



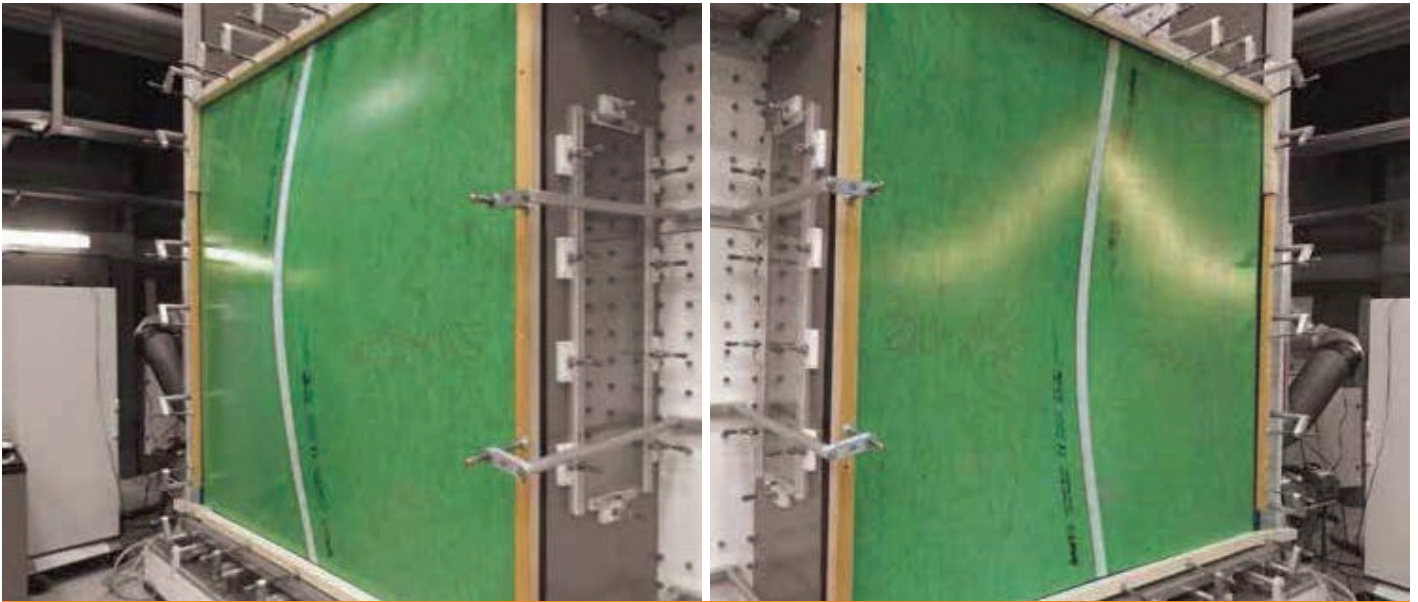
**CERTIFIED
COMPONENT**

Passive House Institute

SMARTPLY AIRTIGHT OSB MANUAL

SMARTPLY[®]
DEFINING THE STANDARD OF OSB

SMARTPLY® AIRTIGHT



Taped panel assembly tested beyond 2000 Pa of positive and negative air pressure - Fraunhofer Institute of Building Physics

SMARTPLY AIRTIGHT is a Passive House Institute certified airtight OSB panel with integrated vapour control layer for use as structural sheathing in timber frame structures.

Applications

A patent is pending for SMARTPLY AIRTIGHT. Airtightness is engineered into the OSB panel substrate, whilst SMARTPLY's in house speciality surfacing technology provides an integrated vapour control barrier with consistently high vapour resistance over the entire surface. The coating also provides a smooth durable surface for superior bonding of airtight tape at panel joints. SMARTPLY AIRTIGHT provides a sustainable and robust alternative to specialist AVCL membranes which are prone to damage by site trades during the construction process. The product is suitable for both new build and renovation projects.

Features And Benefits

Explanatory notes:

- The most important feature is that the SMARTPLY AIRTIGHT is certified airtight; followed by integrated vapour control layer (industry terminology); followed by structural performance
- Insulation removed in these details for clarity. Also screws shown for demo purposes only. A demo wall model was used for photographing the details
- All tapes used for the purpose of this installation instructions manual are generic and unbranded - user to select preferred tape system following specification guidelines in Appendix 1
- SMARTPLY would like to acknowledge the assistance of Passive House Academy in the preparation of this best practice airtightness guidance document

- Airtightness engineered into OSB substrate with specialist surfacing technology providing integrated vapour barrier – no need for additional AVCL membranes
- Consistently high vapour resistance – prevents interstitial condensation within the timber frame structure
- Easy to cut and fix – reduces installation time
- Rigid panel – less susceptible to damage than flexible membranes
- Durable smooth surface – excellent for airtight tape adhesion
- High racking strength – suitable for structural use (Category 1 to BS5268)
- No added formaldehyde – contributing to healthier environments
- Hygroscopic wood panel – helps prevent condensation in limited cases of reverse diffusion
- Manufactured from FSC® certified timber from our own forests – assured supply of sustainable raw material



The mark of responsible forestry

DETAIL 1 / SMARTPLY AIRTIGHT PANEL TO PANEL CONNECTION



1

- Panel junctions to be aligned centrally on timber stud framing
- Fixings to be inserted $\geq 10\text{mm}$ from panel edge



