NSAI Agrément

IRISH AGRÉMENT BOARD CERTIFICATE NO. 07/0297

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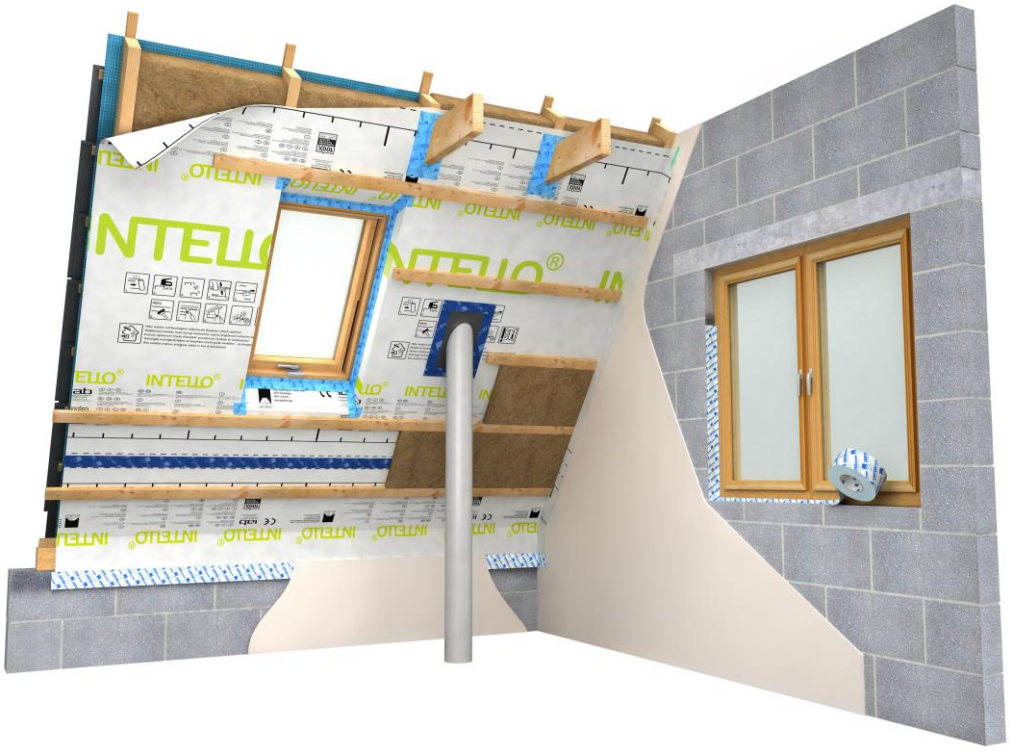
pro clima Intelligent Airtight System

NSAI Agrément (Irish Agrément Board) is designated by Government to issue European Technical Approvals.

NSAI Agrément Certificates establish proof that the certified products are **'proper materials'** suitable for their intended use under Irish site conditions, and in accordance with the **Building Regulations 1997 to 2019**.



PRODUCT DESCRIPTION

This Certificate relates to the pro clima Intelligent Airtight System which consists of a range of intelligent vapour checks (INTELLO, INTELLO PLUS and DB+), tapes and adhesives. This Certificate certifies compliance with the requirements of the Building Regulations 1997 to 2019.

USE:

Airtightness is the control of air leakage, i.e. the elimination of unwanted draughts through the fabric of the building envelope through the correct and proper installation of a vapour check or vapour barrier. Consequently condensation, mould, rot, damp and structural damage are also eliminated, ensuring a more viable structure, an insulation layer that can perform properly as it is now protected against penetrating moisture, reducing the amount of energy-in-use in the building and CO_2 emissions.

The airtightness layer prevents uncontrolled air infiltration, i.e. air convection, while air exchange from inside to outside by ventilation still occurs. The quality of airtightness is determined by the freedom from leakages in the building envelope, i.e. the more leakages there are in the inner building envelope such as the vapour check, the poorer the airtightness. Interior air flowing to the outside through leaks in the vapour check transports heat and consequently leads to a higher heating energy demand. As it flows through the thermal insulation, the warm air cools and condenses on the exterior building elements. This precipitating moisture in the

structure, referred to as condensation, leads to mould formation which may remain undetected for a considerable period of time and can lead to structural damage.

Mould occurs not only when the actual temperature drops below the dew point, i.e. when condensation precipitates, but also if the relative humidity lies above 80% for extended periods of time within building elements. Reduction in surface temperatures of building elements can be caused by thermal bridges or by defective airtightness. The colder it is outside, the more the building elements will cool. A damp room climate leads to a higher dew point temperature and mould limit temperature and therefore acceleration in mould growth.

The dry air that is often found in rooms in wintertime is due to cold outside air coming into the house through gaps in the structure. As this cool air heats, its relative humidity drops, resulting in uncomfortable dry air. In summertime, gaps in the airproofing layer allow high levels of air exchange between the building and the external environment due to the high temperature difference and the resulting pressure difference. This means that the insulation is no longer able to contribute effectively to protecting the occupants of the building from the summer heat.

