





Number BAW 12-008/01/C Replaces: -	 	Category Timber frame and masonry walls
Date 2012.11.15	BDA Agrément® BAW 12-008/01/C Document linked with Kiwa Certificate KGaC 2006 GB, issued by Kiwa Ltd., Cheltenham, UK	Phase Assessment
Project number 12-B-0518		Subject Multi-layer foil-faced laminate
Product Producer Description Scope (use) Summary of Certificate Major points of assessment Statement	<p>Foil-Tec Single and Foil-Tec Double Wall Insulation</p> <p>Yorkshire Building Services (Whitwell) Ltd. The Craggs Industrial Park Morven Street Derbyshire S80 4AJ UK</p> <p>T.: +44 (0) 1909 721662 F.: +44 (0) 1909 721442 I.: www.ybsinsulation.com E.: technical@ybsinsulation.com</p> <p>Multi-layer foil-faced laminate with reinforcement; Foil-Tec Single has aluminium foil on one side and Foil-Tec Double has aluminium foil on both sides.</p> <p>Thermal insulation for new or existing timber frame and masonry walls of dwellings and buildings with similar temperature and humidity conditions, designed and constructed in accordance with the Certificate holder's instructions.</p> <p>This Certificate covers the following:</p> <ul style="list-style-type: none"> • Conditions of use • Frame of reference, including relevant codes of practice and test reports • Independently verified product characteristics • Factory Production Control • Annual verification procedure • Points of attention for the specifier and specific details • Installation procedure • Compliance with Building Regulations and NHBC Standards <p>Thermal performance aspects (sections 1.2, 8.2 & 8.3) The basic property of Foil-Tec Single and Foil-Tec Double Wall Insulation concerns the thermal performance. BDA Test Institute has assessed the thermal performance of the product according to BS EN ISO 6946 and the principles of BR443. The product can be used to improve the thermal performance of a wall construction.</p> <p>Condensation and water penetration risk (section 8.4) The performance of Foil-Tec Single and Foil-Tec Double Wall Insulation with regard to interstitial condensation, surface condensation and water penetration has been considered.</p> <p>Behaviour in relation to fire (section 8.5) An insulated timber frame or masonry wall system using Foil-Tec Single or Foil-Tec Double Wall Insulation can be designed to meet the UK requirements.</p> <p>Durability (section 8.6) Foil-Tec Single and Foil-Tec Double Wall Insulation are stable, rot-proof and durable and will remain effective as an insulant for the life of the building in which it is installed.</p> <p>It is the opinion of the Kiwa BDA Expert Centre Building Envelope (ECBE) that Foil-Tec Single and Foil-Tec Double Wall Insulation is fit for its intended use, provided it is specified, installed and used in accordance with this Certificate.</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div data-bbox="331 1684 657 1881">  Professor Nico Hendriks, MSc ECBE Chairman </div> <div data-bbox="922 1675 1241 1881">  Authorization: Johan Sanders BDA Advies Managing Director </div> </div> <p style="text-align: center;">To check the validity of this document please consult www.bda.nl</p>	
Version 01	Kiwa BDA Expert Centre Building Envelope (ECBE) Department of BDA Advies BDA Group Ltd (BDA Groep B.V.) Avelingen West 24 P.O. Box 389 NL - 4200 AJ Gorinchem	Page 1 of 7 pages T: +31(0)183 669690 F: +31(0)183 630630 Copyright© 2012 BDA

