SURECAV®

SureCav®25

Cavity Spacer System

Patented System

Welcome

Welcome to SureCav, from Charlie Ayers MD

Thank you for your interest in using SureCav as the superior method in constructing buildings with all types of masonry finishes.

Established in 2004, SureCav50 has successfully proved to be outstanding in saving time and money, as well as enhancing the quality of the construction project.

SureCav25 has been introduced to build on this success and to assist architects and designers meet compliance with the latest building regulations. SureCav25 guarantees mortar and moisture-free 25mm clear cavities. Additionally, SureCav25 gives the choice of creating up to 6% additional floor-space or to provide extra insulation in the cavity to help drive down U-Values.

As I always say, "It's not just because I designed SureCav that I am trying to sell the system. After all, if someone else had designed it, I would buy it.

Well I would - because it works!"

Charlie

Cover photos: Building design by Lees Munday Architects

Your guide to understanding SureCav…

Introduction

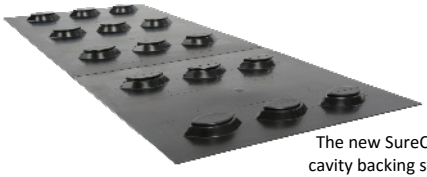
What is SureCav25?

SureCav25 is a 100% recycled polypropylene panel that forms a 25mm protected clear cavity. This allows an extra 25mm insulation to help drive down U-Values, or alternatively, to gain around 1.25% extra floor space when the original external dimensions are used. SureCav25 can be used on timber-frame or traditional build with any external masonry finish.

Main features

- SureCav25 will make more space in the cavity for insulation, making it possible to achieve a U-value of 0.18 W/m²K within a 100mm overall cavity.
- Alternatively, using the original external dimensions of the property, SureCav25 will reduce the width of the wall from between 25mm to 150mm, creating at least 1.25% extra floor space in the dwelling, rising to 6% in some cases. Consider this, ***with a 1.25% gain this is equivalent to the floor space of 1 extra house on an 80 house site!***
- Removes the need for a backing block when building with natural/random stone
- Guarantees a consistently clean, mortar-free and moisture-free 25mm clear cavity
- BBA approved 25mm free cavity in very severe exposure zones with SureCav25 instead of required 75mm (NHBC) or 50mm (LABC)
- Durable and remains effective for the life of the building
- SureCav25 will significantly reduce labour and material costs with a faster, cleaner build
- Ensures no water penetration from wind driven rain
- SureCav is now being used by architects, builders and developers nationwide!

100% recycled polypropylene



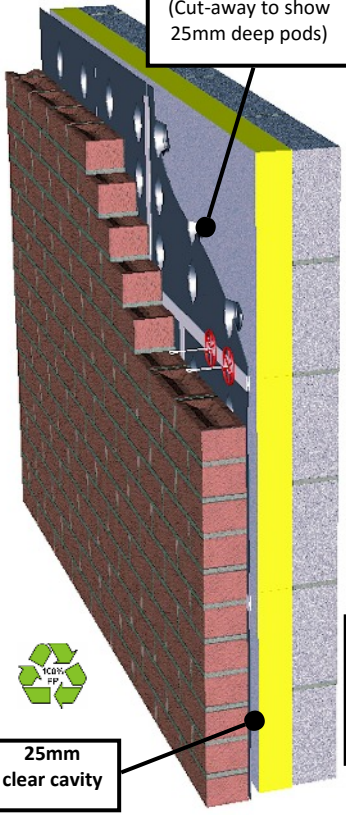
The new SureCav25 cavity backing system

4 SURECAV.

SureCav25
Just a 25mm profile…
but with added value!

Panels
Length: 1200mm
Width: 450mm
Total thickness: 25mm
Sheet thickness: 2mm

Joining strips (H section)
Horizontal strip length: 900mm
Vertical strip length: 400mm



SureCav25 builds on the success of SureCav50: The "wall" of plastic, formed by the panels not only provides an excellent surface for the construction of the outer masonry leaf but shields the cavity and inner leaf from water ingress.

The unique shape of the SureCav25 pods directs any moisture to the outside leaf, thus protecting the fabric of the building with a 25mm clear cavity, instead of the usual 50mm currently used as standard building practice.

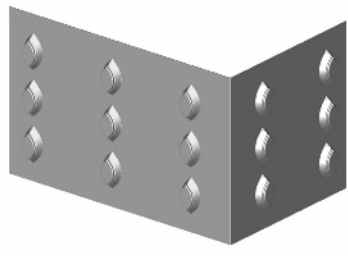
The barrier formed by the panels, locked together by the joining strips, will protect the structure in even the most exposed weather conditions.