Air permeability can be measured by means of pressure testing of a building prior to completion, in accordance with I.S. EN ISO 9972[1], where performance is measured in terms of cubic metres per square metre of external surface area per hour ($m^3/(hr.m^2)$) at 50 Pascals pressure difference.

MANUFACTURE AND MARKETING:
The product is manufactured on behalf of:
Moll bauökologische Produkte GmbH,
"pro clima",
Rheintalstr. 35-43,
68723 Schwetzingen,
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Part One / Certification 1

1.1 ASSESSMENT
In the opinion of NSAI Agrément, the pro clima Intelligent Airtight System if used in accordance with this Certificate can meet the requirements of the Building Regulations 1997 to 2019, as indicated in Section 1.2 of this NSAI Agrément Certificate.

1.2 BUILDING REGULATIONS 1997 to 2019

REQUIREMENT:

Part D - Materials and Workmanship
D3 – The pro clima Intelligent Airtight System, as certified in this NSAI Agrément Certificate, is comprised of 'proper materials' fit for their intended use (see Part 4 of this Certificate).

D1 – The pro clima Intelligent Airtight System, as certified in this Certificate, meets the requirements of the building regulations for workmanship.

Part B – Fire Safety
B2 – Internal Fire Spread (Linings)
The pro clima Intelligent Airtight System installed in accordance with this Certificate may be used on the internal surfaces of buildings to meet this requirement.

B3 – Internal Fire Spread (Structure)
The pro clima Intelligent Airtight System installed in accordance with this Certificate will not adversely affect the control of fire and smoke within concealed spaces in the structure or fabric of a properly designed building.

Part C – Site Preparation and Resistance to Moisture
C3 – Dangerous Substances
As is the case for non-airtight buildings, the ground floor of buildings incorporating the pro clima Intelligent Airtight System must include a radon sump and be provided with a facility for extracting radon. In areas where protection from dangerous substances is required, an approved gas resistant membrane and gas handling system must be provided under the ground floor.

C4 – Resistance to Weather and Ground Moisture

As the three membranes in the pro clima Intelligent Airtight System are for internal use only, the product will not be exposed to external weather conditions. The membranes will not be damaged by moisture from the ground or carry moisture from the ground to any part of the building which would be damaged by it.

Part F – Ventilation

F1 – Means of Ventilation

Air leakage can provide background ventilation; however, this is uncontrolled ventilation and can cause discomfort to occupants as well as potential structural damage. Airtightness should form part of a balanced package of insulation and ventilation measures. The pro clima Intelligent Airtight System in conjunction with trickle vents, passive ventilation and mechanical ventilation systems, can minimise background air leakage (uncontrollable ventilation) and provide controllable ventilation through use of trickle vents etc.

Part L – Conservation of Fuel and Energy

L1 – Conservation of Fuel and Energy

The pro clima Intelligent Airtight System, when installed and used in accordance with this Certificate, can meet this requirement and contribute to less air leakage in the building and therefore less heat loss. A key parameter for achieving an efficient Building Energy Rating (BER) is that the building envelope is designed and insulated to a high level and the fabric airtightness is to a high standard.

2.1 PRODUCT DESCRIPTION

The pro clima Intelligent Airtight System is comprised of a range of three intelligent vapour checks, and ancillary items including various adhesives and tapes. The glue used for all the tapes and adhesives in the pro clima Intelligent Airtight System is waterproof. The product specification of the three intelligent vapour checks is shown in Table 1.

DB+ is a cellulose vapour check, while INTELLO and INTELLO PLUS are polyethylene copolymer membranes with INTELLO PLUS containing a polypropylene reinforcement layer. All three pro clima intelligent vapour checks have humidity-variable vapour diffusion resistance characteristics. This provides superior protection against unforeseen moisture entry (e.g. through leaks, damp building materials or diffusion through adjoining structural surfaces), for thermal insulation and structural elements, compared to conventional vapour barriers/checks. The diffusion resistance of INTELLO PLUS has been designed so that the membrane can provide a moisture vapour transmission rate (MVTR) of over 125MNs/g in winter conditions. As a result, the vapour check will allow almost no moisture to penetrate a structural system during winter, when humidity pressure on the system is at its highest. Diffusion resistance in summer can be reduced to an MVTR of less than 1.0MNs/g, permitting moisture that may be present in the roof or wall system to evaporate rapidly towards the inside.

2.2 ANCILLARY PRODUCTS

2.2.1 ORCON F

ORCON F contains denatured alcohol (15%) allowing it to penetrate deep into substrates ensuring a very tight bond. The alcohol content means that the adhesive can be safely stored outside at temperatures as low as –20°C. These adhesives are suitable for bonding all pro clima's vapour checks and air-proofing membranes to other building materials regardless of whether they have a smooth or rough surface. All surfaces must be clean and free of dust, grease, and silicone. A continuous adhesive bead of at least 5mm in diameter, depending on the substrate, should be applied to the clean surface. The vapour check should be applied directly to the adhesive immediately after application and while still wet without applying force (see Figure 1).