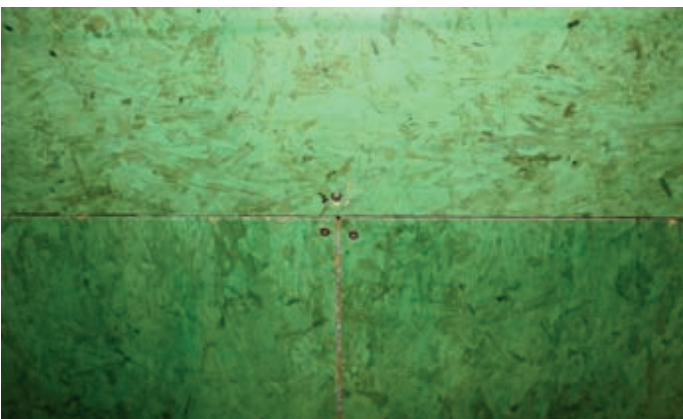
2

- 3mm expansion joint to be left between all panel to panel connections



3

- Equal gap maintained for full length of vertical connection



4

- Same 3mm gap details required for horizontal panel to panel connections also



5

- 60mm wide airtightness tape to be applied equally to both panels (*please see Appendix 1 – Tape Specification 1 for suitable tape to be used for this application*)



6

- Horizontal and vertical tape applications to fully overlap each other



7

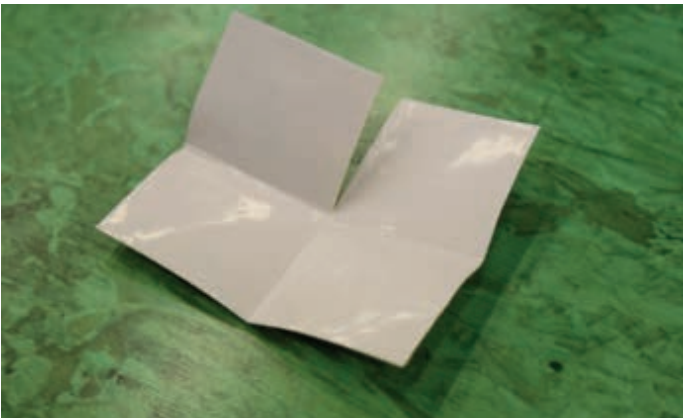
- Tape sealing to be continuous around all panel edges and to connect with floor taping detail. (Further details on floor taping detail to follow)

DETAIL 2 / SMARTPLY AIRTIGHT PANEL TO PANEL CORNER CONNECTION MEETING SMARTPLY OSB/3 FLOOR DECK



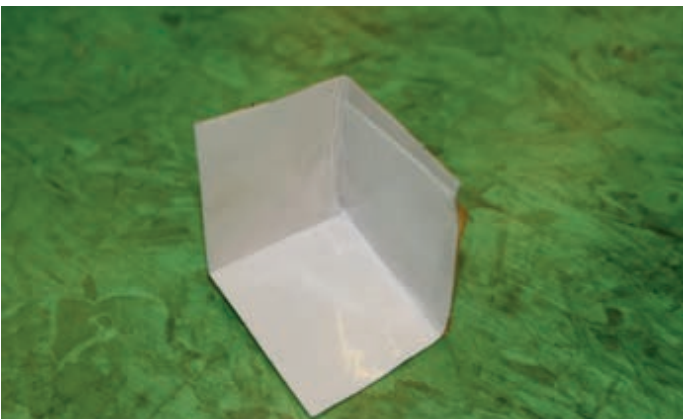
1

- Install wall panels leaving 3mm expansion gap as before at all joints
- Recommend floor deck using SMARTPLY 18mm OSB/3



2

- Create the 3-way corner tape first by folding and cutting tape as shown here (*please see Appendix 1 – Tape Specification 2 for suitable tape to be used for this application*)



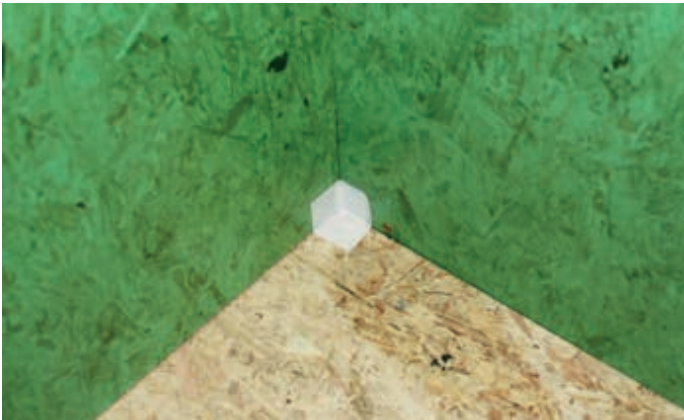
3

- Remove one quarter of the backing tape and form the corner tape, ready for application with backing tape still in place on 3 remaining exposed sides



4

- Remove remaining backing paper and carefully apply pre-formed piece into 3-way corner avoiding tension on the tape corners by pinching backing edges before application



5

- Once the corner piece is in place the other 2-way corners can be sealed using the half split tape again (*Appendix 1 – Tape Specification 2*)



