



Recovery Insulation Ltd

Unit 3/4
53 Mowbray Street
Sheffield
South Yorkshire S3 8EN
Tel: 0114 2499459 Fax: 0114 2499459
e-mail: info@recovery-insulation.co.uk
website: www.recovery-insulation.co.uk

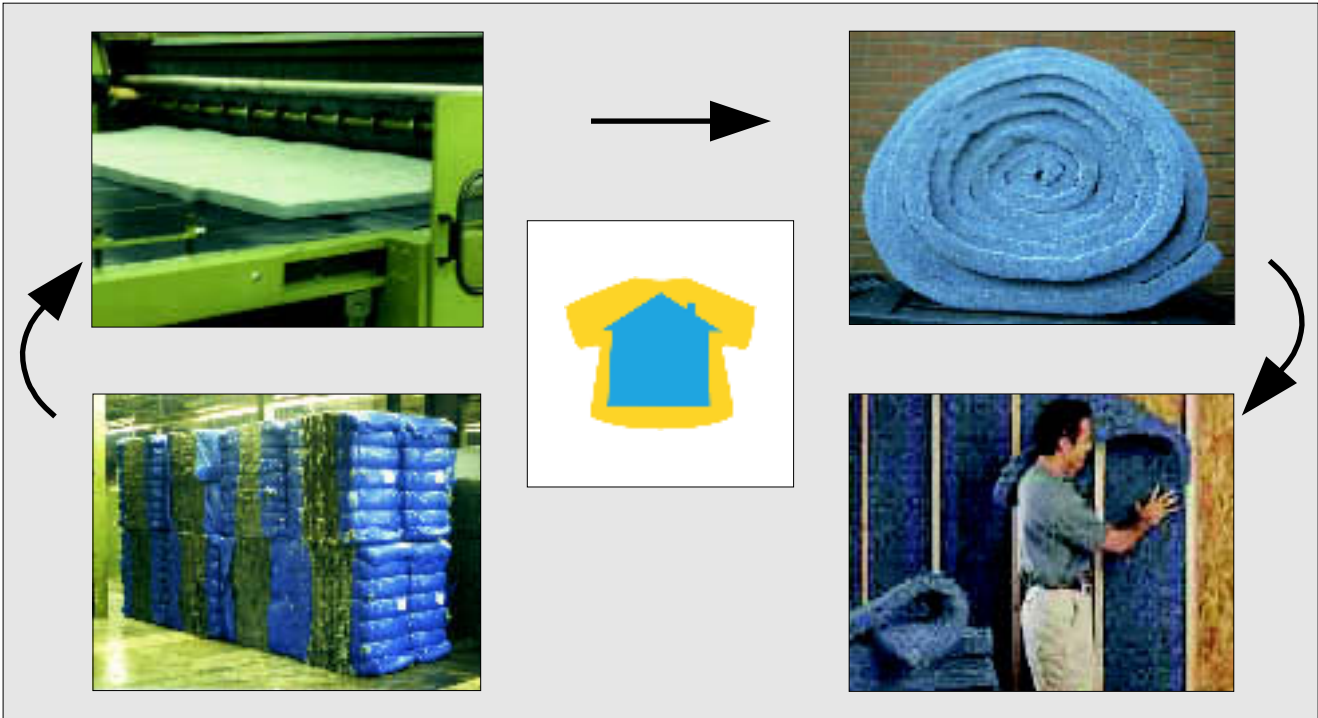
**Agrément
Certificate
No 06/4376**

Designated by Government
to issue
European Technical
Approvals

INNO-THERM

Isolation thermique
Wärmedämmung

Product




• THIS CERTIFICATE REPLACES AND EXTENDS CERTIFICATE No 03/4027 AND RELATES TO INNO-THERM, A RECYCLED COTTON-BASED MATERIAL FOR THERMAL INSULATION, SUPPLIED IN ROLLS OR BATTS FOR USE IN DWELLINGS AND BUILDINGS WITH SIMILAR TEMPERATURE AND HUMIDITY CONDITIONS.

- The product is for use in:
 - loft applications between joists in ventilated and unventilated lofts under pitched roofs and between rafters for tiled or slated pitched roofs designed and constructed in accordance with the relevant clauses of BS 5534 : 2003, and

continued

Regulations — Detail Sheet 1

1 The Building Regulations 2000 (as amended) (England and Wales)

 The Secretary of State has agreed with the British Board of Agrément the aspects of performance to be used by the BBA in assessing the compliance of insulation with the Building Regulations. In the opinion of the BBA, Inno-Therm, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements.

Requirement: B3(4)	Internal fire spread (structure)
Comment:	Lofts, roofs and walls incorporating the product can meet this Requirement. See the tinted areas in the <i>Behaviour in relation to fire</i> section of the accompanying Detail Sheets.
Requirement: C2(c)	Resistance to moisture
Comment:	Elements incorporating the product can meet this Requirement. See the relevant tinted areas of the <i>Condensation</i> section of the accompanying Detail Sheets.
Requirement: L1(a)(i)	Conservation of fuel and power
Comment:	Lofts, roofs or timber-framed walls incorporating the product can contribute to meeting the Target Emission Rate. See the relevant tinted areas of the <i>Thermal performance</i> section of the accompanying Detail Sheets.
Requirement: Regulation 7	Materials and workmanship
Comment:	The product is acceptable. See the tinted area of the <i>Durability</i> section of these Front Sheets.