2.2.2 ORCON MULTIBOND

Solvent-free, permanent, elastic, frost-resistant airtight adhesive that can be applied straight from a roll for bonding of INTELLO, INTELLO PLUS and DB+ on mineral or rough adjacent components such as masonry, plasterwork, concrete, or roughly sawn wood, etc.

2.2.3 ECO COLL

ECO COLL is a natural glue adhesive used in conjunction with DB+ to create a 'natural' airtightness layer. This product is solely for use with DB+ and should not be used with INTELLO or INTELLO PLUS.

2.2.4 CONTEGA PV

CONTEGA PV forms a high-quality bond between vapour check, wood-based panels (e.g. OSB) and masonry. The airtight bond is completed once the light blue PET fleece is plastered into place. The latex-reinforced layer increases the strength of the adjoining plasterwork.

2.2.5 CONTEGA SOLIDO SL/SL-D

CONTEGA SOLIDO SL/SL-D are diffusion resistant tapes which provide a durable, secure, airtight connection from airtightness membranes, windows, doors or planed timber components, such as roof beams, rafters and floor beams, to brickwork or concrete that will be plastered at a later stage in the construction process. CONTEGA SOLIDO SL-D has an additional adhesive zone on the fleece side for an easier application when used to seal windows to adjacent building components. CONTEGA SOLIDO SL/-D may be bonded directly to block walls and plastered at a later stage. TESCON PRIMER RP may be required to stabilise the masonry substrate prior to bonding.

Characteristic		Test method	INTELLO PLUS		INTELLO		DB+	
Thickness* (mm)		EN 1849-2[2]	0.4 ± 0.15 mm		0.25 ± 0.1 mm		0.23 ± 0.1 mm	
Roll Width[1]* (m)		EN 1848-2[3]	1.5 or 3.0		1.5 or 3.0		1.05, 1.35, 1.7, 2.75 (50) 0.75, 0.9, 1.05, 1.35 (100)	
Roll Length[2]* (m)		EN 1848-2[3]	20 or 50 (1.5), 50 (3.0)		20 or 50 (1.5), 50 (3.0)		50 or 100	
Surface weight*		EN 1849-2[2]	110 ± 20 g/m²		85 ± 15 g/m²		190 ± 10 g/m²	
Membrane			Polyethylene copolymer		Polyethylene copolymer		Kraftpaper, Polyethylene (non-halogen)	
Fleece			Polypropylene		Polypropylene		-	
Reinforcement			Polypropylene		-		Fibreglass Mesh	
Fire Rating*		EN 13501-1[4]	E		E		E	
Tensile strength* MD/CD (N/50mm)		EN 12311-2[3][5] EN 13859-1[4][6]	340	220	110	80	550	420
Elongation* MD/CD		EN 13859-1[6]	15%	15%	40%	35%	5%	5%
Nail tear resistance* MD/CD		EN 12310-1[3][7] EN 13859-1[4][6]	200N	200 N	60 N	60 N	70 N	70 N
Artificial ageing by long term*		EN 1296[8] EN 1931[9]	-		-		Passed	
Durability after artificial ageing*		ETA-18/1146:2019[10]	Passed		Passed		-	
Water Vapour Transmission Resistance	Sd*	EN 1931[9]	-		-		2.3 ± 0.25 m	
	Permeance		>13.2 to <0.33 US perms		-		5.4 to 0.82 US perms	
	MVTR	EN ISO 12572[11]	-		-		3.06 to 20.4 MNs/g	
	g-value*	EN 1931[9]	-		-		11.5 ± 1.25 MNs/g	
Sd* [m]		ETA-18/1146:2019[5][10]	INTELLO PLUS & INTELLO					
				23°C 25%RH[6]	23°C 71.5%RH[6]	23°C 90%RH[6]		
			Initial value Aging value	34 ±20% 55 ±20%	1.7 ±20% 2.0 ±20%	0.3 ±40% 0.3 ±40%		

*Refer to Clause 3.7 of this certificate
[1] dimensional tolerance +0.005m
[2] dimensional tolerance +0.5m
[3] unreinforced sheets
[4] reinforced sheets
[5] EN 1296[8]/EN ISO 12572[11]
[6] Conditionings /Arithmetic average of dry point and wet point

Table 1: Product Specification

2.2.6 CONTEGA SOLIDO EXO/EXO-D

CONTEGA SOLIDO EXO/EXO-D are diffusion open tapes which are used for the exterior windproof sealing of windows, doors to brickwork or concrete that will be plastered at a later stage in the construction process. CONTEGA SOLIDO EXO-D has an additional adhesive zone on the fleece side for an easier application when used to seal windows to adjacent building components. CONTEGA SOLIDO EXO/EXO-D may be bonded directly to block walls and TESCON PRIMER RP may be required to stabilise the masonry substrate prior to bonding.

2.2.7 UNI TAPE

UNI TAPE is a universal tape with release paper. It bonds overlaps between sheets of vapour checks. Rolls are 60mm wide and 30m long.