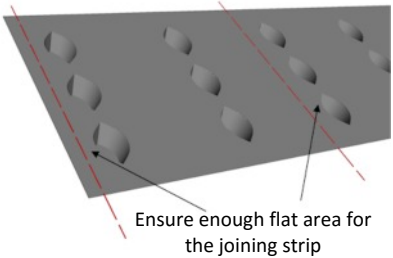
Illustration shows an overall cavity of 100mm, comprising 25mm clear cavity with SureCav25 and 75mm insulation giving 0.18 W/m²K. (Standard 50/50 cavity is 0.24 W/m²K)

Recommendations for use

1. Recommendation for starting corners

Locate the bending line on the sheet and fully bend the sheet back onto its flat face. Now bend the sheet the other way until the pods are touching. Repeat this a couple of times until the sheet stays in the required position.
Also, the sheet can be bent to suit corners that are not 90° such as some conservatory walls etc.





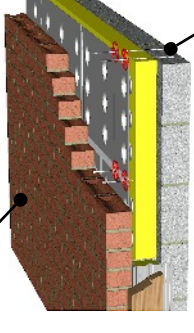
Ensure enough flat area for the joining strip

2. When cutting will intersect the pods

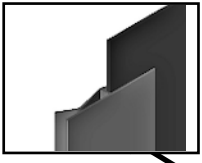
Use two cuts or cut off the end of the sheet. Allow enough flat sheet to take the joining strip.

3. Wall ties adjacent to window and door frames

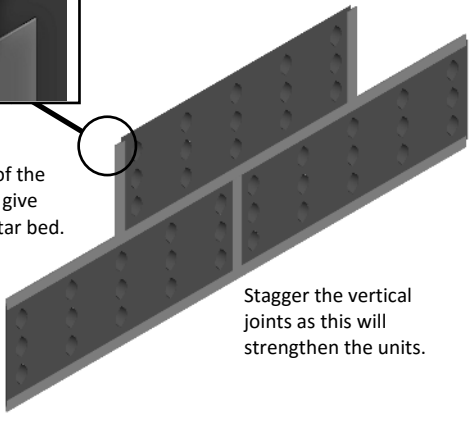
Additional wall ties at 450mm vertical centres within 225mm of all openings are recommended.



4. Stagger the panels

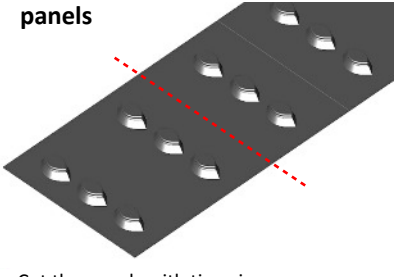


Install with the flat face of the joining strip outwards to give maximum width for mortar bed.



Stagger the vertical joints as this will strengthen the units.

5. Cutting and trimming panels



Cut the panels with tin snips or a saw, or score the panel and then bend it back on itself and the unit will snap off.

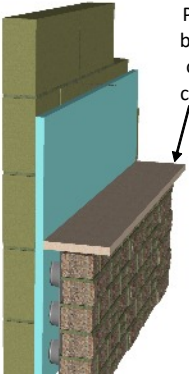
6. Important note about joining strips

The 900mm joining strips are to be used for the horizontal joints. Cut a long joining strip up to a wall tie and use the off-cut to start the next section.

The 400mm joining strips are designed to exactly fit the vertical joints of the SureCav25 panel.

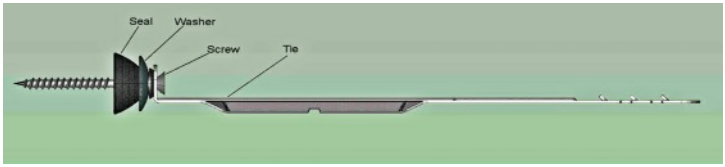
7. Keeping the cavity space clean

When building up the internal wall, **ALWAYS** ensure that a cavity board or length of timber is used to cover the cavity.
It is **essential** that the cavity is kept free from mortar during construction.



8. Fixing a timber frame tie through the back of a SureCav pod

Sealing washers can be purchased directly from SureCav Ltd. with your order. See our web site for details

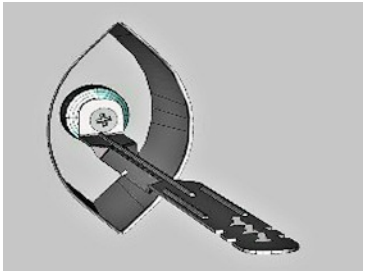


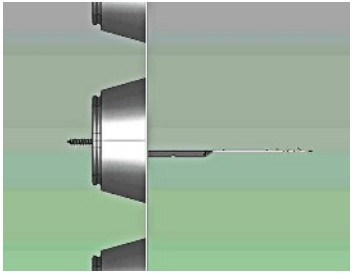
Ensure that the components are assembled in the right order.

