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Agrément Certificate
10/4730
Product Sheet 3

NATUREPRO SHEEPSWOOL NATURAL INSULATION

NATUREPRO SHEEPSWOOL INSULATION FOR USE IN TIMBER FRAME APPLICATIONS

PRODUCT SCOPE AND SUMMARY OF CERTIFICATE

This Certificate relates to NaturePro Sheepswool Insulation for use in Timber Frame Applications between the studding in the timber frame internal leaf of external walls of conventional timber frame dwellings or buildings of similar occupancy.

AGRÉMENT CERTIFICATION INCLUDES:

- factors relating to compliance with Building Regulations where applicable
- factors relating to additional non-regulatory information where applicable
- independently verified technical specification
- assessment criteria and technical investigations
- design considerations
- installation guidance
- regular surveillance of production
- formal three-yearly review.

KEY FACTORS ASSESSED

Thermal performance — the product has a mean thermal conductivity of 0.039 $W \cdot m^{-1} \cdot K^{-1}$ and can achieve a calculated U value of 0.29 $W \cdot m^{2} \cdot K^{-1}$ when installed in walls with 140 mm studs and brick outer leaf (see section 5).

Condensation risk — the product can contribute to limiting the risk of surface condensation and, for the purposes of assessing the risk of interstitial condensation, the products vapour resistivity may be taken as 7.11 $MN \cdot s \cdot g^{-1} \cdot m^{-1}$ at a thickness of 100 mm (see section 6).

Behaviour in relation to fire — the products will not contribute to the development stages of a fire (see section 7).

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 (see section 11).

The BBA has awarded this Agrément Certificate to the company named above for the product described herein. This product has been assessed by the BBA as being fit for its intended use provided it is installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 15 February 2010

Chris Hunt
Head of Approvals — Physics

Greg Cooper
Chief Executive

The BBA is a UKAS accredited certification body — Number 113. The schedule of the current scope of accreditation for product certification is available in pdf format via the UKAS link on the BBA website at www.bbacerts.co.uk

Readers are advised to check the validity and latest issue number of this Agrément Certificate by either referring to the BBA website or contacting the BBA direct.

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Regulations

In the opinion of the BBA, NaturePro Sheepswool Insulation for use in Timber Frame Applications, if used in accordance with the provisions of this Certificate, will meet or contribute to meeting the relevant requirements of the following Building Regulations:

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

Requirement:	B3(1)	Internal fire spread (structure)
Comment:		Walls incorporating this product can meet this Requirement. See section 7.1 of this Certificate.
Requirement:	C2(c)	Resistance to moisture
Comment:		The product may be acceptable depending on the construction. See sections 6.1 and 6.2 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The product can contribute to meeting this Requirement. See sections 5.2 to 5.5 of this Certificate.
Requirement:	Regulation 7	Materials and workmanship.
Comment:		The product is acceptable. See section 11.1 and the *Installation* part of this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Fitness and durability of materials and workmanship
Comment:		The product can contribute to a construction satisfying this Regulation. See section 11.1 and the *Installation* part of this Certificate.
Regulation:	9	Building standards — construction
Standard:	2.4	Cavities
Comment:		Walls incorporating the product can satisfy this Standard, with reference to clause 2.4.1[1] and 2.4.2[1]. See section 7.1 of this Certificate.
Standard:	3.15	Condensation
Comment:		The product can contribute to satisfying this Standard, with reference to clauses 3.15.1[1], 3.15.2[1], 3.15.4[1] and 3.15.5[1]. See sections 6.1 and 6.3 of this Certificate.
Standard:	6.1(a)(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		The product can contribute to a wall satisfying the requirements of this Standard, with reference to clauses 6.1.2[1], 6.1.6[1], 6.2.1[1], 6.2.3[1], 6.2.7[1], 6.2.12[1] and 6.2.13[1]. See sections 5.2 to 5.5 of this Certificate.

(1) Technical Handbook (Domestic).

The Building Regulations (Northern Ireland) 2000 (as amended)

Regulation:	B2	Fitness of materials and workmanship
Comment:		The product is acceptable. See section 11.1 and the *Installation* part of this Certificate.
Regulation:	C5	Condensation
Comment:		A wall incorporating the product can satisfy this Regulation. See section 6.1 of this Certificate.
Regulation:	E4(1)	Internal fire spread — Structure
Comment:		Walls incorporating the product can satisfy or contribute to satisfying this Regulation. See section 7.1 of this Certificate.
Regulation:	F2(a)(i)	Conservation measures
Regulation:	F3	Target carbon dioxide Emissions Rate
Comment:		Walls incorporating the product can satisfy or contribute to satisfying this Regulation. See sections 5.2 to 5.5 of this Certificate.