2.2.8 UNI TAPE XL

UNI TAPE XL is a repair tape and is suitable for sealing injection holes indoors.

2.2.9 TESCON PROFECT

TESCON PROFECT is a pre-folded adhesive tape. The tapes adhesive surface is partly exposed to allow a quick application. It is suitable for windows (including roof windows), doors, planed timber and corners, and offers high protection against piercing in corners due to its high elasticity. Rolls are 60mm wide and 30m long.

Figure 1: Bonding INTELLO to timber beam using ORCON F

2.2.10 TESCON VANA & TESCON No.1

TESCON VANA & TESCON No1 are both multipurpose tapes used to seal overlaps, service penetrations and repairing damaged areas. Standard rolls are 60mm wide and 30m long. Whereas TESCON No.1 is extremely flexible, TESCON VANA features a polypropylene backing fleecing which provides greater rigidity.

2.2.11 TESCON NAIDECK

TESCON NAIDECK is a double-sided nail-sealing tape for use on the underside of a lath on inclined roofs to form a durable seal around nail or screw holes. Rolls are 50mm wide and 20m long.

2.2.12 TESCON PRIMER RP

TESCON PRIMER RP is an adhesive primer for wood, fibreboard, masonry, roof, wall and floorboards for preparing the substrate for subsequent bonding with pro clima TESCON VANA or TESCON PROFECT adhesive tape, or for ORCON MULTIBOND or ECO COLL joint adhesive.

2.2.13 DUPLEX

DUPLEX is a double-sided tape suitable for airtight and moisture-proof sealing of membranes to metal sections in dry construction. Rolls are 25mm wide and 20m long.

2.2.14 DA-S

DA-S is a vapour check and airtight sealing strip manufactured from Polyethylene copolymer with a robust Polypropylene Protection Fleeces. DA-S strips are glued to building substrates to maintain airtightness continuity at critical junctions. Rolls are 210mm wide and 100m long.

Figure 2: INTELLO PLUS sealed to window with TESCON PROFIL/PROFECT

2.2.15 KAFLEX & ROFLEX grummets

Airtight grummets for sealing around cables and pipes are made from non-ageing elastic EPDM and are available in a range of sizes from 4.8mm up to 320mm. Grummets are sealed using TESCON VANA tape. The grummets available are:

- Single (KAFLEX mono), double (KAFLEX duo) or multi (KAFLEX multi – up to 16 cables) cable grummets (see Figure 3)
- Single (ROFLEX 20 to ROFLEX 300) or multi (ROFLEX multi - up to 9 pipes) pipe grummets (see Figure 4)

2.2.16 EXTOSEAL ENCORS

EXTOSEAL ENCORS is a water bearing butyl connection tape with high adhesion strength. EXTOSEAL ENCORS is the ideal weather tight tape for creating robust flashings for window sills and door thresholds and any junctions where there is a likelihood of standing water.

2.2.17 EXTOSEAL MAGOV

EXTOSEAL MAGOV is a highly flexible butyl tape for making airtight connections around service penetrations, joist ends and wall to corrugated deck connections.

2.2.18 EXTOSEAL FINOC

EXTOSEAL FINOC is an air and moisture tight tape. It can be used for joining wood-based panels to smooth mineral surfaces such as internal timber frame boarding to concrete slab floor. EXTOSEAL FINOC is the ideal watertight capillary break tape used to eliminate rising damp under sole plates.

2.2.19 INSTAABOX

INSTAABOX is an installation box for creating space for junction boxes etc. in buildings without a service void behind the dry-lining. It is designed for making airtight connections on vapour check and airtightness layers and can be used on all common substrates in constructions.

2.3 MANUFACTURE

The manufacturing process of INTELLO PLUS involves the bonding together of a polyethylene copolymer membrane with a polypropylene fleece together with a polypropylene reinforcement net through an extrusion coating process, involving heat and pressure in a continuous process. The same process is used to manufacture of INTELLO and DB+.

2.3.1 Product Quality Control

Quality control checks are carried out on the raw material, during production and on the final product. Quality control checks include:

- Visual inspection
- Dimensions
- Tensile strength
- Elongation
- Nail tear resistance
- Diffusion resistance

The management systems of the manufacturing plant have been assessed and registered as meeting the requirements of ISO 9001:2000 by DQS GmbH, Germany.

2.4 DELIVERY, STORAGE AND MARKING

Rolls are supplied on pallets, wrapped in PE foil with product information label inside. This label gives manufacturer's name and product description, NSAI Agrément identification mark and NSAI Agrément Certificate number. The products should be stored on a clean level surface, above ground and away from water and contamination, under cover and away from direct sunlight.

2.5 INSTALLATION

This section of this Certificate will deal solely with Intello Plus – installation of Intello and DB+ is very similar and the Certificate holder's instructions should be followed.

2.5.1 General

The pro clima Intelligent Airtight System must be installed in accordance with the manufacturer's instructions and the recommendations given in this Certificate. This section of the Certificate will detail the installation procedure for INTELLO PLUS, as this procedure is very similar to that of INTELLO and DB+.