Tie shown for illustrative purpose only - always use ties that conform to local building regulations.

For more instructions using SureCav25 visit
www.surecav.co.uk
SureCav Limited Tel: 01963 34660

Looking into the open pod the fixings should look as shown below.

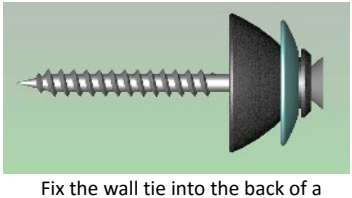




If additional fixings are required and ties are not needed then just fix the SureCav panel through the back of the pod using a screw and sealing washer.

Fixings

Please note that SureCav Limited do not supply fixings with the seal washers. In order to comply with Local Authority Planning Departments and NHBC Standards (6.2 External timber Framed Walls) M10 wall ties and their fixings should be of austenitic stainless steel, comply with the BS EN 845 and be capable of accommodating anticipated differential movement.



Fix the wall tie into the back of a pod using the special seal washer. Additional fixings can be added without the tie if needed.

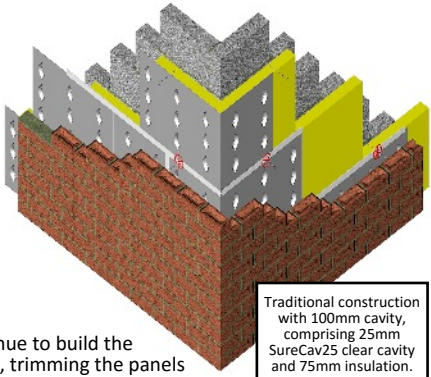
Testimonials

"Having used SureCav on at least 6 contracts we will never use backing blocks or shutter boards again." **Richard, EMM-LEC Ltd Sidmouth, Devon**

"I am so impressed with this product I would be happy for you to bring any of your prospective customers to my site at Wool, Dorset, and I will be pleased to show them your system." **Chris Allworthy, Barratt Homes Site Agent**

Installing the SureCav25 panel in a conventional building

1. You first need to create the corner panel. Locate the bend line on the sheet and bend the flat sides together. Now bend the sheet the other way until the pods are touching, repeating this a couple of times until you have the angle you require The SureCav panels are placed directly against the insulation sheet, holding the insulation in place, enabling it to work to its full efficiency.



Traditional construction with 100mm cavity, comprising 25mm SureCav25 clear cavity and 75mm insulation.

2. Using the joining strips, continue to build the panels along in each direction, trimming the panels around air vents and cavity trays as necessary.

3. Fit a horizontal joining strip before starting the next row. The SureCav25 panel is fixed in place using a wall tie clip on the wall ties that are fitted as standard at 900mm centres. Note that the horizontal joining strips are cut around the wall ties and if extra ties are required for random stonework, helical ties can be fitted through the sheets of SureCav but, of course, not through the pods.

Please note: The 900mm joining strips are to be used for the horizontal joints. Cut a long joining strip up to a wall tie and use the off-cut to start the next section. The 400mm joining strips are designed to exactly fit the vertical joints of the SureCav25 panel.

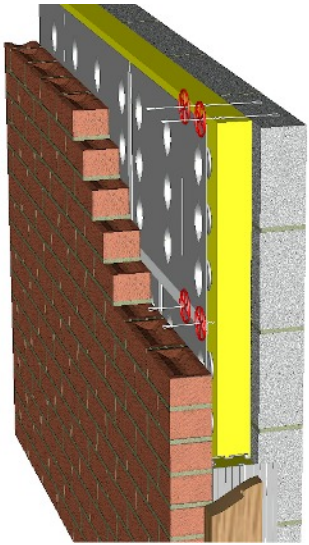
4. It is recommended to stagger the joints of the SureCav25 panels as this will add strength to the whole system. Then continue to fix the panels along the row, trimming the length to meet the corner panel. If the cut coincides with the pods, then cut a shorter length and insert a new SureCav section.

5. The masonry outer leaf can then be built directly against the panels. When building up the inner skin of block-work, always ensure that a board is placed over the cavity. It is essential that the cavity is kept free of mortar during construction.

