

P14 AIR/WIND TIGHT VAPOUR PERMEABLE LAYER SYSTEMS

To be read with the Preliminaries/General conditions A10-A55 and A90 & A94.

SYSTEMS**110A AIR TIGHTNESS LAYER & HUMIDITY-VARIABLE 'INTELLIGENT' VAPOUR CHECK:**

Reference Drawing(s): [____],
 Location: [
 External Envelop
 Inside face of insulated pitched roofs
 Underside face of timber joisted flat roof, using timber or proprietary timber sections,
 Inside face of external stud walls, using timber or proprietary timber sections,
 Ceilings
 Floors
 Underside of floors and ceilings,
 Wet-rooms: Kitchens, showers & bathrooms in domestic buildings,
 Background: [Softwood framing at 600 mm. centres],
 Preceding trades: [
 External wind tightness layer: to P14/110A
 Thermal insulation: to P10/____]
 Membrane: [
 Generally: Pro clima DB+: to P14/311A or Pro clima Intello Plus: to P14/310A
 Good indoor air quality & Eco Projects: Pro clima DB+: to P14/311A
 Wet-rooms: kitchens, shower and bathrooms: Pro clima Intello Plus: to P14/310A]
 Adhesive(s): to P14/320A – P14/322A
 Adhesive tape(s): to P14/330A, P14/332A, P14/334A, P14/335A
 Corner sealing: to P14/336A
 Cable penetration grommet(s): to P14/340A – P14/342A
 Pipe penetration grommet(s): to P14/343A - P14/344A & P14/345A
 Insulation injected hole repair: to P14/350A, P14/680 & P14/685
 Damage repair: to P14/331A
 Fasteners: Staples: to P14/410A
 Tools: to P14/390A
 Noggins and Battens:
 Lap joint support noggins: to P14/420A
 Service zone battens: to P14/423A
 Code of Practice: [See P14/500A]
 Agrément Certificate: Irish Agrément Board Certificate: IAB 07/0297 Pro clima intelligent airtight system
 Manufacturer's recommendations: to P14/502
 Approved installers: to P14/508K
 Workmanship: to P14/540 - P14/695
 Completion:
 Testing: to P14/910 - P14/960 and work section A94
 Test level: [] air changes per hour @ 50 pascals
 Test Report: to P14/950
 Certificate: to P14/960
 Following trades:
 Outside the timber framing and thermal insulation:
 Breather membrane: to P10/____]
 Roofing underlay: to work section H60-H66]
 wind-tightness membrane/Insulation protection layer: to P14/110A
 wood fibre thermal insulation: to P10/____]
 breathing sheathing board: to P10/____]
 Sarking boarding: wooden planking: to G20/____]
 Inside the timber framing and thermal insulation:
 Plastering in onto fleece strip by others: See work section M20
 Drylining by others: See work section K10

111A AIR TIGHTNESS & HUMIDITY VARIABLE VAPOUR CHECK LAYER WITH BLOWN IN INSULATION:

Reference Drawing(s): [____],
 Location: [
 Inside face of insulated pitched roofs
 Underside face of timber joisted flat roof, using timber or proprietary timber sections,
 Inside face of external stud walls, using timber or proprietary timber sections,
 Ceilings

<p>Floors Underside of floors and ceilings, Wet-rooms. Kitchens, showers & bathrooms High humidity rooms]</p> <p>Background: [Softwood framing at 600 mm. centres], Preceding trades: External wind tightness layer See P14/110A Plaster undercoat, See M20/_____]</p> <p>Membrane: [Generally: Pro clima DB+: to P14/311A or Pro clima Intello Plus: to P14/310A Eco Projects: Pro clima DB+: to P14/311A Wet-rooms: kitchens, shower and bathrooms: Pro clima Intello Plus: to P14/310A]</p> <p>Adhesive(s): to P14/320A – P14/322A Adhesive tape(s): to P14/330A – P14/335A Corner sealing: to P14/336A Cable penetration grommet(s): to P14/340A – P14/342A Pipe penetration grommet(s): to P14/343A - P14/344A & P14/345A Insulation injected hole repair: to P14/350A, P14/680 & P14/685 Damage repair: to P14/331A Fasteners: to P14/410A Tools: to P14/390A Noggins and Battens: Lap joint support noggins: to P14/420A Pressure & support battens: to P14/421A Service zone battens: to P14/423A</p> <p>Code of Practice: [See P14/500A] Agrément Certificate: Irish Agrément Board Certificate: IAB 07/0297 Pro clima intelligent airtight system Manufacturer's recommendations: Comply.</p>
<p>Approved installers: to P14/508K Workmanship: to P14/540 - P14/690 Completion: Testing: to P14/910 - P14/960 and work section A94 Test level: [] air changes per hour @ 50 pascals Test Report: to P14/950 Certificate: to P14/960 Following trades: Outside the timber framing and thermal insulation: Breather membrane to P10/_____] Roofing underlay: to work section H60-H66] wind-tightness membrane/Insulation protection layer: to P14/110A wood fibre thermal insulation to P10/_____] breathing sheathing board to P10/_____] Sarking boarding: wooden planking to G20/_____]</p> <p>Between timber framing: Blown in insulation: See work section P11, P11/_____]</p> <p>Inside of timber framing and thermal insulation: Plasterboard dry lining: to work section K10 Linings: to work section K11 Fine linings: to work section K13 Plaster finishing coat in onto fleece strip by others See work section M20.</p>

120A WINDTIGHT VAPOUR PERMEABLE PITCHED ROOF UNDERLAY & INSULATION PROTECTION LAYER:

<p>Reference Drawing(s): [_____], Location: Pitched roofs above rafters and sarking boards/insulation boards Do not use in flat roofs Background: Pitched roof softwood rafters at 600 mm. centres Preceding trades: Timber framing to BS 5268:Part 1, see work section G20 Breather membrane to P10/_____] Wood fibre thermal insulation to P10/_____] Breathing sheathing board to P10/_____] Sarking boarding: wooden planking to G20/_____]</p> <p>Membrane: Pro clima Solitex Plus: to P14/317A</p> <p>Overlaps: (Minimum)</p>
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Roof Pitch	Horizontal lap	Horizontal lap	Vertical lap
	Partially Supported	Fully Supported	
<22.5°	225 mm.	100 mm.	100 mm.
>22.5° <35°	150 mm.	100 mm.	100 mm.
>35°	100 mm.	75 mm.	100 mm.

Battens: to P14/424A
 Adhesive(s): Orcon F: to P14/335A,
 Adhesive tape(s):
 to overlaps: Tescon No.1: to P14/332A
 Corner sealing: Tescon Profil: to P14/336A
 Cable penetration grommet(s): to P14/340A – P14/342A
 Pipe penetration grommet(s): to P14/343A - P14/344A & P14/345A
 Damage repair: Tescon No. 1: to P14/332A
 Fasteners: to P14/411A
 Tools:
 Pressing aid: to P14/390A
 Stapler: to P14/394A
 Code of Practice: install in accordance with: ICP 2:2002, BS 5534-1:2003 and BS 8000-6:1990
 Standard: Exceeds Type 1F reinforced bitumen underlay to BS 747:2000
 Approved installers: to P14/508K
 Workmanship: to P14/710 - P14/770
 Following trades:
 Outside the timber framing and thermal insulation:
 [Roofing battens and tiling/slating: to work section H60-H66](#)
 [PV, PVT, ST tiles: to work section \[\]](#)
 Inside of timber framing and thermal insulation:
 [between rafter thermal insulation: to work section P10, P10/\[\]](#)
 [Blown-in thermal insulation: to work section P11, P11/\[\]](#)
 [Internal air tightness layer: to P14/120, 120A, 121, 121A](#)
 [Plasterboard dry lining: to work section K10](#)
 [Linings: to work section K11](#)
 [Fine linings: to work section K13](#)

140	WINDTIGHT VAPOUR PERMEABLE FACADE UNDERLAY & INSULATION PROTECTION LAYER:
	<p> Reference Drawing(s): [], Location: [], Background: [], Preceding trades: [], Membrane: [], Overlaps: (Minimum): Horizontal lap: [] mm. Vertical lap: [] mm. Adhesive tape(s): [], Cable penetration grommet(s): to P14/340A – P14/342A Pipe penetration grommet(s): to P14/343A - P14/344A & P14/345A Damage repair: [], Fasteners: to P14/411A Tools: Pressing aid: to P14/390A Stapler: to P14/394A Code of Practice: [See P14/500A] Standard: Exceeds Type 1F reinforced bitumen underlay to BS 747 Approved installers: to P14/508K Workmanship: to P14/710 - P14/770 Battens: to P14/424A Following trades: Outside: Cladding hanging battens and tiling/slating: to work section H60-H66 Metal cladding to work section H70-H76 Rainscreen cladding to work section H92 PV, PVT, ST tiles: to work section [] Inside of masonry: Inside of timber framing and thermal insulation: between rafter thermal insulation: to work section P10, P10/[] Blown-in thermal insulation: to work section P11, P11/[] Internal air tightness layer: to P14/120, 120A, 121, 121A Plasterboard dry lining: to work section K10 </p>

Linings: to work section K11
Fine linings: to work section K13

PRODUCTS

310A AIR TIGHT & HUMIDITY-VARIABLE VAPOUR CHECK MEMBRANE:

System: Complete intelligent air-tightness system with all necessary adhesive agents.
Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Reference: Pro clima Intello Plus
Accreditation:
CE Mark in accordance with DIN EN 13984
NSAI Agrément Certificate: NSAI 07/0297
Importing Agents: Ecological Building Systems See P14/509K
UK & Ireland Agent: Ecological Building Systems UK Ltd. See P14/509K
Product Page: http://www.greenspec.co.uk/html/product-pages/intello_plus.php
Properties: Airtight and vapour permeable, easy to apply, no splicing or tear propagation due to reinforcing layer.
Breaking Load:
MD: 425 N/50mm.
CD: 280 N/50mm.
Durability: to EN 13984
Application:
Internal face only
Roofs, walls & floors
Difficult to protect against condensation: Flat roofs, flexible metal sheeting
Fire Rating E
Material: 100 % polyolefins,
Membrane: Polyethylene copolymer
Fleece: Polypropylene
Reinforcement layer: Polypropylene
Manufacture: assembled by extrusion coating process involving heat and pressure.
Colour: Translucent, white with black and green text or markings
These materials allow for easy recycling.
Water Vapour Transmission Resistance:
 s_d : <0.25 m to >10.5 m (humidity variable)
Permeance : >13.2 to <0.33 US perms
MVTR: humidity-variable range: <1.28 to >51 MNs/g
Temperature resistance: -40 to +80 degrees C
Diffusion resistance factor: 37.500
Standard dew point assessment/calculation to BS EN 13788
Thickness: 0.2 mm.
Surface weight: 125 g/m².
Roll size: 1500 mm. x 20 or 50 m. (standard sizes, others available subject to order, upon request)
Environmental Credentials:
Country of origin and manufacture: Germany,
Attributes:
Diffusion Open product for use in breathing construction,
Use with the following sealing adhesive tapes and adhesives:
Adhesives: Orcon F to P14/322A
Adhesive tapes:
Unitape to P14/330A
Tescon No. 1 to P14/336A

311A AIR TIGHT & HUMIDITY VARIABLE PERFORMANCE VAPOUR CHECK MEMBRANE:

System: Complete intelligent air-tightness system with all necessary adhesive agents.
Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Reference: Pro clima DB+,
Importing Agents: Ecological Building Systems See P14/509K
UK & Ireland Agent: Ecological Building Systems UK Ltd. See P14/509K
Product Page: http://www.greenspec.co.uk/html/product-pages/db_plus.php
3rd party Certification:
natureplus Certificate No.: 1701_0901_083_1 Valid until Jan 2012
NSAI Agrément Certificate: NSAI 07/0297
CE Mark in accordance with DIN EN 13984

Properties:

Breaking Load:

MD: 550 N/50mm

CD: 310 N/50mm

Durability: to EN 13984

Application:

Internal face only,
ecological and good indoor air quality projects,

Protection for thermal insulation systems against penetrating moisture, damage and mould.

Reduction in cold air penetration and hot air loss, reducing energy in use of the building and CO₂ emissions.

Airtight and vapour permeable,

Reduces risk of interstitial condensation in summer and winter

Permits vapour to escape internally from constructions with vapour impermeable materials externally

Humidity-variable diffusion resistant membrane

Water Vapour Transmission Resistance:

s_d: (Humidity variable) 0.60 m to 4 m (2.3 m)

Standard dew point assessment/calculation to BS EN 13788

Permeance: 5.4 to 0.82 US perms

MVTR: <3.06 to >20.4 MNs/g

Surface weight: 185 g/m²

Vapour diffusion resistance: 10 MNs/g at an average humidity of 60% (room 70%, construction 50%)

Fire class: E, treated with natural salts against fire

Temperature resistance: Long-lasting up to -40° C to + 80° C

Tear resistant due to reinforcement.

Environmental Credentials:

Country of origin and manufacture: Germany,

Diffusion Open product for use in breathing construction,

Natural content: cellulose fibre paper,

Recycled content: cellulose fibre paper 50 % to ISO 14021

Recyclable.

Material: natural and recycled cellulose fibre Kraftpaper, glued with a thin halogen-free and plasticiser-free

PE Polyethylene film, plastic mesh reinforced for additional strength and treated with natural salts against fire

Thickness: 0.23 mm.

Roll size: 1350 mm. x 50 m. (standard size, others available subject to order, upon request)

Accreditation: CE Mark in accordance with DIN EN 13984

The membrane has no front and back side and can be fitted with either the printed or the unprinted side facing the room.

The printed markings are only an aid to orientation.

Use with the following sealing adhesive tapes and adhesives:

Adhesives:

Ecological and good indoor air quality Pro clima Eco Coll to P14/320A

Pro clima Orcon F to P14/322A

Adhesive tapes:

Unitape to P14/330A

Tescon No. 1 to P14/336A

314B AIR TIGHT VAPOUR CHECK VAPOUR CHECK SEALING STRIP:

System: vapour check air-tightness sealing strip with all necessary adhesive agents.

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K

Reference: Pro clima DA-S

Accreditation:

CE Mark in accordance with DIN EN 13984

IAB Certificate 07/0297 Pro clima intelligent airtight system

Importing Agents: Ecological Building Systems See P14/509K

Backgrounds: Plywood, chipboard, OSB, concrete, timber, membranes,

Applications:

Internal only

Airtight sealing strip at critical junctions between building materials:

(e.g. OSB to concrete) in accordance to DIN 4108,

For roof, roof slopes, walls and floors,

Eaves and gables,

Skirting junction with floor

Large gaps at junctions to windows and doors

Materials with short term moisture penetration

Properties:	
	<p>Weatherproof, water repellent and water resistant Air tight sealing layer and generally applied on the inside of insulation Fire Rating E Material: made up of two layers Robust polypropylene protection fleece, Halogen free polypropylene film</p>
<p>Temperature resistance: -40 degrees C to +90 degrees C Life expectancy: 60 years +</p>	
	<p>Roll size: 210 mm. x 100 m. Environmental Credentials: Country of origin and manufacture: Germany, Attributes: Vapour check and airtight,</p>
Site issues:	
	<p>Protects the building from the weather during construction Protecting structure during construction phase More resistant to site conditions than other vapour checks Can be exposed to the elements for 4 months. When applied externally it is not possible to perform quality control testing either using a pressure differential method such as using the Pro clima Wincon see P14/690 or by means of a visual test, such as the Blower Door See P14/910 & 970 It is therefore imperative that all taping and attachment is done with utmost care. Ensure detailed planning, particularly of fitting at the eaves and gables, Ensure careful execution when fitting insulation over rafters. Use with: Adhesives: Pro clima Orcon F: to P14/322A, Adhesive tapes: Tescon No. 1 to P14/332A, Tools: Double dispensing gun: to P14/392A. Delay between taping/sealing and air testing: Generally: 10 minutes minimum.</p>

317A	<p>WIND TIGHT, VAPOUR PERMEABLE, PITCHED ROOF UNDERLAY:</p> <p>System: Complete vapour permeable wind-tightness system with all necessary adhesive agents. Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Reference: Pro clima Solitex Plus Accreditation: CE Mark in accordance with DIN EN 13984 British Board of Agrément Certificate: BBA 07/4432 Pro clima Solitex Vapour permeable roofing underlay Irish Agrément Certificate: IBA 02/0138 Solitex Plus & Solitex UD Vapour Permeable Roofing Underlays for Pitched Roofs NSAI Agrément Certificate: NSAI 07/0297 3rd party product endorsement: NHBC Standards 2007 Importing Agents: Ecological Building Systems See P14/509K Product page: http://www.greenspec.co.uk/html/product-pages/solitex_plus.php Applications: External only unsupported and supported tiled or slated pitched roof underlay warm ventilated and non-ventilated tiled or slated pitched roofs cold ventilated and non-ventilated tiled or slated pitched roofs. Materials: 4 layers Roof tile underlay with net reinforcement. Outer layers: spun bonded polypropylene felt fabric central layer: monolithic nonporous TEEE (thermoplastic ether ester elastomer) membrane reinforcement net: Polypropylene Manufacturing process: bonding together through an extrusion-coating process, using a combination of heat and pressure in a continuous process. Performance: provides a barrier to minimise the effects of wind load generated under wind gusts acting on slates and tiles when installed in accordance with this Certificate. facilitate the control of surface and interstitial condensation in insulated roofs. roof tile underlay offers resistance to tearing during installation and will give higher flexibility at low ambient temperatures. Properties: s_d value: 0.03m or < than 0.15MNs/g See table in BBA Certificate. Water vapour resistance: < 0.15 MNs/g Nail tear resistance: > 350 N/m</p>
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Waterproof: > 2500 mm. of water column, waterproof when subjected to heavy rain.
Wind driven pelting rain: extreme resistance
Temperature range: -40 degrees C to +100 degrees C
Weight: 170 g/m²
Fire Rating E

Standard: Exceeds Type 1F reinforced bitumen underlay to BS 747

Roll size: 1500 mm. x 50 m. (smaller rolls available for window and floor connections)

Colour: Mid Blue & Dark blue text stripe/Dark grey & white grid back

Environmental Credentials:

Country of origin and manufacture: Germany,

Attributes:

Diffusion Open product for use in air impermeable moisture breathing construction,

Site issues:

Can be exposed to the elements for 6 months.