<p>1 Conditions of use</p>	<p>1 Application The assessment and certification of Foil-Tec Single and Foil-Tec Double Wall Insulation relate to the use of the product in dwellings and buildings with similar temperature and humidity conditions and correctly detailed timber frame or masonry wall systems, designed and constructed in accordance with the Certificate holder's instructions. Foil-Tec Single and Foil-Tec Double Wall Insulation shall not be exposed to organic solvents or plasticisers.</p> <p>2 Assessment BDA Test Institute*) has assessed the thermal performance of the product according BS EN 6946 and BR 443. The hemispherical emissivity has been assessed according BS EN 16012, Annex D and the characteristic properties according BS EN 16012, BS EN 1848-2 and BS EN 12310-1. *) CPD Notified Laboratory Nr. NB 1640; Testing Accreditation RvA L 447 (acknowledged by UKAS)</p> <p>3 Installation It is recommended that the quality of installation and workmanship is controlled by an independent competent inspector. This inspector can be either a qualified employee of the specifier or a qualified employee of a consulting engineer. The product shall be installed strictly in accordance with the instructions of the Certificate holder and the requirements of this Certificate.</p> <p>4 Geographical scope The validity of this document is limited to England, Wales, Scotland and Northern Ireland, with due regard to section 11 (Regulations) of this document.</p>
<p>2 Frame of reference</p>	<ol style="list-style-type: none"> 1 BDA Guideline – BDA Agrément®, 15th June 2012 2 BS 5250:2011 Code of practice for control of condensation in buildings 3 BS EN ISO 6946: 2007 Building components and building elements -Thermal resistance and thermal transmittance - Calculation method 4 BR443: Conventions for U-value calculations, 2006 edition, BRE Scotland 5 BS EN ISO 10211: 2007 Thermal bridges in building constructions – Calculation of heat flows and surface temperatures 6 BDA Report 0286-K-12/1: Determination of product characteristics (initial type testing), 2012.09.20 7 BDA-Kiwa report: Technical Documentation, containing information to demonstrate the conformity of the products to the applicable requirements of BDA Agrément®+ Kiwa Certificate BAW 12-008/01/C 8 BBA Information Bulletin No. 3: Reflective foil Insulation – Conventions for U-value calculations, March 2010 9 BS EN 16012: 2012 Thermal insulation for buildings – Reflective insulation products – Determination of the declared thermal performance 10 NHBC Standards, Chapter 6.1 External masonry walls and Chapter 6.2 External timber framed walls 11 Kiwa Guideline K22005, 15th June 2012 12 Kiwa Certificate KGaC 2006 GB, 2012.08.31, Kiwa Ltd., Cheltenham, UK 13 BS 5268-2: 2002 Structural use of timber – Code of practice for permissible stress design, materials and workmanship 14 BS 5268-5: 1989 Structural use of timber – Code of practice for the preservative treatment of structural timber 15 BS 5628-3: 2005 Code of practice for the use of masonry – Materials and components, design and workmanship 16 BS 8212: 1995 Code of practice for dry lining and partitioning using gypsum plasterboard 17 BDA Report 12-B-0518/2rev Foil-Tec Wall Insulation: calculation of thermal resistance, 2012.09.24 <p>Remark: in the text of this document reference is made to these sources by adding the relevant reference number in superscript</p>
<p>3 Independently verified product characteristics</p>	<ul style="list-style-type: none"> • nominal length : 50 (m) • nominal width : 1000, 1500 (mm) • nominal thickness : ≤ 1 (mm) • emission coefficient of aluminium foil⁶ : 0.02 (-) • thermal resistance¹⁷ <ul style="list-style-type: none"> - Foil-Tec Single with adjacent non-ventilated minimum 25 mm cavity, horizontal heat flow : 0.74 (m².K.W⁻¹) - Foil-Tec Double with 2 adjacent non-ventilated minimum 25 mm cavities, horizontal heat flow : 1.48 (m².K.W⁻¹) • dimensional stability (length) : 1.5 (%) • dimensional stability (width) : 2.3 (%) • tearing resistance (nail shank)⁶ : 408 (N) • water vapour diffusion factor μ (with seam) : 1700 (-) • water vapour diffusion factor μ (without seam) : 75000 (-) • reaction to fire classification : Euroclass E (BS EN 13501-1)
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<p>4 Ancillary items (outside scope of this Certificate)</p> <p>5 Factory Production Control (FPC)</p> <p>6 Quality control</p> <p>7 Annual verification procedure</p>	<ul style="list-style-type: none"> • YBS Insulation foil-backed tape with acrylic adhesive, width 75 mm • 14 mm staples or nails • pre-treated counter battens • additional insulation where required <p>Kiwa N.V., Approval Body, has determined that Yorkshire Building Services (Whitwell) Ltd. (YBS), with respect to the products Foil-Tec Single and Foil-Tec Double Wall Insulation fulfills all provisions concerning the specifications described in BDA Agrément® nr. BAF 12-00701/C. The Factory Production Control has been found to comply with the Kiwa Guideline K22005¹¹ and BDA Agrément® nr. BAW 12-008/01/C. The Factory Production Control system of YBS is in line with the Technical Documentation from the producer⁷. Kiwa Ltd. has performed the initial inspection of the factory and of the Factory Production Control and performs the continuous surveillance of the Factory Production Control¹².</p> <p>Foil-Tec Single and Foil-Tec Double Wall Insulation are produced under a Quality Management System, which is deemed to satisfy the requirement concerning the FPC. The quality system enables the Certificate holder to demonstrate that the product fulfils the requirements of this Certificate. This means that the following aspects are covered:</p> <ul style="list-style-type: none"> • the quality objectives, quality planning, quality manual and control of documents must fully take on board the objective of delivering a product that conforms to the specifications in this Certificate; • the manufacturer must identify and document the essential requirements that are relevant for the product and the harmonised standards to be used or other technical solutions that will ensure fulfilment of the specifications in this Certificate; • the identified standards or other technical solutions must be used as design input, and as verification that design output as given in a continuous technical consulting service ensures that the specifications in this Certificate will be met; • the measures taken by the Certificate holder to control production must ensure that the products conform to the identified safety requirements; • the Certificate holder in its measurement and control of the production process and finished products must identify and use methods which are identified in standards or other appropriate methods to ensure that the specifications in this Certificate are met; and • quality records, such as inspection reports and test data, calibration data, qualification reports of the personnel concerned, must be suitable to ensure the fulfilment of the applicable specifications in this Certificate. <p>In order to demonstrate that the FPC is in conformity with the requirements of the technical specification described in this Certificate the continuous surveillance, assessment and approval of the FPC will be done in a frequency of not less than 1 time per year by Kiwa Ltd. For the purpose of the annual assessment a sample of the product (1 roll) will be independently taken at the production site. The annual assessment will concern the following product characteristics, which will be determined and assessed by BDA and Kiwa Ltd.:</p> <ul style="list-style-type: none"> • Thickness BS EN 823:1995 • Width BS EN 1848-2:2001 • Length BS EN 1848-2:2001 • Hemispherical emissivity of foil faces BS EN 16012:2012, Annex D <p>Remark: If at the time of the verification testing a new version of a mentioned Test Standard has been issued, this new version shall prevail</p>	
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8 Points of attention for the specifier