Full BBA and LABC approval

Additional wall ties to satisfy structural requirements

This procedure will prevent slots having to be made in the SureCav sheet on each course of block work when building away from a doorway or window reveal. The ties should be fitted every 450mm vertically, coinciding with the joint in the SureCav sheet.



It is recommended that an additional wall tie is included within 225mm of the opening on each board coarse level to satisfy the structural requirements.

Testimonial

"The speed of build, easy storage and handling make SureCav an ideal system. We have found this especially to be the case where storage and working space on site is at a premium."

Ray Holmes, Site Agent, Hopkins

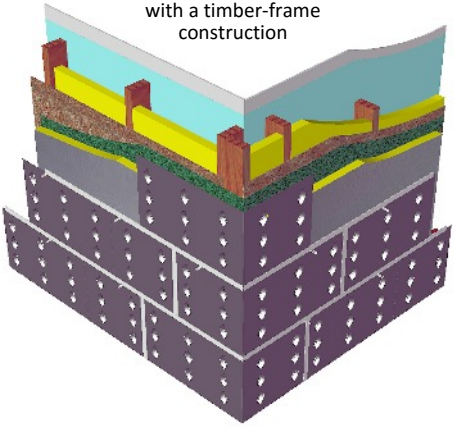
Testimonial

"SureCav is a very good way of achieving this effect (very high quality dry stone effect, random walling in Purbeck Stone) without the need for all of the additional foundations, and loss of floor space in the building associated with a block-work backing to the external masonry. This saves time, space and money plus it gives the additional layer of weather protection provided by the SureCav sheets."

We are very pleased with the high quality stonework. SureCav makes it easier to achieve the effect we want.

Phil Easton, Founding Director at Western Design Architects

Installing the SureCav25 panel with a timber-frame building



SureCav25 panels with a timber-frame construction

1. First, make the corner piece. Using the bend line on the sheet, bend the flat sides together. Now bend the sheet the other way until the pods are touching, repeating this a couple of times until you have the angle you require.

2. Place this corner piece directly against the breather membrane or outer insulation of the timber-frame structure and, using the joining strips, continue to build the panels along in each direction.

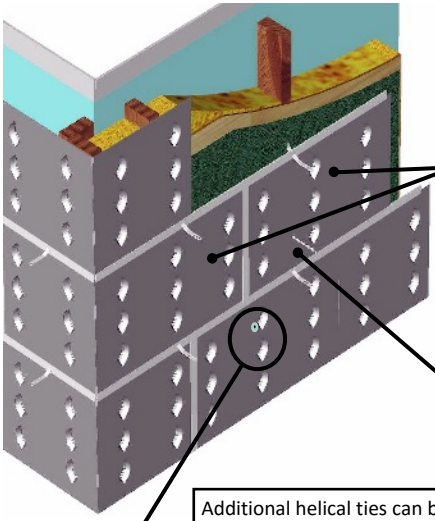
3. If you find you need extra ties for random stonework, screw the tie into the back of the SureCav25 pod using a seal-washer. If you simply wish to fix the panel in place, then just use the seal- washer without the tie.

4. Now, fit the horizontal joining strips before starting the next row, cutting them around the timber-frame ties. It is recommended that the joints of the panels are staggered to add strength to the system. Then continue to fix the panels along the row, trimming the length to meet the corner panel.

   Please note: The 900mm joining strips are to be used for the horizontal joints. Cut a long joining strip up to a wall tie and use the off-cut to start the next section. The 400mm joining strips are designed to exactly fit the vertical joints of the SureCav25 panel.

5. If you find the cut coincides with the pods, then cut a shorter length and insert a new SureCav25 section. The brick or stone wall is built directly against the panels. These SureCav panels remain in the cavity for the lifetime of the building, providing an excellent 25mm air-flow system that ensures the cavity remains free from the build-up of moisture.

Timber-frame fixings



Align all the ties with the main timber-frame studding.

Ties are placed every 450mm vertically, to coincide with the SureCav joints.

Cut the horizontal joining strip to fit up to the tie and then continue the joint using the off-cut.

If you need extra ties for random stonework, screw the tie into the back of the SureCav pod using the special seal washer.

