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BBA APPROVAL INSPECTION TESTING CERTIFICATION
TECHNICAL APPROVALS FOR CONSTRUCTION

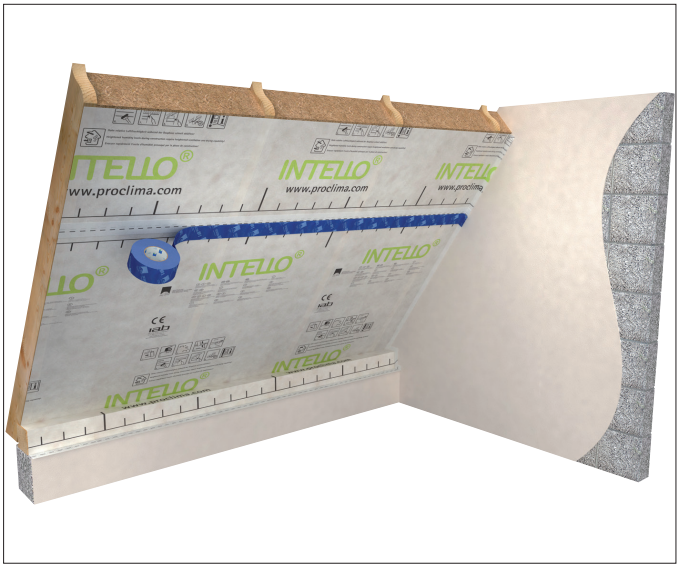
Agrément Certificate
14/5155
Product Sheet 1

PRO CLIMA INTELLIGENT VAPOUR CONTROL AND AIRTIGHT SYSTEMS

INTELLO AND INTELLO PLUS

This Agrément Certificate Product Sheet(1) relates to Intello and Intello Plus, humidity-variable vapour control layers manufactured from a polyethylene copolymer with a polypropylene fleece and reinforcing net, for use as a vapour control layer in roofs, walls and suspended floors and as part of the Pro Clima Intelligent Airtight System, in domestic and non-domestic buildings up to and including humidity class 4 and air barriers.

(1) Hereinafter referred to as 'Certificate'.



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

Risk of condensation — the products will reduce the risk of interstitial condensation (see section 6).

Air permeability — the products are air barriers and can reduce heat loss by air infiltration (see section 7).

Strength — the products have adequate strength to resist damage during installation (see section 8).

Durability — the products will have a service life comparable to other similar elements of construction (see section 11).

The BBA has awarded this Certificate to the company named above for the products described herein. These products have been assessed by the BBA as being fit for their intended use provided they are installed, used and maintained as set out in this Certificate.

On behalf of the British Board of Agrément

Date of First issue: 22 January 2015

Simon Wroe
Head of Approvals — Materials

Claire Curtis-Thomas
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, Intello and Intello Plus, if installed, used and maintained in accordance with this Certificate, can satisfy or contribute to satisfying the relevant requirements of the following Building Regulations (the presence of a UK map indicates that the subject is related to the Building Regulations in the region or regions of the UK depicted):

The Building Regulations 2010 (England and Wales) (as amended)

Requirement:	C2(c)	Resistance to moisture
Comment:		The products can contribute to limiting the risk of interstitial condensation. See section 6.4 of this Certificate.
Requirement:	L1(a)(i)	Conservation of fuel and power
Comment:		The products can contribute to meeting this Requirement. See section 7 this Certificate.
Regulation:	7	Materials and workmanship
Comment:		The products are acceptable. See section 11 and the *Installation* part of this Certificate.
Regulation:	26	CO_2 emission rates for new buildings
Comment:		The products can contribute to meeting this Regulation. See section 7 this Certificate.

The Building (Scotland) Regulations 2004 (as amended)