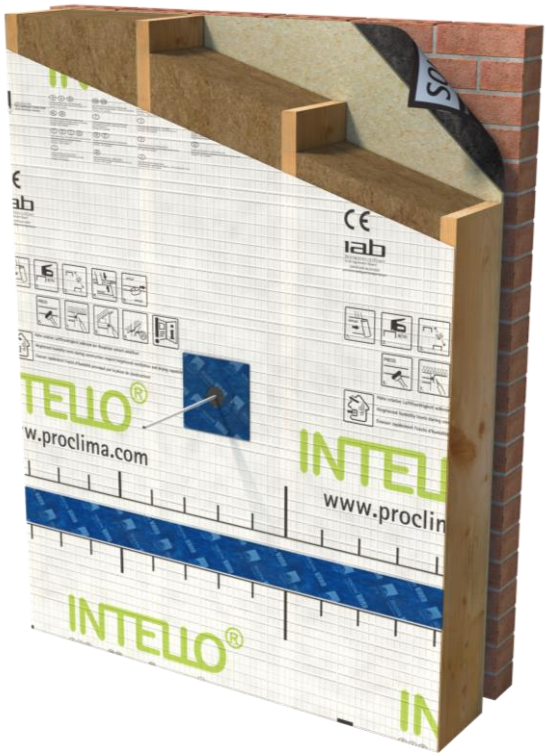


Figure 3: Wall detail with KAFLEX single cable grommet

The diffusion resistance of INTELLO PLUS is designed to ensure that an effective diffusion resistance is maintained even in high humidity conditions, for example in newly built houses or in rooms which are prone to high short-term humidity levels, such as kitchens and bathrooms.

Newly built houses have high indoor humidity levels due to moisture released during construction and due to use. The diffusion resistance of the vapour check should be such that it is at least 10MNs/g even at an average humidity of 60% (room humidity 70%, humidity within the construction 50%) in order to adequately protect the structure from airborne humidity. INTELLO PLUS has a diffusion resistance of approximately 20MNs/g at a relative humidity of 60%.

Figure 4: Roof detail with pipe grummet

During construction, when plaster or screed is being laid, the humidity in a building can be very high. At an average relative humidity of 70% (room humidity 90%, humidity within the construction 50%) the Hydrosafe-value (diffusion resistance) of a vapour check should be above 7.5MNs/g in order to protect the structure from excessive moisture from the high humidity on the building site and thus preventing mould growth. INTELLO PLUS comfortably exceeds this with a Hydrosafe-value of 10MNs/g at a relative humidity of 70%. The moisture carried by building should always be allowed to escape from the building as rapidly as possibly by ventilating well (through open windows). Dryers are recommended in the winter to accelerate the drying process in order to prevent the high relative humidity persisting long-term.

2.5.2 Installation Procedure

INTELLO PLUS should be laid with the membrane-coated side (i.e. with writing on) facing indoors. It can be laid flat either horizontally or vertically on the sub-structure, such as the rafters, without sagging. If laid horizontal then the maximum space permitted between the rafters is 1m. After laying it is necessary to support the weight of the insulation with lathing on the inside. The laths should be no more than 500mm apart.

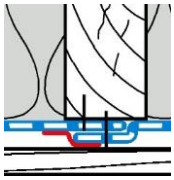
Staples at least 10mm wide and 8mm long, between 100 and 150mm apart, should be used to attach the membrane when using insulating boards. The sheets of the membrane should overlap by approximately 100mm.

Insulation should never be installed more than 2 days, room by room, before INTELLO PLUS is installed, especially in winter months, in order to prevent the insulation becoming moist from the indoor air.

INTELLO PLUS and DB+ can also be used as membranes for all types of blown-in insulation. The reinforcing layer of these membranes prevents stretching during injection of the insulating material. If laid along the sub-structure it has the advantage that the overlap is supported on a firm foundation and is therefore protected. The staples used to attach the membrane should be between 50 and 100mm apart. If laid at right angles to the sub-structure a supporting lath should be attached directly on top of the taped overlap, after it has been installed, in order to prevent the tape from being subjected to tension. Alternatively, the tape can be reinforced along the overlap by sticking tape at right angles to the overlap every 300mm.

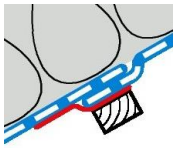
To maximise the performance of pro clima intelligent vapour checks, layers which may prevent vapour diffusion, such as OSB or plywood, should not be applied on the inside of the membrane, particularly if the construction is vapour diffusion tight externally.

Installing Parallel to the Sub-Structure



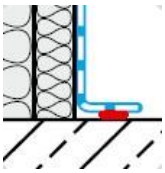
Installing the tape along the sub-structure, e.g. along the rafters, has the advantage that the overlap has a firm foundation. It is therefore possible to exert a lot of pressure on the tape. The overlap isn't subjected to forces by the thermal insulation, allowing an ideal bond to be formed.