Additional helical ties can be used in any flat area of the sheet to provide extra support to masonry as necessary, **but NOT through the pods.**

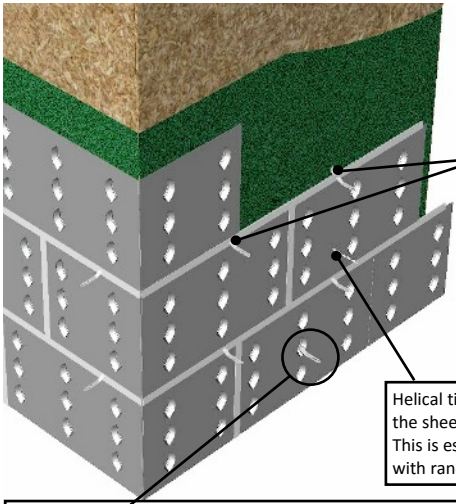
Special seal-washers* can screwed through the pods to fix the whole system to the timber-frame sheathing, enabling the whole building to be clad prior to the start of building the external leaf. Additional masonry support ties can also be fixed through the pods using the seal washers.

Notes:

1. It is recommended that the joints of the SureCav panels are staggered to add strength to the system.
2. Do not cut the panels through the pods. If a cut coincides with the pods then simply shorten the length and insert a new SureCav section using the vertical joining strips.
3. It is recommended that an additional wall tie is included within 225mm of an opening on each board course level to satisfy structural requirements. This procedure will prevent slots having to be made in the SureCav sheet on each course of block-work when building away from a doorway or window reveal.

* Seal-washers can be purchased from SureCav Limited

SIP fixings

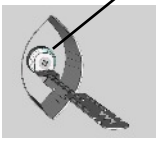


SIP panels do not have main support timbers so the tie can be placed in any suitable position along the length of the SureCav panel.

Ties are placed every 450mm vertically, to coincide with the SureCav joints.

Cut the horizontal joining strip to fit up to the tie and then continue the other side of the tie using the off-cut.

Helical ties can be used in any flat area of the sheet, **but NOT through the pods.** This is especially useful when building with random stonework.



Additional ties can be fixed through any of the pods using special seal washers.*
The seal-washers, used without the tie, can be screwed through the pods to fix the whole system to the SIP sheathing, enabling the whole building to be clad prior to the start of building the external leaf.

Ties shown for illustrative purposes only. Use stainless steel ties approved by LABC

Notes:
1. Stainless steel wall ties can be directly attached to the OSB/3 face of the panel using stainless-steel screw fasteners.
2. It is recommended that the joints of the SureCav panels are staggered to add strength to the system.
3. Do not cut the panels through the pods. If a cut coincides with the pods then simply shorten the length and insert a new SureCav section using the vertical joining strips.
4. It is recommended that an additional wall tie is included within 225mm of an opening on each board course level to satisfy structural requirements. This procedure will prevent slots having to be made in the SureCav sheet on each course of block-work when building away from a doorway or window reveal.

* Seal-washers can be purchased from SureCav Limited

- Using the original external dimensions of the property, SureCav®25 will create around 1.25% extra floor space in the dwelling, rising to 6% additional space in some cases. Consider this,with a 1.25% gain this equates to the floor space of 1 extra house on an 80 house site!
- Alternatively, SureCav®25 makes more space in the cavity for insulation, making it possible to achieve a U-value of 0.18 W/m²K within a 100mm overall cavity
- Removes the need for a backing block when building with natural/random stone
- Guarantees a consistent clean, mortar-free and moisture-free 25mm clear cavity
- BBA approved 25mm free cavity in very severe exposure zones with SureCav®25 - usually 75mm (NHBC) or 50mm (LABC)
- 100% recycled polypropylene
- Durable and remains effective for the life of the building
- SureCav®25 will significantly reduces labour and material costs with a faster, cleaner build
- Ensures no water penetration from wind driven rain
- SureCav is now being used by architects, builders and developers nationwide!

- Injection moulded Polypropylene - 100% fully recycled material
- A new fold line has been incorporated into the design to simplify corner construction
- Perfect for masonry construction for all types of outer leaf
- Saves time and money compared to using concrete backing blocks

Improved design *now even easier to use!*

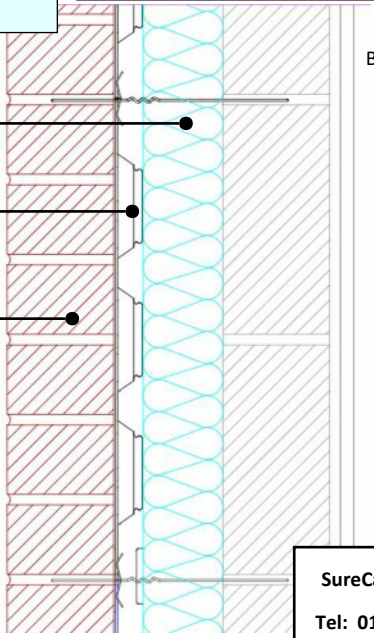
Benefits: More space in the cavity!

Brick builds: Lower the U-Value with SureCav25!