Regulation:	8(1)	Durability, workmanship and fitness of materials
Comment:		The products satisfy the requirements of this Regulation. See section 11 and the *Installation* part of this Certificate.
Regulation:	9	Building standards applicable to construction
Standard:	3.15	Condensation
Comment:		The products can contribute to limiting the risk of interstitial condensation, with reference to clauses 3.15.1[1][2] and 3.15.5[1][2] of this Standard. See section 6.4 of this Certificate.
Standard:	6.1(b)	Carbon dioxide emissions
Standard:	6.2	Building insulation envelope
Comment:		See section 7 this Certificate, with reference to clauses 6.1.1[1], 6.1.2[2], 6.1.6[1], 6.2.4[1], 6.2.6[2], 6.2.10[1], 6.2.12[2].
Standard:	7.1(a)(b)	Statement of sustainability
Comment:		The products can contribute to meeting the relevant requirements of Regulation 9, Standards 1 to 6, and therefore will contribute to a construction meeting a bronze level of sustainability as defined in this Standard. In addition, the product can contribute to a construction meeting a higher level of sustainability as defined in this Standard, with reference to clauses 7.1.4[1][2] [Aspects 1[1][2] and 2[1]], 7.1.6[1][2] [Aspects 1[1][2] and 2[1]] and 7.1.7[1][2] [Aspect 1[1][2]]. See section 7 of this Certificate.
Regulation:	12	Building standards applicable to conversions
Comment:		All comments given for this system under Regulation 9, Standards 1 to 6, also apply to this Regulation, with reference to clause 0.12.1[1][2] and Schedule 6[1][2].

(1) Technical Handbook (Domestic).
(2) Technical Handbook (Non-Domestic).

The Building Regulations (Northern Ireland) 2012

Regulation:	23(a)(i)(iii)b	Fitness of materials and workmanship
Comment:		The products are acceptable. See section 11 and the *Installation* part of this Certificate
Regulation:	29	Condensation
Comment:		The products can contribute to limiting the risk of interstitial condensation. See section 6.4 of this Certificate.
Regulation:	39(a)(i)	Conservation measures
Regulation:	40(2)	Target carbon dioxide emission rate
Comment:		The products can contribute to meeting these Regulations. See section 7 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 sections:	1 *Description* (1.2), 3 *Delivery and site handling* (3.1) and 9 *Properties in relation to fire* (9.2) of this Certificate.

Additional Information

NHBC Standards 2014

NHBC accepts the use of Intello and Intello Plus when used in conjunction with vapour open insulations, such as mineral wool as a variable resistance vapour control layers, provided they are installed, used and maintained in accordance with this Certificate, in relation to *NHBC Standards*, Chapters 6.2 *External timber framed walls*, 7.1 *Flat roofs and balconies* and 7.2 *Pitched roofs*.

In NHBC projects where Intello and Intello Plus are used in conjunction with a vapour-closed insulation, a diffusion open membrane must be used on the cold side of the insulation.

CE marking

The Certificate holder has taken the responsibility of CE marking the products in accordance with harmonised European Standard EN 13984 : 2013. An asterisk (*) appearing in this Certificate indicates that data shown are given in the manufacturer's Declaration of Performance.

Technical Specification

1 Description

1.1 Intello and Intello Plus are vapour control layers with a resistance to vapour diffusion that depends on the moisture content of the air adjacent to the membrane. In summer conditions, and in winter conditions where solar radiation is incident on the element, the vapour resistance reduces and facilitates the inward diffusion/escape of accumulated moisture.

1.2 Intello consists of a polyethylene copolymer coating on a polypropylene fleece and Intello Plus includes an additional reinforcing net. The nominal characteristics of the membranes are given in Table 1.

Table 1 Nominal characteristics

Characteristic (unit)	Membrane type	
	Intello	Intello Plus
Mass per unit area* ($g \cdot m^{-2}$)	85	110
Roll length (m)	20[1] or 50	20[1] or 50
Roll width (m)	1.5 or 3.0	1.5 or 3.0
Thickness (mm)	0.2	0.2
Tensile strength* [N (50 mm)$^{-1}$]		
longitudinal	≥ 120	≥350
transverse	≥ 90	290
Elongation* (%)		
longitudinal	≥ 50	≥ 15
transverse	≥ 45	≥ 15
Nail tear* (N)		
longitudinal	≥ 60	≥ 240
transverse	≥ 60	≥ 200
Water vapour diffusion — equivalent air layer thickness* (S_d) (m)	7.5	7.5
Water vapour diffusion — equivalent air layer thickness range (S_d) (m)	0.25 to 10	0.25 to 10
Water vapour resistance ($MN \cdot s \cdot g^{-1}$)	37.5	37.5
Water vapour resistance range ($MN \cdot s \cdot g^{-1}$)	1.25 to 50	1.25 to 50
Colour	white	white

(1) Available only in 1.5 m width.