It must only be fitted using staples or tacks in areas protected by an overlap.

To maximise the windtightness of the external membrane it is imperative that all taping and attachment is done with utmost care.

Ensure detailed planning, particularly of fitting at the eaves and gables,

Ensure careful execution when fitting insulation over rafters.

Small damage repairs: Pro clima Tescon No. 1: to P14/332A

Services apertures: Pipe Grommet: Pro clima Roflex to P14/343A or P14/344A

Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

320A GUN APPLIED NATURAL JOINT ADHESIVE:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K

Product Reference: Eco Coll

Importing Agents: Ecological Building Systems See P14/509K

Product Page: http://www.greenspec.co.uk/html/product-pages/eco_coll.php

Adhesive: cartridge for use with standard applicator gun,

Material: Natural latex adhesive, casein, talc, cellulose, water and tree resin,
3rd party accreditation:

NSAI Agrément Certificate: NSAI 07/0297

Life expectancy: 60 years+

Temperature resistance: -10 to +40 degrees C.

Use with: Pro clima DB+ to P14/311A

Do not use with Pro clima Intello Plus to P14/310A

Use:

Natural adhesive for use with natural sheet to make a natural membrane

Internal applications only

For joints between membrane at laps

For joints between membrane and adjacent construction

Backgrounds: smooth masonry, plastered, rough surfaces or rough structural components

Application: 5 mm. thick bead,

Cartridge: 310 ml. sufficient for 5-10 meters,

Adhesive remover: water based solution

Product Reference: Glumex

Rough surfaces: increase bead size as necessary.

Delay between sealing and air testing: 12 to 24 hours depending on weather conditions

322A GUN APPLIED ADHESIVE TO POROUS STRUCTURAL SURFACES:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K

Product Reference: Orcon F

Importing Agents: Ecological Building Systems See P14/509K

Adhesive: tubular film sleeve or cartridge for use with standard applicator gun,

Material:

Non-ageing Acrylate polymers without softeners or halogenated compounds which is insusceptible to embrittlement.

Contains denatured alcohol (15%) allowing it to penetrate deep into stone substrates, ensuring a very tight bond.

Properties:

Exceptionally high inner strength (cohesion) while also being elastic.

Outstanding adhesion to building materials gives the joint the necessary safety and longevity.

High strength on building material substrates

Greater resistance to high humidity on building sites

Long lasting adhesion and elasticity

<p>Frost resistant: to -20° C Temperature range: -20° C to +80° C Low VOC: compliant with Sentinel House Institute German indoor Air Quality standard Life expectancy: 60+ years Airtight bonding to DIN 4108-7, SIA 180 and ONorm B8110-2</p> <p>3rd party accreditation: NSAI Agrément Certificate: NSAI 07/0297</p> <p>Applications: Internal and external Airtight outdoor joints e.g. vapour check for external roof insulation Airtight outdoor joints e.g. sub or top vapour check for refurbishment reroofing Wind proof bonding of roof underlay Wind proof bonding of façade membranes</p> <p>Use with: Pro clima Intello Plus to P14/310A Pro clima DB+ to P14/311A all of Pro clima's vapour checks, air-tightness and wind-tightness membranes, PE Polyethylene PA Polyamide (Nylon) PP polypropylene aluminium foils</p> <p>Product Page: http://www.greenspec.co.uk/html/product-pages/orconf.php</p> <p>Use: Multipurpose joint adhesive Suitable for bonding to following: To smooth, rough or stony surfaces, to concrete, plaster, render, lime based mineral plasters.</p> <p>Do not use on: unstable or crumbling surface unless grounded and stabilised See P14/580B unprotected metal surfaces. Rust resistant metals: See Pro clima Duplex to P14/355A</p> <p>Preparation: Damp surfaces: allow to dry Grounding and stabilising: to P14/580</p> <p>Packaging: tubular film sleeve or cartridge for use with standard applicator gun,</p> <p>Application rate: 310 ml (g) cartridge approx. 5-10 m. 600 ml refill tube for approx. 10-25 m.</p> <p>Application: Internal and external applications smooth surfaces: 5 mm. thick continuous bead Mineral or rough structural component surfaces: increase bead size as necessary.</p> <p>Following trades: Does not require a pressure batten. Delay between sealing and air testing: 12 to 24 hours depending on weather conditions</p>

<p>330A AIRTIGHTNESS LAP JOINT UNIVERSAL ADHESIVE TAPE:</p> <p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Uni Tape, Importing Agents: Ecological Building Systems See P14/509K Product Page: http://www.greenspec.co.uk/html/product-pages/unitape.php Irish Agrément Certificate: IAB 07/0297 Pro clima intelligent airtight system (endorsed by NSAI) Type: Single sided adhesive tape with quick release paper Material: Acrylate which is free from solvents and softeners Colour: pale blue Size: 60 mm. wide x 30 m. Properties: Tears off easily Permeable universal tape Temperature resistance: -40 to +90 degrees C. Life expectancy: 60+ years Airtight bonding to DIN 4108-7, SIA 180 and ONorm B8110-2</p> <p>Use with: Pro clima Intello Plus to P14/310A Pro clima DB+ to P14/311A</p> <p>Application: Internal use only Membrane lap joints See P14/600 & 625 Bonds overlaps between sheets of vapour check</p>

Joints to adjacent structural components See P14/610 & 620
Gable walls are treated similarly. .
Applied to large patch repairs to P14/682
Suitable backgrounds:
joints to smooth, non-mineral structural components
E.g. jamb wall made of OSB panels See work section G20
Sheathing paper membranes
Foil membranes
Tools: pressure sealing to P14/390A
Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

331A HOLE REPAIR ADHESIVE TAPE:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Uni Tape XL,
Importing Agents: Ecological Building Systems See P14/509K
Type: Single sided adhesive tape with release paper
Colour: pale blue
Size: 150 or 200 mm. wide x 15 or 30 m.
Material: Backing: special reinforced paper
Use with:
Pro clima Intello Plus to P14/310A
Pro clima DB+ to P14/311A
Uni Tape patch to P14/350A
Application:
Internal use only
Sealing internal insulation injection hole patches indoors, See P14/350A & P14/685
Sealing damage repairs
Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

331B HOLE REPAIR ADHESIVE TAPE:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Uni Tape XL easy
TAPE XL easy: pre-cut patches
Importing Agents: Ecological Building Systems See P14/509K
Use with:
Pro clima Intello Plus to P14/310A
Pro clima DB+ to P14/311A
Uni Tape Patch to P14/350A
Single sided adhesive tape with release paper
Colour: pale blue
Size: 150 or 200 mm. wide x 15 or 30 m.
Material: Backing: special reinforced paper
Application:
Internal use only
Sealing internal insulation injection hole patches indoors, See P14/350A & P14/685
Sealing damage repairs
Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

332A MEMBRANE OVERLAP FLEXIBLE AIRTIGHTNESS UNIVERSAL SEALING ADHESIVE TAPE:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Tescon No. 1
Importing Agents: Ecological Building Systems See P14/509K
3rd party accreditation:
NSAI Agrément Certificate: NSAI 07/0297
Type: Single sided, flexible, multipurpose adhesive tape with 1 release paper
Colour: dark blue
Size: 60 mm. wide x 30 m.
Properties:
Tears off easily by hand
High flexibility
High elasticity: resistant to piercing in corners
Life expectancy: 60+ years
Temperature resistance: -40 to +90 degrees C
[Airtight bonding to DIN 4108-7, SIA 180 and ONorm B8110-2](#)
Materials:

<p>Backing: perforated Polyethylene PE-foil and adhesive Acrylate which is free from solvents and softeners</p> <p>Use with:</p> <ul style="list-style-type: none"> Pro clima Intello Plus to P14/310A Pro clima DB+ to P14/311A Pro clima Solitex Plus to P14/317A <p>Suitable backgrounds:</p> <ul style="list-style-type: none"> Wood based panels: OSB, MDF Wood fibre softboard: e.g. Gutex, <p>Application: Multi-purpose,</p> <ul style="list-style-type: none"> Internal and external use Wood based boards: sealing butt joints Membrane lap joints See P14/600 & 625 damage repairs See P14/331A Seals around service penetrations, e.g. around pipes See P14/340A - P14/345A Insulation injection hole repairs See P14/350A <p>Product Page: http://www.greenspec.co.uk/html/product-pages/unitape.php Delay between taping/sealing and air testing: Generally: 10 minutes minimum.</p>

332B	MEMBRANE OVERLAP FLEXIBLE AIRTIGHTNESS UNIVERSAL SEALING ADHESIVE TAPE:
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<p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Tescon Vana Importing Agents: Ecological Building Systems See P14/509K 3rd party accreditation: NSAI Agrément Certificate: NSAI 07/0297</p> <p>Single sided, flexible, multipurpose adhesive tape with 1 release paper Colour: dark blue Size: 60 mm. wide x 30 m.</p> <p>Properties:</p> <ul style="list-style-type: none"> High tensile strength Tears off easily by hand High flexibility Life expectancy: 60+ years Temperature resistance: -40 to +90 degrees C Airtight bonding to DIN 4108-7, SIA 180 and ONorm B8110-2 <p>Materials:</p> <p>Backing: perforated Polyethylene PE-foil and adhesive Acrylate which is free from solvents and softeners</p> <p>Use with:</p> <ul style="list-style-type: none"> Pro clima Intello Plus to P14/310A Pro clima DB+ to P14/311A Pro clima Solitex Plus to P14/317A <p>Suitable backgrounds:</p> <ul style="list-style-type: none"> Wood based panels: OSB, MDF Wood fibre softboard: e.g. Gutex, with Pro clima Tescon Primer RP to P14/370B <p>Application: Multi-purpose,</p> <ul style="list-style-type: none"> Internal and external use Wood based boards: sealing butt joints Membrane lap joints See P14/600 & 625 damage repairs See P14/331A Seals around service penetrations, e.g. around pipes See P14/340A - P14/345A Insulation injection hole repairs See P14/350A <p>Delay between taping/sealing and air testing: Generally: 10 minutes minimum.</p>

334A	PLASTERED WALL ABUTMENT AIRTIGHTNESS JOINT ADHESIVE TAPE:
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<p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Contega PV Importing Agents: Ecological Building Systems See P14/509K 3rd party accreditation: NSAI Agrément Certificate: NSAI 07/0297</p> <p>Preceding trade: plaster undercoat to receive tape See work section M20. Type: Single sided airtight fleece with plaster reinforcement mesh Purpose: for secure, long-lasting joints between membrane and plastered surfaces</p> <p>Materials:</p> <ul style="list-style-type: none"> 3 layers PET fleece

<p>plaster reinforcement mesh: latex-reinforced Acrylate adhesive, free from solvents and softeners Colour: pale blue fleece and dark blue plaster reinforcement mesh Properties: Life expectancy: 60 years + Temperature resistance: -40 to +90 degrees C Application: Internal use only high quality bond Suitable backgrounds: wood based panel (e.g. OSB), See work section G20 plastered masonry See work sections F10 or F30 & M20 Size: 200 mm. wide x 15 m. The airtight bond is completed once the fleece is plastered into place. The latex reinforced layer increases the strength of the adjoining plasterwork. Use with: Pro clima Intello Plus to P14/310A Pro clima DB+ to P14/311A Delay between taping/sealing and air testing: Generally: 10 minutes minimum. Completion: others to apply plaster onto fleece and push through, See work section M20.</p>
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335A	MEMBRANE PERIMETER BONDING TO METAL, AIRTIGHTNESS SEALING ADHESIVE TAPE:
	<p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Duplex Importing Agents: Ecological Building Systems See P14/509K 3rd party accreditation: NSAI Agrément Certificate: NSAI 07/0297 Type: Double sided adhesive tape with release paper Materials: Acrylate which is free from solvents and softeners Application: Internal and external uses bond to metal framing in dry construction membrane to membrane overlaps rust resistant metals Properties: Air tight and moisture proof Rain-proof Temperature resistance: -40 to +90 degrees C. Colour: white with blue reinforcing mesh Size: 25 mm. wide x 20 m. Use with: Pro clima Intello Plus to P14/310A Airtightness membrane: Pro clima DB+ to P14/311A Wind tight rain proof membrane: Pro clima Solitex Plus, to P14/317A PE Polyethylene vapour barriers to metal studs PA Polyamide (Nylon) vapour barriers to metal studs PP polypropylene vapour barriers to metal studs aluminium foils vapour barriers to metal studs Tools: Tape dispenser: to P14/391A Pressure applicator: to P14/390A Delay between taping/sealing and air testing: Generally: 10 minutes minimum.</p>

336A	CORNER AIRTIGHTNESS SEALING ADHESIVE TAPE:
	<p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Tescon Profil Importing Agents: Ecological Building Systems See P14/509K Product Page: http://www.greenspec.co.uk/html/product-pages/tescon_profile.php 3rd party accreditation: NSAI Agrément Certificate: NSAI 07/0297 Type: Single sided, flexible, multi-purpose adhesive tape with 3-part release paper Application: Internal and external for quick and awkward tight corners at perimeter of windows doors and rooflights Colour: dark blue</p>

Size: 60 mm. wide x 30 m.

Properties:

- Tears off easily by hand
- High flexibility
- High elasticity: resistant to piercing in corners
- Release papers separate easily
- Life expectancy: 60+ years
- Temperature resistance: -40 to +90 degrees C
- [Airtight bonding to DIN 4108-7, SIA 180 and ONorm B8110-2](#)

Materials:

- Backing: perforated Polyethylene PE-foil and adhesive Acrylate which is free from solvents and softeners

Use with:

- Pro clima Intello Plus to P14/310A
- Pro clima DB+ to P14/311A
- Pro clima Solitex Plus to P14/317A

Application:

- Internal and external corner joints, sealing reveals,
- Abutments with windows,
- Abutments with roof windows,
- Abutments with doors,
- Abutments with planed timber.

It is equipped with three strips of release paper.

This allows 'activation' of a single part of the adhesive surface and sealing of one side at a time. In the second step, remove the remainder of the release paper and finish the sealing of the joint.

Tools: Pressure applicator: to P14/390A

Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

337A AIRTIGHTNESS SEALING ADHESIVE TAPE FOR WINDOW JOINTS TO PLASTERED MASONRY:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K

Product Reference: Contega FC

Importing Agents: Ecological Building Systems See P14/509K

Product Page: <http://www.greenspec.co.uk/html/product-pages/contega.php>

3rd party accreditation:

- NSAI Agrément Certificate: NSAI 07/0297

Type: Single sided, flexible, adhesive tape

Materials:

- 3 layer PET fleece
- Adhesives: integrated non-aging acrylate, free from solvents and softeners

Colour: pale blue fleece

Properties:

- High temperature resistance

- Strong durable bond

- Gypsum plaster compatible

- Airtight

- Vapour resistant: > 11.5 MNs/G

- Sd value: 2.3 m.

- Temperature resistant: long term -40 to +90 degrees C

- Working temperature from -10 degrees C

- [Quality & testing requirements: ensure window joints are RAL German quality assurance association compliant.](#)

- [\(airtight on the inside, higher diffusion resistance on the inside than the outside\)](#)

Size: 85 mm. wide x 15 m.

Applications: high quality bond

- Internal use only
- airtight internal transition from adjoining masonry brickwork, blockwork or concrete:
- corners at perimeter of window frame
- corners at perimeter of door frame
- corners at perimeter of rooflights
- visible rafters
- visible roof beams
- for bedding into bonding plaster
- [plastered masonry See work sections F10 or F30 & M20](#)

Purpose: for secure, long-lasting joints between:

- membrane, structural and secondary elements and plastered surfaces

Completion: others to apply plaster onto fleece, See work section M20.

Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

337B AIRTIGHTNESS SEALING ADHESIVE TAPE FOR WINDOW JOINTS TO PLASTERED MASONRY:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K

Product Reference: Contega SL

Importing Agents: Ecological Building Systems See P14/509K

Type: Single sided, flexible, adhesive tape

Materials:

2 layer PET fleece

Adhesives: integrated non-aging Acrylate, free from solvents and softeners

Colour: pale blue fleece

Properties:

High flexibility

High temperature resistance

Strong durable bond

Gypsum plaster compatible

Airtight

Vapour resistant: > 11.5 MNs/G

Sd value: 2.3 m.