Construction (Design and Management) Regulations 2007

Construction (Design and Management) Regulations (Northern Ireland) 2007

Information in this Certificate may assist the client, CDM co-ordinator, designer and contractors to address their obligations under these Regulations.

See section: 12 *Installation* (12.1 and 12.2).

Non-regulatory Information

NHBC Standards 2008

NHBC accepts the use of NaturePro Sheepswool Insulation for use in Timber Frame Applications, when installed and used in accordance with this Certificate, in relation to *NHBC Standards*, Chapter 6.2 *External timber framed walls.*

Technical Specification

1 Description

1.1 NaturePro Sheepswool Insulation for use in Timber Frame Applications, is a natural fibre/polyester insulation, predominantly wool, treated with natural inorganic fire retardants.

1.2 The product is available in batts and rolls in the sizes as given in Table 1.

Table 1 Product details(1)

Length (mm)	Width (mm)	Thickness (mm)	Density ($kg \cdot m^{-3}$)
1200	375	50, 75, 100, 140	19
1200	575	50, 75, 100, 140	19
6000	375, 575	100	19
4000	375, 575	150	19

(1) Other sizes are available to order.

2 Delivery and site handling

2.1 The product is delivered to site in packs wrapped in polythene, each pack includes a label bearing the product name, number of batts and the BBA identification mark incorporating the number of this Certificate.

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

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

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on NaturePro Sheepswool Insulation for use in Timber Frame Applications.

Design Considerations

3 General

3.1 The wall and sub-frame should be structurally sound and should have been designed and constructed in accordance with the following Standards:

- timber — BS 5268-2 : 2002, BS 5268-5 : 1989, BS 5589 : 1989 and BS EN 351-1 : 2007
- masonry — BS 5628-1 : 2005, BS 5628-3 : 2005, BS 8110-1 : 1997, BS 8110-2 : 1985, BS EN 1996-2 : 2006.

3.2 The insulation is for use between studding in the timber-frame internal leaf of external walls of conventional timber-frame dwellings or similar buildings.

3.3 Constructions incorporating a masonry outer leaf (masonry includes clay and calcium silicate bricks, concrete blocks, natural and reconstituted stone blocks) should be in accordance with BS 5628-3 : 2005 or BS 5390 : 1976, the designed cavity width should be a minimum of 50 mm.

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

3.5 Installation of plasterboard must be in accordance with the relevant sections of BS 8212 : 1995.

4 Practicability of installation

The product is designed to be installed by a competent general builder, or a contractor, experienced with this type of product.

5 Thermal performance

5.1 Calculations of thermal transmittance (U value) should be carried out in accordance with BS EN ISO 6946 : 2007 and BRE report *Conventions for U value calculations* (BR 443 : 2006) using a thermal conductivity (λ_{mean}) of 0.039 $W \cdot m^{-1} \cdot K^{-1}$ for the product. Example U value calculations are shown in Table 2.

Table 2 Example U values calculations[1]

Thickness of insulation (mm)	U value ($W \cdot m^{-2} \cdot K^{-1}$)
100	0.38
140	0.29

(1) Assuming construction of wall (external to internal):

- outer leaf brick — 102 mm
- unventilated air cavity — 50 mm
- breather membrane
- OSB — 13 mm
- insulation (85%)/timber frame (15%)
- vapour control layer
- plasterboard – 12.5 mm, λ = 0.21 $W \cdot m^{-1} \cdot K^{-1}$
- plaster skim coat – 3 mm.

5.2 When considering insulation requirements, designers should refer to the detailed guidance contained in the documents supporting the national Building Regulations. The U values shown in Table 3 and 4 indicate that the product can enable or contribute to enable, a wall to achieve typical design U values referred to in those supporting documents.

Table 3 Typical design U values for walls — England and Wales, and Northern Ireland

Construction type	U value ($W \cdot m^{-2} \cdot K^{-1}$)
Mean for new extensions[1]	0.30
'Notional' mean in SAP and SBEM and limit mean for new-build	0.35
Limit mean for replacement, renovated and retained walls and non-domestic consequential improvements[1]	0.35
Individual limit for new-build and flexible approaches[1]	0.70

(1) Alternative/flexible approaches are described in the relevant documents supporting the national Building Regulations.