Installing at Right Angles to the Sub-Structure



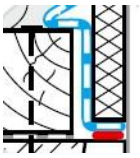
When applying the sheets of membrane at right angles to the sub-structure, e.g. at right angles to the rafters, make sure that the sheets of INTELLO PLUS are stretched tight to allow as much pressure as possible to be exerted when applying the tape. Since the insulation is resting on the overlap and may exert a force on it, ensure that the tape is applied centrally. If using blown-in insulation, installation along the sub-structure is recommended. If laid at right angles, affix laths below and parallel to the tape in order to reduce the load exerted on the tape by the insulation or apply additional tape at right angles to the overlap every 300mm.

Sticking to Concrete Floor Slab



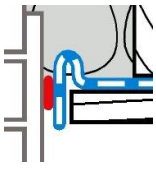
Sweep the concrete surface and remove fine dust if necessary. Stick the INTELLO PLUS membrane to the floor slab using ORCON F/MULTIBOND. Fill any gaps around brackets or screws with airtight joint adhesive.

Sticking to Eave Plate



Install the vapour check over the eave plate and stick it onto the tie beam using ORCON F /MULTIBOND, in order to form a seal between the eave plate and the tie beam.

Sticking to Plastered Gable Wall/Concrete

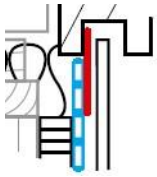


Install the vapour check with sufficient slack to allow for movement in the structure. The use of a pressure lath is recommended if laying the vapour check in frosty weather, when the adhesive will take longer to dry, or if the substrate is unstable.

Sticking to Window Frames or Wood Based Panels

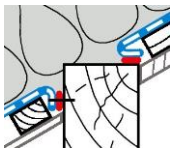
Use TESCON PROFIL/PROFECT to create an uninterrupted airtight seal around window frames.

Sticking to Roof Window Frames or Wood Based Panels



Stick the vapour check into the groove to create an uninterrupted airtight seal around the frame of the roof window using TESCON PROFIL/PROFECT.

Sticking Visible Middle or Ridge Purlins and Vapour Check or Wood Based Panels

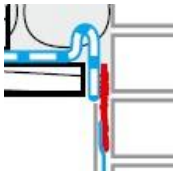


Stick the vapour check to the top or side of the planed middle purlin with ORCON F /MULTIBOND to create an airtight seal. Take care when positioning to ensure that it is properly covered by the inner lining.

Sticking Membrane Sheets and Wood Based Panels to Unrendered Masonry

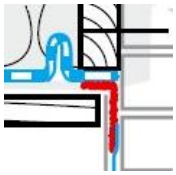
CONTEGA PV or CONTEGA SOLIDO SL plaster bonding tape can be used to form an effective seal between the vapour check and the plaster. The vapour check is joined to the airtight CONTEGA PV/CONTEGA SOLIDO SL fleece with the integrated tape. While CONTEGA SOLIDO SL is plastered on one side, CONTEGA PV must be embedded in the plaster. Embedding the fleece in the central layer of the plaster forms an airtight connection from the membrane to the plaster rendering on the wall.

<u>First Rafter</u>



Sticking the vapour check to the masonry/plaster without a firm foundation. It is important to ensure that there is some slack to compensate for movement of the structure.

<u>Lathing</u>



Sticking the vapour check to the masonry/plaster supported by laths or battens. CONTEGA PV can also be affixed to a supporting lath or batten on the wall.

Sticking to Unrendered Surfaces

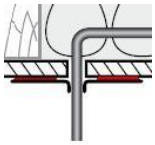
Fix the CONTEGA PV tape in position on the wall with nails or spots of ORCON F. On soft substrates such as expanded concrete, pumice concrete or hollow elements, nail directly onto the bricks, otherwise nail between the bricks. The airtight CONTEGA PV fleece is subsequently embedded in the central layer of the plaster. Avoid voids or air bubbles below the tape, i.e. make sure that the tape is firmly stuck to the

wall, especially at the top edge of the tape. Once the CONTEGA PV fleece has been attached to the wall, stick the vapour check to the tape on the CONTEGA PV leaving some slack to allow for movement.

2.5.3 Penetrations

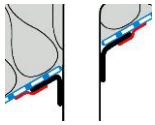
pro clima have produced a larger variety of service grummets. These are called KAFLEX and ROFLEX. Creating an airtight seal around pipes and cables which pass through the INTELLO PLUS airproofing layer is quick and cost-effective using pro clima KAFLEX and ROFLEX grummets. These grummets are made of non-ageing elastic EPDM rubber and are available in a range of sizes from 4.8mm to 320mm. Another advantage of these grummets is that the cable or pipe can easily be moved within the gasket after installation if necessary. Alternatively, it is also possible to seal pipes using TESCON VANA tape.

<u>KAFLEX mono, duo and multi</u>
Single, double or multi grummets (DIY-set for up to 16 cables, diameter 4.8mm to 12mm).