6

- Remove backing tape from half of tape and carefully apply tape into corner
- Once in place remove second strip and seal to second panel with crisp 90° corner, again avoiding tension on the tape in the corner



7

- Repeat detail at wall to floor corner junctions
- Please follow tape manufacturer's instructions in deciding whether the OSB/3 on the floor needs to be primed before tape application
- SMARTPLY AIRTIGHT does not require a primer



8

- Complete the 3-way corner detail ensuring full overlap of tape (to manufacturer's guidelines) at all tape connections

Please note, some tape manufacturers recommend the use of a wider tape (circa. 150mm) for wall to floor junctions for ease of application. Please follow selected manufacturer's guidelines

DETAIL 3 / SMARTPLY AIRTIGHT PANEL TO PANEL EXTERNAL CORNER AND WINDOW REVEAL CONNECTION



1

- External corner detail (window reveal)
- Internal face of wall studs and all window reveals lined with panels to create airtight layer



2

- Straight wall panel to panel connection must also be sealed as before (in Detail 1)



3

- Straight panel to panel connection sealed using tape in *Appendix 1 – Tape Specification 1* as before (in Detail 1)



4

- *Appendix 1 – Tape Specification 2* used for 3-way external corner
- Take a square piece of tape and fold in half
- Slice tape to midpoint and apply as seen here



5

- Having completed step 4 this is what the junction will look like



6

- Repeat step 4 applying the tape in the opposite direction as seen here
- There is still a small risk or pin sized leak at the outer most edge of the reveal corner even when a corner tape is applied into the reveal



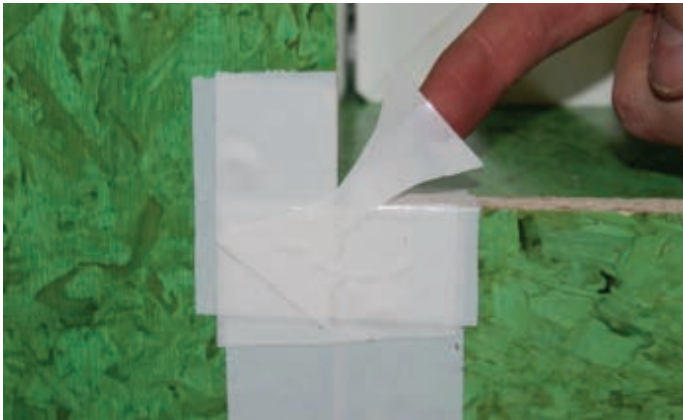
7

- Using a square piece of tape, create a bow-tie shaped piece of tape as seen here
- Please use *Appendix 1 – Tape Specification 3* for this piece



8

- Discard the waste pieces leaving just the bow-tie piece



9

- Apply bow-tie piece onto wall panel first as seen here



10

- Stretch the bow-tie piece into the reveal and press firmly into corner sealing the junction fully and creating a crisp, sealed junction



11

- 3-way external corner is now fully sealed and 2-way external sill corners can now be sealed using *Appendix 1 – Tape Specification 2*
- Ensure full overlap of tape connections to manufacturer's guidelines



12

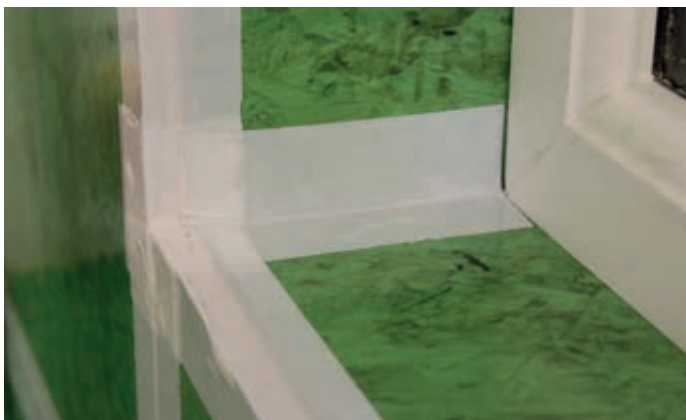
- Finally, the side-reveal can be sealed using same method as sill connection



13

- When complete the external corner detail should look like this

DETAIL 4 / SMARTPLY AIRTIGHT PANEL TO WINDOW CONNECTION



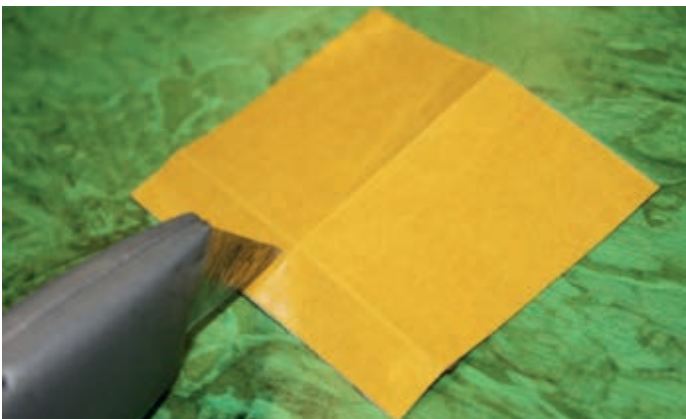
1

- Having sealed the reveals next it is important to seal from the reveal to the window face
- Fixed glass non Passive House suitable double glazed PVC window used in this instructions manual by way of demonstration only