Temperature resistant: long term -40 to +90 degrees C

Working temperature from -10 degrees C

Quality & testing requirements: ensure window joints are RAL German quality assurance association compliant.

(airtight on the inside, higher diffusion resistance on the inside than the outside)

Size: 85 mm. and 120 mm. wide x 30 m.

Applications: high quality bond

Internal use only

airtight internal transition from adjoining masonry brickwork, blockwork or concrete:

corners at perimeter of window frame

corners at perimeter of door frame

corners at perimeter of rooflights

visible rafters

visible roof beams

for bedding into bonding plaster

plastered masonry See work sections F10 or F30 & M20

use Orcon F to P14/322A to adhere Contega SL to P14/337B to bricks or blocks; or plaster may be applied directly on top of the fleece

Purpose: for secure, long-lasting joints between:

membrane, structural and secondary elements and plastered surfaces

Completion: others to apply plaster onto fleece, See work section M20.

Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

340A SERVICE APERTURE AIRTIGHT SINGLE CABLE GROMMET:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K

Product Reference: Kaflex Mono Grommet

Importing Agents: Ecological Building Systems See P14/509K

Product Page: <http://www.greenspec.co.uk/html/product-pages/karflex.php>

3rd party accreditation:

NSAI Agrément Certificate: NSAI 07/0297

Application: internal only

Performance:

Life expectancy: 60 years +

Temperature resistance: -40 to +100 degrees C

Properties:

Airtight seal to service passing through

High elasticity and high protection against piercing

Can accommodate services being moved through grommet once installed without loss of seal

Material:

non-ageing elastic EPDM

integrated Acrylate solvent-free adhesive tape

release paper for ease of application

Use with:

Pro clima Intello Plus to P14/310A

Pro clima DB+ to P14/311A

Size: 145 x 145 mm.

Aperture size range: 6 mm. to 12 mm.
Apertures: single
Service type: pipes or small cables,
Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

341A SERVICE APERTURE AIRTIGHT DOUBLE CABLE GROMMET:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Kaflex Duo Grommet
Importing Agents: Ecological Building Systems See P14/509K
Product Page: <http://www.greenspec.co.uk/html/product-pages/karflex.php>
3rd party accreditation:
NSAI Agrément Certificate: NSAI 07/0297
Application: internal only
Performance:
Life expectancy: 60 years +
Temperature resistance: -40 to +100 degrees C
Properties:
Airtight seal to service passing through
High elasticity and high protection against piercing
Can accommodate services being moved through grommet once installed without loss of seal
Material:
non-ageing elastic EPDM
integrated Acrylate solvent-free adhesive tape
release paper for ease of application
Use with:
Pro clima Intello Plus to P14/310A
Pro clima DB+ to P14/311A
Size: 145 x 145 mm.
Aperture size range: 6 mm. to 12 mm.
Apertures: double
Service type: pipes or small cables,
Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

342A SERVICE APERTURE AIRTIGHT MULTIPLE CABLE GROMMET:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Kaflex Multiple Grommet
Importing Agents: Ecological Building Systems See P14/509K
Product Page: <http://www.greenspec.co.uk/html/product-pages/karflex.php>
3rd party accreditation:
NSAI Agrément Certificate: NSAI 07/0297
Application: internal only
Performance:
Life expectancy: 60 years +
Temperature resistance: -40 to +100 degrees C
Properties:
Airtight seal to service passing through
High elasticity and high protection against piercing
Can accommodate services being moved through grommet once installed without loss of seal
Material:
non-ageing elastic EPDM
integrated Acrylate solvent-free adhesive tape
release paper for ease of application
Use with:
Pro clima Intello Plus to P14/310A
Pro clima DB+ to P14/311A
Size: 140 x 140 mm.
Aperture size range: 6 mm. to 12 mm.
Apertures: single
Service type: pipes or small cables,
Apertures: set out for multiple apertures, up to 16 services, arrangement: to suit services,
Cutting apertures: Using puncher tool: to P14/393A
Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

343A SERVICE APERTURE AIRTIGHT PIPE GROMMET:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K

Product Reference: Roflex 20 Grommet
 Importing Agents: Ecological Building Systems See P14/509K
 Product Page: <http://www.greenspec.co.uk/html/product-pages/Roflex.php>
 3rd party accreditation:
 NSAI Agrément Certificate: NSAI 07/0297
 Application: internal and external
 Performance:
 Life expectancy: 60 years +
 Temperature resistance: -40 to +120 degrees C
 Properties:
 Airtight seal to pipework passing through
 High elasticity and high protection against piercing
 Can accommodate pipe(s) being moved through grommet once installed without loss of seal
 Material:
 non-ageing elastic EPDM
 Use with:
 Pro clima Intello Plus to P14/310A
 Size: 145 x 145 mm.
 Aperture size range: 6 mm. to 12 mm.
 Pipe aperture size range: 15 mm. to 30 mm.
 Apertures: single
 Service type: pipes ,
 Sealing to membrane: Adhesive tape: Tescon No. 1 see P14/332A.
 Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

344A SERVICE APERTURE AIRTIGHT PIPE GROMMET:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
 Product Reference: [Roflex 50, 100, 150 & 200 Grommet]
 Importing Agents: Ecological Building Systems See P14/509K
 Product Page: <http://www.greenspec.co.uk/html/product-pages/Roflex.php>
 3rd party accreditation:
 NSAI Agrément Certificate: NSAI 07/0297
 Application: internal and external
 Performance:
 Life expectancy: 60 years +
 Temperature resistance: -40 to +120 degrees C
 Properties:
 Airtight seal to pipework passing through
 High elasticity and high protection against piercing
 Can accommodate pipe(s) being moved through grommet once installed without loss of seal
 Material:
 non-ageing elastic EPDM
 Use with:
 Pro clima Intello Plus to P14/310A
 Size: see schedule
 Pipe aperture size range: see schedule.
 Apertures: single
 Service type: pipes ,
 Schedule:

Reference	pipe size range	Grommet size[
Roflex 50	50 to 90 mm.	140 x 140 mm.
Roflex 100	100 to 120 mm.	200 x 200 mm.
Roflex 150	120 to 170 mm.	250 x 250 mm.
Roflex 200	170 to 220 mm.	300 x 300 mm.]

Sealing to membrane: Adhesive tape: Tescon No. 1 see P14/332A.
 Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

345A SERVICE APERTURE AIRTIGHT PIPE SEAL USING TAPE:

Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
 Product Reference: Tescon No. 1 See P14/332A.
 Importing Agents: Ecological Building Systems See P14/509K
 Product Page: http://www.greenspec.co.uk/html/product-pages/tescon_1.php
 Size: cut to short lengths, to reduce risk of stretching tape at installation.
 Tools: Pressfix: to P14/390A
 Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

350A	INSULATION INJECTION HOLE REPAIR PATCH:
	<p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Uni Tape Patch Importing Agents: Ecological Building Systems See P14/509K Pre-cut patches Size: 180 x 180 mm. Application: for repairing internal: insulation injection holes in membrane See P14/685 large perforations or damage Sealing: repair tape: to P14/331A Uni tape to P14/330A Delay between taping/sealing and air testing: Generally: 10 minutes minimum.</p>

370B	PRIMER/STABILISER
	<p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Tescon Primer RP. Importing Agents: Ecological Building Systems See P14/509K Applications: Floors, Roofs, Walls, structure, Suitable backgrounds: Plastered surfaces Wood fibreboard surfaces Wood fibreboard softboard to P10/___ e.g. Gutex Wood Blockwork walls Concrete Sand cement screed Plaster skimmed surfaces Use with and prepare surface for: Adhesives: Ecological and good indoor air quality Pro clima Eco Coll to P14/320A Pro clima Orcon F to P14/322A Adhesive tapes: Pro clima Tescon No. 1 to P14/332A Pro clima Tescon Vana to P14/332B Pro clima Tescon Profil to P14/336A Material: Solvent-free Acrylate copolymer primer Dissolvent: water Properties: Working temperature: +2 to +45 degrees C Temperature resistance: -40 to +90 degrees C Storage: frost protection, frost-free, shelf life 24 months Contents: 0.75, 1 or 2.5 litres Coverage: 7.5 m2, 10 m2 or 25 m2 Mixing: shake bottle before application, Preparation: surfaces shall be: Free from dust, loose materials, or sawdust Smooth, dry and stable Surfaces may be wet, bond will still be achievable Thawed and not frozen Surfaces must be set and fully cured and dried Application: to P14/580A For speedy application: no drying of primer is necessary Bonding of Tescon No.1 to P14/332A or Tescon Vana to P14/332B to wet primer is possible Use with wind tightness underlay membranes: Pro clima Solitex Plus: to P14/317A Pro clima Intello Plus to P14/310A</p>

390A	TOOL: ADHESIVE/TAPE PRESSING AID:
	<p>Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K Product Reference: Pro clima Pressfix Importing Agents: Ecological Building Systems See P14/509K</p>

391A	DOUBLE SIDED TAPE DISPENSER:
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For use with Pro clima Duplex: to P14/335A
Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Pro clima Tape Dispenser
Importing Agents: Ecological Building Systems See P14/509K

392A SEALANT GUN:

Single row sealant dispenser
Product Reference: dispensing gun

392B SEALANT GUN: DOUBLE DISPENSING HEAD

Double row sealant dispenser
Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Pro clima DKF double dispensing gun
Importing Agents: Ecological Building Systems See P14/509K
Application: to P14/110B.
Advantages: speed of application, one pass, keeps adhesive 'open' time longer.

393A TOOL: APERTURE PUNCH:

For use with Pro clima Kaflex Multiple: to P14/342A to cut holes to suit project requirements
Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Pro clima Puncher
Importing Agents: Ecological Building Systems See P14/509K

394A TOOL: MEMBRANE STAPLER:

Type: pneumatic or electric stapler
Do not use hammer tapper type stapler

MATERIALS

410A FASTENERS: STAPLES

Applications: [
Air-tightness layer
Roofing underlay
Rainscreen breather membrane]

Type: Staples

Material: [
Stainless steel
Galvanized mild steel]

Width: 10 mm. wide

Length: 8 mm.

Application: stapler: to P14/394A

Spacing:

Airtightness layer:

Generally: 100 - 150 mm.

Pro clima Intello plus: 50 - 100 mm.

Pro clima DB+: 100 - 150 mm.

With blow-in insulation systems: 50 - 100 mm. See work section P11

Roofing underlay:

Pro clima Solitex Plus: to P14/317A

See IAB Certificate application table.

The underlay should be tacked at the head of the sheet only,

Spacing: \leq 1200 mm.

It is important that all tacking nails be covered by 100 mm. overlap of the next underlay course.

411A FASTENERS: TACKS

Application: roofing underlay

Size: 3 mm. diameter x 20 mm. long

Type: extra large head felt nails

Material: copper, aluminium alloy, galvanized steel

The underlay should be tacked at the head of the sheet only, at centres not exceeding 1200 mm.

See IAB Certificate application table.

It is important that all tacking nails be covered by the overlap of the next underlay course so that the minimum head-lap is maintained between the tacks and the lower edge of the overlapping underlay.

420A SOFTWOOD NOGGINS

Provision: to P14/565.
Application: within timber framing
Material: Reclaimed, locally grown or FSC temperate softwood
Moisture content: Seasoned to 20 % +/- 2%
Size: to suit
Purpose:

To provide support to laps in membranes otherwise unsupported by framing
To provide support for pressure & support battens
To protect from wind pressure buffeting and premature failure of membranes

Location: place at membrane overlaps between framing.
NB. It is not essential to provide support at all lap joints, an adequate joint can be achieved by ensuring the membrane is taught between supports, using the pressure application tool to ensure a good bond
Spacing: to ensure membranes are supported at maximum 600 mm. centres
Secure to structural timber adjacent to lap joints.

421A PRESSURE BATTENS:

Material: Reclaimed, locally grown or FSC temperate softwood
Moisture content: Seasoned to 20 % +/- 2%
Size: 25 mm. x width to correspond to the backing structural timber
Purpose:

to provide mechanical retention and compression on lapped and sealed joints
to protect from wind pressure buffeting and premature failure.

Location: place at membrane overlaps.
Spacing: to ensure membranes are supported at maximum 600 mm. centres

422A SUPPORT BATTENS:

Material: Reclaimed, locally grown or FSC temperate softwood
Moisture content: Seasoned to 20 % +/- 2%
Size: 25 x width to correspond to the backing structural timber
Purpose:

To provide support to heavy insulation which may exert pressure on the membrane
To provide support to blown-in insulation materials that may slump

Location:
Spacing: to ensure membranes are supported at maximum 500 mm. centres
Centres: To support weight of blown insulation against Pro clima Intello membrane: 500 mm.

WORKMANSHIP

500A UK CODE OF PRACTICE: install in accordance with: [
[BS 5250](#), [BS 5534-1](#), [BS 5925](#), [BS 8000-6](#).]

500B NON-UK CODE OF PRACTICE: install in accordance with: [
[German Standards: DIN 4108-2 and -7](#)
[Swiss Standards: SIA 180:01](#)
[Austrian Standards: ÖNorm B8110-2](#)]

501 AGRÉMENT CERTIFICATE
Install in accordance with: [
[Irish Agrément Certificate:](#)
[IAB 02/0138 Solitex Plus & Solitex UD Vapour Permeable Roofing Underlays for Pitched Roofs](#)
[IAB 07/0297 Pro clima intelligent airtight system \(NSAI endorsed\)](#)
[British Board of Agrément Certificate:](#)
[BBA 07/4432 Pro clima Solitex Vapour permeable roofing underlay](#)]

502 MANUFACTURERS RECOMMENDATIONS:
Install in accordance with: manufacturer's recommendations as described in: [
[Pro clima Intelligent Airtight and Windtight building systems Product Portfolio \(not dated, published 2009\)](#)
[Pro clima INTELLO High performance intelligent vapour check Application Guide \(vh_intello_11.07\)](#)]

508 TRAINING:

Ensure all applicators/installers have received suitable training from the manufacturer's UK or Irish Agents: On-site guidance is offered in England, Wales and Scotland by the UK Agent. See P14/509K
"Upskilling for airtightness"
Off-site training is offered in Ireland by the Irish Agent at a training centre. See P14/509K

508K APPLICATORS/INSTALLERS:

Obtain installation/application sub-contract services from one company for each type of work unless specified or agreed otherwise in advance.
Ensure the company has had training in the use of the materials See P14/508 or
Organise the training for the project on or off-site. See P14/508
Obtain from only one of the following trained/experienced applicators/installers:

APPLICATORS/INSTALLERS:

Contact Importing Agents Suppliers for the latest list of Applicator/installers

WALES:

Pen Y Coed Construction & Insulation Ltd. Pen y Lan, Meifod, Powys, SY22 6DA

T 01938 500 797

E info@penycoed-warmcel.com W www.penycoed-warmcel.com

JPW Construction Ltd. 6 Vane Hall Place, Pentrerhedyn St, Machynlleth, Powys, SY20 8DQ

E info@jpwconstruction.idps.co.uk W www.jpwconstruction.idps.co.uk/contact.html

IRELAND

Roman Szytura 3 Charles Street, Sligo, Co Sligo

T 087 2389876

E roman@clioma.ie W www.clioma.ie

Romac Acoustics, 10 Belgree Court, Killbride, Clonee, Co Meath

T 087 2768668

Er ronan@romac.ie W www.romacacoustics.ie

Fitzsimons Insulations Unit 55 Baldoyle Industrial Estate, Dublin 13

T 01 8391111

E Peter@FITZIN.IE W <http://www.fitz-in.ie/>

Inform CA of selected applicator/installer at an early date.

Where possible select from local companies to support local economy and local employment.

See Preliminaries A90 Performance Specification A90/117.

509K MATERIALS: AIRTIGHTNESS LAYERS: MANUFACTURER & SUPPLIERS

Obtain materials of one type from only one source, unless specified or agreed otherwise in advance.
Obtain from only one of the following manufacturer(s)/fabricator(s)
Inform CA of selected manufacturer/fabricator at an early date.
Select from local companies to support local economy and local employment.
See Preliminaries A90 Performance Specification A90/117.

MANUFACTURER:

MOLL bauökologische Produkte GmbH, Rheintalstraße 35 – 43, D – 68723, Schwetzingen, Germany
ISO 9001:2000 by TUV Nord Cert GmbH, Germany.

Contact details are not included: All enquiries will be redirected to UK agents

IMPORTERS AGENTS SUPPLIERS:

England, Wales & Scotland Agent:

Ecological Building Systems UK Ltd. 17, City Business Centre, Lower Road, London SE16 2XB.