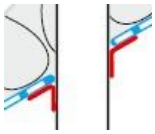


<u>ROFLEX, 20 multi</u>
Single or multi conduit grummets are to be used for conduits or thick cables (DIY-set for up to 9 conduits, diameter 15mm to 30mm).

<u>ROFLEX 30, 50, 100, 150 200, 250 and 300</u>
Pipes can be sealed using ROFLEX pipe grummets, which are available in diameters from 30mm to 320mm.



<u>TESCON No.1/VANA Pipe Seal</u>
Alternatively, pipes can be sealed using TESCON No.1/ VANA elasticated tape. Ensure that no tension is exerted on the bond. A tension-free joint can be achieved by using short pieces of tape.



3.1 GENERAL

The pro clima Intelligent Airtight System is suitable for traditional masonry and timber frame constructions. Suitable timber frame constructions are defined as those designed and built in accordance with the relevant parts of Eurocode 5 – Design of timber structures.

3.2 STRENGTH

INTELLO PLUS, INTELLO and DB+ will resist the loads associated with the installation of the material on to a wall, roof or ceiling.

The membranes should not be left uncovered for longer than is absolutely necessary. Should the membranes be damaged by high winds, careless handling or by vandalism, any damaged areas should be repaired or replaced before the final internal finish is applied.

3.3 VENTILATION

The pro clima Intelligent Airtight System can minimise background air leakage (uncontrollable ventilation) and provide controllable ventilation through use of trickle vents, passive ventilation and mechanical ventilation. In accordance with good building construction practice, all openings for services and trap doors should be draught sealed, and trap doors should not be located in bathrooms, shower rooms or kitchens

3.4 CONSERVATION OF FUEL AND ENERGY

In conventional constructions, energy loss by air infiltration and exfiltration can account for a significant portion of the total heat loss through the building envelope. The pro clima Intelligent Airtight System, when installed as per the manufacturer's instructions and this Certificate, will significantly reduce the potential for interstitial condensation, reduce heat loss due to convection, and significantly reduce the possibility of structural degradation, dry rot and mould growth.

3.5 VAPOUR RESISTANCE

pro clima's range of intelligent vapour checks feature a humidity variable diffusion resistance. This technology ensures their intelligent membranes may become more vapour 'diffusion open' when required. This means that they have the ability to alter their vapour diffusion resistance depending on the average relative humidity surrounding the vapour check (See Figure 5).

3.6 HYDROSAFE

In winter, INTELLO has a very high diffusion resistance and provides optimal protection

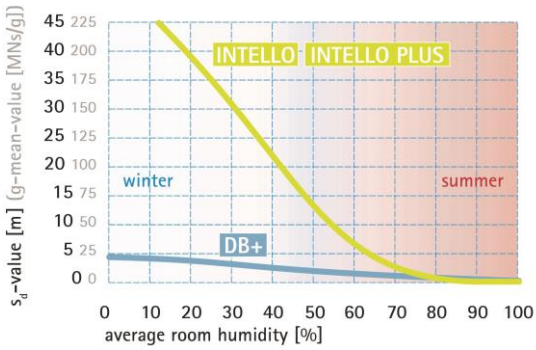


Figure 5: Humidity-variable vapour check

against structural damage and mould for building elements.

Even during the winter season when atmospheric and site humidity levels may exceed 90% for prolonged periods, INTELLO still provides outstanding protection. In this way INTELLO is Hydrosafe. This feature means INTELLO has the ideal intelligent vapour control properties for Irish and British buildings sites.

The Hydrosafe-value specifies how vapour resistant a humidity-variable vapour check is, even when exposed to very damp conditions often experienced on site in Ireland and the UK. INTELLO has a Hydrosafe-value of 2m and can thus protect insulation and building elements reliably – even if there is an elevated humidity level at the building stage.

In winter the membrane remains diffusion tight and will resist the diffusion of vapour from the internal fabric of the building into the insulated layer.

In summer pro clima's membranes, INTELLO, INTELLO PLUS and DB+, may become more vapour open, and as such if vapour pressure were to build up behind the membrane, this moisture which may be trapped in the insulated fabric of the building is allowed to back dry to the inside of the building.

3.7 CE MARKING

The manufacturer has taken the responsibility of CE marking INTELLO, INTELLO PLUS and DB+, in accordance with the Construction Products Regulation No. 305/2011 and ETA-18/1146[10]. An asterisk (*) appearing in this Certificate indicates that data shown is an essential characteristic of the product and declared in the manufacturer's

Declaration of Performance (DoP). Reference should be made to the latest version of the manufactures DoP for current information on any essential characteristics declared by the manufacturer.

Part Four / Technical Investigations 4

4.1 BEHAVIOUR IN FIRE

INTELLO PLUS, INTELLO and DB+ were tested to I.S. EN ISO 11925-2[13] and I.S. EN 13501-1[4]. INTELLO PLUS, INTELLO and DB+ achieved a fire class of E.

Cavity barriers must be provided as indicated in Section 3 of the TGD to Part B of the Building Regulations 1997 to 2019.

4.2 WATER PENETRATION

The pro clima Intelligent Airtight System, when used in accordance with this Certificate, presents no significant risk of water penetration.