2

- Start with the 3-way window to reveal corners
- Cut out a square piece of *Appendix 1 – Tape Specification 4*
- Fold backing paper along the 12mm serration and fold tape in half in other plane as seen here



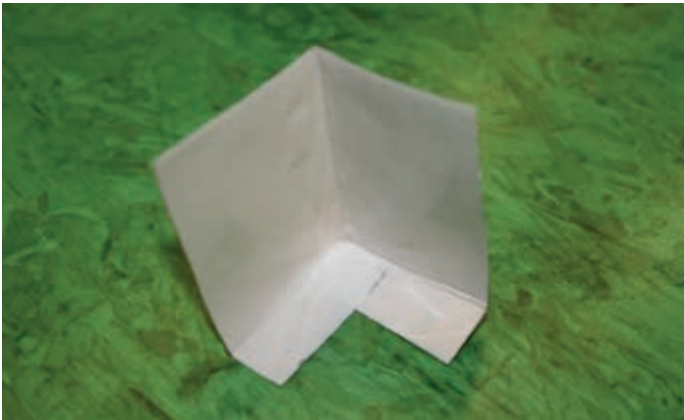
3

- Cut the tape along the half split to the 12mm serration



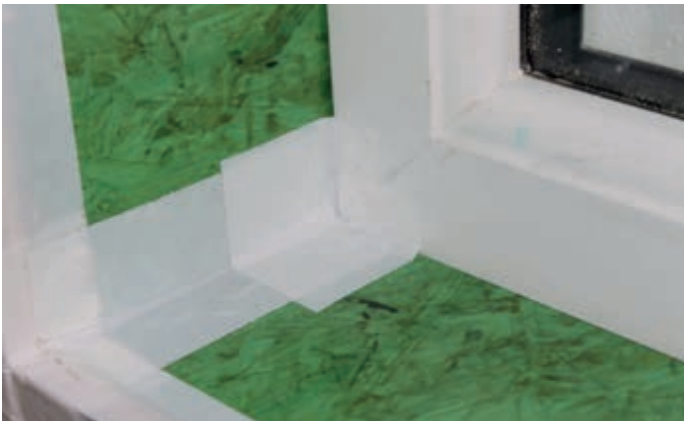
4

- Fold as seen here to form a corner with 12mm exposure on the window side
- Carefully pinch back corners to form crisp edges with backing paper still in place



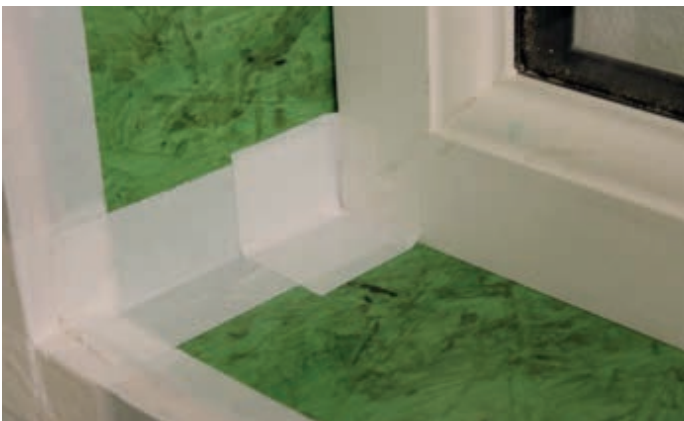
5

- The 3-way window corner piece should look like this ready for application with backing paper still in place at this point



6

- Carefully remove backing paper from 12mm edges and seal to face of window
- Subsequently remove remaining backing paper and seal to reveal lining panels with tension-free crisp edges



7

- The 12mm edges sealed to the window will later be hidden using reveal lining plasterboard or alternative internal finish



8

- Still using *Appendix 1 – Tape Specification 4*, fully seal the perimeter of the window to reveal connection
- Using strips, take off the 12mm backing paper and carefully seal to window face
- Then remove 48mm backing paper and seal back to reveal Panel

9

- Repeat the sill detail on the side and top reveals to fully air seal the window perimeter

10

- When taping is complete, the window airtightness junction should look like this



DETAIL 5 / STRAIGHT CONNECTION FROM SMARTPLY AIRTIGHT PANEL TO SMARTPLY OSB/3



1

- Panels junctions to be aligned centrally on timber stud framing
- Screws to be inserted $\geq 10\text{mm}$ from panel edge
- 3mm expansion joint to be left between all panel to panel connections
- Equal gap maintained for full length of connections



2

- 60mm wide airtightness tape to be applied equally to both panels (*please see Appendix 1 – Tape Specification 1 for suitable tape to be used for this application*)
- Please follow tape manufacturer's instructions in deciding whether the OSB/3 needs to be primed before tape application
- SMARTPLY AIRTIGHT does not require a primer

DETAIL 6 / SMARTPLY AIRTIGHT WALL PANEL TO CONCRETE FLOOR



1

- Install SMARTPLY AIRTIGHT wall panels leaving 3mm expansion gap as before at all joints
- Floor airtightness created by the concrete



2

- Ensure the concrete floor is clean and dry and free from dust
- Apply the concrete primer with a brush or roller as per chosen tape manufacturer's guidelines