– timber-frame wall applications between studding with a weather-resistant cladding, and a ventilated and drained cavity.

• Recovery Insulation Ltd is in association with the Schools & Homes Energy Education Project. Website: www.pluggingtothesun.org.uk

These Front Sheets must be read in conjunction with the accompanying Detail Sheets, which provide information specific to insulation applications.

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2 The Building (Scotland) Regulations 2004



In the opinion of the BBA, Inno-Therm, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Regulations and related Mandatory Standards as listed below.

<p>Regulation: 8 Regulation: 8(1) Comment:</p>	<p>Fitness and durability of materials and workmanship Fitness and durability of materials and workmanship The product can contribute to a construction meeting this Regulation. See the <i>Installation</i> part of the accompanying Detail Sheets and the tinted area of the <i>Durability</i> section of these Front Sheets.</p>
<p>Regulation: 9 Standard: 2.4 Comment:</p>	<p>Building standards – construction Cavities Elements incorporating the product can contribute to satisfying this Standard, with reference to clauses 2.4.1⁽¹⁾ to 2.4.3⁽¹⁾ and 2.4.6⁽¹⁾. See the tinted areas in the <i>Behaviour in relation to fire</i> section of the accompanying Detail Sheets.</p>
<p>Standard: 3.15 Comment:</p>	<p>Condensation The product is acceptable and can contribute to satisfying this Standard, with reference to clauses 3.15.1⁽¹⁾ to 3.15.4⁽¹⁾. See the relevant tinted areas of the <i>Condensation</i> section of the accompanying Detail Sheets.</p>
<p>Standard: 6.2 Comment:</p>	<p>Building insulation envelope The product can enable or contribute to enabling a wall, roof or loft to satisfy the requirements of this Standard, with reference to clauses 6.2.1⁽¹⁾ Table 1, 6.2.4⁽¹⁾ and 6.2.5⁽¹⁾. See the relevant tinted areas of the <i>Thermal performance</i> section of the accompanying Detail Sheets.</p>

(1) Technical Handbook (Domestic).

3 The Building Regulations (Northern Ireland) 2000



In the opinion of the BBA, Inno-Therm, if used in accordance with the provisions of this Certificate, will satisfy or contribute to satisfying the various Building Regulations as listed below.

<p>Regulation: B2 Comment:</p>	<p>Fitness of materials and workmanship The product is acceptable. See the tinted area of the <i>Durability</i> section of these Front Sheets.</p>
<p>Regulation: C5 Comment:</p>	<p>Condensation The product will contribute to enabling a roof to satisfy this Regulation. See the relevant tinted areas of the <i>Condensation</i> section of the accompanying Detail Sheets.</p>
<p>Regulation: E3 Comment:</p>	<p>Internal fire spread – Linings Lofts, roofs and walls incorporating the product can meet this Requirement. See the tinted areas in the <i>Behaviour in relation to fire</i> section of the accompanying Detail Sheets.</p>
<p>Regulation: F2 Comment:</p>	<p>Building fabric Lofts, roofs or timber-framed walls incorporating the product will satisfy, or contribute to satisfying the requirement of the Elemental Method of limiting heat loss. See the relevant tinted areas of the <i>Thermal performance</i> section of the accompanying Detail Sheets.</p>

4 Construction (Design and Management) Regulations 1994 (as amended) Construction (Design and Management) Regulations (Northern Ireland) 1995 (as amended)

Information in this Certificate may assist the client, planning supervisor, designer and contractors to address their obligations under these Regulations.

See sections: 5 *Description* (5.2) and 6 *Delivery and site handling* (6.3) of these Front Sheets.

Technical Specification

5 Description

5.1 Inno-Therm comprises 80% cotton-based, recycled cotton fibre and incorporating low-melt polyester. The product is treated with a fire-retardant and formed into rolls or batts. The material is hydrophobic in nature.

5.2 The nominal characteristics of the product are given in Table 1.

6 Delivery and site handling

6.1 The rolls or batts are delivered to site in packs wrapped in polythene, each pack includes a label bearing the product name, grade, roll (or batt) length, thickness and weight/unit area (in imperial and metric measurements) and the BBA identification mark incorporating the number of this Certificate.

6.2 The product should be stored flat under cover, and out of contact with ground moisture.

6.3 The product must not be exposed to naked flame or other ignition sources.

6.4 Protective clothing or equipment is not necessary when handling this product.

Design Data

7 Water vapour penetration

Inno Therm is not a moisture vapour control layer barrier and will allow water vapour to migrate through it.