Table 4 Typical design U values for walls – Scotland

Construction type	U value ($W \cdot m^{-2} \cdot K^{-1}$)
'Notional' mean for dwellings in SAP and the 'simplified' approach:	
– solid fuel, package 6	0.20
– other fuels, packages 1–5	0.25
Mean for new extensions, conversions, alterations[1]	0.27
Mean for stand-alone buildings less than 50 m^2	0.27
'Notional' mean for non-domestic in SBEM and limit mean for new-build and stand-alone buildings of 50 m^2 or more	0.30
Individual limit for new-build, extensions, conversions, alterations, reconstructions and stand alone-buildings less than 50 m^2	0.70

(1) Alternative/flexible approaches are described in the relevant documents supporting the national Building Regulations.

New buildings

5.3 Walls with U values lower than (or the same as, for dwellings in Scotland) the relevant 'notional' value specified in Tables 3 or 4 will contribute to a building meeting its Target Emission Rate. Walls with higher U values will require additional energy saving measures in the building envelope and/or services.

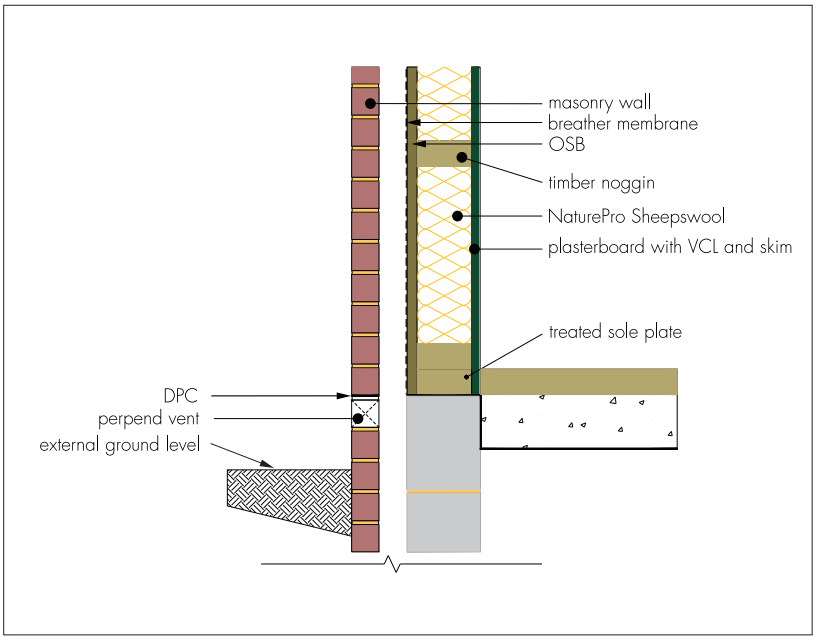
5.4 The product can maintain, or contribute to maintaining, continuity of thermal insulation at junctions between external walls and other building elements. Details shown in Figure 1 (see section 11.5) will allow use of the default psi values for Accredited Construction details in Target Emission Rate calculations to SAP 2005 *The Government's Standard Assessment Procedure for Energy Rating of Dwellings* or the Simplified Building Energy Model (SBEM). Detailed guidance on this and on limiting heat loss by air filtration can be found in:

England and Wales — *Limiting thermal bridging and air leakage : Robust construction details for dwellings and similar buildings* TSO 2002 or Accredited Construction Details (version 1.0)

Scotland — Accredited Construction Details (Scotland)

Northern Ireland — Accredited Construction Details (version 1.0).

Figure 1 Junctions



Existing buildings

5.5 For existing buildings such as extensions and conversions, walls will be acceptable where they do not exceed the relevant U value in Tables 3 or 4 and junctions and openings comply with section 5.4.

6 Condensation risk

Interstitial condensation

6.1 Walls incorporating the product will contribute to limiting the risk of interstitial condensation when designed and constructed in accordance with BS 5250: 2002, Section 8.4 and Appendix D. For the purposes of assessing the risk of interstitial condensation, the products vapour resistivity may be taken as 7.11 $MN \cdot s \cdot g^{-1} \cdot m^{-1}$ at a thickness of 100 mm.

Surface condensation

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

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

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

6.5 A vapour control layer on the warm side of the insulation is required in this type of construction. It is essential that proper care and attention is given to maintaining the integrity/continuity of vapour control layers.

6.6 If the product is to be used in the external walls of rooms expected to have high humidity, care must be taken to provide adequate ventilation to avoid possible problems from the formation of interstitial condensation in the internal wall leaf.

7 Behaviour in relation to fire

7.1 When installed, the product will be contained within the cavity sheathing and internal lining board until these layers are destroyed. Therefore, it will not contribute to the development stages of a fire or present a smoke or toxic hazard until the lining is compromised.