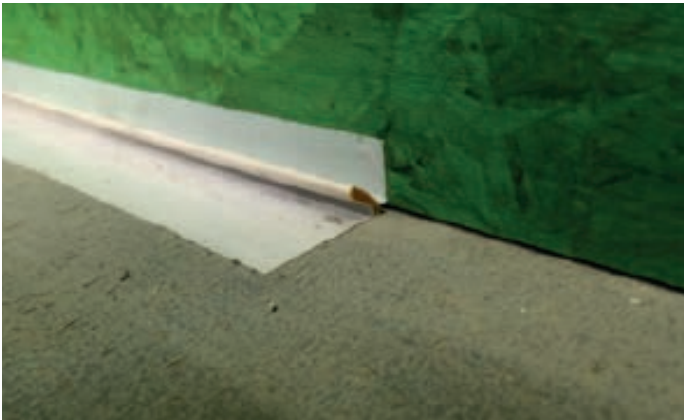
3

- Ensure primer is applied fully and consistently along concrete perimeter at wall connection
- Allow primer to set as per manufacturer's guidelines before tape application



4

- Seal connection using *Appendix 1 – Tape Specification 2*
- Remove backing tape from section 1 of tape and carefully apply tape into corner on floor
- Once in place, remove backing strip 3 and seal to Panel with stress relief loop incorporated, avoiding tension on the tape in the corner



5

- Please see further guidelines for creation of this stress relief loop detail in Detail 6.1 below

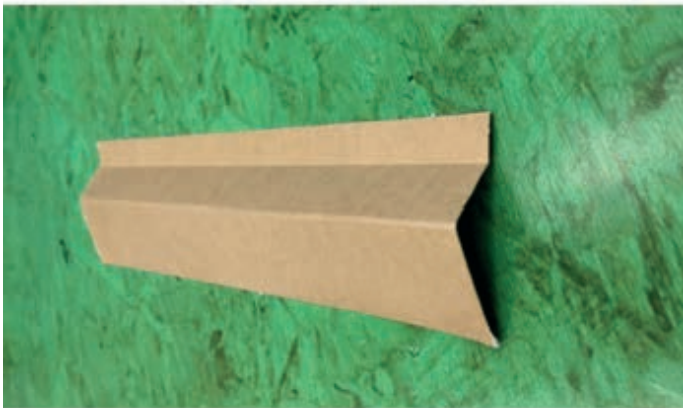


6

- Complete the corner detail for full floor perimeter ensuring full overlap of tape (to manufacturer's guidelines) at all tape connections

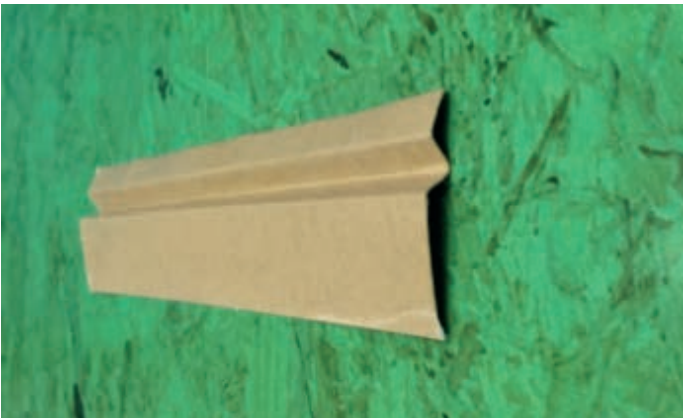
Please note, some tape manufacturers recommend the use of a wider tape (circa. 150mm) for wall to floor junctions for ease of application. Please follow selected manufacturer's guidelines

DETAIL 6.1 / SMARTPLY AIRTIGHT WALL PANEL TO CONCRETE FLOOR – STRESS RELIEF LOOP INSTALLATION



1

- Creating a stress relief loop using *Appendix 1 –Tape Specification 2* for junctions with varying substrates where differential movement is a risk
- The selected tape has three backing strips



2

- Pre-fold tape on the centre strip before removing any backing papers to prepare for installation at junction



3

- Fold tape creating the shape that it will be installed in, a 90° corner with additional tape loop fold at the junction interface. Strip 1 and 3 of the tape will be sealed to the substrates whilst backing strip 2 (middle) will remain in place



4

- When junction is ready for tape application, as above, strip 1 can be removed and sealed to primed concrete floor and subsequently strip 3 can be removed and sealed to SMARTPLY AIRTIGHT panel. Strip 2 forms the stress relief loop

DETAIL 7 / SMARTPLY AIRTIGHT WALL PANEL TO PLASTERED MASONRY WALL



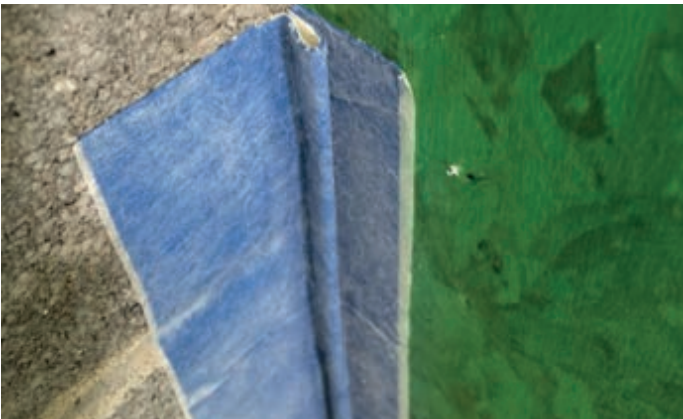
1

- SMARTPLY AIRTIGHT panel will create the airtight layer on the right-hand wall
- Wet applied sand/cement plaster will create the airtight layer of the left-hand wall
- Install panel allowing expansion gap as before