T 05600 758025 F 05600 758026

E info@ecologicalbuildingsystems.com

W www.ecologicalbuildingsystems.com

Contact: Penny Randell, UK Business Development Manager

M	0781 7896775
E	pennyrandell@ecologicalbuildingsystems.com
Ireland & Northern Ireland Agent:	
Ecological Building Systems UK Ltd. Main Street, Athboy, Co. Meath, Ireland	
T	00353 46 9432104 F 00353 46 9432435
E	info@ecologicalbuildingsystems.com
W	www.ecologicalbuildingsystems.com
ISO 9001	
STOCKISTS/SUPPLIERS:	
Construction Resources (Elink Ltd.) 111 Rotherhithe Street, London SE16 4NF, United Kingdom	
T	020 7232 1181 F 020 7023 3789
E	General Enquiries info@constructionresources.com
E	Sales / Request a Quotation sales@constructionresources.com
W	http://www.constructionresources.com/default.asp
Contact: Richard Handyside	
EcoMerchant Ltd. Head Hill Road, Goodnestone, Nr. Faversham, Kent, ME13 9BU	
T	01795 530130
E	info@ecomerchant.co.uk W www.ecomerchant.co.uk
Green Building Store, Heath House Mill, Heath House Lane, Bolster Moor, West Yorkshire HD7 4JW	
T	01484 461705 F 01484 653765
E	info@greenbuildingstore.co.uk W www.greenbuildingstore.co.uk
Pen Y Coed Construction & Insulation Ltd. Pen y Lan, Meifod, Powys, SY22 6DA	
T	01938 500 797
E	info@penycoed-warmcel.com W www.penycoed-warmcel.com

509L	AIRTIGHTNESS COMPONENTS: MANUFACTURER & SUPPLIERS
<p>Obtain materials of one type from only one source, unless specified or agreed otherwise in advance. Obtain from only one of the following manufacturer(s)/fabricator(s) Inform CA of selected manufacturer/fabricator at an early date. Select from local companies to support local economy and local employment. See Preliminaries A90 Performance Specification A90/117. MANUFACTURER:</p>	
<p>MOLL bauökologische Produkte GmbH, Rheintalstraße 35 – 43, D – 68723, Schwetzingen, Germany ISO 9001:2000 by TUV Nord Cert GmbH, Germany. Contact details are not included: All enquiries will be redirected to UK agents</p> <p>IMPORTERS AGENTS SUPPLIERS:</p> <p>England, Wales & Scotland Agent: Ecological Building Systems UK Ltd. 17, City Business Centre, Lower Road, London SE16 2XB. T 05600 758025 F 05600 758026 E info@ecologicalbuildingsystems.com W www.ecologicalbuildingsystems.com Contact: Penny Randell, UK Business Development Manager M 0781 7896775 E pennyrandell@ecologicalbuildingsystems.com Ireland & Northern Ireland Agent: Ecological Building Systems UK Ltd. Main Street, Athboy, Co. Meath, Ireland T 00353 46 9432104 F 00353 46 9432435 E info@ecologicalbuildingsystems.com W www.ecologicalbuildingsystems.com ISO 9001</p>	

DESIGN

512	AIRTIGHTNESS CHAMPION
<p>Appoint an airtightness champion for the duration of the project, this need not be their only task but significant time must be allocated to the task at appropriate times. Choose a person who is: Full time</p>	

Based on site (site agent or project manager)

Interested in achieving airtightness or has past experience, reluctance is unlikely to lead to good will or good results.

Duties include:

Liaison with Project design team's airtightness champion in design team meetings and on site.

Checking labour force for airtightness training or qualifications history

Organise any additional visits for "Upskilling for Airtightness training"

Facilitate or provide Airtightness tool box talks for airtightness and interface trades

Co-ordination of sequence, responsibilities and interface of trades on site

Development of checklists specific to project based on [_____]

Facilitate airtightness intermediate checking, formal testing and any retesting

Recording failures into checklist, report back to all interface trades

Checking remedial action is understood and carried out.

Managing all paperwork associated with airtightness champion tasks.

PREPARATION

535 DELIVERY, STORAGE AND MARKING

Membranes are supplied in rolls.

Ensure:

Rolls are delivered on a pallet and shrink wrapped.

Accessories are

Each roll is labelled with a paper wrapper, which shows the manufacturer's name, product description and production batch number identifying date and time of batch.

Product reference is printed on the exposed surface of the label and material.

Every roll shows the IAB identification mark and Certificate number and contains instructions on storage and installation.

Rolls are stored on end or laid flat

Rolls are kept under cover to protect from UV light.

Precautions:

Avoid contact with solvents and with materials containing volatile organic components VOC such as coal tar, and timbers newly treated with creosote.

Rolls must not be exposed to a naked flame or other ignition source.

540 PRE-INSTALLATION CHECKS:

Product Reference: Pro clima DB+ vapour check paper

Report any departures to the CA, do not commence until rectification by others is complete, ensure:

Insulation is installed between the [rafters/joists/studs](#).

There are no gaps or chinks in the insulation and between the insulation and the [rafters/joists/studs](#).

Wind tightness layer is installed on the outside/topside of the insulation.

No surfaces are frozen nor temperature is falling towards freezing point.

Timbers and insulation are not affected by or covered by moisture, frost, ice or mould.

Check timber member spacing and order roll width(s) to suit, to minimise waste.

Check abutment surfaces to determine type of sealant and size of sealing bead required for ordering quantities.

Noggins are available for fixing to support laps not occurring along framing members.

550 CURRENCY OF INFORMATION & METHODS:

Check with the agent' technical helpline, See P14/509K, to ensure any technical developments are understood and included in the works.

560 CO-ORDINATION OF PROGRAMMES

Interface component installers:

Above and outside of framing:

Wind tightness membrane installed after insulation between framing

Between framing

Insulation installed between framing before airtightness membrane

Cables and wire to wall sockets, ceiling lights and other accessories

Water and gas pipes and drainage services

Blown-in insulation

Below and inside of framing

Carcass

Linings

Plasterboard drylining Inside of masonry walls:
Plastering
<p>Inform and co-ordinate with other installers, of the membrane installation programme to permit timely setting out and installation of services before, thermal insulation before or blown in thermal insulation after the membrane is substantially complete.</p> <p>Ensure sealing of services apertures and insulation injection holes can be completed as quickly as possible afterwards to protect from moisture, water, wind,</p> <p>Ensure covering up of membrane to protect from UV light.</p> <p>During colder months, ensure vapour check and air-tightness layer are fitted and secured immediately after installation of the thermal insulation.</p>

565	SOFTWOOD NOGGINS:
	<p>Co-ordination: co-ordinate with timber frame/roof sub-contractor</p> <p>Provision: Ensure sufficient softwood noggins are provided free issue and left loose or lightly nailed to enable easy removal and re-fixing to suit.</p> <p>Final positioning and fixing: [By membrane sub-contractor to correspond with lap-joint positions. By carpenter to membrane sub-contractor's requirements]</p> <p>Spacing: maximum 600 mm. centres but subject to IAB Certificate schedule.</p>

570	PREPARATION:
	<p>During colder months, fit and secure the membrane immediately after installation of the thermal insulation.</p> <p>Ensure all surfaces are suitable for permanent, airtight adhesion with air-tightness tape and joint adhesive, are stable, dry, smooth and free of dust, silicone and grease.</p> <p>Ensure dust is vacuum cleaned or wiped off with a cloth.</p> <p>Brush down surfaces before bonding.</p> <p>NB. Adhesion to frozen surfaces is not possible.</p>

580A	PREPARATION: UNSTABLE OR CRUMBLING SURFACES:
	<p>Remove unstable or crumbling surfaces back to stable material</p> <p>Grounding: [_____]</p> <p>Stabilise surface using compatible stabiliser, See P14/370B</p>

APPLICATION: AIR TIGHTNESS

600A	APPLICATION:
	<p>Product Reference: Pro clima Intello Plus</p> <p>The membrane has a front and back and must be fitted with the printed side facing the room/installer.</p> <p>The printed markings are an aid to orientation and installation accuracy.</p> <p>On the interior side, beneath the insulation, install the membranes:</p> <p style="padding-left: 40px;">In the case of a wall: working from head to base</p> <p style="padding-left: 40px;">In the case of a pitched roof: working from ridge to eaves,</p> <p>The membrane may be unrolled and stapled either along or across the timber substructure members.</p> <p>Ensure the membrane extends at abutment sufficient for movement and sealing see P14/610</p> <p>Once the first membrane is in place, apply the second lapping layer</p> <p>Always overlap the membranes on rafters/joists/studs/noggins to provide support for sealing.</p> <p>Overlap the membranes:</p> <p style="padding-left: 40px;">with application of membrane across members:</p> <p style="padding-left: 80px;">end laps over timber members at least 100 mm.</p> <p style="padding-left: 80px;">side laps over noggins at least 100 mm.</p> <p style="padding-left: 40px;">with application of membrane along members:</p> <p style="padding-left: 80px;">end laps over noggins: at least 100 mm.</p> <p style="padding-left: 80px;">side laps over timber members at least 100 mm.</p> <p>Lay the membrane without sagging but do not place under excess tension</p> <p>Lay the membrane without creasing, as far as practicable.</p> <p>Secure using staples: to P14/410A into timber backing members.</p> <p>Pressure laths are usually not required on stable and unsupported surfaces.</p>

601A	APPLICATION:
	<p>Product Reference: Pro clima DB+</p> <p>The membrane has no front and back and can be fitted with either the printed or the unprinted side facing</p>

the room.

The printed markings are an aid to orientation and installation accuracy.

On the interior side, beneath the insulation, install the membranes:

In the case of a wall: working from head to base

In the case of a pitched roof: working from ridge to eaves,

The membrane may be unrolled and stapled either along or across the timber substructure members.

Ensure the membrane extends at abutment sufficient for movement and sealing see P14/610

Once the first membrane is in place, apply the second lapping layer

Always overlap the membranes on rafters/joists/studs/noggins to provide support for sealing.

Overlap the membranes:

with application of membrane across members:

end laps over timber members at least 100 mm.

side laps over noggins at least 100 mm.

with application of membrane along members:

end laps over noggins: at least 100 mm.

side laps over timber members at least 100 mm.

Lay the membrane without sagging but do not place under excess tension

Lay the membrane without creasing, as far as practicable.

Secure using staples: to P14/410A into timber backing members.

Pressure laths are usually not required on stable and unsupported surfaces.

610 SETTING OUT AND SECURING PERIMETER ABUTMENTS:

Ensure perimeter abutment joints can be sealed air-tight later.

Gable or jamb walls:

Ensure the membrane extends at abutment sufficient for movement and sealing

Wrap in excess material for expansion and fold into gap between perimeter abutment and closest framing member.

Allow about 30 mm. for sealing onto the abutment,

Initially fasten with staples if possible.

620 SEALING PERIMETER ABUTMENTS:

Jamb wall

Joint adhesives: Eco Coll: to P14/320A or Orcon F: to P14/322A

Apply directly from the cartridge in an approx. 5 mm. thick adhesive bead.

Apply to adjacent mineral/masonry structural components, plasterboard/plastered or rough wooden components

e.g. plastered walls or sawn timber.

On rough surfaces, increase the bead size as necessary.

Apply the membrane direct to the adhesive immediately and whilst the adhesive is still wet without applying excessive force.

Allow for movement of the parts, do not press the joint adhesive completely flat.

Tool: pressing aid See P14/390A

625A SEALING LAPS:

Product Reference: Pro clima Intello: to P14/312A

Once the membrane is fitted, seal the overlaps:

Ensure lap joints are sealed air-tight.

Ensure bonding with adhesive tapes to the smooth printed side.

Seal membranes in the overlap area, without strain or loading,

Tape:

Internal or external: Tescon No. 1 See P14/332A

Internal only: universal adhesive tape Uni Tape See P14/330A.

Ensure joints occur on the framing members or fix noggins to suit.

Avoid creases in the membrane in the overlap area.

Any creases that do occur in the over-lap area must be cut off or the membrane relayed to remove creases.

Ensure creases are not taped over.

Apply the tape centrally over the joint and press down firmly

Tool: pressing aid See P14/390A

Delay between taping/sealing and air testing: Generally: 10 minutes minimum

625B SEALING LAPS:

Product Reference: Pro clima DB+: to P14/311A

Once the membrane is fitted, seal the overlaps:

Ensure lap joints are sealed air-tight.

Seal membranes in the overlap area, without strain or loading,
Tape:

Internal or external: Tescon No. 1 See P14/332A

Internal only: universal adhesive tape Uni Tape See P14/330A.

Ensure joints occur on the framing members or fix noggins to suit.

Avoid creases in the membrane in the overlap area.

Any creases that do occur in the over-lap area must be cut off or the membrane relayed to remove creases.

Ensure creases are not taped over.

Apply the tape centrally over the joint and press down firmly

Tool: pressing aid See P14/390A

Delay between taping/sealing and air testing: Generally: 10 minutes minimum

630 CORNER SEALING

Ensure angled joints in membrane are made air-tight.

Use flexible corner adhesive tape Tescon Profil See P14/336A

Delay between taping/sealing and air testing: Generally: 10 minutes minimum

640 DOUBLE SKIN METAL FLUE PIPE

Background: double-skin insulated metal flue,

Apply approx. 30 mm. of Pro clima DB+ membrane: to P14/311A to the metal surface

Apply approx. 5 mm. thick adhesive bead (more if surface texture requires it) of Eco Coll: to P14/320A

Offer up the membrane, with excess materials to form an expansion joint,

Set membrane in adhesive bed.

Do not press the adhesive completely flat.

Seal the corners with short pieces of adhesive tape Tescon No. 1. See P14/332A

Cut halfway through the adhesive tape pieces on the centre line, then apply shaping to the circular profiles.

Delay between taping/sealing and air testing: Generally: 10 minutes minimum

650A TIMBER ROOF BEAM/RAFTERS:

Product Reference: Pro clima DB+: to P14/311A

Background: sawn timber beams or rafters,

Apply joint adhesive Eco Coll: to P14/320A in an approximately 5 mm. thick adhesive bead.

With rough background surfaces, increase the bead size as necessary.

Offer up the membrane with excess materials to form an expansion joint and fold accordingly.

Lay the vapour check in the adhesive bed,

Do not press the adhesive completely flat.

Delay between taping/sealing and air testing: 12 to 24 hours depending on weather conditions

660A UNPLASTERED GABLE WALL INTERIOR:

Product Reference: Pro clima DB+: to P14/311A

Reference Detail: to P14/502 item 7, page 18

Plaster sealing tape: Contega PV: to P14/334A

Fix the fleece as far as possible in the corner using mechanical fixing or adhesive:

Mechanical fixings: Non-percussion drill, expanding or resin bolts, large head washers,

Adhesive: Orcon F: to P14/322A or Eco Coll: to P14/320A

Apply dabs of adhesive to the masonry or a bead of adhesive or using tacks at 400 mm. maximum.

Do not install the tape with a concave shape, fit tightly and neatly into corner

Offer up the membrane.

Remove the strips of release paper from the back of the Contega PV: to P14/334A

Fix the fleece to the membrane using adhesive tape, pressing firmly to secure.

Background: masonry walls to be plastered:

Suitable plaster types:

Gypsum bonding coat

Cement with a PVAC primer/adhesive

Lime with a PVAC primer/adhesive

Clay/loam plasters with a PVAC primer/adhesive

Ensure Contega PV: to P14/334A is embedded between coats of plaster.

Roll back the fleece and reinforcement away from the surface to be plastered.

Allow others to apply first coat of a suitable plaster to the wall

Unroll the fleece and reinforcement into the fresh layer of plaster

Allow others to complete the plaster work.

Delay between taping/sealing and air testing:

Generally: 10 minutes minimum

Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions

660B UNPLASTERED GABLE WALL INTERIOR:

Product Reference: Pro clima Intello: to P14/312A
Reference Detail: to P14/502 item 7, page 18
Plaster sealing tape: Contega PV: to P14/334A
Attach the tape using its self-adhesive strips to the smooth side of the membrane.
The white airtight fleece with the integrated blue plaster reinforcement mesh is then pushed back and fixed as far as possible into the corner,
Adhesive: Orcon F: to P14/322A
Apply dabs of adhesive to the masonry or a bead of adhesive or using tacks at 400 mm. maximum.
Background: masonry walls to be plastered:
Suitable plaster types:
 Gypsum bonding coat
 Cement with a PVAC primer/adhesive
 Lime with a PVAC primer/adhesive
 Clay/loam plasters with a PVAC primer/adhesive
Ensure Contega PV: to P14/334A is embedded between coats of plaster.
Roll back the fleece and reinforcement away from the surface to be plastered.
Allow others to apply first coat of plaster to the wall,
Unroll the fleece and reinforcement into the fresh layer of plaster
Allow others to complete the plaster work.
Delay between taping/sealing and air testing:
 Generally: 10 minutes minimum
 Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions

665B PLASTERED GABLE WALL INTERIOR

Product Reference: Pro clima Intello: to P14/312A
Background: plastered gable walls,
Apply adhesive directly from the cartridge in an approximately 5 mm. thick adhesive bead.
Adhesive: Orcon F: to P14/322A
With rough surfaces, increase the bead size as necessary.
Offer up the membrane, with excess material to form an expansion joint, fold in accordingly,
Lay the membrane in the adhesive bed.
To allow for movement of the parts, do not press the glue completely flat.
Pressure laths are usually not required on stable surfaces.
Delay between taping/sealing and air testing: 12 to 24 hours depending on weather conditions

665C PLASTERED GABLE WALL INTERIOR

Product Reference: Pro clima DB+
Background: plastered gable walls,
Apply adhesive directly from the cartridge in an approximately 5 mm. thick adhesive bead.
Adhesive: Orcon F: to P14/322A or Eco Coll: to P14/320A
With rough surfaces, increase the bead size as necessary.
Offer up the membrane, with excess material to form an expansion joint, fold in accordingly,
Lay the membrane in the adhesive bed.
To allow for movement of the parts, do not press the glue completely flat.
Pressure laths are usually not required on stable surfaces.
Delay between taping/sealing and air testing: 12 to 24 hours depending on weather conditions

670 PIPES AND CABLES

Allow others to carryout setting out and fixing of services
Accurately cut the membrane at location of all pipe and cable penetrations, ensure the cut is no larger than required.
Allow others to securely fit and fix pipes or cables to accessories and surface boxes and or plates through the membrane.
Fit the correct size flexible grommet to each size of pipe and cable to ensure a tight fit and airtight seal
Push the grommet over the pipe or cable slide along length until in approximately the correct location(s).
Remove the release paper from the pipe and cable grommets, secure down to the membrane
Fix grommets using:
 Internal or external: Tescon No. 1: to P14/332A
 Internal only: Uni Tape: to P14/330A.
Press firmly to secure the adhesive tape.
Delay between taping/sealing and air testing: Generally: 10 minutes minimum.