4.3 WATER VAPOUR PENETRATION AND CONDENSATION RISK

The risk of condensation is highest in new-build construction during the first heating period, where there is high moisture loading due to wet trades, such as in-situ cast concrete slabs or plaster. The risk of condensation diminishes as the building naturally dries out. Dryers are recommended in the winter to accelerate the drying process in order to prevent the high relative humidity persisting long-term.

The general design guidelines contained in TGD to Part F of the Building Regulations 1997 to 2019 and BS 5250[14] must be met when installing the pro clima Intelligent Airtight System.

The water vapour transmission resistance values of INTELLO PLUS, INTELLO and DB+ are shown in Table 1.

4.4 DURABILITY

The pro clima Intelligent Airtight System will be unaffected by the normal conditions found in a wall, roof or ceiling construction and will have a life comparable with other elements of construction in accordance with BS 7543[15]. However, the membrane like most similar materials must be protected from sunlight, flame and solvents.

4.5 TESTS AND ASSESSMENTS WERE CARRIED OUT TO DETERMINE THE FOLLOWING:

- Dimensional accuracy
- Tensile strength
- Density
- Nail tear resistance
- Elongation at break
- Water vapour permeability
- Dimensional stability
- Efficiency of the construction and installation process

4.6 OTHER INVESTIGATIONS

(i) Existing data on product properties in relation to fire, toxicity, environmental impact and the effect on mechanical strength/stability and durability were assessed.

(ii) The manufacturing process was examined including the methods adopted for quality control, and details were obtained of the quality and composition of the materials used.

(iii) Blower door and WINCON site tests were performed on the pro clima Intelligent Airtight System.

(iv) A condensation risk analysis was performed.

5.1 National Standards Authority of Ireland ("NSAI") following consultation with NSAI Agrément has assessed the performance and method of installation of the product/process and the quality of the materials used in its manufacture and certifies the product/process to be fit for the use for which it is certified provided that it is manufactured, installed, used and maintained in accordance with the descriptions and specifications set out in this Certificate and in accordance with the manufacturer's instructions and usual trade practice. This Certificate shall remain valid for five years from date of issue or revision date so long as:

(a) the specification of the product is unchanged.

(b) the Building Regulations 1997 to 2019 and any other regulation or standard applicable to the product/process, its use or installation remains unchanged.

(c) the product continues to be assessed for the quality of its manufacture and marking by NSAI.

(d) no new information becomes available which in the opinion of the NSAI, would preclude the granting of the Certificate.

(e) the product or process continues to be manufactured, installed, used and maintained in accordance with the description, specifications and safety recommendations set out in this certificate.

(f) the registration and/or surveillance fees due to NSAI Agrément are paid.

5.2 The NSAI Agrément mark and certification number may only be used on or in relation to product/processes in respect of which a valid Certificate exists. If the Certificate becomes invalid the Certificate holder must not use the NSAI Agrément mark and certification number and must remove them from the products already marked.

5.3 In granting Certification, the NSAI makes no representation as to:

(a) the absence or presence of patent rights subsisting in the product/process; or

(b) the legal right of the Certificate holder to market, install or maintain the product/process; or

(c) whether individual products have been manufactured or installed by the Certificate holder in accordance with the descriptions and specifications set out in this Certificate.

5.4 This Certificate does not comprise installation instructions and does not replace the manufacturer's directions or any professional or trade advice relating to use and installation which may be appropriate.

5.5 Any recommendations contained in this Certificate relating to the safe use of the certified product/process are preconditions to the validity of the Certificate. However the NSAI does not certify that the manufacture or installation of the certified product or process in accordance with the descriptions and specifications set out in this Certificate will satisfy the requirements of the Safety, Health and Welfare at Work Act 2005, or of any other current or future common law duty of care owed by the manufacturer or by the Certificate holder.

5.6 The NSAI is not responsible to any person or body for loss or damage including personal injury arising as a direct or indirect result of the use of this product or process.

5.7 Where reference is made in this Certificate to any Act of the Oireachtas, Regulation made thereunder, Statutory Instrument, Code of Practice, National Standards, manufacturer's instructions, or similar publication, it shall be construed as reference to such publication in the form in which it is in force at the date of this Certification.

NSAI Agrément

This Certificate No. **07/0297** is accordingly granted by the NSAI to **Moll bauökologische Produkte GmbH** on behalf of NSAI Agrément.

Date of Issue: **December 2007**

Signed

Seán Balfe
Director of NSAI Agrément

Readers may check that the status of this Certificate has not changed by contacting NSAI Agrément, NSAI, 1 Swift Square, Northwood Business Park, Santry, Dublin 9, Ireland. www.nsai.ie

Revisions: February 2016
Product specification updated to reflect manufactures Declaration of Performance (DoP).

Revisions: 2nd June 2021
5-year review

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[14] BS 5250:2011+A1:2016, *Code of practice for the control of condensation in buildings.*

[15] BS 7543:2015, *Guide to the durability of building elements, products and components*