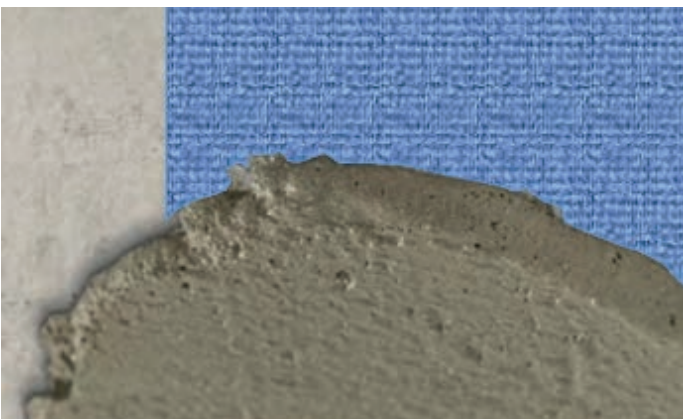
2

- Using *Appendix 1 – Tape Specification 5* remove the backing paper off the shorter side and bond to edge of SMARTPLY AIRTIGHT panel
- Ensure to create a stress relief loop at this junction to avoid deterioration of seal with differential movement



3

- Remove the backing paper from the shorter side (strip 1) and bond to edge of SMARTPLY AIRTIGHT. Remove the backing paper off the longer side (strip 3) and bond to masonry wall, using a plastic roller to press firmly onto substrate. Strip 2 (middle) remains in place and forms the stress relief loop
- Please see further guidelines for creation of this stress relief loop detail in Detail 7.1 below



4

- Fleece tape backing can then be plastered over to create a permanent airtight seal
- Tape surface lends the required mechanical strength to prevent stresses and strains on the plaster which could otherwise cause cracking in future



5

- Complete plastering of full masonry wall surface to ensure airtightness across surface
- Plasterer needs to be careful not to damage the tape with the trowel during installation

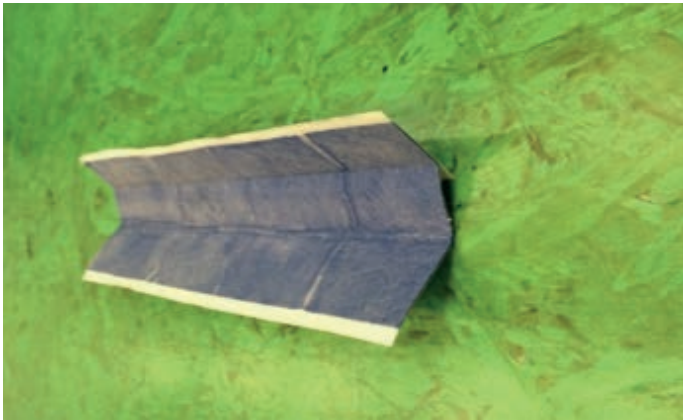


6

- Plaster can then be painted with undercoat and readied for final decoration
- Service cavity with plasterboard finish can be applied to inside of SMARTPLY AIRTIGHT panel to hide the protruding tape and achieve a consistent aesthetic finish on both walls

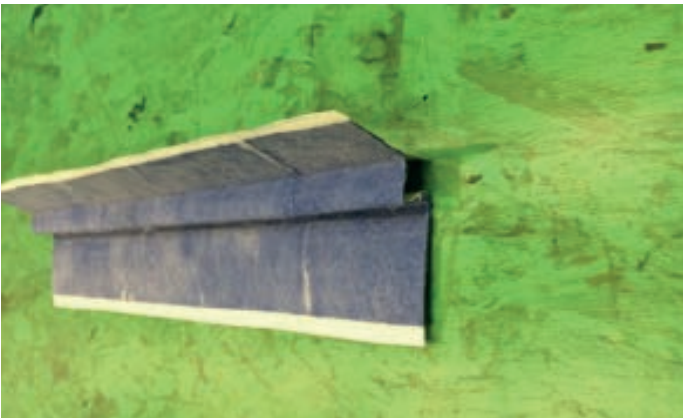
Please note, there are many tape variations on the market suitable for plastered airtight connections so it is very important to follow the guidelines of the selected tape manufacturer when sealing masonry to SMARTPLY AIRTIGHT panel connections

DETAIL 7.1 / SMARTPLY AIRTIGHT WALL PANEL TO PLASTERED MASONRY WALL – STRESS RELIEF LOOP INSTALLATION



1

- Creating a Stress relief Loop using *Appendix 1 – Tape Specification 5* for junctions with varying substrates where differential movement is a risk
- The selected tape has three backing strips or can be folded to create a third strip if required



2

- Pre-fold tape on the centre strip before removing any backing papers to prepare for installation at junction