8 De-rating of electrical cables

As with other insulation products, it may be necessary in some cases to de-rate electrical cables buried in the insulation. In the *IEE Wiring Regulations — Regulations for Electrical Installation Sixteenth Edition 1992* it is suggested that where

wiring is completely surrounded by insulation, it may need to be de-rated to as low as half its free air current carrying capacity. Guidance should be sought from a qualified electrician.

9 Durability



The product is stable, rot-proof and durable and will remain effective as an insulant for the life of the building in which it is installed.

Technical Investigations

The following is a summary of the technical investigations carried out on Inno-Therm.

10 Tests and investigations

10.1 Tests were undertaken to determine:

- resistance to smouldering
- resistance to mould fungus
- retention of additives
- corrosivity of metals in direct contact
- thermal conductivity
- common clothes moth larvae resistance
- condensation risk assessment.

10.2 The manufacturing processes were examined including quality control.

Bibliography

BS 5534 : 2003 *Code of practice for slating and tiling (including shingles)*

Table 1 Nominal characteristics

Product	Roll length ⁽¹⁾		Roll width ⁽¹⁾		Thickness ⁽²⁾		Weight per unit area		Density
	(m)	(ft)	(mm)	(inches)	(mm)	(inches)	(kgm ⁻²)	(oz ft ⁻²)	(kgm ⁻³)
R11	12.20	40	394 597	15.5 23.5	89	3.5	1.297	4.25	14.6
R13	12.20	40	394 597	15.5 23.5	89	3.5	1.65	5.40	18.5
R19	9.75	32	394 597	15.5 23.5	140	5.5	2.06	6.75	14.7

(1) Batts are supplied in 400 or 600 mm widths and in 1.2 m lengths.

(2) Other thicknesses are available, subject to size of order.

Conditions of Certification

11 Conditions

11.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is granted only to the company, firm or person named on the front page — no other company, firm or person may hold or claim any entitlement to this Certificate
- is valid only within the UK
- has to be read, considered and used as a whole document — it may be misleading and will be incomplete to be selective
- is copyright of the BBA
- is subject to English law.

11.2 References in this Certificate to any Act of Parliament, Regulation made thereunder, Directive or Regulation of the European Union, Statutory Instrument, Code of Practice, British Standard, manufacturers' instructions or similar publication, are references to such publication in the form in which it was current at the date of this Certificate.

11.3 This Certificate will remain valid for an unlimited period provided that the product/system and the manufacture and/or fabrication including all related and relevant processes thereof:

- are maintained at or above the levels which have been assessed and found to be satisfactory by the BBA
- continue to be checked as and when deemed appropriate by the BBA under arrangements that it will determine
- are reviewed by the BBA as and when it considers appropriate.

11.4 In granting this Certificate, the BBA is not responsible for:

- the presence or absence of any patent, intellectual property or similar rights subsisting in the product/system or any other product/system
- the right of the Certificate holder to manufacture, supply, install, maintain or market the product/system
- individual installations of the product or system, including the nature, design, methods and workmanship of or related to the installation
- the actual works in which the product/system is installed, used and maintained, including the nature, design, methods and workmanship of such works.

11.5 Any information relating to the manufacture, supply, installation, use and maintenance of this product/system which is contained or referred to in this Certificate is the minimum required to be met when the product/system is manufactured, supplied, installed, used and maintained. It does not purport in any way to restate the requirements of the Health & Safety at Work etc Act 1974, or of any other statutory, common law or other duty which may exist at the date of this Certificate or in the future; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any present or future statutory, common law or other duty of care. In granting this Certificate, the BBA does not accept responsibility to any person or body for any loss or damage, including personal injury, arising as a direct or indirect result of the manufacture, supply, installation, use and maintenance of this product/system.



In the opinion of the British Board of Agrément, Inno-Therm is fit for its intended use provided it is installed, used and maintained as set out in this Certificate. Certificate No 06/4376 is accordingly awarded to Recovery Insulation Ltd.

On behalf of the British Board of Agrément

Date of issue: 6th October 2006

Chief Executive



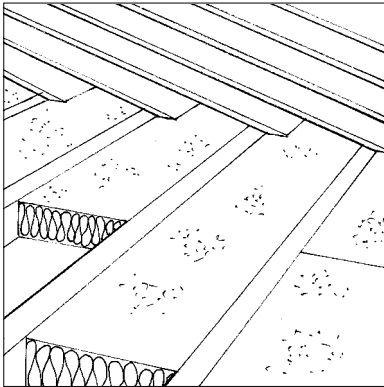
Recovery Insulation Ltd

Certificate No 06/4376

DETAIL SHEET 2

INNO-THERM — LOFT INSULATION

Product



• THIS DETAIL SHEET REPLACES CERTIFICATE No 03/4027 AND RELATES TO INNO-THERM — LOFT INSULATION, A COTTON-BASED THERMAL INSULATION ROLL OR BATT FOR USE IN LOFTS WITH VENTILATED OR UNVENTILATED SPACES UNDER PITCHED ROOFS IN DWELLINGS OR OTHER BUILDINGS.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the products, and the Conditions of Certification, respectively.