7.2 Care must be taken to ensure continuity of fire resistance at junctions with fire-resisting elements, in accordance with the relevant provisions of the national Building Regulations.

7.3 Elements must incorporate cavity barriers at edges, around openings, at junctions with fire-resisting elements and in extensive cavities in accordance with the relevant provisions of the national Building Regulations. The design and installation of cavity barriers must take into account any anticipated differential movement.

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. BS 7671 : 2008 suggests 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 Proximity of flues and appliances

When the product is installed in close proximity to certain flue pipes and/or heat producing appliances, for buildings subject to national Building Regulations the relevant provisions and guidance given below should be met:

England and Wales — Approved Document J, paragraph 2.15

Scotland — Mandatory Standard 3.19, clauses 3.19.1(1) to 3.19.9(1)

(1) Technical Handbook (Domestic).

Northern Ireland — Technical Booklet L, paragraph 2.9.

10 Maintenance

As the product is confined within the wall cavity and has suitable durability (see section 11), maintenance is not required.

11 Durability

11.1 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.

11.2 The product is treated with a non-volatile larvacide, therefore, the risk of moth or beetle infestation is negligible.

Installation

12 General

12.1 Installation of NaturePro Sheepswool Insulation for use in Timber Frame Applications should be in accordance with the Certificate holder's instructions and current good building practice.

12.2 As a precaution, a disposable dust mask and gloves should be worn.

12.3 Batts are placed between studs, butted against each other. Where necessary, batts can be cut to size by tearing or by cutting with sharp scissors. Care should be taken to minimise gaps. All gaps should be sealed using pieces of uncompressed batt.

12.4 The batts are pushed between studs with friction acting as the predominant force which secures the product.

12.5 A vapour control layer should be provided to the warm side of the product. See section 6 and Figure 1.

Technical Investigations

13 Tests and investigations

13.1 Tests were undertaken on NaturePro Sheepswool Insulation for use in Timber Frame Applications to determine:

- corrosion developing capacity
- thickness
- retention of additives
- dimensional stability
- thermal conductivity.
- water vapour transmission.

13.2 Test data were also examined in relation to:

- common clothes moth and carpet beetle larvae resistance
- condensation risk assessment.
- flammability and resistance to smoulder.

13.3 The manufacturing processes were examined, including quality control.

Bibliography

BS 476-21 : 1987 *Fire tests on building materials and structures — Methods for determination of the fire resistance of loadbearing elements of construction*

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

BS 5268-2 : 2002 *Structural use of timber — Code of practice for permissible stress design, materials and workmanship*

BS 5268-5 : 1989 *Structural use of timber — Code of practice for the preservative treatment of structural timber*

BS 5268-6.1 : 1996 *Structural use of timber — Code of practice for timber frame walls — Dwellings not exceeding four storeys*

BS 5390 : 1976 *Code of practice for stone masonry*

BS 5589 : 1989 *Code of practice for preservation of timber*

BS 5628-1 : 2005 *Code of practice for the use of masonry — Structural use of unreinforced masonry*

BS 5628-3 : 2005 *Code of practice for the use of masonry — Materials and components, design and workmanship*

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

BS 7671 : 2008 *Requirements for electrical installations. IEE Wiring Regulations. Seventeenth Edition*

BS 8110-1 : 1997 *Structural use of concrete — Code of practice for design and construction*

BS 8110-2 : 1985 *Structural use of concrete — Code of practice for special circumstances*

BS 8200 : 1985 *Code of practice for design of non-loadbearing external vertical enclosures of buildings*

BS 8212 : 1995 *Code of practice for dry lining and partitioning using gypsum plasterboard*

BS EN 351-1 : 1996 *Durability of wood and wood-based products — Preservative-treated solid wood — Classification of preservative penetration and retention*

BS EN 1365-1 : 1999 *Fire resistance tests for loadbearing elements — Walls*

BS EN 1996-2 : 2006 *Eurocode 6 : Design of masonry structures — Design considerations, selection of materials and execution of masonry*

14 Conditions

14.1 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.

14.2 Publications and documents referred to in this Certificate are those that the BBA deems to be relevant at the date of issue or re-issue of this Certificate and include any: Act of Parliament; Statutory Instrument; Directive; Regulation; British, European or International Standard; Code of Practice; manufacturers' instructions; or any other publication or document similar or related to the aforementioned.

14.3 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.

14.4 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/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.

14.5 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; nor is conformity with such information to be taken as satisfying the requirements of the 1974 Act or of any 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.

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