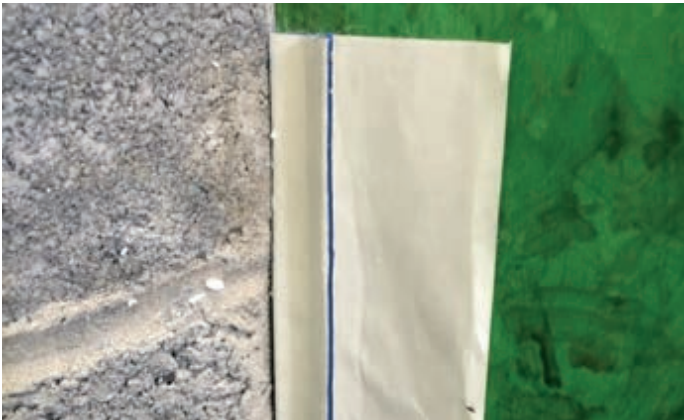
3

- Fold tape creating the shape that it will be installed in, a 90° corner with additional tape loop fold at the junction interface. Strip 1 and 3 of the tape will be sealed to the substrates whilst backing strip 2 (middle) will remain in place



4

- When junction is ready for tape application, as above, strip 1 can be removed and sealed to the SMARTPLY AIRTIGHT panel



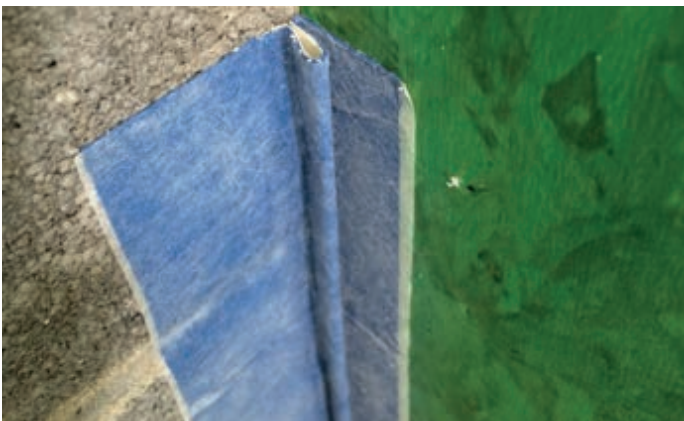
5

- At this stage, strip 2 and 3 are still in place for ease of application



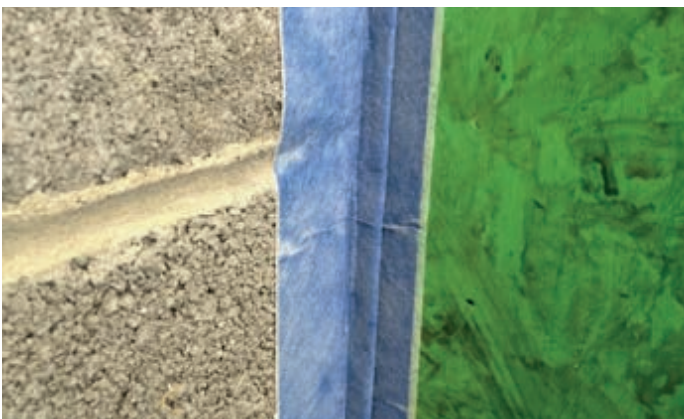
6

- Now strip 3 can be removed in preparation for sealing to the masonry wall. Backing Strip 2 will later form the stress relief loop and hence should remain in place



7

- Strip 3 can now be sealed to masonry wall and bonded using a plastic roller to press firmly onto substrate. Strip 2 forms the stress relief loop as can be seen here



8

- Complete the corner detail for full length of the junction ensuring full overlap of tape (to manufacturer's guidelines) at all tape connections

APPENDIX 1 – TAPE SPECIFICATIONS / TAPE SPECIFICATION 1

Product Description

60mm wide airtightness tape with single backing paper suitable for butt joint junctions

| | | Standards | Units | Values |
|---|---|-----------|---------------------------------|-----------------|
| Dimensions | width | | m | 0.06 |
| Temperature Resistance | | | °C | -40°C to +100°C |
| Processing Temperature | | | °C | From -10°C |
| Diffusion-equivalent air layer thickness s_d | | EN 1931 | m | ≈ 8 |
| Airtightness: Joint permeability coefficient Linear reference air permeability | a-value Q_{1000} -value | EN12114 | $m^3/(hmdaPA2/3)$ $m^3/(mh)$ | < 0.1 ≤ 0.25 |
| Ageing resistance | High permanent adhesive strength, non-drying and non-embrittling without caoutchouc, resin or solvent, can reliably and durably follow structural movements | | | |
| Suitability for storage | Unlimited | | | |

Sample products for this application type:

- SIGA Sicrall
- Isocell Airstop Adhesive Tape
- Pro Clima Tescon Vana
- Ampack Ampacoll INT
- Isover Vario KB1
- Alpha Pro
- Or other equivalent and proven age tested airtightness tape