Design Data

1 General

Inno-Therm — Loft Insulation is effective in reducing the U value (thermal transmittance) of ceiling structures with ventilated or unventilated pitched roofs.

2 Thermal performance

2.1 Calculations of the thermal transmittance (U value) of loft constructions should be carried out in accordance with BS EN ISO 6946 : 1997, and BRE report (BR 443 : 2006), *Conventions for U-value calculations* using a typical thermal conductivity value of $0.040 \text{ Wm}^{-1}\text{K}^{-1}$ for the Inno-Therm insulation. The U value of a typical loft construction will depend on the insulation thickness. Example U values are given in Table 1.

Table 1 Loft — with insulation between and over joists on flat ceiling

Joists height (mm)	Insulation thickness (mm)	U value ($\text{Wm}^{-2}\text{K}^{-1}$)	
		Additional continuous layer of insulation (thickness = 89 mm)	Additional continuous layer of insulation (thickness = 140 mm)
100	100	0.21	0.16
150	150	0.17	0.14

Notes

- Assuming plasterboard thickness 12.5 mm and thermal conductivity $0.21 \text{ Wm}^{-1}\text{K}^{-1}$.
- Roof space beneath tiled roof to have resistance of $0.2 \text{ m}^2\text{KW}^{-1}$.

2.2 Subject to the selection of an appropriate insulation thickness, loft construction can improve on the U value of $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ required by the 2002 Regulations. The product can therefore contribute to enabling a

building to meet the Target Emission Rate 'average' improvements of 20% (dwellings) and 23 to 28% (buildings other than dwellings) specified in Approved Documents L1A and L2A respectively.

2.3 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the loft and other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in the TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002.

2.4 Compliance with the guidance referred to in section 2.3 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, SAP 2005, in Target Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM)⁽¹⁾.

(1) Published by the Department for Communities and Local Government on its website: www.communities.gov.uk

2.5 When installed in lofts of existing buildings, the product can meet, or contribute to meet, the relevant requirements of the following guidance documents:

- Approved Document L1B, section 2
- Approved Document L2B, section 3.

2.6 Subject to the selection of an appropriate insulation thickness, lofts can satisfy the Elemental target U value of $0.16 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Table 1 to clause 6.2.1 of the Technical Handbook (Domestic).

2.7 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the loft and other building elements. Guidance in BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks* is acceptable.



2.8 Subject to the selection of an appropriate insulation thickness, lofts in Northern Ireland can satisfy the Elemental target U value of $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Tables 1.2 and 1.4 of Technical Booklet F.

3 Behaviour in relation to fire

3.1 The product contains a fire retardant which inhibits flaming and smouldering combustion.



3.2 When tested to BS 5803-4 : 1985, the product adequately limited the extent of combustion and satisfied the criteria for cellulose loft insulation to BS 5803-3 : 1985.

3.3 When installed with a fire-rated ceiling plasterboard, the insulation will remain intact until the ceiling board is destroyed.

3.4 Where a ceiling incorporates recessed luminaires, care must be taken to ensure that the product is not installed in such a way as to cause them to overheat.

4 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and/or heat-producing appliances the following provisions to the national Building Regulations are acceptable:

England and Wales

Approved Document J

Scotland

Mandatory Standard 3.19

Northern Ireland

Technical Booklet L.

5 Condensation

Surface condensation



5.1 Ceilings below the loft space will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ Wm}^{-2}\text{K}^{-1}$ for walls and $0.35 \text{ Wm}^{-2}\text{K}^{-1}$ for roofs at any point and the loft hatch and junctions with walls/roofs are designed in accordance with the relevant requirements of TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06.



5.2 Ceilings below the loft space will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ Wm}^{-2}\text{K}^{-1}$ at any point. Guidance may be obtained from Section 8

and of BS 5250 : 2002 and BRE report (BR 262 : 2002).

Interstitial condensation



5.3 Roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2002 and Appendix D and BRE report (BR 262 : 2002).

5.4 Insulation material placed at ceiling level will considerably reduce the temperature of an unheated roof structure and, if moist air passes into the roof space, condensation on cold surfaces is likely to be enhanced. Roof structures incorporating the insulation at ceiling level must have provision for adequate dispersal of water vapour, for example, permanent ventilation of the space above the insulation to minimise the formation of condensation in the roof space.

5.5 Permanent ventilation of the roof structure should be provided by continuous openings or regularly-spaced vents of equivalent area situated along two opposite sides of the roof at eaves level. The size and position of ventilation openings for pitched roofs (greater than 15° to horizontal), roofs with spans exceeding 10 metres, and monopitched roofs, should be in accordance with Clause 8.4 of BS 5250 : 2002. Further information and guidance is given in BRE report (BR 262 : 2002).

5.6 Ventilation openings should be arranged to prevent the ingress of rain, snow, birds and small mammals and the risk of subsequent blockage by other building operations.

5.7 Unventilated roofs designed and installed in accordance with and within the limitation imposed by, a relevant BBA Certificate are also acceptable.

5.8 In roof structures incorporating the product at ceiling level, a breathable membrane can be used to limit excessive condensation.

