 14:47)

Element type: Roof - Pitched roof - insulated ceiling

Calculation Method: BS EN ISO 6946

plane roof

Layer	d (mm)	λ layer	λ bridge	Fraction	Density	Sp. heat	R layer	R bridge	Description
							0.100		Rsi
1	12.5	0.210			700	1000	0.060		Plasterboard
2	200	0.040	0.130	0.0900	12	1030	5.000	1.538	Mineral wool quilt
3	200	0.040			12	1030	5.000		Mineral wool
4		R-value ¹			1	1000	0.200		Roof space
							0.040		Rse
	<u>413 mm</u>						10.400		

¹Roof space - tiled roof, with felt or sarking boards

Total resistance: Upper limit: 9.953 Lower limit: 9.558 Ratio: 1.041 Average: 9.755 m²K/W

U-value (uncorrected) 0.1025

U-value corrections

Air gaps in layer 2 $\Delta U = 0.0000$ (Level 0)

Loft hatch $\Delta U = 0.0038$ (Insulation thickness = 50 mm)

Total ΔU 0.0038

U-value (corrected) 0.106

U-value (rounded) 0.11 W/m²K

Heat capacity per m² (κ) 8.8 kJ/m²K

Calculated by:

447821128660

U-value calculation

by BRE U-value Calculator version 2.04g

Printed on 29 Jul 2020 at 08:26

Filename: Z:\Work in Progress\Ridge\RG2 8AW - Camelford Close\uvalues\sloping roof.uva (File saved: 29 Jul 2020 08:26)

Element type: Roof - Pitched roof - insulated slope, sloping ceiling

Calculation Method: BS EN ISO 6946

sloping roof

<u>Layer</u>	<u>d (mm)</u>	<u>λ layer</u>	<u>λ bridge</u>	<u>Fraction</u>	<u>Density</u>	<u>Sp. heat</u>	<u>R layer</u>	<u>R bridge</u>	<u>Description</u>
1	77.5	R-value			700	1000	0.100 3.000		Rsi Celotex PL4065
insulated plasterboard									
2	150	R-value	0.130	0.0800	20	1030	5.450	1.154	Celotex XR4120/ rafters
3	50	R-value			1	1000			Air layer ventilated
4									Breather membrane
5	25	R-value			1	1000			Air layer ventilated
6	15	1.000			2000	800			Tiles (clay)
							0.100 #		Rse
	<u>318 mm</u>	(total roof thickness)					8.650		

this resistance substitutes for Rse and the resistance of layers 3-6 because of the ventilated air layer (layer 3)

Total resistance: Upper limit: 8.017 Lower limit: 7.399 Ratio: 1.084 Average: 7.708 m²K/W

U-value (uncorrected) 0.130

U-value correctionsAir gaps in layer 2 $\Delta U = 0.004$ (Level 1)

No fixings in layer 2

Total ΔU 0.004

U-value (corrected) 0.134

U-value (rounded) 0.13 W/m²KHeat capacity per m² (κ) 0.0 kJ/m²K

Calculated by:

447821128660