680	BLOWN-IN INSULATION INJECTION & HOLES:
<p>Allow others to create injection holes and complete injected insulation installation. See work section P11. Immediately after injection is completed, carryout injection hole repair, avoiding risk of injected insulation material loss at hole and moisture ingress.</p>	
681	INSULATION INJECTION HOLE REPAIR:
<p>Patches: to P14/350A Sealing tape: to P14/331A Location: towards top of element that is insulated Loading: less pressure at top due to insulation, pressure taken by pressure battens where required, See P14/421A Application: Attached tape to one edge of patch Apply patch centrally to cover hole Apply hand pressure to facilitate bond of tape to membrane, do not apply extreme pressure Apply strips of tape to remaining three sides of patch to complete task Delay between taping/sealing and air testing: Generally: 10 minutes minimum Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions</p>	
682	DAMAGE REPAIR
<p>Adhesive tape: Uni Tape to P14/330A Patches: Uni Tape patch to P14/350A Hole repair adhesive tape to P14/331A</p>	
685	VENTILATE REGULARLY TO PREVENT BUILD-UP OF EXCESS HUMIDITY:
<p>Avoid build up of excess humidity in the building during the work. Likely times of high humidity: during periods of high precipitation: mist, fog, rain, snow, drizzle, etc. during winter season, during wet trade drying Actions: open window, permit cross ventilation close windows and introduce ventilation close windows and introduce dehumidification</p>	
690	AIRTIGHTNESS TESTING: INTERMITTENT TESTING:
<p>Timing: As rooms or parts of building are completed Building fabric substantially complete After service zone battening (if any) is complete Before wall linings and surface finishes are complete Purpose: To check workmanship and integrity as the work progresses To identify any difficult or problematic joints to be concentrated upon in subsequent works Preparation: Ensure all membrane connections have been made air-tight, Ensure the thermal insulation system is sealed in, Ensure all service penetrations are sealed Ensure all damage is repaired Seal any other structural openings related to tested space Delay between taping/sealing and air testing: Generally: 10 minutes minimum Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions Check the air-tightness Equipment: See P14/900A Scope: Testing is possible for full rafter insulation if there are no other large openings in the building shell (i.e. when all windows have been installed), but not for testing with insulation above the rafters. Method of test: use blower to exert negative pressure and detect air infiltration, Keep records to enable carrying out of remedial actions.</p>	

695	ADHESION TESTING:
	<p>Delay between taping/sealing and testing: Generally: 10 minutes minimum Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions The best bonds are achieved against timber derived sheathing, prepared as described. With other materials and in case of doubt, carry out adhesion tests.</p>

APPLICATION: WIND TIGHTNESS

710	GENERAL
	<p>Product Reference: Pro clima Solitex Plus: to P14/317A. Roof tile underlay must be installed and fixed in accordance with the Agrément Certificate, the manufacturer's instructions, and the relevant recommendations of ICP 2:2002 and BS 5534-1:2003.</p>

715	GENERAL INSTALLATION CRITERIA: ROOFING UNDERLAY
	<p>Product Reference: Pro clima Solitex Plus: to P14/317A Roof tile underlay are not suitable for use in flat roof construction. Where the length of the rafter slope measured on plan exceeds 6 m. roof tile underlay should not be used unless the manufacturer's guidance is sought in relation to detailing. Installation of roof tile underlay can be carried out in all conditions normal to pitched roofing work. In roof construction it is important to remember that roof tile underlay are the second line of defence in excluding water penetrating the roof. For this reason the following list of criteria must be met to comply with the requirements of the Agrément Certificate: Ensure that roof tile underlay are correctly installed and not damaged. Where roof tile underlay become damaged for whatever reason, it is imperative that they are suitably repaired with a new piece of matching material or a adhesive tape if the damage is minimal. See Pro clima Tescon No. 1 P14/332A</p>

720	INSTALLATION: ROOFING
	<p>Product Reference: Pro clima Solitex Plus: to P14/317A During the operation of installing the roofing underslating: Ensure that persons working on the roof do not use roof tile underlay for supporting themselves or the slates/tiles independently of the roof. Provide overlaps of the roof tile underlay in accordance with the minimum dimensions given in ICP 2:2002. See P14/110A.</p>

725	INSTALLATION: ROOFING BATTENS & COUNTER BATTENS
	<p>Product Reference: Pro clima Solitex Plus: to P14/317A Ensure batten gauges do not exceed that recommended by the tile/slate manufacturer for the particular tile/slate being used. Ensure moisture content of battens at time of fixing do not exceed 22%. Ensure that where overlaps do not coincide with a batten: either include an extra batten at the overlap or increase the underlay overlap to coincide with the next batten. Seek manufacturer's guidance in relation to chemical attack from wood preservative on roofing underlay. The application of counter battens significantly reduces the risk associate with water penetration due to water ponding or by capillary action along the nail penetrations.</p>

730	INSTALLATION: ROOFING UNDERLAY:
	<p>Product Reference: Pro clima Solitex Plus: to P14/317A When tacking roof tile underlay to the rafters, use tack: to P14/411A or staples: to P14/410A Ensure underlay is tacked at the head of the sheet only, at centres not exceeding 1200mm. Ensure that all tacking nails are covered by the overlap of the next underlay course so that the minimum head-lap is maintained between the tacks and the lower edge of the overlapping underlay. Where hips and valleys occur, they should be covered with an additional layer of underlay at least 750 mm. wide on each side, run continuously from eaves to ridge. At ridge level, carry on roof tile underlay over the ridge. Carryout correct detailing for ridge vents if the roof is ventilated, and a minimum overlap of 225mm. Where roof tile underlay are fully supported on decking, counter battens must be used or where the architect/engineer specifies it to allow a deflection in the underlay to run the water into the gutter. Roof tile underlay must be laid horizontally across the roof with the product name facing up. Ensure that when installing roof tile underlay without counter battens in unsupported roofs, the roof tile</p>

underlay is draped with a deflection of 5-10 mm. between rafters to permit free drainage of water vapour into the gutter.
Ensure the deflection is not so great as to permit contact with the underside of the slating or tiling when the underlay is subject to wind uplift.

735 INSTALLATION: ROOFING VENTILATION:

Product Reference: Pro clima Solitex Plus: to P14/317A
Underlay may be installed without ventilation, however where ventilation is considered:
Ensure ventilation requirements are in accordance with TGD to Part F of the Building Regulations 1997 to 2006.
Ensure continuous ventilation is provided at a minimum rate equivalent to:
 eaves ventilation: 10 mm./linear meter
 ridge ventilation: 5 mm./linear meter
Incorporate a fly screen to prevent birds and insects entering the roof void.
Cold roof: proprietary eaves ventilators is strongly recommended as they ensure that quilt or loose fill insulation will not obstruct the flow of air where the insulation and roof meet. See P10/[_____].
When using tile/slate ventilators they should be installed as close to the ridge as possible to increase ventilation circulation.

740 INSTALLATION VAPOUR CONTROL LAYERS:

Product Reference: Pro clima Solitex Plus: to P14/317A roof tile underlay.
Where roof tile underlay are used in dormer roof construction, i.e. where the ventilation is along the line of the rafters, install a vapour control layer on the warm side of the insulation.
Materials:
 [See Pro clima Intello Plus vapour check P14/313A,](#)
Non-ventilated cold roof design where the insulation is laid on top of the ceiling,
Include a sealed vapour control layer, such as Pro clima Intello Plus, on the warm side of the insulation.
Ensure all perforations for pipes, electrical cables etc. are sealed using Pro clima sealing accessories.
Ensure the vapour control layer is turned up around the edge of the insulation and sealed to the walls and soffit to inhibit warm humid air entering the attic.
Sealing:
 Adhesive: Pro clima Orcon F: to P14/322A
 Tape: Tescon No. 1 tape P14/332A or Uni Tape: to P14/330A
For further guidance regarding sealing this detail, refer to manufacturer.

745 INSTALLATION EAVES:

Product Reference: Pro clima Solitex Plus: to P14/317A roof tile underlay,
Roof tile underlay, if exposed to UV light on a continuous basis, will degrade;
At the eaves use waterproof underlay or eaves reinforcement sheet
Properties:
 resistant to UV light
 resistant to rot
Ensure the membrane is provided with a tilting fillet and is dressed 50 mm. into the gutter.
Where the UV resistant eaves protection sheet is dressed into the gutter, ensure it allows effective rainwater and water vapour drainage into the gutter but not affect the flow of rainwater in the gutter
Once the roof tile underlay is installed, ensure it is not exposed to UV light for more than 6 months as it will degrade.

750 INSTALLATION CRITERIA FOR NON-VENTILATED ROOF DESIGNS: CONDENSATION RISK:

Product Reference: Pro clima Solitex Plus: to P14/317A
Roof underlay have a significantly lower water vapour resistance than that of conventional roof underlay and therefore do not have to rely upon air movement beneath the underlay to minimise the risk of condensation. However, it is essential that the amount of water vapour generated in the dwelling below is limited.
The following measures will help to reduce the build-up of water vapour:
Ensure all penetrations into the roof space are properly sealed
Ensure loft hatches are made convection tight by means of a compressible draught seal.
Provide airtight loft hatches: to P14/380
Ensure all other penetrations are sealed using Pro clima sealing accessories
Ensure the dwelling below the roof is ventilated in accordance with F1 of TGD to Part F of the Building Regulations 1997 to 2006 for the dispersal and rapid dilution of water vapour.
Ensure all water tanks in the loft space are covered and all pipe work lagged.
Ensure a sealed vapour control layer, is installed on the warm side of the insulation in both cold roof and warm roof designs.
[See Pro clima Intello Plus vapour check P14/313A,](#)

Ensure all penetrations, e.g. pipe work, electrical fittings, to the loft space are sealed using purpose made grommets or tapes.
See Pro clima rubber grommets: to P14/340A – P14/342A and P14/343A - P14/344A & P14/345A,
See Pro clima Tescon No. 1 flexible tape P14/332A
There is no requirement for eaves or ridge ventilation as both roof underlay do not require air movement to avoid damage by condensation.

760 NON-VENTILATED COLD ROOF:

In a non-ventilated cold roof, ensure the insulation is laid horizontally on the vapour check at ceiling level and is pushed into the eaves and against the underlay to ensure that there are no gaps present,
See Pro clima Intello Plus P14/313A
Ensure that a barrier to vapour movement is maintained on the warm side of the insulation over the whole ceiling.
Pay particular attention to the junction from the ceiling to the external wall.
Delay between taping/sealing and air testing:
Generally: 10 minutes minimum
Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions
Test the integrity of the membrane using a blower door or Wincon tester prior to and post fixing of the internal lining(s). See: to P14/910 – P10/990.

770 NON-VENTILATED WARM ROOF:

Product Reference: Pro clima Solitex Plus: to P14/317A
In a non-ventilated warm roof, the insulation is installed between the rafters so as to fill the rafter void. It is important to install the vapour check on the warm side of the insulation over the whole roof.
All laps, junctions to adjacent structural elements and service penetrations of the vapour check should be sealed using suitable sealing accessories.
In a non-ventilated warm roof the underlay may be laid taut or draped, parallel to the eaves and fixed by counter battens (minimum thickness 25 mm.)
To increase the wind tightness of the roof, in the case of roofs with a low pitch, or in exposed areas, all overlaps, penetrations and junctions to adjacent structural elements of Solitex Plus or Solitex UD may be sealed using adhesive/tapes.
Application of Pro clima Solitex Plus shall be in accordance with BBA/IAB certificate application guidance details

See Pro clima Tescon No. 1: to P14/332A

COMPLETION

900A TESTING EQUIPMENT: AIRTIGHTNESS QUALITY CONTROL UNIT IN CASING:

Airtightness Blower panel in casing
Controls & Magnahelic pressure gauge
Manufacturer: MOLL bauökologische Produkte GmbH, See P14/509K
Product Reference: Pro clima Wincon.
Performance 9800 m³/h at 50 Pa pressure differential to IS EN 13829:2000.
Voltage:
for construction site 110 V
for occupied building 220 V
CDM and Manual handling Regulations:
Weight: 30 kg. fan and 20 kg. box
Method statement: Provide a method statement on handling of equipment in excess of 20 kg.

905A TESTING EQUIPMENT: AIRTIGHTNESS Blower Door:

Equipment: Airtightness Blower Door
Manufacturer: Minneapolis
Product Reference: Minneapolis Blower Door
Test method as Preliminaries section A94
Test level:
See A94/[]
n50-Airchanges value: <[] h-1 ([] ACH at 50 Pa)

920 AIRTIGHTNESS TESTING: FORMAL TESTING: PRE LINING COMPLETION

Timing:
Building fabric substantially complete
After service zone battening (if any) is complete

Before wall linings and surface finishes are complete
 Preparation:
 Ensure all membrane connections have been made air-tight,
 Ensure the thermal insulation system is sealed in,
 Ensure all service penetrations are sealed
 Ensure all damage is repaired
 Seal any other structural openings
 Delay between taping/sealing and air testing:
 Generally: 10 minutes minimum
 Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions
 Check the air-tightness
 Equipment: See P14/905
 Test level:
 See A94/[]
 n50-Airchanges value: <[] h-1 ([] ACH at 50 Pa)
 Method of test: use blower to exert negative pressure and detect air infiltration,
 Keep records to enable carrying out of remedial actions.

925

REMEDIAL ACTION

Review surveys:

Infrared thermo graphic surveys see P14/930.

Review further inspection reports

Propose remedial actions and submit to the CA for review.

Participate in discussions on proposals, assist in decision making process.

Seek instruction to suit the programme

Carryout works as proposed/instructed.

Cease wind pressure whilst adhesives and tapes are applied and until they are set.

927

DELAY AFTER REMEDIAL ACTION BEFORE RETESTING:

Delay between taping/sealing and air testing:

Generally: 10 minutes minimum.

Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions

960

EXTERIOR CLADDINGS:

Protect membranes from damage and UV light.

Install within the manufacturer's recommended time period, or 3 months maximum if less,

Allow others to install exterior cladding as early as possible after completion of testing, rectification and retesting.

Ensure claddings are fixed to battens to avoid puncturing membrane.

965

INTERIOR LININGS:

Protect membranes from damage and UV light.

Install within the manufacturer's recommended time period, or 3 months maximum if less,

Allow others to install interior lining as early as possible after completion of testing, rectification and retesting.

Ensure linings are fixed to service battens to avoid puncturing membrane.

970

AIRTIGHTNESS TESTING: FORMAL TESTING: POST LINING COMPLETION

Timing:

Building fabric substantially complete

After service zone battening (if any) is complete

After wall linings and surface finishes are complete

Purpose: to check if the installation of linings has damaged the integrity of the airtightness membranes

Preparation:

Ensure all membrane connections have been made air-tight,

Ensure the thermal insulation system is sealed in,

Ensure all service penetrations are sealed

Ensure all damage is repaired

Seal any other structural openings

Delay between taping/sealing and air testing:

Generally: 10 minutes minimum

Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions

Check the air-tightness

Equipment: See P14/905

Test method as Preliminaries section A94

Test level:

See A94/[]

n50-Airchanges value: <[] h-1 ([] ACH at 50 Pa)

Method of test: use blower to exert negative pressure and detect air infiltration,
Keep records to enable carrying out of remedial actions.

997 DELAY AFTER REMEDIAL ACTION BEFORE RETESTING:

Delay between taping/sealing and air testing:

Generally: 10 minutes minimum.

Orcon F: to P14/322A or Eco Coll: to P14/320A: 12 to 24 hours depending on weather conditions

END OF WORK SECTION P14

GENERAL GUIDANCE NOTES

110A Constantly humid buildings e.g. swimming and leisure pool buildings are not suitable for the Pro Clima product range

DESIGN ISSUES

The joints must not be systematically or intentionally subjected to strain.

When the vapour check membrane is sealed, the weight of the insulating material must be borne by lathing.

Adhesive or taped joints should be supported by battens, if necessary.

Press firmly to secure the adhesive tape.

Ensure there is sufficient backpressure.

Airtight seals can only be achieved on vapour check membranes that have been laid without folds or creases.

CURRENCY OF INFORMATION:

The information provided in literature and this specification is based on practical experience and the current state of knowledge.

The manufacturer reserve the right to make changes to the recommendations given or to make alterations due to technical developments and associated improvements in the quality of our products.

We would be happy to inform you of the current state of technical knowledge at the time you use our products.

TERMS AND CONDITIONS

Further information about application and construction is given in the Pro clima planning documentation.