Installation

6 General

6.1 The installation of Inno-Therm — Loft Insulation can be carried out as a DIY operation. Protective clothing or equipment is not necessary when handling this product.

6.2 When necessary rolls and batts can be cut to size using a sharp straight blade knife. After cutting, preferably on both sides, the material may be torn by hand horizontally.

6.3 The product should be shaken prior to installation, to re-form the material due to any compression that may have occurred during transit or storage.

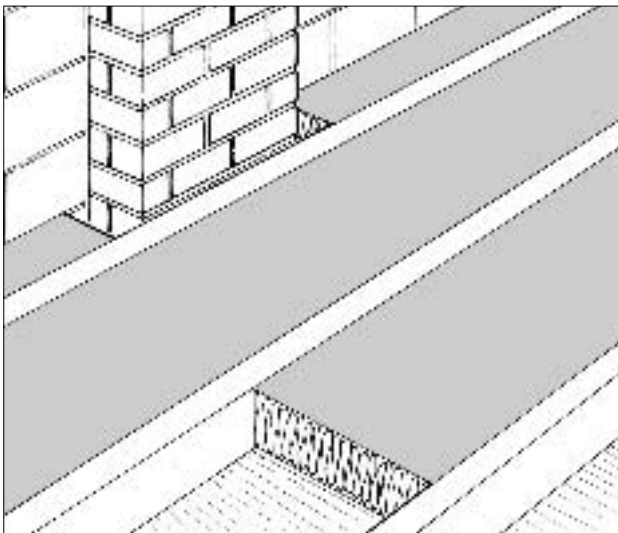
6.4 All removable obstructions should first be cleared from the loft space and any holes in the

ceiling, such as around pipes, should be sealed. Water tanks should be covered and any sources of moisture, eg vent pipes for central heating, should be arranged to avoid water vapour entering the loft space.

6.5 To reduce the risk of frost damage due to ceiling insulation, the pipes and tank in the loft space should be lagged before installing the product. The area directly below cold water tanks when resting at joist level must not be insulated to avoid the risk of the stored water freezing in cold weather.

6.6 As with other insulating materials, the product should not be installed around metal chimney fabrications or flues passing through the loft space (see Figure 1). Contact between these components and the insulant must be avoided.

Figure 1 Typical installation



6.7 During installation, boards should be placed across the joists to reduce the risk of ceiling damage and care should be exercised when filling up to and above joist level.

7 Procedure

7.1 Rolls or batts are laid between joists with ends, butted against each other. The product can be laid on top of existing insulation.

7.2 During installation it is essential that all ventilation points, for example eaves gaps and air bricks at gable ends, are kept clear of insulant ensuring the air flow is maintained.

7.3 On completion, if required, a piece of insulation should be cut to size and fixed to the loft trap door.

Bibliography

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5803-3 : 1985 *Thermal insulation for use in pitched roof spaces in dwellings — Specification for cellulose fibre thermal insulation for application by blowing*

BS 5803-4 : 1985 *Thermal insulation for use in pitched roof spaces in dwellings — Methods for determining flammability and resistance to smouldering*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*



On behalf of the British Board of Agrément

Date of issue: 6th October 2006

Chief Executive

Electronic Copy

British Board of Agrément

P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA
Fax: 01923 665301

©2006

e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk



For technical or additional information,
contact the Certificate holder (see
front page).
For information about the Agrément
Certificate, including validity and
scope, tel: Hotline 01923 665400,
or check the BBA website.



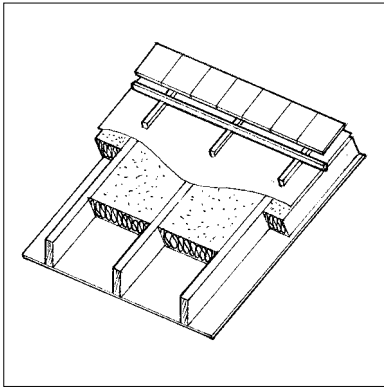
Recovery Insulation Ltd

Certificate No 06/4376

DETAIL SHEET 3

INNO-THERM — SARKING

Product



• THIS DETAIL SHEET RELATES TO INNO-THERM — SARKING, A COTTON-BASED THERMAL INSULATION ROLL OR BATT FOR USE BETWEEN RAFTERS IN WARM PITCHED ROOFS.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the products, and the Conditions of Certification, respectively.

Design Data

1 General

1.1 Inno-Therm — Sarking installed between rafters is satisfactory for use as a thermally-insulated, pitched-roof, sarking system. The batts are used in conjunction with a vapour-permeable roof tile underlay, treated-timber counter battens and tiling battens in tiled or slated pitched roofs designed and constructed in accordance with the relevant clauses of BS 5534 : 2003 for dwellings.

1.2 The product is are for use in constructions where the ceiling follows the pitch of the roof and encloses a habitable space, or where the ceiling is horizontal and encloses a loft space.

1.3 The product is effective in reducing the U value (thermal transmittance) of ventilated or unventilated pitched roofs where it is installed.