Where heat conservation is the prime concern, by maintaining the original internal and external dimensions of the property, SureCav25 will release an additional 25mm that can be used for extra insulation in the cavity. Using the example below in the chart, 0.15 W/m²K can be achieved by increasing the insulation to 100mm.

Example:
100mm overall cavity width
75mm insulation
25mm SureCav25 (clear cavity)
U-Value is 0.18 W/m²K

- **Lower the U-Value with extra insulation**
- **Guaranteed clean and moisture free 25mm clear cavity**



75mm insulation

SureCav25
25mm clear cavity spacer board

Brick or other masonry

Suitable for all masonry finishes

BBA and LABC approved

100% PP

SureCav25 shown with lightweight block inner leaf and 12.5mm plasterboard

SureCav Limited

Tel: 01963 34660

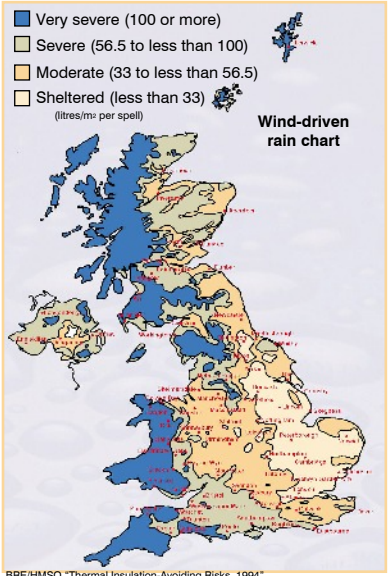
www.surecav.co.uk

SureCav25 + Brick/Stone Outer leaf = Perfect Match

Insulation Options using SureCav25			
Brick or stone outer leaf - lightweight block inner leaf (0.15) plus 3mm skim on 12mm plasterboard			
Overall cavity width (mm)	**Insulation (mm)**	**Clear cavity with SureCav25 mm)**	**U-Value (W/m^2K)**
75	50	25	0.24
100	75	25	0.18
125	100	25	0.15
145	120	25	0.14

In England and Wales, for areas up to severe exposure to wind driven rain., NHBC current requirements require a 50mm residual cavity when using partial cavity fill in fair-faced masonry cavity walls. This increases to 75mm cavities in very severe exposure zones. Full details of cavity widths are given in NHBC Standards Chapter 6.1

In the first two examples on the next page, we will examine the special situation where the NHBC demand 75mm free cavities in the parts of the country that experience very severe weather conditions. As shown on the map, the UK is divided into 4 regions and the blue areas denote these very severe weather zones that experience 100 or more litres/m^2 per spell.

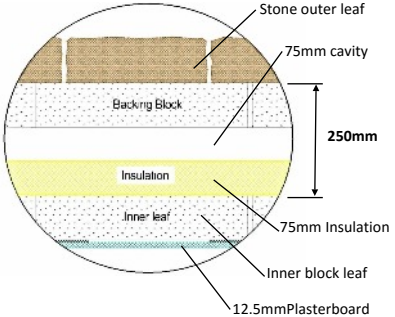


BRE/HMSO "Thermal Insulation-Avoiding Risks, 1994"

Benefits: Reduce the width of the cavity

Example 1: **Designed to achieve a U-value of 0.18 W/m²K with a random stone outer leaf (Weather: Very severe exposure zone)**

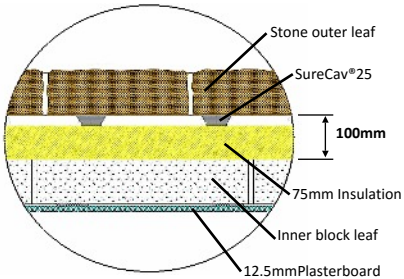
Current NHBC wall requirements



Standard NHBC construction:

- Stone outer leaf
- Backing block (100mm)
- 150mm overall cavity width
- 75mm clear cavity (very severe weather zone)

What SureCav25 will achieve!