1.3 Other items which may be used with the products as part of the Pro Clima Intelligent Airtight System, but which are outside the scope of this Certificate, are:

- Orcon Classic and Orcon F Acrylate — adhesives for use in bonding the membranes to other building materials
- Tescon Vana — an adhesive tape for bonding overlaps in the membranes
- Tescon No 1 — the same adhesive tape as Tescon Vana with a single-part release paper, for use as a multi-purpose tape for overlaps, service penetrations and repairing damaged areas
- Tescon Profil — an adhesive tape with a two- or three-part release paper, for use in areas where application is difficult, eg windows, doors, corners
- Contega PV — an adhesive tape with PET netting attached, for use as a plaster bond tape to help form an airtight joint between the vapour control layer and the plaster

- Contega FC — a three-layer PET fleece vapour-resistant plaster gap sealing tape (masonry only). The product is embedded in plaster
- Contega SL — a similar tape to Contega FC but for use on plaster substrates. The tape is bonded using Orcon F
- Uni Tape — a paper adhesive tape with release paper, for bonding overlaps in the vapour control layer
- Uni Tape XL/Uni Tape Patch — for patching or repairing the membranes, eg for sealing injection holes indoors
- Duplex — a double-sided adhesive tape for sealing the membrane to metal surfaces
- Kaflex Mono, Duo, Post and Multi Airtight Grummet — EPDM grommets for cables
- Roflex 20 to Roflex 300 Airtight Grummets — a range of EPDM grommets for pipes
- Roflex 20 Multi Airtight Grummets — an EPDM grommet for multiple cables
- DA-S — a polypropylene vapour check and airtight sealing strip with a polypropylene protection fleece
- Tescon Primer RP — a primer for preparing substrates including wood, wood-fibre boards, blocks and concrete
- Stoppa — sealing grommets for service tubes
- Instaa-box — an installation box for sealing services, such as sockets, when a service void is not available behind dry lining.

2 Manufacture

2.1 Intello is manufactured by coating the fleece with the copolymer. The reinforcement net in Intello Plus is laminated to the membrane using the molten copolymer coating.

2.2 As part of the assessment and ongoing surveillance of product quality, the BBA has:

- agreed with the manufacturer the quality control procedures and product testing to be undertaken
- assessed and agreed the quality control operated over batches of incoming materials
- monitored the production process and verified that it is in accordance with the documented process
- evaluated the process for management of nonconformities
- checked that equipment has been properly tested and calibrated
- undertaken to carry out the above measures on a regular basis through a surveillance process, to verify that the specifications and quality control operated by the manufacturer are being maintained.

2.3 The products are marketed in the United Kingdom by Ecological Building Systems Limited, Tel: 01228 711511, Fax: 01228 712280, e-mail : info@ecologicalbuildingsystems.com, website: www.ecologicalbuildingsystems.com

3 Delivery and site handling

3.1 Rolls are delivered to site packaged on a pallet, 42 rolls per pallet for the 20 m length and 20 rolls per pallet for the 50 m length. Each pallet carries a label bearing the product name, product type, dimensions, production order number and production date. The product is printed with the product name, CE marking and the BBA logo incorporating the number of this Certificate.

3.2 Rolls should be stored flat, on a smooth, clean dry surface under cover and protected from direct sunlight.

Assessment and Technical Investigations

The following is a summary of the assessment and technical investigations carried out on Intello and Intello Plus.

Design Considerations

4 General

4.1 Intello and Intello Plus are satisfactory for use as vapour control layers/air barriers in new-build and refurbishments in domestic and non-domestic buildings up to and including humidity class 4, on the warm side of the insulation as part of the Pro Clima Intelligent Airtight System and as an alternative to traditional materials, in the following roof, wall and floor specifications:

- at the rafter line in slated or tiled pitched timber warm roof constructions in conjunction with an HR or LR underlay
- at ceiling level in warm pitched roof constructions
- at ceiling level in slated or tiled pitched cold roof constructions
- in walls in timber, masonry and steel-frame constructions
- suspended floors
- conventional flat roofs.

4.2 Further information is given in BRE Report (BR 262 : 2002) *Thermal insulation : avoiding risks*.

4.3 Where constructions need to comply with *NHBC Standards*, specifiers should observe the requirements given in Chapters 6.2 *External timber framed walls*, 7.1 *Flat roofs and balconies* and 7.2 *Pitched roofs*.