2 Thermal performance

2.1 Calculations of the thermal transmittance (U value) of a roof construction should be carried out in accordance with BS EN ISO 6946 : 1997, and BRE report (BR 443 : 2006), *Conventions for U-value calculations* using a typical thermal conductivity value of $0.040 \text{ Wm}^{-1}\text{K}^{-1}$ for the insulation. The U value of a typical warm pitched roof construction will depend on the insulation thickness and rafters depth. Example U values are given in Table 1.

Table 1 Warm pitched roof with insulation between rafters

Rafters depth (mm)	Insulation thickness (mm)	U value ($\text{Wm}^{-2}\text{K}^{-1}$)
150	150	0.29
220	220	0.20

Notes

- Assuming plasterboard thickness 12.5 mm and thermal conductivity $0.21 \text{ Wm}^{-1}\text{K}^{-1}$.



2.2 Subject to the selection of the appropriate insulation thickness, the roof construction can improve on the U value of $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ as required by the 2002 Regulations. The product can therefore contribute to enabling a building to meet the Target Emission Rate 'average' improvements of 20% (dwellings) and 23 to 28% (buildings other than dwellings) specified in Approved Documents L1A and L2A respectively.

2.3 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the roof and other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in the TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002.

2.4 Compliance with the guidance referred to in section 2.3 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of *The Government's Standard Assessment Procedure for Energy Rating of dwellings*, SAP 2005, in Target Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM)⁽¹⁾.

(1) Published by the Department for Communities and Local Government on its website: www.communities.gov.uk

2.5 When installed in roofs of existing buildings, the product can meet, or contribute to meet, the relevant requirements of the following guidance documents:

- Approved Document L1B, section 2
- Approved Document L2B, section 3.



2.6 Subject to the selection of an appropriate insulation thickness, a roof can satisfy the Elemental target U value of $0.20 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Table 1 to clause 6.2.1 of the Technical Handbook (Domestic).

2.7 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the loft and other building elements. Guidance in BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks* is acceptable.



2.8 Subject to the selection of an appropriate insulation thickness, lofts in Northern Ireland can satisfy the Elemental target U value of $0.25 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Tables 1.2 and 1.4 of Technical Booklet F.

3 Behaviour in relation to fire

3.1 The product contains a fire retardant which inhibits flaming and smouldering combustion.



3.2 The rolls or batts must not be carried over junctions between roofs required to provide a minimum period of fire resistance. The continuity of fire resistance must be maintained, for example as described in the national Building Regulations:

England and Wales

Approved Document B, sections 10 and 11

Scotland

Mandatory Standard 2.4, clauses 2.4.1⁽¹⁾ to 2.4.3⁽¹⁾ and 2.4.6⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland

Technical Booklet E, Section 3.

3.3 When tested to BS 5803-4 : 1985, the product adequately limited the extent of combustion and satisfied the criteria for cellulose insulation to BS 5803-3 : 1985.

3.4 The use of the product will not affect the rating obtained by tiled or slated roofs when evaluated by assessment or test to BS 476-3 : 1958 or 2004.

3.5 When installed with an internal lining plaster board, the insulation will be contained between the roof and internal lining board until one is destroyed. Therefore, the insulation will not contribute to the development stages of a fire or present a smoke or toxic hazard.

4 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and/or heat-producing appliances the following provisions to the national Building Regulations are acceptable:

England and Wales

Approved Document J

Scotland

Mandatory Standard 3.19

Northern Ireland

Technical Booklet L.

5 Condensation

Surface condensation



5.1 Pitched roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.35 \text{ Wm}^{-2}\text{K}^{-1}$ at any point and the junctions with walls are designed in accordance with the relevant requirements of TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06.



5.2 Roofs will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ Wm}^{-2}\text{K}^{-1}$ at any point. Guidance may be obtained from Section 8 and of BS 5250 : 2002 and BRE report (BR 262 : 2002).

Interstitial condensation



5.3 Pitched roofs will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2002, Section 8 and Appendix D.

5.4 The risk of interstitial condensation is greatest when the building is drying out after construction. Guidance on preventing condensation from this and other sources is given in BRE Digest 369 *Interstitial condensation and fabric degradation* and BRE report (BRE 262 : 2002).

6 General

- 6.1 The installation of Inno-Therm — Sarking Insulation can be carried out as a DIY operation. Protective clothing or equipment is not necessary when handling this product.
- 6.2 When necessary rolls and batts can be cut to size using a sharp straight blade knife. After cutting, preferably on both sides, the material may be torn by hand horizontally.
- 6.3 The product should be shaken prior to installation, to re-form the material due to any compression that may have occurred during transit or storage.
- 6.4 Galvanized and copper-based metals in contact with the product are not subject to corrosion.
- 6.5 Should the product become soaked by water it should be allowed to dry out and re-installed as normal.

7 Procedure

- 7.1 Rolls or batts are laid butt-jointed and push-fitted between the rafters and are held in place by friction.
- 7.2 Care should be taken to minimise gaps in the insulation, all gaps should be sealed using pieces of uncompressed material.
- 7.3 The product can be installed after tiling/slating is completed from the inside of the roof space. A vapour control layer should be installed to the warm side of the product.