- 1 The product is delivered in rolls packed in a protective sealed bag and should include product name, dimensions, the BDA identification mark and the number of this Certificate.
- 2 **Wall insulation**
 - the building physical behaviour of wall constructions incorporating the product must be analyzed by a specialist; The specialist can be either a qualified employee of the specifier or a qualified consultant or a qualified employee of the Certificate holder. He will check the building physical behaviour of the designed wall construction and if need be, advice about improvement to achieve final specification;
 - walls will adequately limit the risk of interstitial condensation when they are designed and constructed in accordance with BS 5250². The membranes with sealed joints have a water vapour resistance of greater than 75 m and can be used as a vapour control layer;
 - Foil-Tec Single and Foil-Tec Double must be installed in accordance with the requirements of the manufacturer's instructions and section 10 of this Certificate;
 - the wall construction should be structurally sound and de designed in accordance with BS 5268-2¹³, BS 5268-5¹⁴, BS 5628-3¹⁵ and BS 8212¹⁶.
- 3 **Thermal performance aspects**
 - calculations of the thermal transmittance (U value) of specific wall constructions should be carried out in accordance with BS EN ISO 6946³, BS-EN-ISO 10211⁵ and BR 443⁴, using an emissivity of 0.02 and an air space of at least 25 mm. Examples of calculated U values are shown in Tables 1 and 2;
 - the requirement for limiting the heat loss through the building fabric, including the effect of thermal bridging can be satisfied if the U-values of the building elements do not exceed the maximum values in the relevant Elemental Methods given in the National Building Regulations of England and Wales (Approved Documents L), Scotland (Technical Standards Regulations 9) and Northern Ireland (Technical Booklet F); further information on regulations is given in section 11 of this Certificate;
 - some examples of typical wall cross sections are given in Section 9, Figures 1 and 2.