4.4 It is essential that proper care and attention is given to maintaining the products' integrity and continuity.

4.5 New elements should incorporate the products on the warm side of the insulation, and the overall construction must be designed and constructed in accordance with the relevant good practice, Regulations and Standards.

4.6 Existing elements must be in a good state of repair without evidence of rain penetration, damp or frost damage.

4.7 NHBC will only accept the use of the products as variable resistance vapour control layers when used in conjunction with vapour open insulations, such as mineral wool. When used in conjunction with a vapour closed insulation, a diffusion open membrane must be used on the cold side of the insulation.

5 Practicability of installation

The products are designed to be installed by competent installers who have experience of this type of product.

6 Risk of condensation

6.1 The products are variable vapour control layers that alter their vapour resistance between an S_d of 0.25 m and 10 m according to the direction of heat flow and the relative humidity between both sides of the membrane. In summer, the membranes' vapour resistance decreases, allowing moisture to pass through the membrane back into the room. In winter, the membranes' vapour resistance increases to minimise vapour transfer into the construction.

6.2 The risk of condensation occurring will depend upon the properties and vapour resistance of other materials used in the construction, the internal and external conditions, and the effectiveness of the products' installation.

6.3 Consideration must be given in the overall installation to minimise penetrations by services. Joints at ceilings/walls must be sealed to offer significant resistance to water vapour transmission. Sealing must be carried out in accordance with the Certificate holder's instructions.

6.4 When the products are installed in the warm side of the construction with a diffusion-tight layer on the outer face (eg waterproofing membranes, green roofs, HR underlay as defined in BS 5250 : 2011) a dynamic condensation assessment in accordance with BS EN 15026 : 2007 should be carried out for each particular situation, using an appropriate dynamic modelling package and considering parameters of:

- vapour diffusion resistance values of Intello in section 6.1 of this Certificate
- hygrothermal properties of all other materials in the construction, in particular vapour resistances in the cold side
- type of insulation
- element location, orientation and pitch
- rainfall and water absorption coefficient of the outermost external layer
- shading and solar absorptivity
- internal humidity conditions
- degree of airtightness of the construction.

6.5 Where incidence of solar radiation is low, such as in the Highlands of Scotland or north of Inverness, the potential for back drying is reduced and the advice of the Certificate holder should be sought.

7 Air permeability

The products are air barriers and when lapped, fixed and taped correctly can contribute to elements and junctions minimising heat loss by unplanned air infiltration. Guidance in this respect can be found in:

England and Wales — Accredited Construction Details (version 1.0)
Scotland — Accredited Construction Details (Scotland)
Northern Ireland — Accredited Construction Details (version 1.0).

8 Strength

The products have adequate strength to resist damage during installation and subsequent works.

9 Properties in relation to fire

9.1 The products will melt and shrink away from heat, but will burn in the presence of a naked flame. The products are Class E* material in accordance with EN 13501-1 : 2007.

9.2 When the products are used unsupported, there is a risk that fire can spread if they are accidentally ignited during building and maintenance works, eg by a roofer's or plumber's torch. As with all types of membrane, care should be taken during building and maintenance to avoid ignition.

9.3 In walls, cavity barriers must be used to satisfy the requirements of the national Building Regulations.

10 Maintenance

As the products are confined within the roof/wall/floor structure and have suitable durability (see section 11), maintenance is not required.

11 Durability

The products are rot-proof, do not tear easily and will have a life equal to that of the element in which they are installed.

Installation

12 General

12.1 Installation of Intello and Intello Plus must be in accordance with the Certificate holder's instructions and good building practice.

12.2 Where wood preservatives and damp-proofing treatments containing solvents have been applied, sufficient time must be allowed for solvents to disperse before the products are installed.

12.3 Surfaces to which the membranes are being adhered must be sound, dry, frost-free, smooth and free from dust, silicone and grease.

12.4 The products are installed with the printed side facing the installer on the warm side of the insulation.

13 Procedure

13.1 The products are rolled out either horizontally or vertically on the warm side of the insulation, as far as possible without creasing, and stapled to the timber studs/rafters/joists. On rafter line and wall applications, installing horizontally normally leads to less waste.

13.2 Corrosion-resistant staples should be a minimum of 10 mm wide and 8 mm long, and located between 100 mm and 150 mm apart when used in conjunction with insulation boards, and from 50 mm and 100 mm when blown insulation is used.