- BS 476-3 : 1958 *Fire tests on building materials and structures — External fire exposure roof test*
- BS 476-3 : 2004 *Fire tests on building materials and structures — Classification and method of test for external fire exposure to roofs*
- BS 5534 : 2003 *Code of practice for slating and tiling (including shingles)*
- BS 5250 : 2002 *Code of practice for control of condensation in buildings*
- BS 5803-3 : 1985 *Thermal insulation for use in pitched roof spaces in dwellings — Specification for cellulose fibre thermal insulation for application by blowing*
- BS 5803-4 : 1985 *Thermal insulation for use in pitched roof spaces in dwellings — Methods for determining flammability and resistance to smouldering*
- BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*



On behalf of the British Board of Agrément

Date of issue: 6th October 2006

A handwritten signature in black ink, appearing to read 'G. A. Cooper', is positioned above the title 'Chief Executive'.

Chief Executive

Electronic Copy

British Board of Agrément

P O Box No 195, Bucknalls Lane
Garston, Watford, Herts WD25 9BA
Fax: 01923 665301

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e-mail: mail@bba.star.co.uk
website: www.bbacerts.co.uk



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For information about the Agrément
Certificate, including validity and
scope, tel: Hotline 01923 665400,
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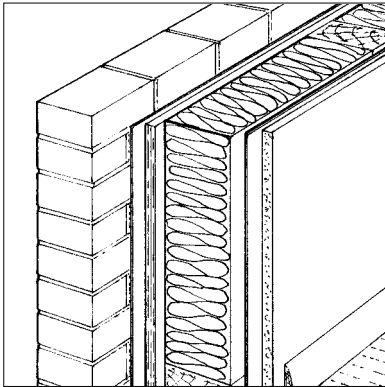
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DETAIL SHEET 4

INNO-THERM — TIMBER FRAME WALLS

Product



• THIS DETAIL SHEET RELATES TO INNOTHERM — TIMBER FRAME, A COTTON-BASED THERMAL INSULATION ROLL OR BATT FOR USE BETWEEN STUDDING IN THE TIMBER-FRAME INTERNAL LEAF OF EXTERNAL WALLS OF NORMAL DWELLINGS AND BUILDINGS WITH SIMILAR TEMPERATURE AND HUMIDITY CONDITIONS.

This Detail Sheet must be read in conjunction with the Front Sheets, which give the product's position regarding the Building Regulations, general information relating to the products, and the Conditions of Certification, respectively.

Design Data

1 General

1.1 When installed, Inno-Therm — Timber Frame is effective in reducing the U value (thermal transmittance) of inner leaf timber-framed wall of external walls. It is essential that such walls are designed and constructed to incorporate the normal precautions against moisture ingress.

1.2 Proper care and attention must be given to maintaining the continuity of the vapour control layers (see section 4.2).

2 Thermal performance

2.1 Calculations of the thermal transmittance (U value) of a specific wall construction should be carried out in accordance with BS EN ISO 6946 : 1997, BS EN ISO 13370 : 1998 and BRE report (BR 443 : 2006), *Conventions for U-value calculations* using a typical thermal conductivity value of $0.040 \text{ Wm}^{-1}\text{K}^{-1}$ for the insulation. The U value of a typical timber-framed wall construction will depend on the insulation thickness. Example U values are given in Table 1.

Table 1 Example U values — timber-framed wall

Studs depth (mm)	Insulation thickness (mm)	U value ($\text{Wm}^{-2}\text{K}^{-1}$)
89	89	0.43
140	140	0.30

Notes

- Assuming plaster board thickness 12.5 mm and thermal conductivity $0.21 \text{ Wm}^{-1}\text{K}^{-1}$ respectively.
- Assuming the resistance of slightly ventilated air space is $0.15 \text{ m}^2\text{KW}^{-1}$.



2.2 Subject to the application of additional insulation, wall constructions as shown in Table 1 can improve on the U value of $0.35 \text{ Wm}^{-2}\text{K}^{-1}$ as required by the 2002 Regulations. The product can therefore contribute to enabling a building to meet the Target Emission Rate 'average' improvements of 20% (dwellings) and 23 to 28% (buildings other than dwellings) specified in Approved Documents L1A and L2A respectively.

2.3 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between the timber-framed wall and other building elements. Guidance in this respect, and on limiting heat loss by air infiltration, can be found in the TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002.


2.4 Compliance with the guidance referred to in section 2.3 will allow the use of the default psi values from Table 3 of BRE Information Paper IP 1/06 *Assessing the effects of thermal bridging at junctions and around openings* and Table K1 of *The Government's Standard Assessment Procedure for Energy Rating of Dwellings*, SAP 2005, in Target Emission Rate calculations to SAP 2005 or the Simplified Building Energy Model (SBEM)⁽¹⁾.

(1) Published by the Department for Communities and Local Government on its website: www.communities.gov.uk


2.5 When installed in wall of existing buildings, the product can meet, or contribute to meet, the relevant requirements of the following guidance documents:

- Approved Document L1B, section 2
- Approved Document L2B, section 3.