Table 1 – Example of U-value calculation for wall buildup with Foil-Tec Single (Figure 1)

Layer	Thickness (mm)	λ -value (W.m ⁻¹ .K ⁻¹)	R-value (m ² .K.W ⁻¹)
Outside surface	-	-	0.040
Brick, external ¹⁾	102.50	0.770	0.133
Cavity, non-ventilated	50.00	-	0.180
Breather membrane	-	-	-
Sheating board	9.00	0.130	0.069
MWG-insulation ²⁾	140.00	0.044	3.182
Foil-Tec Single	-	-	-
Batten cavity	25.00	-	0.740
Plasterboard	12.50	0.190	0.066
Inside surface	-	-	0.130
U-value, Combined	Method:	0.25 W.m ² .K ⁻¹	
¹⁾ bridged by 17.2% mortar ²⁾ bridged by 15% timber			

Remark: other insulation materials than MWG are also possible, e.g. MWR, PIR, PUR and EPS

Table 2 – Example of U-value calculation for wall buildup with Foil-Tec Double (Figure 2)

Layer	Thickness (mm)	λ -value (W.m ⁻¹ .K ⁻¹)	R-value (m ² .K.W ⁻¹)
Outside surface	-	-	0.040
Brick, external ¹⁾	102.50	0.770	0.133
Cavity, non-ventilated	50.00	-	0.180
Breather membrane	-	-	-
Sheating board	9.00	0.130	0.069
MWG-insulation ²⁾	140.00	0.044	3.182
Batten cavity	25.00	-	0.740
Foil-Tec Double	-	-	-
Batten cavity	25.00	-	0.740
Plasterboard	12.50	0.190	0.066
Inside surface	-	-	0.130
U-value, Combined	Method:	0.21 W.m ² .K ⁻¹	
¹⁾ bridged by 17.2% mortar ²⁾ bridged by 15% timber			

Remark: other insulation materials than MWG are also possible, e.g. MWR, PIR, PUR and EPS

8 Points of attention for the specifier
(continued)

- 4 Condensation risk**
- walls incorporating the product will adequately limit the risk of interstitial condensation when designed in accordance with BS 5250²;
 - when the product is installed in accordance with Section 10 of this Certificate the wall construction will adequately limit the risk of surface condensation; see also Section 11 Regulations.
- 5 Behaviour in relation to fire**
- the product does not prejudice the fire-resistance properties of the wall. Therefore, the insulation will not contribute to the development stages of a fire or present a smoke or toxic hazard;
 - when properly installed, the product will not add significantly to any existing fire hazard;
 - the product will be contained within the wall by the overlay until the overlay itself is destroyed. Therefore, the products will not contribute to the development stages of a fire or present a smoke or toxic hazard.
- 6 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. There is no risk for moth or beetle infestation.

9 Specific details

Figure 1 – Wall buildup with Foil-Tec Single

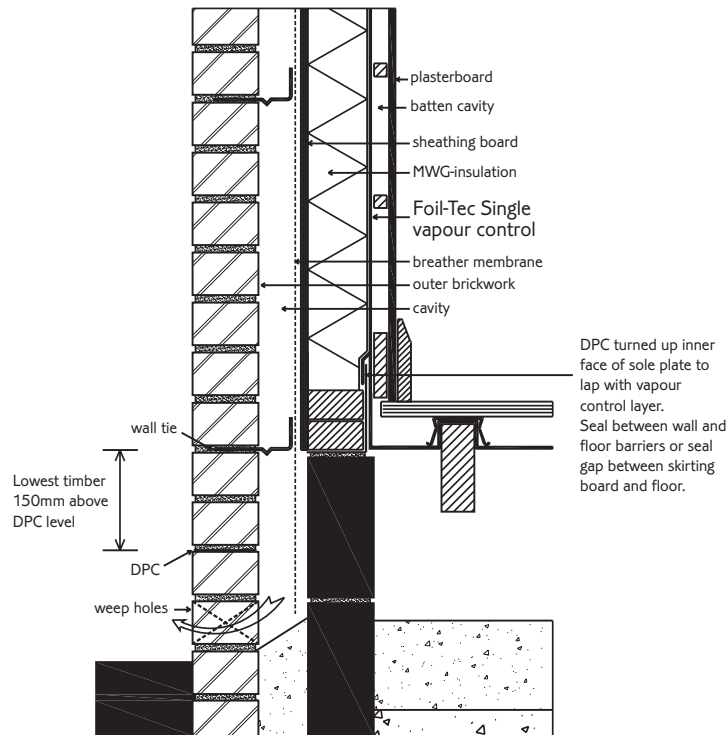
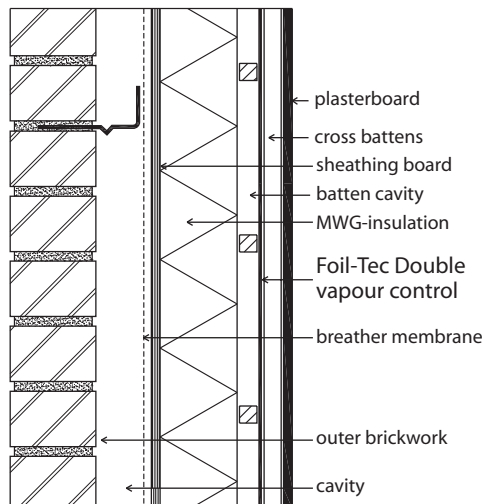