(Please also take note of the sealing recommendations contained in the current Pro clima application matrix.)

END END OF SPECIFICATION GENERAL GUIDANCE NOTES

CLAUSE GUIDANCE NOTE

P14/311A Pro Clima DB+.

A paper based humidity variable INTELLIGENT internal airtight vapour check which possesses effective variable moisture vapour diffusion resistance properties

It is manufactured from cellulose fibre, reinforced for additional strength and treated with natural salts against fire.

Pro clima DB+ provides a consistent internal airtight seal for the construction, while reducing the risk of interstitial condensation in both summer and winter conditions.

In summer conditions Pro clima Pro clima DB+ allows more vapour diffusion, therefore structural components can rapidly dry out.

In winter conditions it permits less vapour diffusion, hence protecting the building fabric from harmful vapour penetration.

In non-breathing structures i.e. those with highly vapour impermeable external materials, with a vapour barrier installed internally, any moisture that gets into the insulation will become trapped and immediately begin to degrade its performance.

Pro clima DB+ eliminates this risk by allowing any trapped moisture to evaporate away, enhanced by its humidity variable moisture vapour resistance.

Pro clima DB+ is able to adjust its vapour resistance to reflect changes in local humidity to maximise its performance in all conditions.

It permits less vapour diffusion in dry winter conditions and more in summer when humidity levels may be higher at the vapour check due to condensation in the previous winter.

Pro clima DB+ is also very strong due to its reinforced structure.

When installed in conjunction with the range of Pro clima proprietary airtightness tapes and adhesives, Pro clima DB+ assures an airtight building envelope with maximum potential freedom from structural damage.

As Pro clima DB+ has the ability to react to varying humidity levels, the result is a much more efficient and healthier building structure, even when it is penetrated by unanticipated moisture as a result of extremely adverse conditions, for instance, air leakage, or increased incorporated moisture during the construction phase, in timber building materials or insulating materials.

Pro clima DB+ reduces the risk of interstitial condensation dramatically, which in turn eliminates the threat of mould growth, ineffective insulation as a result of moisture saturation and damp rot.

With the introduction of the Code for Sustainable Homes and revisions to the Building Regulations Approved Document L, 'Part L', the airtightness of a construction is crucial to maximise thermal performance and reduce the CO₂ emissions of our housing stock.

After the Pro clima DB+ humidity variable vapour check is installed, in conjunction with the Pro clima specialist tapes and adhesives a blower door airtightness measurement or a Wincon airtightness quality test can be performed. See Preliminaries section A94 Airtightness testing.

Pro clima Pro clima DB+ provides the optimum paper based ecological solution to airtightness as it automatically adapts to atmospheric conditions, ensuring the building remains in good physical shape, healthy and airtight.

P14/317A

Pro Clima Solitex Plus: The Next Generation Vapour Permeable Underlay

Solitex Plus is the Next Generation of High Performance vapour permeable Underlay. With an impressive range of characteristics such as high Vapour Permeability, Extreme Watertightness, High Nail Tear Resistance and Thermostability, Solitex Plus offers superior protection against condensation risk and extreme resistance against pelting rain.

Solitex Plus, from Pro clima is a Diffusion-Open vapour permeable membrane, and has received upgraded Irish Agrément Board certification which confirms its performance in all roofing systems, ventilated or non-ventilated, warm and cold roofs and has now also been awarded BBA Certification in the UK.

Solitex Plus is designed, engineered and manufactured under stringent conditions by Pro clima in Germany.

When under mechanical stress caused by accidentally stepping on the surface or nailing, the four ply combination of layers, the non slip outer fleece and especially the reinforced fillet material ensures that the product is highly tear resistant so there is minimal damage caused during installation.

The weather-tightness of conventional micro-porous membranes is to a large extent determined by the surface tension of water. If the surface tension is reduced due to conditions which may be found on construction sites, this may reduce the water resistance of the membrane and hence moisture may penetrate the porous membrane.

Solitex Plus contains a monolithic membrane which employs Closed Cell Technology. Closed cell membranes offer superior weather tightness & at the same time, ensure that a significant amount of water vapour is actively removed from the inside of the building structure & diffused to the exterior. The combination of these two properties is the determining factor when it comes to quality & the safety of the roof construction.

The four ply layer and Closed Cell Technology ensures that Solitex Plus has the best combination of extreme water resistance, high vapour permeability and outstanding physical strength. Solitex Plus vapour permeable membrane provides the following key benefits:

Totally resistant to all wood preservatives, wood treatments or natural wood resins
Extreme resistant to wind driven pelting rain
Totally resistant to contamination due to on site chemicals

Solitex Plus, the next generation high performance underslating felt - ensures your roof will be finished to the highest possible specification using the most advanced underslating felt approved by the BBA and the IAB and now available on the market.

P14/740 INSTALLATION: VAPOUR CONTROL LAYERS

Vapour control layers described in P10/[]].
If polyethylene should be minimum thickness: ≥ 1000 gauge

P14/900A & 910

AIRTIGHTNESS TESTING: FORMAL TESTING: PRE LINING COMPLETION

Only for testing internal airtightness membrane

Test level:

UK Building Regulations Approved Document L, L1A/L1B/L2A/L2B: Air permeability Q50 ≤ 10 m³/hr/m²

Ireland Building Regulations: Air permeability Q50 ≤ 10 m³/hr/m²

EnEV,

Naturally ventilated: n50-Airchanges value: < 3 h⁻¹ (3 ACH at 50 Pa)

Without a mechanical ventilation system: n50-Air change value: < 3 h⁻¹ (3 AC/H at 50 Pa)

With a mechanical ventilation system: n50-Air change value: < 1.5 h⁻¹ (1.5 AC/H at 50 Pa)

Passivhaus Institute in Darmstadt Germany: target: n50 Air change value: ≤ 0.6 h⁻¹ (0.6 AC/H at 50 Pa)

DIN 4108-7

Test level: n50 value: ≤ 3 air changes/hour

Building with controlled ventilation: n50 value: ≤ 1.5 h⁻¹ (air changes/hour)

Canadian Super E Standard: n50 < 1.5 h⁻¹

NB n50 of 10 = Q50 of 10

P14/970 AIRTIGHTNESS TESTING: FORMAL TESTING: POST LINING COMPLETION

Only for testing internal airtightness membrane

Test level:

UK Building Regulations Approved Document L, L1A/L1B/L2A/L2B: Air permeability Q50 ≤ 10 m³/hr/m²

Ireland Building Regulations: Air permeability Q50 ≤ 10 m³/hr/m²

EnEV

Naturally ventilated: n50-Airchanges value: < 3 h⁻¹ (3 ACH at 50 Pa)

Without a mechanical ventilation system: n50-Air change value: < 3 h⁻¹ (3 AC/H at 50 Pa)

With a mechanical ventilation system: n50-Air change value: < 1.5 h⁻¹ (1.5 AC/H at 50 Pa)

Passivhaus Institute in Darmstadt Germany: target: n50 Air change value: ≤ 0.6 h⁻¹ (0.6 AC/H at 50 Pa)

DIN 4108-7

Test level: n50 value: ≤ 3 air changes/hour

Building with controlled ventilation: n50 value: ≤ 1.5 h⁻¹ (air changes/hour)

Canadian Super E Standard: n50 < 1.5 h⁻¹

NB n50 of 10 = Q50 of 10

END END OF SPECIFICATION CLAUSE GUIDANCE NOTES

P14 AIR/WIND TIGHTNESS VAPOUR PERMEABLE LAYERS JARGON BUSTER (GLOSSARY OF TERMS)

See also Jargon buster for preliminaries A94 Airtightness testing and A95 Infrared Thermographic surveys

AIR BARRIER

An air barrier comprises materials and/or components, which are air impervious or virtually so, separating conditioned spaces (heated, cooled or humidity controlled, usually inside), from unconditioned spaces (unheated, uncooled, humidity uncontrolled, usually outside).

(based on SEDA Scottish Environmental Design Association definition)

AIR CHANGES

A measure of the air exchange in a building.

One air change is an exchange of a volume of air equal to the interior volume of a building.

(Hastoe HA www.GreenStreet.org)

ACH AIR CHANGES/HOUR

See ACR

ACR AIR CHANGE RATE

The rate at which outside air enters a space divided by the volume of that space.

This is expressed as ACH (air changes/hour).

(SEDA Scottish Environmental Design Association)

AIR EXFILTRATION

The uncontrolled outward leakage of indoor air through cracks, discontinuities and other unintentional openings in the building envelope.

In winter the air is likely to be heated and heated air exfiltration will result in uncontrolled heat loss and potential interstitial condensation risk.

(SEDA Scottish Environmental Design Association, GreenSpec '09 & Ecological Building Systems '09)

AIR INFILTRATION

The uncontrolled inward leakage of outdoor air through cracks, discontinuities and other unintentional openings in the building envelope.

In winter the air is likely to be cold and cold air infiltration will result in uncontrolled draughts, leading to thermal discomfort and condensation risk.

(SEDA Scottish Environmental Design Association, GreenSpec '09 & Ecological Building Systems '09)

AIR LEAKAGE AUDIT

The inspection of materials and components, between conditioned and unconditioned spaces to try to establish where major discontinuities in an air barrier system might exist.

(SEDA Scottish Environmental Design Association)

AIR LEAKAGE INDEX

The leakage of air ($m^3 \cdot h^{-1}$) in or out of a building space, per unit area (m^2) of envelope (excluding ground floor area, except for non-ground supported lower floors) at a reference pressure of 50 Pa between inside and outside the building.

= $m^3/h/m^2$

(SEDA Scottish Environmental Design Association)

AIR LEAKAGE PATH(S)

A route by which air enters or leaves a building or flows through a component.

The air leakage path may not pass directly through an element but can also pass long its length or across its area, leaks in the external envelop can manifest themselves in more than one location and in any junction of external or internal construction.

Plasterboard is an example of an airleaky construction where air moves between walls and plasterboard and leaks out of electrical switches and sockets, around skirting, etc.

(SEDA Scottish Environmental Design Association & GreenSpec '09)

Holes through the building fabric through which air can pass, that can destroy the integrity of the fabric's acoustic, fire, thermal, wind, weather, water and air tightness performance.

The building fabric can be both internal construction or external envelop, air leakage paths can link them.

During the heating season, air passing through air leakage paths will carry heat, increase energy demand and increase the carbon footprint of the building and its occupants.

Air leakage paths will show up on InfraRed-Thermography images as an anomaly.

(GreenSpec '09)

AIR LEAKAGE RATE

The leakage of air ($m^3 \cdot h^{-1}$) in or out of a building space, per unit volume (m^3) at a reference pressure of 50 Pa

between inside and outside the building.
(SEDA Scottish Environmental Design Association)

AIR PERMEABILITY

The leakage of air (m³.h⁻¹) in or out of a building space, per unit area (m²) of envelope (including ground floor area) at a reference pressure of 50 Pa between inside and outside the building.
(SEDA Scottish Environmental Design Association)

AIR TIGHT ENVELOPE

This describes the state of the external faces of a building, it is vitally important that buildings are airtight to ensure no hot air escapes and no cold enters in the heating season making the building more expensive and fuel consuming than it needs to be to heat.

See U value Envelope
(GreenSpec '09)

AIRTIGHTNESS

Identifying and controlling air leakage is key to preventing energy losses through convection of warm air.
(based on Ecos Renews 17)

A term relating to the leakiness of a building.

The smaller the leakage for a given pressure difference across a building, the tighter the building envelope.

(based on SEDA Airtightness Guide definition)

A term referring to the airtightness of a building but describing the opposite, i.e. leakiness of a building.

An airtight building is one which does not lose either heated or cooled air to the outside in an uncontrolled manner.

The smaller the leakage for a given test pressure difference through the external envelope of the building, the tighter the building envelope.

Old buildings were designed to be leaky and it would normally be desirable for this to remain the case, for the health of the construction.

As we move towards zero carbon buildings air tightness and deliberate controlled efficient ventilation are deemed essential.

(BCT & GreenSpec '08)

Airtightness is also a precursor to increased vapour control reducing the incidence of interstitial condensation particularly in timber or lightweight structures.

(Ecological Building Systems '09)

AIRTIGHTNESS TEST & TESTING

The air tightness of a building can be ascertained during an air tightness test – sometimes known as a Blower Door-Test.

The building is pressurised and areas of air leakage are identified using smoke guns or other means.

This gives a measurement of air changes per hour within the building.

Identifying and controlling air leakage is key to preventing energy losses through loss of warm air or gaining of cool air.

(based on Ecos Renews 17)

Airtightness is also a precursor to increased vapour control reducing the incidence of interstitial condensation particularly in timber or lightweight structures.

(Ecological Building Systems '09)

AIRTIGHTNESS CHAMPION

In order for airtightness to be achieved it is important to give an individual within the construction team the role of championing the achievement of airtightness for the duration of the project; this need not be their only task but significant time must be allocated to the task at appropriate times.

Choose a person who is full time, based on site (it may be a site agent or a project manager)

They must be interested in achieving airtightness or has past experience; reluctance is unlikely to lead to good will or good results.

Duties include:

Liaison with Project design team's airtightness champion in design team meetings and on site.

Checking labour force for airtightness training or qualifications history

Organise any visits for "Upskilling for Airtightness" training

Facilitate or provide Airtightness tool box talks for airtightness and interface trades

Co-ordination of sequence, responsibilities and interface of trades on site

Development of checklists specific to project

Facilitate airtightness intermediate checking, formal testing and any retesting

Recording failures into checklist, report back to all interface trades

Checking remedial action is understood and carried out.

Managing all paperwork associated with airtightness champion tasks.

(GreenSpec '09)

AIRTIGHTNESS LAYER

A layer built into the external envelope of a building designed to minimise the movement of air through infiltration and exfiltration.

It may consist of a wide range of materials (for example, walls, plasters, floors, sealants, gaskets, glazing or membranes) and should be continuous to be effective.

The materials can be within a building element (e.g. walls or roofs) or at its surface but should be continuous to be effective.

Abutments between elements need to maintain the continuity.

(BCT & GreenSpec '08)

Air-tightness layers can be one of 4 types: vapour barrier (VB), breather membrane (BM), wind tightness layer (WTL) or air tightness layer (ATL).

Air-tightness layers can be vapour open (breather membrane, wind tightness layer or air tightness layer) or vapour closed (vapour barriers).

Typically, airtightness layers control the passage of air and vapour penetration from the heated space to the cold space using an appropriate vapour control layer

Wind tightness ensures air/wind penetration through the insulation is minimised from the outside reducing potential convective losses.

It also protects the building structure from moisture penetration from the outside, this is typically a breather membrane. (based on SEDA Scottish Environmental Design Association, GreenSpec '09 & Ecological Building Systems '09)

AIRTIGHTNESS LINE

Achieving airtightness is not just about workmanship on site it is a design issue, the airtightness is not about luck it is about designed intention; when designing a building it is essential that the designer determines the parts of the building forming the airtight line and to indicate them on the drawings as you would a damp proof membrane with a dotted line linking DPM in floors to DPC in walls.

Since airtightness is a new issue to builders as well as designer they need to know what they are trying to make airtight.

The methods and the materials used to make the airtightness line must be known, capable, designed, drawn and specified.

Then it's performance is determined by workmanship on site.

AIRTIGHTNESS TEST

The air tightness of a building can be ascertained during an air tightness test – sometimes known as a Blower Door-Test. The building is depressurised or/and pressurised and areas of air leakage are identified using smoke guns or other means.

This gives a measurement of air changes/hour within the building.

(based on Ecos Renews 17 & Ecological Building Systems '09)

The air tightness of a building can be ascertained during an air tightness test – sometimes known as a Blower Door-Test.

The building is depressurised or/and pressurised and areas of air leakage are identified using smoke guns or other means.

This gives a measurement of air changes/hour within the building.

(based on Ecos Renews 17 & Ecological Building Systems '09)

Air tightness testing is a method of measuring the extent to which air is lost through leaks in the building.

Air tightness testing can also be referred to as air leakage testing or air pressure testing.

The testing to measure the air leakage rate from a building is usually based on a standard 50 Pa reference pressure difference.

Current Building Regulations require a test pass rate of 10, it is expected that the pass rate will reduce with each revision of the Building Regulations.

Testing should occur on the building shell before claddings, linings and finished are applied.

(BCT & GreenSpec '08)

BATTENS & NOGGINS

Small timber sections with numerous purposes in relation to windtightness and airtightness membranes and timber framed constructions.

Normally provided by the timber framing carpenter, but requiring some co-ordination between the carpenter and the following trade making use of them to ensure there are enough and they are in the required location or are fixed loosely to enable repositioning.

Material choices from an environmental perspective we recommend the following order of preference: Reclaimed, locally grown or FSC temperate softwood

SOFTWOOD NOGGINS

Usually associated with partitions and ceilings, additional sections trimming opening and providing support for fixtures or in the case of membranes to provide support at lap joints.

Provides support to laps in membranes otherwise unsupported by framing

Provides support for pressure & support battens

Protects from wind pressure buffeting and premature failure of membranes

It is not essential to provide support at all lap joints, an adequate joint can be achieved by ensuring the membrane is taught between supports, using the pressure application tool to ensure a good bond.

PRESSURE BATTENS:

Usually associated with membranes subject to external wind pressure and internal wind pressure buffeting.