5 Condensation


 2.6 Subject to the selection of an appropriate insulation thickness, timber-framed wall can satisfy the Elemental target U value of $0.30 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Table 1 to clause 6.2.1 of the Technical Handbook (Domestic).

2.7 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between wall and other building elements. Guidance in BRE report (BR 262 : 2002) *Thermal insulation : avoiding risks* is acceptable.

 2.8 Subject to the selection of an appropriate insulation thickness, walls in Northern Ireland can satisfy the Elemental target U value of $0.45 \text{ Wm}^{-2}\text{K}^{-1}$ specified in Tables 1.2 and 1.4 of Technical Booklet F.

3 Behaviour in relation to fire

3.1 The product contains a fire retardant which inhibits flaming and smouldering combustion.

 3.2 Walls must be designed to provide the minimum period of fire resistance in accordance with the national Building Regulations and Standards:

England and Wales

Approved Document B, sections 10 and 11

Scotland

Mandatory Standard 2.4, clauses 2.4.1⁽¹⁾ to 2.4.3⁽¹⁾ and 2.4.6⁽¹⁾

(1) Technical Handbook (Domestic).

Northern Ireland

Technical Booklet E, section 3.

3.3 When tested to BS 5803-4 : 1985, the product adequately limited the extent of combustion and satisfied the criteria for cellulose insulation to BS 5803-3 : 1985.

3.4 When installed with an internal lining plaster board, the insulation will be contained within the cavity sheathing and internal lining board until these layers are destroyed. Therefore, the insulation will not contribute to the development stages of a fire or present a smoke or toxic hazard.

4 Proximity of flues and appliances

When installing the product in close proximity to certain flue pipes and/or heat-producing appliances the following provisions to the national Building Regulations are acceptable:

England and Wales

Approved Document J


Scotland


Mandatory Standard 3.19

Northern Ireland


Technical Booklet L.

Surface condensation

 5.1 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $0.7 \text{ Wm}^{-2}\text{K}^{-1}$ at any point and openings and junctions with the other elements are designed in accordance with the relevant requirements of TSO publication *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or BRE Information Paper IP 1/06.

 5.2 Walls will adequately limit the risk of surface condensation when the thermal transmittance (U value) does not exceed $1.2 \text{ Wm}^{-2}\text{K}^{-1}$ at any point. Guidance may be obtained from Section 8 of BS 5250 : 2002 and BRE report (BR 262 : 2002).

Interstitial condensation

 5.3 Timber-frame walls incorporating the product will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250 : 2002, section 8 and Appendix D and BRE report (BR 262 : 2002).

5.4 A vapour control layer with at least $S_d = 12$ is recommended (eg polyethylene or plasterboard lining with an integral vapour control layer).

5.5 Installation must not be carried out until the moisture content of the timber frame is less than 20%.

5.6 It is essential that the continuity of vapour control layers is maintained at laps and joints at wall/ceiling and wall/floor level. Perforations, eg for service outlets, should be kept to a minimum and be well sealed and taped. The recommendations of BS 5250 : 2002 should be followed to minimise the risk of condensation within the structure.

Installation

6 General

6.1 The installation of Inno-Therm — Timber Frame Wall Insulation can be carried out as a DIY operation. Protective clothing or equipment is not necessary when handling this product.

6.2 When necessary rolls and batts can be cut to size using a sharp straight blade knife. After cutting, preferably on both sides, the material may be torn by hand horizontally.

6.3 The product should be shaken prior to installation to re-form the material due to any compression that may have occurred during transit or storage.

6.4 Galvanized and copper-based metals in contact with the product are not subject to corrosion.

6.5 Should the product become soaked by water it should be allowed to dry out and re-installed as normal.

7 Procedure

7.1 Rolls or batts are laid butt-jointed and push-fitted between the timber stud and held in place by friction.

7.2 Care should be taken to minimise gaps in the insulation, all gaps should be sealed using pieces of uncompressed material.

7.3 During installation, it is essential that all ventilation points, eg air bricks at gable ends, are kept clear of insulation to ensure airflow is maintained.

7.4 A vapour control layer, (see section 5.4) should be installed to the warm side of the product. The internal cladding should be installed as soon as the insulation has been added.

7.5 The product should not be installed around metal chimney fabrications or flues passing through walls. Contact with these features must be avoided.

Bibliography

BS 5250 : 2002 *Code of practice for control of condensation in buildings*

BS 5803-3 : 1985 *Thermal insulation for use in pitched roof spaces in dwellings — Specification for cellulose fibre thermal insulation for application by blowing*

BS 5803-4 : 1985 *Thermal insulation for use in pitched roof spaces in dwellings — Methods for determining flammability and resistance to smouldering*

BS EN ISO 6946 : 1997 *Building components and building elements — Thermal resistance and thermal transmittance — Calculation method*

BS EN ISO 13370 : 1998 *Thermal performance of buildings — Heat transfer via the ground — Calculation methods*



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