Figure 2 – Wall buildup with Foil-Tec Double



<p>10 Installation procedure</p>	<p>1 General</p> <ul style="list-style-type: none"> - installation of Foil-Tec Single and Foil-Tec Double Wall Insulation and additional products should be in accordance with the Certificate holder's instructions and current good building practice; - during installation care must be taken to avoid damaging of the product; should damage occur, holes in the product should be repaired with suitable tape, as provided by the Certificate holder; - the installation of the products requires careful detailing around windows and doors; - when the product is cut to fit around openings or connections, gaps must be minimized; any exposed cut edges should be sealed with aluminum foil-backed tape with acrylic adhesive for repair in detailing of the product, as provided by the Certificate holder, see section 4 of this Certificate; - bearing surfaces for timber battens should comply with BS 8212¹⁶; - timber and timber products shall either be naturally durable or where necessary be treated with preservative to give adequate resistance against decay and insect attack; - battens shall always be positioned at the top and bottom of the wall and around the perimeter of windows and doors; - services can be incorporated behind the dry lining in such a way that penetration of the products by services are kept to a minimum to avoid water vapour penetration; - the products should be butt-jointed onto the insulation facing or the battens and sealed with YBS Insulation foil-backed tape. <p>2 Delivery and site handling</p> <ul style="list-style-type: none"> - the product is delivered to site in rolls packed in a protective bag sealed with a plastic tie; fitting instructions are placed in the bag; - the rolls should be stored in clean, dry conditions, not exposed to sunlight; - the product must be protected from being dropped or crushed by objects. Care must be exercised when storing large quantities on site; - the product must not be exposed to open flame or other ignition sources and must be stored away from flammable material such as paint and solvents; - to ensure maximum performance of the product when installed, on site precautions must be taken to protect it from mud and dirt. <p>3 Foil-Tec Single (Figure 1, Section 9)</p> <ul style="list-style-type: none"> - the product should be cut equal to the height of the wall plus 150 mm; - the product should be rolled out on the timber wall frame vertically and stapled or nailed onto the timber studs at minimum 300 mm centres; - the butt-joints are sealed with YBS Insulation foil-backed tape; - timber battens (recommended dimensions 25 mm by 38 mm) are then placed on top of the product creating a minimum cavity depth of 25 mm and fixed to the frame through the product; - the plasterboard is fixed onto the battens. <p>4 Foil-Tec Double (Figure 2, Section 9)</p> <ul style="list-style-type: none"> - timber battens (recommended dimensions 25 mm by 38 mm) are fixed to the frame at minimum 400 mm centres, creating a minimum cavity depth of 25 mm; - the product should be cut equal to the height of the wall plus 150 mm; - the product should be rolled out on the wall vertically and stapled or nailed onto the battens at minimum 300 mm centres; - the butt-joints are sealed with YBS Insulation foil-backed tape; - timber battens (recommended dimensions 25 mm by 38 mm) are then placed, perpendicular to the first line of battens, on top of the product creating a minimum cavity depth of 25 mm and fixed to the wall battens through the product; - the plasterboard is fixed onto the battens. <p>5 Maintenance and repair</p> <ul style="list-style-type: none"> - once installed, the product does not require any maintenance, provided that it remains installed strictly in accordance with the requirements of this Certificate and of the Certificate holder; - the Certificate holder must continue to provide a technical consulting service. 	