APPENDIX 1 – TAPE SPECIFICATIONS /

TAPE SPECIFICATION 2

Product Description

60mm wide airtightness tape with half/half split backing paper suitable for corner junctions

| | | Standards | Units | Values |
|---|---|-----------|---------------------------------|-----------------|
| Dimensions | width | | m | 0.06 |
| Temperature Resistance | | | °C | -40°C to +100°C |
| Processing Temperature | | | °C | From -10°C |
| Diffusion-equivalent air layer thickness s_d | | EN 1931 | m | ≈ 8 |
| Airtightness: Joint permeability coefficient Linear reference air permeability | a-value Q_{1000} -value | EN12114 | $m^3/(hmdaPA2/3)$ $m^3/(mh)$ | < 0.1 ≤ 0.25 |
| Ageing resistance | High permanent adhesive strength, non-drying and non-embrittling without caoutchouc, resin or solvent, can reliably and durably follow structural movements | | | |
| Suitability for storage | Unlimited | | | |

Sample products for this application type:

- SIGA Corvum 30/30
- Isocell Airstop Corner Tape
- Pro Clima Tescon Profil
- Ampack Ampacoll XT 60 (Double Slit)
- Isover Vario Multitape SL
- Alpha Flex Split
- Or other equivalent and proven age tested airtightness tape

APPENDIX 1 – TAPE SPECIFICATIONS /

TAPE SPECIFICATION 3

Product Description

60mm wide airtightness tape with single backing paper suitable for junctions with high elasticity and flexibility requirements

| | | Standards | Units | Values |
|---|---|-----------|---------------------------------|-----------------|
| Dimensions | width | | m | 0.06 |
| Temperature Resistance | | | °C | -40°C to +100°C |
| Processing Temperature | | | °C | From -10°C |
| Diffusion-equivalent air layer thickness s_d | | EN 1931 | m | ≈ 40 |
| Airtightness: Joint permeability coefficient Linear reference air permeability | a-value Q_{1000} -value | EN12114 | $m^3/(hmdaPA2/3)$ $m^3/(mh)$ | < 0.1 ≤ 0.25 |
| Ageing resistance | High permanent adhesive strength, non-drying and non-embrittling without caoutchouc, resin or solvent, can reliably and durably follow structural movements | | | |
| Suitability for storage | Unlimited | | | |

Sample products for this application type:

- SIGA Rissan
- Isocell Airstop Elasto
- Pro Clima Tescon No.1
- Ampack Ampacoll INT
- Isover Vario Multitape
- Alpha Flex
- Or other equivalent and proven age tested airtightness tape

APPENDIX 1 – TAPE SPECIFICATIONS / TAPE SPECIFICATION 4

Product Description

60mm wide airtightness tape with 12mm/48mm split backing paper suitable for window junctions

| | | Standards | Units | Values |
|---|---|-----------|---------------------------------|-----------------|
| Dimensions | width | | m | 0.06 |
| Temperature Resistance | | | °C | -40°C to +100°C |
| Processing Temperature | | | °C | From -10°C |
| Diffusion-equivalent air layer thickness s_d | | EN 1931 | m | ≈ 8 |
| Airtightness: Joint permeability coefficient Linear reference air permeability | a-value Q_{1000} -value | EN12114 | $m^3/(hmdaPA2/3)$ $m^3/(mh)$ | < 0.1 ≤ 0.25 |
| Ageing resistance | High permanent adhesive strength, non-drying and non-embrittling without caoutchouc, resin or solvent, can reliably and durably follow structural movements | | | |
| Suitability for storage | Unlimited | | | |

Sample products for this application type:

- SIGA Corvum 12/48
- Isocell Airstop Window Tape
- Pro Clima Tescon Profil
- Ampack Ampacoll XT 60 (Double Slit)
- Isover Vario Multitape SL
- Alpha Flex Split
- Or other equivalent and proven age tested airtightness tape

APPENDIX 1 – TAPE SPECIFICATIONS / TAPE SPECIFICATION 5

Product Description

Varied width airtightness tape with special film/fleece combination (that can be plastered over) and high-performance adhesive. Split backing paper for ease of installation at corner and other junctions

| | | Standards | Units | Values |
|---|---|------------|---------------------------------|-----------------|
| Dimensions | width | | m | 0.08 – 0.15 |
| Temperature Resistance | | | °C | -40°C to +100°C |
| Processing Temperature | | | °C | From -10°C |
| Diffusion-equivalent air layer thickness s_d | | EN 1931 | m | ≈ 20 |
| Tensile properties Maximum tensile strength | lengthwise crosswise | EN 12311-1 | N/50mm | 220 140 |
| Tensile properties Elongation at maximum tensile | lengthwise crosswise | EN 12311-1 | % | 70 80 |
| Airtightness: Joint permeability coefficient Linear reference air permeability | a-value Q_{1000} - value | EN12114 | $m^3/(hmdaPA2/3)$ $m^3/(mh)$ | < 0.1 ≤ 0.25 |
| Ageing resistance | High permanent adhesive strength, non-drying and non-embrittling without caoutchouc, resin or solvent, can reliably and durably follow structural movements | | | |
| Suitability for storage | Unlimited | | | |

Sample products for this application type:

- SIGA Fentrim 20
- Isocell Isowindow Feba Soft (Internal)
- Pro Clima Contega FC
- Ampack Ampacoll BKF
- Isover Vario Bond
- Alpha Fultra-i
- Or other equivalent and proven age tested airtightness tape

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