Provides additional security at the points or runs where the membrane is subject to maximum tensions and stress.

The batten is applied over the lap joints and fixed through the lapped membranes to the timber structure framing or noggins below, to provide mechanical retention and compression on lapped and sealed joints

SUPPORT BATTENS:

Usually associated with timber or metal framed stud walls, blown-in insulation fills the stud zone and weight of heavy insulation at high level pushes down on insulation at low level, pressure can be exerted upon the membranes, the battens resist the pressure.

SERVICE ZONE BATTENS:

Usually associated with timber framed construction and breathing walls where to avoid services penetrations through membranes and reduce risk of potential penetration of airtightness layer by fasteners, a space is created inside of the airtightness layer (or vapour barrier) for services (traditionally running vertically but potentially running horizontally) and internal linings are fixed to these battens.

TILING/SLATING BATTENS & COUNTER-BATTENS:

Battens used to support and secure pitched roof or vertical hanging of tiles, slates, shingles or shakes; potentially having a secondary function of securing wind tightness and underlay membranes acting like pressure battens.

Counter battens are used on top of boarded roofs and followed by battens.

(GreenSpec '09)

BLOWN-IN INSULATION

Insulation pumped or blown into cavities during construction, can be renewable fibrous materials like recycled paper blown into timber frame or non-renewable foamed into masonry wall cavities

There are two types of recycled paper application, dry or with added moisture (like papier mache), and two methods, blown at open casset panels against backing board and between studs or through a hole in the outer lining at the top of the stud zone.

See Specification work section P11

(GreenSpec '09)

BREATHER MEMBRANE (BM)

A water-resistant sheet which allows transmission of water vapour (usually outwards), but which provides resistance to air-flow (usually outwards)

(based on SEDA Scottish Environmental Design Association)

Used in roof construction roof tile underlay or in wall construction as a damp proof membrane in rainscreen construction or behind timber weatherboarding.

Restricting air flow also reduced heat loss or coolth gain when the air can carry heat away.

A breather membrane is always located on the cold side of the thermal insulation.

Breather membranes are essential against open pore insulation against ventilated cavities

Partially insulated masonry cavity walls using glass rock or slag fibre insulation without a breather membrane waste heat to the cavity ventilation and stack effect in the cavity when the wall is heated by the sun.

In Austria a breather membrane will be used in a masonry cavity wall with partial fill insulation where the insulation is of an open fibre material.

See Wind tightness layer

A breather membrane is always located on the cold side of the thermal insulation.

(GreenSpec '09)

It is always recommend that the construction should be as diffusion open as possible on the outside and as diffusion tight as necessary on the inside.

(Ecological Building Systems '09)

Often forms part of the Air-tightness layer.

(BCT & GreenSpec '08)

BREATHING CONSTRUCTION: ROOFS

Diffusion Open (diffusion open) construction applies to timber framed roof construction where air resistant roofing underlay are not used but replaced with an wind tightness layer externally, this permits outward passage of vapour out of the construction.

Eaves ventilation can be omitted in this construction.

See Diffusion Open

(GreenSpec '09)

BREATHING CONSTRUCTION: WALLS

Breathing construction applies to timber framed wall construction where vapour barriers are not used but replaced with an airtightness layer internally, this permits passage of vapour into the construction, this is supplemented by a breathing sheathing board in the outside permitting egress of the vapour from the construction outwards.

Hygroscopic insulation needs to be used in breathing wall construction as it will be subject to higher moisture content than with conventional timber frame construction; it will absorb moisture from the air spaces that normally provide the insulation function, into the material's fibres without loss of thermal performance and be held until conditions permit evaporation and passage to the exterior air.

See Diffusion Open
(GreenSpec '09)

It is recommended that the construction should be as vapour diffusion open as possible on the outside and as vapour diffusion tight as necessary on the inside to minimise condensation risk and maximise the drying that can occur in the event of moisture entry into the construction.

(Ecological Building Systems '09)

BUILT IN INSULATION

Insulation batts built in during construction (not pumped or blown in material).

See Specification work section P10

(CC Publication: Concrete and Sound insulation & GreenSpec '09)

CE MARK

Previously known as the EC Marks but the graphic presentation was CE so it got renamed

It is used by manufacturers to indicate their products comply with relevant EU directives or national interpretive regulations, from children's toys to computers, in the case of the construction industry the Construction Products Directive and Regulations and then to the Building Regulations: Regulation 7.

It is not a quality mark like BSI Kitemark or BBA Certificate but it is a Proper Material under Regulation 7

(GreenSpec '09)

CONDENSE

When a gas such as water vapour (steam) changes to liquid it is *condensing*, when it has become water it has been *condensed*.

(Cherrington '95)

CONDITIONED ZONE

The occupied zone in a building requiring heating, cooling or humidity control and normally bounded by an airtightness layer.

(based on SEDA Scottish Environmental Design Association definition)

DIFFUSION OPEN

Wind-tightness layers is generally a diffusion open (breather membrane or wind tightness layer).

If integrity is achieved air does not pass through but a minute amount of moisture vapour can.

(GreenSpec '09)

It is recommended that the construction should be as vapour diffusion open as possible on the outside and as vapour diffusion tight as necessary on the inside to minimise condensation risk and maximise the drying that can occur in the event of moisture entry into the construction.

(Ecological Building Systems '09)

DIFFUSION TIGHT

See Air-tightness layers

Air-tightness layers can be diffusion tight (vapour barriers or vapour control layers).

If integrity is achieved air does not pass through but a minute amount of moisture vapour can.

(GreenSpec '09)

It is always recommended that a suitable vapour control layer should be applied on the warm side of the insulation layer.

(Ecological Building Systems '09)

DRAUGHT

Excessive air movement within the conditioned zone, which may cause discomfort.

The draughts may occur through air leakage paths through the building envelope resulting in heat loss or cooling gains and may cause thermal discomfort.

(SEDA Scottish Environmental Design Association & GreenSpec '09)

DRAUGHT-TIGHTNESS DRAUGHT-PROOFING

Filling gaps between opening parts of components and their frames e.g. window, rooflights and doors.

(based on SEDA Scottish Environmental Design Association definition)

Often achieved with EPDM extrusions stapled into frames or to casements, the corner details are critical, mitred and welded joints are critical to success.

(GreenSpec '09)

DRYLINING:

Plasterboard drylining on the inside face of external masonry walls was introduced to replace plaster as a dry

construction trade, it is also used on timber or metal stud framework in external walls, partitions and ceilings, however it creates zone for air movement behind the board and is notorious for being a poor performer for airtightness.

A plaster skim coat on plasterboard lining may make the plasterboard lining airtight but leaks in the external wall feed into the drylining cavity and the perimeter boundary of the plasterboard leaks the air at skirting and ceiling level into other voids.

See Parge Coat
(GreenSpec '09)

ENVELOPE

This includes the external walls, pitched shallow and flat roof and the ground supported floor or suspended upper floors over open spaces and corridors

(based on SEDA Scottish Environmental Design Association definition & GreenSpec '09)

ENVELOPE AREA

The boundary or barrier (in m²) separating the interior volume of the building from the outside environment.

This includes the area of the external walls, roof and depending upon the air leakage parameter specified the area of the ground supported floor.

(SEDA Scottish Environmental Design Association)

EVAPORATION

Water at elevated temperatures will change phase and change to a gas as steam, in doing so it will consume heat energy from the water.

Porous building materials in walls can absorb moisture during inclement weather and heating of the building will evaporate that absorbed moisture, in doing so a considerable amount of energy is consumed, with well insulated buildings, the amount of energy used in drying the building will prevent achieving and maintaining zero carbon buildings.

(GreenSpec '09)

EXPANDING FOAM ADHESIVE/FILLER/SEALANT

Seen as a magic solution to many difficult details, these 'foams from a can' solutions are often bad environmentally and for the health of the user, check the back of the can.

They use foaming agents that were or may still be bad for the ozone layer, may contain solvents, check the contents, health hazard label and the health and safety data sheet.

The problem with any materials used for airtightness is that they need to bond to the surfaces they touch, but since they are often used in inaccessible voids the surfaces are unlikely to be cleaned, dust free, dry or primed and so will be impossible to stick to.

Once the foam has passed the airtightness test they will shrink and pull away from surfaces and be airleaky again.

(GreenSpec '09)

FAN PRESSURISATION TEST

A method of testing air leakage of a building.

It allows airflow and pressure difference across the envelope to be measured and an estimate of leakage to be obtained.

(SEDA Scottish Environmental Design Association)

FLANKING ELEMENT

Any building element e.g. flanking wall, that contributes to the airborne sound or impact transmission between rooms in a building and which is not the direct separating element (i.e. not the separating wall or separating floor).

(CC Publication: Concrete and Sound insulation)

GROMMET

The name of a popular plastercine pet dog owned by Wallace, made famous by Nick Park the animator.

Grommets are also used in airtight construction associated with membranes.

These are square sheets of EPDM rubber with a central hole that stretches and fits tightly around a pipe or cable that passes through an airtightness membrane.

(GreenSpec '09)

HEAT LOSS

The amount of heat lost through the building envelope, e.g. walls, windows, doors, roof, rooflights, floors.

(Hastoe HA GreenStreet.org)

HUMIDITY

When liquids evaporate they turn to a gas, or steam in the case of water, if ventilation does not remove the steam from the air the steam will saturate the air and the conditions experienced by humans in these conditions are described as humid.

Humidity is measurable and quoted as Relative Humidity and stated as a percentage. E.g. 75% RH

It is relative humidity due to the difference that air pressure can make to the level of moisture that can be carried by the air.

(GreenSpec '09)

HUMIDITY VARIABLE

Intelligent system membranes are ones that are diffusion open but the level of openness varies according to the humidity level.

(GreenSpec '09)

INFILTRATION

The uncontrolled movement of outdoor air into the interior of a building through cracks and gaps.

The gaps are usually found around walls, joints, windows, doors, roofs, etc.

(Hastoe HA GreenStreet.org)

INFILTRATION RATE

The rate at which outside air infiltrates a building or a room under natural meteorological conditions (normally expressed in air changes per hour or litres per second)

(based on SEDA Scottish Environmental Design Association definition)

INFRARED CAMERA

A camera sensitive to the infrared part of the spectrum, which can be used to 'see' locally cooled areas on the internal surfaces or heated areas on internal and external surfaces of the envelope of a building.

(based on SEDA Scottish Environmental Design Association definition)

INTELLIGENT SYSTEMS

In Europe a number of manufacturers have developed diffusion open airtightness membranes with properties that vary according to the humidity; these have been described as intelligent systems, despite having no brain like intelligence.

The terminology has been adopted at a generic level and by association is now accepted.

The UK has yet to adopt the term, but with 'Intelligent systems' available in the materials market this should follow.

(GreenSpec '09)

Intelligent vapour checks are characterised as having a variable vapour resistance depending on the average humidity immediately surrounding the membrane. If the average humidity surrounding the membrane is high, it's vapour resistance decreases, whereas if the average humidity is low, it can increase dramatically.

In this way, Intelligent membranes can provide effective vapour tightness or vapour openness when required, increasing the drying potential of constructions.

Pro clima Intello Plus is the world's highest performing Intelligent vapour check as it can alter its vapour resistance by over 50 times depending on climatic factors surrounding the membrane.

(Ecological Building Systems '09)

K KELVIN

Centigrade is the scale adopted in the metric world for temperature: at 0 degrees water freezes, at 100 degrees water boils. '3 degrees centigrade' is specific temperature, close to freezing point. 3 degrees of difference e.g. between 0 and 3 degrees has been called '3 centigrade degrees' but for clarity and avoidance of doubt Kelvin has been adopted.

U Values are now expressed as 0.5 W/m².K

(GreenSpec '09)

LIQUID

The natural state of water between 1 and 99 degrees centigrade at sea level air pressures.

(GreenSpec '09)

MINIMUM VENTILATION REQUIREMENT

The minimum quantity of outdoor or conditioned air which must enter a building to maintain an acceptable indoor air environment for occupants.

(based on SEDA Scottish Environmental Design Association definition)

MOISTURE

MOISTURE RESISTANCE & PERMEABILITY

Cement is impervious to moisture and when used in mortar or render can prevent moisture absorption and release by evaporation from surfaces.

Lime on the other hand is permeable to moisture and will allow moisture evaporation from masonry and rendered walls.

(GreenSpec '09)

MVTR MOISTURE VAPOUR TRANSFER RATE

See VAPOUR DIFFUSION RESISTANCE & VAPOUR BARRIER/CHECK

(GreenSpec '90)

NATURAL METEOROLOGICAL CONDITIONS

Wind is generated by differences in air pressure.

High pressure is normally associated with warmer weather and low pressure normally associated with colder weather. Different air pressures also have an effect upon the relative humidity of the air.

Wind pressure on buildings will exert positive pressure on the leading elevation, and negative pressures on the side and leeward elevations, negative pressures on flat roofs and positive pressures on pitched roofs.

These pressure differences lead to air movement through air leakage paths, drawing air and heat or coolth.

Depending on the height of a building and the air flow around its surfaces, eddie currents can be set up at corners between the leading and side elevations and wind speed at the ground can be greater that the wind speed hitting the building at height.

Solar heated air is more buoyant than colder air and will rise to

(GreenSpec '09)

NATURAL VENTILATION

The movement (caused by wind, temperature and air pressure differences) of outdoor air into or through a building, room or space, through intentionally provided openings, such as windows, rooflights and doors and non-powered ventilators on more than one side of the building, room or space.

(based on SEDA Scottish Environmental Design Association definition)

NATUREPlus

NaturePlus is a product testing and endorsement label scheme based in Germany and increasingly adopted in countries across Europe.

Its criteria for success are based around natural content and indoor air quality.

(GreenSpec '09)

Pa PASCALS

Pascal is the scale adopted in the metric world for air pressure

Airtightness is expressed as $x \text{ m}^3/\text{hr}/\text{m}^2 @ 50 \text{ Pa}$

(GreenSpec '09)

PASSIVHAUS

PassivHaus Institute in Germany have developed a design standard for very low energy consumption buildings.

It combines very low U value building fabric and windows, high levels of airtightness, low level mechanical ventilation and high efficiency heat recovery and exploits the heat generated by humans, pets, cooking, equipment and appliances.

This design standard was developed for housing but has been adopted for other non-domestic building types.

It focuses on energy efficiency rather than carbon focussed targets unlike UK policy.

It has been interpreted for a UK climate and mains energy mix by AECB Carbonlite programme and in their scheme is seen as an equivalent of Code for Sustainable Homes level 5 (energy only).

Its use in the UK as a readymade solution is gaining ground and proving popular with Architects.

Passivhaus also has a product certification scheme for manufacturers addressing many components, e.g. windows and doors, whole buildings and even permanent formwork which helps achieve airtight concrete construction.

Passivhaus addresses indoor air quality by mechanical ventilation rather than choice of materials in construction.

PHPP PassivHaus Planning Package is the software used to verify PassivHaus compliance.

Passivhaus Institute Germany:

Product Reference: PHPP Passivhaus Planning Package

W www.passivhaus.de

See CarbonLite

W www.carbonlite.org.uk

(GreenSpec '09)

PA POLYAMIDE

In the form of sheets is used in making vapour barriers or vapour control layers

Product name: Nylon

(GreenSpec '09)

PARGE COAT

A single base coat of plaster applied to the inside face of masonry walls to achieve a level of air tightness before applying plasterboard drylining.

Ironically plasterboard was introduced to eliminate wet trade plaster, parge coats reintroduce them.

See DRYLINING,

(GreenSpec '09)

PCM PHASE CHANGE MATERIALS

Materials that readily change from solid to liquid, liquid to gas, gas to liquid or liquid to solid

In this example the material has 3 phases

This phase change is usually associated with introducing or withdrawing heat, ice + heat = water, water + heat = steam, steam – heat = water, water – heat = ice

Some materials have greater capacity to absorb and release heat, e.g. wax

Use of phase change materials allows heat from a space to be absorbed by the PCM and be stored away and later when the space becomes colder the heat can be released from the PCM back into the space.

To exploit the phase change capability the PCM should be spread thinly over large areas to absorb and release the heat over a large surface area.

Phase change materials can be used in room linings e.g. wall and ceilings; lining boards have been developed, e.g. plasterboard containing wax and metal double skin panels containing wax.

PCM can also be used in bulk with integrated heat exchange pipes to store heat collected in one time period for use in a later time period e.g. Solar panels can collect heat in the day, store the heat in PCM and heat can be released in to a room in the evening or at night.

(GreenSpec '09)

PE POLYETHYLENE

(Proprietary Name: Polythene)

(Envirowise Packaging & Waste)

In the form of sheets is used in making vapour barriers or vapour control layers

(GreenSpec '09)

PHPP

See PassivHaus

(GreenSpec '09)

POLYOLEFINS

A collective name for Polyethylene and Polypropylene

(GreenSpec '09)

PP POLYPROPYLENE

In the form of sheets is used in making vapour barriers or vapour control layers

(GreenSpec '09)

PRESSURE BATTENS:

See BATTENS & NOGGINS

(GreenSpec '09)

PVAC POLYVINYL ACETATE:

A water dispersible adhesive, primer, sealer.