<p>11 Regulations</p>	<p>1 Requirements: The Building Regulations (England and Wales) (as amended)</p> <ul style="list-style-type: none"> - B3(4) Internal fire spread (structure) – combustible materials are permitted by the regulation. Foil-Tec has a Class 1 surface spread of flame rating. - C4 Resistance to weather and ground moisture – Foil-Tec can adequately resist the passage of moisture, provided the wall is constructed in accordance with BS 5268-2¹³, BS 5268-5¹⁴, BS 5628-3¹⁵, BS 8212¹⁶ and Section 10 of this Certificate; - L1 Conservation of fuel and power – masonry and/or timber frame or discontinuous weather resistant cladding external cavity walls constructed using Foil-Tec can be designed and constructed to provide a U-value of no greater than 0.20 W.m⁻²K⁻¹; The product, when used in masonry and/or timber frame or discontinuous weather resistant cladding external cavity walls, can contribute to a building meeting the Target Emission Rate. - Regulation 7 Materials and workmanship – Foil-Tec is manufactured from suitably safe and durable materials for their application and can be installed to give a satisfactory performance. 	
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<p>11 Regulations (continued)</p>	<p>2 Requirements: The Building (Scotland) Regulations (as amended)</p> <p>2.1 Regulations 8 (1) Durability of materials and workmanship</p> <ul style="list-style-type: none"> - Foil-Tec Single and Foil-Tec Double Wall Insulation are manufactured from acceptable materials and are considered to be adequately resistant to deterioration and wear under normal service conditions, provided they are installed in accordance with the requirements of this Certificate. <p>2.2 Regulation 9 Building Standards Construction</p> <p>Section 2 Fire</p> <ul style="list-style-type: none"> - 2.4 cavity barriers - combustible materials are permitted in the cavity but require any opening to be sealed. - 2.5 Heat-producing, solid fuel burning or oil- or gas-fired installations - a wall, incorporating Foil-Tec single or double can be designed and constructed to comply with these Standards, provided that they are isolated from the flue of a gas-fired, or solid fuel, or oil-fired heat-producing appliance by a separation. The insulation must be adequately separated from a fire place opening, recess, hearth or flue pipe, or from any heat-producing appliance. <p>Section 3 Environment</p> <ul style="list-style-type: none"> - 3.10 Precipitation - Foil-Tec can adequately resist the passage of moisture provided the wall is constructed in accordance with BS 5268-2¹³, BS 5268-5¹⁴, BS 5628-3¹⁵, BS 8212¹⁶ and Section 10 of this Certificate. - 3.15 Condensation - a wall formed using Foil-Tec in accordance with the requirements of Section 10 of this Certificate and of BS 5250², can be designed and constructed to comply with these Standards. <p>Section 6 Energy</p> <ul style="list-style-type: none"> - 6.1(b) Where a proposed wall U value is not better than (or in Scotland is greater than) the relevant 'notional' value, additional energy saving measures will be required in the building envelope and/or services to achieve the required overall carbon dioxide emission rate reduction of about 20% in dwellings (18% to 25% in Scotland) and 23% to 28% in buildings other than dwellings. - 6.2.1. Conservation of fuel and power: the building fabric - walls can be designed and constructed with Foil-Tec to provide a U-value of less than 0.25 W.m⁻²K⁻¹. <p>3 Requirements: The Building Regulations (Northern Ireland) (as amended)</p> <ul style="list-style-type: none"> - B2 Fitness of materials and workmanship - Foil-Tec is manufactured from materials which are considered to be suitably safe and acceptable for use as insulation for timber frame and masonry walls. - C5 Resistance to ground moisture and weather - where Foil-Tec is installed within timber frame and masonry walls, these walls can be designed and constructed so as to prevent the passage of moisture or moisture or water vapour through it. Advice is given in Section 10 of this Certificate. - C7 Condensation - a wall incorporating Foil-Tec can be designed and constructed to prevent any harmful effect from moisture in the form of interstitial condensation. - F2 Conservation of fuel and power - timber frame and masonry walls, incorporating Foil-Tec, can be designed and constructed to provide a U-value no greater than 0.20 W.m⁻².K⁻¹. - F3(2) The product can contribute to a building satisfying its Target Emission Rate. 	
<p>12 NHBC Standards</p>	<p>NHBC accepts the use Foil-Tec Single and Foil-Tec Double Wall Insulation, provided it is specified, installed and used in accordance with this Certificate, in relation to the NHBC Standards, Chapter 6.1 External masonry walls and Chapter 6.2 External timber framed walls¹⁰.</p>	
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