With SureCav®25:

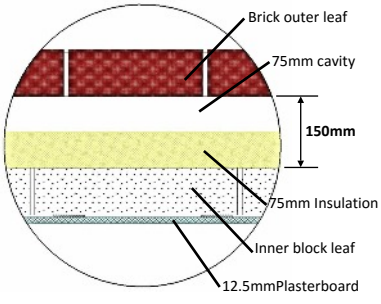
- No backing block (saves 100mm)
- Free cavity of only 25mm
- 100mm overall cavity width
- **U-Value of 0.18 W/m²K**

Conclusion: SureCav25 will reduce the overall wall width requirement by 150mm
(removal of backing block and reduction of clear cavity to 25mm)

Benefits: Reduce the width of the cavity

Example 2: **NHBC requirements to achieve 0.18 W/m²K with brick outer leaf (Weather: Very severe exposure zone)**

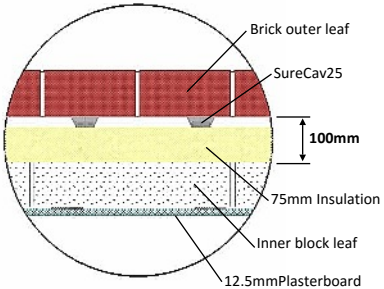
Current NHBC wall requirements



Standard NHBC construction:

- Brick outer leaf
- 150mm overall cavity width
- 75mm clear cavity (very severe weather zone)

What SureCav25 will achieve!



With SureCav25:

- Free cavity of only 25mm
- 100mm overall cavity width
- **U-Value of 0.18 W/m²K**

Conclusion: SureCav25 will reduce the overall wall width requirement by 50mm
(reduction of clear cavity to 25mm)

SureCav25 - Combats wind-driven rain

Damage from moisture affecting buildings

One of the greatest threats to the integrity of the building structure come from water ingress, one of the most common sources of moisture affecting buildings in the United Kingdom. Damage from the build up of moisture results in mould, mildew and condensation on windows and in the loft space. Additionally, where there is a moisture problem in the wall cavity, damage readily occurs to the insulation and wall ties, also affecting wall plates, the timber frame itself and installed joinery.

Preventing this from occurring is obviously a priority in the minds of all designers and builders interested in quality construction.

SureCav25 - the solution

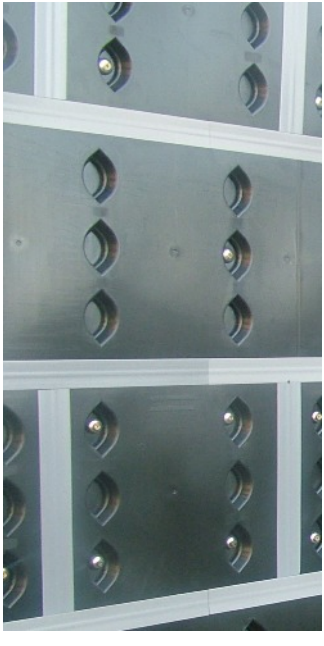
The incidence of wind-driven rain is likely to be more prevalent in properties closer to the western coast of Britain and any increase in moisture giving rise to wall saturation will require a managed construction. The increased affect of wind driven rain will be particularly relevant where external walls do not have a suitable cavity or rain screen.

- **SureCav25** will prevent any water ingress from wind driven rain when building external walls with any recognised material
- A moisture and mortar-free 25mm cavity will be maintained that will be easily ventilated
- Insulation, if required, is held in places at all times, enabling it to work to its full efficiency

SureCav25 ensures no water penetration from wind driven rain with a 25mm cavity instead of the usual 50mm or even 75mm required in high exposure zones. The barrier formed by the panels, locked together by the joining strips, will protect the structure in even the most exposed weather conditions.

Pre-clad wall with SureCav25:

SureCav25 has been fixed to the timber-frame through 100mm insulation, in preparation for the stone masons to begin laying the stone. Helical ties will be fixed through the flat face of the SureCav25 panels (not through the pods) at appropriate intervals, conforming with local building standards.



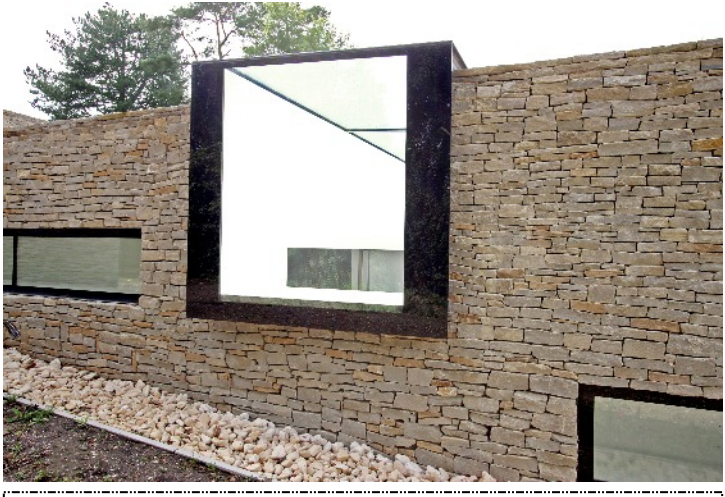
Testimonial

I have been personally really impressed with the overall SureCav system and have happily shown some of your prospective customers around my site at Langton Matravers, Dorset, where we are using it on a house with semi-dry stone walling designed by Western Design Architects. The biggest advantage, of course, is that you can increase the overall floor area by using SureCav. I can see this completely doing away with outdated backing block design. My opinion is that SureCav is the way forward and is a great product and great solution.