RD ROBUST DETAIL

A Robust Detail for Building Regulation Approved Document 'Part' E has been given the status of RD following a minimum of 30 'field tests' where the recorded mean performance was at least 5 dB better than the sound insulation requirements as described in Approved Document E for new build separating walls and floors.

(CC Publication: Concrete and Sound insulation)

RELATIVE HUMIDITY

Humidity is measurable and quoted as Relative Humidity and stated as a percentage. E.g. 75% RH

It is relative humidity due to the difference that air pressure can make to the level of moisture that can be carried by the air.

(GreenSpec '09)

ROBUST DETAILS LTD.

The company set up to administer the Building Regulation Approved Document 'Part E' Robust Details scheme.

(CC Publication: Concrete and Sound insulation)

SECONDARY ELEMENTS

Construction classification keywords used in information libraries, meaning: elements within primary elements, e.g. windows and doors in external walls, rooflights in roofs, stairs between floors.

(GreenSpec '09)

SERVICE ZONE BATTENS:

See BATTENS & NOGGINS

SMOKE TEST

A building (or parts of it) is filled with smoke using smoke machines and then pressurised to force the smoke through gaps in the building envelope.

(based on SEDA Scottish Environmental Design Association definition)

SMOKE TUBE/PENCIL/WAND/GENERATOR

A hand held device which produces smoke in small quantities for more specific identification of leakage paths within a building under depressurisation, or under natural infiltration.

(based on SEDA Scottish Environmental Design Association definition & GreenSpec '09)

SOFTWOOD NOGGINS

See BATTENS & NOGGINS

SPORES

Ever present airborne microscopic living material often associated with mushrooms and other fungi they are dispersed from fruiting bodies and carried on the winds and deposited on surfaces everywhere.

If the surfaces are moist through condensation, the spores can start to grow and form moulds which in turn can develop into rot that can feed off cellulose in timbers causing decay and structural failure.

Humid warm conditions are good for mould growth once the moulds have developed they too can be dispersed.

Spores are breathed into lungs and can cause asthma.

Controlling humidity and avoiding condensation are paramount to healthy living conditions.

(GreenSpec '09)

STACK EFFECT

Air or gas generally rises in a duct, or vertical passage, when heated.

This is due to its lower density compared with surrounding air or gas.

Passive ventilation works on these principles drawing warm moist air out of rooms.

(Hastoe HA GreenStreet.org)

Vertical air movement through a building caused by differences in the density of air due to temperature differences between the air at higher and lower levels of the building and if venting to the exteriors, between air inside and outside of the building.

Air leakage paths or openings are required to permit air in to replace air leaving the building.

(based on SEDA Scottish Environmental Design Association definition)

Some lateral movement will be induced to feed the stack effect, thus ventilation of spaces adjacent to tall spaces can be achieved.

Air leakage paths or openings are required to permit air in to replace air leaving the building.

(GreenSpec '09)

SUPPORT BATTENS:

See BATTENS & NOGGINS

TEEE THERMOPLASTIC ETHER ESTER ELASTOMER

Used in monolithic nonporous membranes

(GreenSpec '09)

THERMAL BREAK

Unwanted heat loss or gain occurs due to conduction through a thermal bridge.

To reduce or prevent this heat loss or gain a thermal break is included in the construction in the line of the thermal bridge.

Thermal breaks need to have greater thermal resistance or lower thermal conductivity than the thermal bridge and ideally by a considerable margin.

Thermal breaks are used in window sections, external doors, curtain walling, at floor edges and between floors and cantilevered balconies.

(GreenSpec '09)

THERMAL BRIDGE

Unwanted heat loss or gain occurs due to conduction through a material.

This can lead to significant energy losses and may also result in the build up of condensation.

An example of thermal bridging is heat loss that occurs due to metal wall ties or steel framing that is insufficiently insulated between areas of temperature differences e.g. the internal and external environment.

(based on Ecos Renews 17)

THERMAL BYPASS

There are many forms of thermal bypass and these are discussed in considerable detail in Green Building Magazine Building for a future Summer 2009 Vol 9 No.1, Pages 16 – 23.

Where heat may bypass insulation by escaping into cavities and moving through air spaces

One significant example: Cavity walls in separating walls (party walls) between housing in terraces or between flats in blocks are known to be poorly insulated (No Building Regulation Approved Document L requirements) heat escapes into the cavity and rises to the top floor or attic and escapes through roof tiling or into attic spaces.
(GreenSpec '09)

THERMAL EMITTERS

Where the geometry of the building profile encourages greater heat loss by radiating from a large surface area at the outside of a thermal bridge.

e.g. Flat roof balconies above flats below, Pavement over basement accommodation, Flats over access balcony walkways.

See Thermal Radiators.

(GreenSpec '09)

THERMAL FLANKING

Where heat may take a longer route around insulating construction via a thermal bridge.

(GreenSpec '09)

THERMAL MASS.

Materials with high thermal mass include masonry, rock and water.

These materials are capable of absorbing and retaining heat e.g. from the sun, and slowly releasing the heat back into the building when internal space temperature falls.

(Ecos Renews 17 & GreenSpec '09)

THERMAL RADIATOR

(not central heating radiators)

Where the geometry of the building outside of a thermal bridge encourages greater heat loss by radiating from its large surface area

e.g. cantilevered concrete balcony or walkway

See Thermal Emitters

(GreenSpec '09)

THERMAL STORE

A thermal store is a structure typically made from a material with high thermal mass.

In sustainable building, thermal stores are used as a passive means of maintaining a constant internal space temperature, therefore reducing the need for mechanical heating and cooling.

These stores are often designed to be part of the internal fabric of the building, usually in the form of a high density wall situated near a heat source or in view of solar gains.

(Ecos Renews 17 & GreenSpec '09)

THERMODYNAMICS

The physical science of heat flow.

In engineering, this is mainly with respect to heat flow in fluids and fluid processing.

(Cherrington '95)

THERMOGRAPHY

The use of cameras sensitive to infrared radiation to identify differences in thermal performance in the envelop of the building.

These can later be analysed and to help identify thermal bridges and air leakage paths through gaps and cracks in the building.

(based on SEDA Scottish Environmental Design Association definition)

TILING/SLATING BATTENS & COUNTER-BATTENS:

See BATTENS & NOGGINS

U VALUE

This is a measure of heat loss through the fabric of a building.

U values are measured in W/m².K

(Hastoe HA from www.GreenStreet.org corrected by GreenSpec)

U-values apply to any material where thermal performance is important.

U-values give a measure of air-to-heat transmission (loss or gain) due to the thermal conductance of the material e.g. from inside to outside a building.

The lower the U-value the lower the material's thermal conductance and the better the material performs to resist heat loss or heat gain through the fabric of the building.

(based on Ecos Renews 17)

The Building Regulations & Approved Document L "Part L" and Code for Sustainable Homes dictates the maximum U value of elements of buildings designers can improve on these minimum

(GreenSpec '09)

Elements of construction are made up of numerous materials of different thicknesses and different insulating characteristics, even air spaces within the layers and at the surface of the elements have insulating characteristics. Surface resistances, material thermal resistances and thicknesses are multiplied, totaled up and inverted to give a U value which is used by designers to show compliance with the Building Regulations and to determine how big boilers and radiators need to be to warm the building and occupants.

The lower the U value the less energy is needed to heat the building and the lower the CO2 emissions.

(BCT & GreenSpec '08)

U VALUE ENVELOP

Coined at a BCT (Bat Conservation Trust) event for simplicity usually consists of all the parts of the external envelop of the building keeping the heat in and the cold out.

Consists of roof (pitched shallow or flat roofs) or roof terraces and recessed balconies, external walls, ground/basement floor (suspended or ground bearing) and doors, windows and rooflights.

Occasionally there are also soffits to projecting or bridging rooms over drives and passageways or soffit of suspended ground floors.

Each part will contain structure, thermal insulation, weather or rinsing damp barriers, wind tight & airtight barriers or vapour barriers and breather membranes to make sure the insulation works well and for the life of the building without gaining moisture which may affects its performance.

Occasionally the U value envelope is not the external weather envelop, for example the flat ceiling below a pitched roof, in this case the insulation is at ceiling level the attic is allowed to be cold in winter and hot in summer.

If there is a water storage cistern in the attic the U value envelop needs the ceiling insulation to wrap up and over the cistern.

Walls between the house and integral garages also have lesser requirements to external walls, since the garage door is less likely to have a good U value this wall should be the U value envelop and be the same as an external wall.

(GreenSpec '09)

UNVENTILATED ROOF SPACE

A slightly confusing term in common use in the industry.

Small triangular ventilated spaces may still occur at eaves and ridge.

Ventilation must occur to prevent rotting of timbers but this ventilation occurs as air passes through a (usually) 50 mm ventilation zone under the battens and over the insulation (with or without breather membrane or sarking boarding).

The roof space is inside of the insulated and air-tight envelope, where the loss of warm air is minimal.

Most roofs with or without vapour barriers need to have purposeful and energy efficient ventilation from the occupied space to the exterior to remove moisture build up.

(BCT & GreenSpec '08)

VAPOUR

Usually associated with water: (water vapour), water at an elevated temperature evaporates and turns to a gas, this higher temperature gas contains high levels of moisture and if allowed to cool can condense.

If vapour can enter construction and then be cooled by construction materials, insulation or over time it can condense and deposit the water in the construction materials (interstitial condensation).

Water in construction can activate ever present spores (airborne microscopic living material) once these are moist they can start to grow mould which if left uncontrolled in turn can cause asthma and in extreme cases death, also making the buildings hazardous to enter, demolish and dispose of.

Moist conditions and these moulds can lead to timber structures becoming infested by dry rot or wet rot that digest the timber cells leading to weakening and ultimately to failure of the timber if structural.

(GreenSpec '09)

VAPOUR BARRIER

A construction material impervious to the flow of moisture and air.

Used to prevent condensation around insulation in buildings.

(Hastoe HA GreenStreet.org)

See VAPOUR DIFFUSION RESISTANCE

VAPOUR CHECK

Since little care is often given to design, specification and workmanship in vapour barriers they often do not achieve objective i.e. integrity, due to leaky joints or low performance materials.

In the UK the term 'vapour check' was adopted to describe a partial vapour barrier or to reducing but not stopping the passage of vapour.

(GreenSpec '09)

See VAPOUR DIFFUSION RESISTANCE

VAPOUR CONTROL LAYER

A layer impervious to water vapour and usually enclosing an occupied space.
(based on SEDA Scottish Environmental Design Association definition)
It is always recommend that a vapour control layer should be applied on the warm side of the insulation layer.
(Ecological Building Systems '09)

VAPOUR DIFFUSION RESISTANCE & VAPOUR BARRIER/CHECK

μ value is the vapour resistance factor of a material (see also IS EN 12524).

d is the thickness of a layer.

sd is the equivalent air layer thickness

i.e. a vapour barrier with an sd of 1500 m is equivalent to 1500 m thickness of still air in terms of vapour resistance and is calculated as follows :

$$sd [m] = \mu \times d [m]$$

vapour check: $0.5 \text{ m} < sd < 1,500 \text{ m}$

vapour barrier: $sd > 1,500 \text{ m}$

(BRE IP 2/05 Modelling and Controlling Interstitial Condensation in Buildings. 2005)

VENTILATED ROOF SPACE

A roof space, where ventilation occurs via purposeful gaps at the eaves and the ridge of the roof structure.
Flat roof are also ventilated at their perimeters.

(BCT & GreenSpec '08)

VENTILATION

Supplying, moving or removing air, by natural or mechanical means, to, through or from a space or building.
(based on SEDA Airtightness Guide definition)

VENTILATION

Supplying, introducing, moving or removing air, by natural, passive, active or mechanical means, to, through or from a space or building.

(based on SEDA Scottish Environmental Design Association definition)

WIND TIGHTNESS LAYER

A wind tight layer which allows transmission of water vapour, but which provides resistance to air-flow
Used in roof construction roof tile underlay or in wall construction as a damp proof membrane in rainscreen construction or behind timber weatherboarding.

It is used to ensure that the thermal insulation in the construction can perform to the optimum level.

Ventilation air in voids ensures the moisture levels to not build to levels where moisture sets off moulds and rot, but air movement across open fibre materials will draw heat out of the insulation's surface and cool the building.

(GreenSpec '09)

A wind tight layer is generally located on the external side of the thermal insulation layer.

(Ecological Building Systems '09)

W Watt

A unit of power, measuring the rate of flow of electricity or heat energy

(Hastoe HA GreenStreet.org and GreenSpec 09)

WUFI

Computer assisted simulation programme for heat and humidity transports (dynamic) to BS EN 15026

W www.wufi.de

(GreenSpec '09)

Appendix/Clause(s) on previous page(s)

NB: NOTES ON EDITING SPECIFICATIONS:

Use as [guidance, a stand alone appendix or merge into work section](#).

Delete all of the Information on this and other pages of guidance notes, excluding the page break above, down to the end of **NBS** compatibility URLs (website addresses), when adding this work section or clauses to a project specification or purchase order.

Edit the clauses by selecting the clauses required, deleting any not required, by editing the [\[blue text which often describes options available\]](#) within square brackets to suit the project; or edit the specification to suit the procurement method.

Remove all square brackets using search for [and replace with nothing and search for] and replace with nothing.

Replace [blue text](#) with black text by selecting all and choosing auto or black colour text.

There are clauses in Red text in the Specification these are examples of project specific versions of the generic clauses that are included for guidance and are likely to be deleted or edited if they are useful to the project.

Remove any grey tone by selecting all text, and select Format > Borders and Shading > Shading > No fill > Okay.

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REV REVISIONS

Revision No	Description	Author	Date	Checked by
A00	For Preliminary Issue Draft clause for DB+ for Construction Resources Clause used in numerous project specifications	BRM	08/09/2008	Never completed by CR
A01	Complete rewrite for Ecological Building Systems Many clauses for 3 membranes and all accessories. Workmanship clauses and Guidance Notes First issue for comment	BRM	11/05/2009 - 13/05/2009	
A02	Text revisions throughout Added Intello & Intello plus text for comparison highlighting differences for new clauses Added Intello & Intello plus text for General guidance notes Restructure and renumber as separate work section P14	BRM	19/05/2009 - 02/06/2009	
A02	Added Solitex SD & Solitex Plus text Other membranes added Added information from samples Created Appendix in file & literature Clauses renumbered throughout and Cross referencing completed Terms and conditions added Further information from material data sheets Ecological Building Systems commissioned clauses boxed	BRM	02/06/2009 - 07/06/2009	
A03	Training opportunities added Added other airtightness components Added Jargon Buster and emailed in separate file to P & N @ Ecological Building Systems UK Ltd. Change file name from P10_300A_SC_ProClimaDB+.doc: to P14_SWS_Airtightness_Working.doc Meeting 11/06/09 feedback substantially complete Prioritize Intello Plus, keep 3 Plus(s) and omit others (incomplete)	BRM	09/06/2009 - 16/06/2009	
A04	Mark up from meeting 30/06/09 Updating from PennyFeedback170709 email Updated from NiallFeedback070709 email Additional airtight socket insert Jargon Buster updated from A94, A95 & P14 Jarbon Busters Update from new brochure. Removed surplus text from old brochures and website Moved Jargon Buster to end	BRM	17/06/2009 - 27/07/2009	
A05	Rearrange clauses in order and revise Update Jargon Buster Merge in feedback from: NiallFeedbackEmail130809.html and P14_SWS_Airtightness_A04_270709Niall.doc Other completions Save copy	BRM	02/08/2009 - 19/08/2009	

A06	Remove all single strikethrough text Remove grey tone	BRM	19/08/2009	
A07	Pro clima UK mainland products only Edited down to Ecological Building System's Specification only Red Text to Black Remove paragraph boxes Issue to Ecological Building Systems	BRM	19/08/2009	
A08 from A06	Feedback from NC mark up Add 3 more accessories to Ecological Building Systems set. Cross reference check Removed all grey tone Removed red text where safe to do so	BRM	21/08/2009	
A09	Pro clima UK mainland products only Edited down to Ecological Building System's Specification only Remove paragraph boxes Issue to Ecological Building Systems	BRM	21/08/2009	
A10	Feedback from emails and marked up attachment from NC @ Ecological Building Systems EBS in full, Scope boxes updated, other updates Stripped down to basics remainder of file from www.GreenSpec.co.uk	BRM	28/08/2009	
Pending	Split file			
B00	Reviewed, post on Website			

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1.3 The specification clauses in this document (the 'Information') are based on past project work, information gathered from seminars, workshops and assimilated from published or unpublished verbal and written information.

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4 General

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4.2 This Agreement is covered by the Laws of England and Wales.

Addenda

NBS compatibility

National Building Specification (NBS) is the industry standard specification library.

GreenSpec's Green Building Specification (GBS) is designed to complement NBS.

GreenSpec clauses are written specifically to address issues of environmental sustainability.

NBS adopts and develops the Construction Project Information Committee's (CPIC) classification system Common Arrangement of Work Sections (CAWS) 1998 edition.

GBS adopts and develops the CPIC and NBS versions of CAWS to enable integration into NBS-based specifications.

GBS adopts NBS clause numbering to provide for easy clause assimilation.

CPIC: www.productioninformation.org/

CAWS: www.productioninformation.org/CAWS.asp

Proposed changes: www.productioninformation.org/cawsuni/topcawsuni.asp

NBS: www.thenbs.com/