13.3 Adjacent membranes are overlapped by 100 mm. Joints in the membranes, sealing to other materials and detailing are carried out as described in sections 13.8 to 13.11 of this Certificate.

13.4 Where required, cross battens are installed at 500 mm spacings to support the weight of the insulation. Internal linings are applied and fixed to the cross battens, as in normal practice.

Suspended floors

13.5 The products are rolled out loose over the floor insulation with adjacent membranes overlapped by 100 mm.

13.6 Joints in the membranes, sealing to other materials and detailing are carried out as described in sections 13.8 to 13.11 of this Certificate.

13.7 The screed or floorboards are applied over the membranes as in normal practice.

Jointing, sealing and detailing

13.8 Overlaps are sealed without strain or load using Tescon No 1, Tescon Vana or Uni Tape. Creases in the overlap area must be cut off and sealed. The tape is placed centrally over the edge of the overlap and pressed down firmly.

13.9 Sealing to other construction material is carried out in accordance with the Certificate holder's installation instructions, using the appropriate tape or adhesive. In cases of doubt, the advice of the Certificate holder or his UK representative should be sought.

13.10 Penetrations through the membranes must be sealed. A range of EPDM grommets is available for sealing around pipes and cables. When a service void is not available behind dry lining, services such as sockets are sealed using Instaa-box.

13.11 The sealing of corners is simplified by the use of Tescon Profil. The tape has either a two- or three-part release paper allowing a single part of the adhesive to be exposed at a time while installing.

13.12 It is recommended by the Certificate holder that installations of the Pro Clima Intelligent Airtight System are tested for airtightness on completion of work using the Pro Clima Wincon testing device.

14 Repair

Damage to the products must be repaired with Uni Tape XL or Uni Tape Patch. Extensively damaged areas are made good by overlaying a new sheet and sealing as described in section 13.8.

Technical Investigations

15 Tests

15.1 An assessment was made of data to EN 13984 : 2004 in relation to:

- thickness
- mass per unit area
- tensile strength and elongation

- nail tear
- water vapour transmission properties
- water vapour transmission properties after ageing
- reaction to fire
- air permeability.

15.2 Tests were carried out to determine:

- dimensional stability
- air permeability of joints
- water vapour transmission properties at various temperature and humidity conditions

to assess performance in service.

16 Investigations

16.1 Calculations on the risks of interstitial condensation occurring in various constructions, temperatures and humidity conditions were carried out.

16.2 The manufacturing process was evaluated, including the methods adopted for quality control, and details were obtained of the quality and composition of materials used.

Bibliography

BS 5250 : 2011 *Code of practice for control of condensation in buildings*

BS EN 15026 : 2007 *Hygrothermal performance of building components and building elements — Assessment of moisture transfer by numerical simulation*

EN 13501-1 : 2007 *Fire classification of construction products and building elements — Classification using test data from reaction to fire tests*

EN 13984 : 2004 *Flexible sheets for waterproofing — Plastic and rubber vapour control layers — Definitions and characteristics*

17 Conditions

17.1 This Certificate:

- relates only to the product/system that is named and described on the front page
- is issued only to the company, firm, organisation or person named on the front page — no other company, firm, organisation or person may hold or claim that this Certificate has been issued to them
- 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.

17.2 Publications, documents, specifications, legislation, regulations, standards and the like referenced in this Certificate are those that were current and/or deemed relevant by the BBA at the date of issue or reissue of this Certificate.

17.3 This Certificate will remain valid for an unlimited period provided that the product/system and its manufacture and/or fabrication, including all related and relevant parts and 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.

17.4 The BBA has used due skill, care and diligence in preparing this Certificate, but no warranty is provided.

17.5 In issuing this Certificate, the BBA is not responsible and is excluded from any liability to any company, firm, organisation or person, for any matters arising directly or indirectly from:

- 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
- actual installations of the product/system, including their nature, design, methods, performance, workmanship and maintenance
- any works and constructions in which the product/system is installed, including their nature, design, methods, performance, workmanship and maintenance
- any loss or damage, including personal injury, howsoever caused by the product/system, including its manufacture, supply, installation, use, maintenance and removal
- any claims by the manufacturer relating to CE marking.

17.6 Any information relating to the manufacture, supply, installation, use, maintenance and removal 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, maintained and removed. It does not purport in any way to restate the requirements of the Health and Safety at Work etc. Act 1974, or of any other statutory, common law or other duty which may exist at the date of issue or reissue 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.

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