Daniel Cox, Matrod Frampton Site Agent

Appreciation of the importance of flint:

Flint and its effects can produce stunning results, especially when laid in alternate bands in stone or with brick quoins, as shown in this image.



Testimonial

"*Charlie, all the semi-dry stone walling is on SureCav. Brilliant idea you had! The stone is Cotswold Stone, 150mm on bed, laid semi dry to conceal the mortar. We wanted it to look like random walling without regular, level, coursing. The walling craftsmen were able to achieve this random effect with SureCav.*"

David Lees, Director. Lees Munday Architects, Guildford, Surrey

SureCav25 is well suited to cope with angles that are not 90°

The SureCav25 panels are fixed to the timber-frame ahead of the stone masons making a start. Helical ties will be used throughout the project - fixed through the flat face and not through the pods.

Structural Engineering Calculations

SureCav Limited have made available the structural calculations that have been produced for various construction projects. The scope of these calculations include brick, flint and stone as well as random stonework.

Calculations have been carried out for assessments of Stability, Wall load, Wind load, Lateral load, Foundations, Wall ties and Insulation.

Download from www.surecav.co.uk

Example Summary

Re: Cavity Wall Spacer System Wall Visual and Analytic Assessment

…..These calculations have demonstrated that the wall system will be stable in most locations and altitudes and assumed lateral pressure of 1.15kN/m2. In addition type 2 wall ties and grade 3 mortar are required to satisfy this on external walls.

….. we are of the opinion that the Incorporation of this stiff however light material is likely to have marginal increases in effective and allowable flexural characteristics due to its robust nature.

…..queries have been raised with respect to the suitability of using this system with random stone and whether the wall ties will pull out on uneven beds and stone thickness. This is a genuine query when considering a random stone external skin that will be unstable and we agree that concrete block backing would be recommended for most thin stonework. However, the incorporation of this system applied to the back face of insulation or timber frame etc provides an extremely stable and vertical smooth formwork face providing a stable backing to the cavity. As the external wall skin is constructed in short lifts any gaps can be filled tight with mortar and rammed into the dimple moulded recess, leaving a scabbled and scarified key at the top for the next lift and allowing the mortar to cure will ensure that a homogenous and robust vertical slab is provided. Therefore wall ties whether embedded over stone or mortar are embedded in this case into the same monolithic mass of masonry.

Ian Caldwell Bsc(Hons) CEng MICE MI Struct Eng. CC Engineers Ltd.

Technical specification

Extracts from the BBA Certificate 04/4154

Information in this Certificate may assist the client, CDM coordinator, designer and contractors to address their obligations under these Regulations.

Description

SureCav25 forms a 25mm clear cavity to replace a concrete block backing wall when building with stone, slate, brick or flint.

Non-regulatory Information

NHBC Standards 2010. NHBC accepts the use of the SureCav Cavity Wall Spacer System, when installed and used in accordance with this Certificate, in relation to NHBC Standards, Chapter 6.1 External masonry walls or Chapter 6.2 External timber-framed walls.

Technical Specification

1.1 The SureCav Cavity Wall Spacer System is a black, 100% recycled, injection moulded polypropylene sheet, with raised spacer protrusions at 260mm centres . The sheets interlock via plastic joining H section profile strips at all edges when installed. Corners are formed by bending the sheet along the integral fold.

Design Considerations

3 Use

3.1 The SureCav Cavity Wall Spacer System is satisfactory for use in new, external cavity wall constructions, with a height restriction of 12 metres. The system ensures a minimum cavity width of 25mm when using natural or reconstituted stone outer leafs in conjunction with:

a) conventional masonry inner leafs, with or without partial fill cavity wall insulation (masonry includes clay, calcium silicate, concrete and stone units).

b) timber-frame inner leaf.

3.2 The system may also be used with conventional clay and calcium silicate brick and concrete block outer leafs.

Durability

The panel is durable and will remain effective for the life of the building in which it is installed. *For additional information see www.surecav.co.uk*

www.surecav.co.uk

Please visit our web site for more information:

Ordering online, CAD details and construction drawings, FAQs, installation instructions, news items, cost comparisons, instructional videos and much more!

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SureCav®25 1stEdition - March 2016