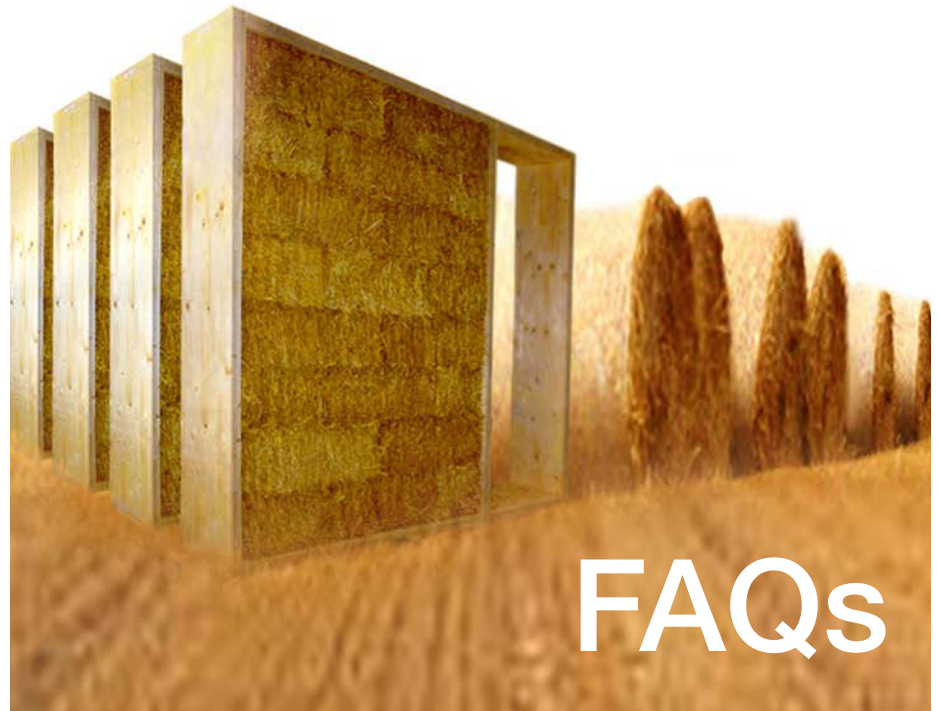


# modcell

helping you  
build a more  
sustainable  
future

**ModCell is a sustainable, prefabricated straw bale and hemp cladding panel designed for use in offices, schools, housing, and commercial buildings.**



## ModCell™ FAQs

### What about fire?

ModCell™ bales are tightly packed and covered with Lime render or a protective sheathing. Fire needs a ready supply of oxygen to burn and without it no combustion will occur. The panels provide a near airless environment, so fire resistance is very good. Recent tests show a fire rating of over 2 hours for both ModCell Straw™ and ModCell Hemp™ Panels.

### What about infestation?

Straw contains very little nutritional value and will not, in itself, support a pest population. The density of straw discourages rodent activity. Infestation can only occur when panel has been damaged and straw is open to outer atmosphere. ModCell Hemp™ is a monolithic structure not dissimilar to lightweight aerated concrete and as such prevents infestation occurring. Lime render is aseptic further reducing the possibility of infestation.

### Won't the straw decompose?

ModCell™ panels are designed to be breathable and prevent the buildup of humidity levels. It is high humidity levels that causes decomposition to take place. It has been established that straw begins to decompose when the moisture content exceeds 25%, and that to ensure a high level of confidence it is generally accepted that moisture content should not exceed 20%. As a result of the breathable nature of

ModCell™ panels decomposition is prevented. The lime render used in the ModCell™ panel has been specially formulated to be both 'breathable' and strong, and takes up to 6 months to fully carbonate. Research has shown that the moisture content is a figure of just below 15%, which is well within acceptable limits to prevent decomposition.

### What about damp?

ModCell™ is delivered to site as closed panels with all but the finishing surfaces applied. Relative Humidity (RH) and moisture levels are measured at factory gate. Research has shown that damp is kept at bay naturally as part of the breathable properties of the materials used

### What about mould?

Lime is aseptic. The RH, moisture content, air changes are not conducive to microbial and higher order animals.

### What sizes do they come in?

A variety of sizes can be supplied. Please contact us for details.

### How thick are the panels?

ModCell Straw™ = 490mm  
ModCell Hemp™ = 490mm or 300mm  
ModCell Lite™ = 380mm

### Why are they so thick?

To accommodate standard size UK straw bales. To meet the same u-Value using brick block and mineral wool insulation the wall would need to be 533mm thick.

### Does ModCell™ help towards the thermal mass of the building?

ModCell™ has an optimum combination of mass and super insulation. ModCell Hemp™ has higher thermal mass than ModCell Straw™. The mass of both deliver a thermal lag of 8 hours, which is optimal for most uses.

### What are the u-Values?

This is dependent on the panel type:  
490 mm ModCell Straw™ = 0.13\*  
490 mm ModCell Hemp™ = 0.14  
380 mm Modcell Lite™ = 0.13  
300 mm ModCell Hemp™ = 0.22  
ModCell™ solid timber frame = 0.13

\*Source - Centre for Window & Cladding Technology

Insulation values are nearly 3 times higher than current regulations require.

ModCell™ panels deliver an airtight construction, to PassivHaus specifications. As a result, buildings using ModCell™ can help deliver zero heat requirements, saving money and CO<sub>2</sub> emissions. BaleHaus™ has an air tightness of 1m<sup>2</sup>/(h.m<sup>2</sup>) at 50Pa, 10 times better than current regulations require.

### What about Carbon?

ModCell™ panels are carbon negative. Embodied carbon - A 3 x 3 ModCell™ panel has 598kg of atmospheric equivalent CO<sub>2</sub> sequestered into its fabric.

### How are they made?

The structural timber frame is 'infilled' with locally sourced straw bales, which are

stacked to form a wall, compressed and pinned together for stability. The wall is then either plastered using a protective lime render or dry lined.

### **What are they made of?**

Straw bale or Hemcrete, timber, lime render or wood cladding and small quantities of steel fixings. ModCell™ is made of by-product wood, infilled with straw or hemp. They are precision-engineered using modern methods of construction.

### **Are they sustainable?**

Yes, ModCell™ panels are made from 100% renewable materials. ModCell Panel™ frames are constructed using PEFC timber as standard. FSC certified timber can be sourced on request. All straw, which is an annual 3m ton by-product of the agricultural industry, is untreated and locally sourced. ModCell Hemp™ uses hemp grown as a field crop in the UK, a field of hemp has a different biodiversity profile to that of straw, but we know of no adverse impact.

### **Is there waste from the manufacturing process?**

Straw bales are cut to size in the Flying Factory and trimmings and rejected material are composted, used as bedding for farm animals or recovered as biomass. The frame is made using offcuts from the timber industry. Cut materials from the frame manufacturing process are used in the factory's biomass boiler. Cut waste is minimal as each panel is CNC cut from larger sheets. Lime render is spray applied with almost no residual waste. Offcuts of stainless steel are minimised by design but are collected and recycled via the scrap industry.

### **Do they cut noise levels?**

Yes, they produce an approximate reduction of 50db

### **How heavy are they?**

Weight varies by panel type and size. A fully rendered 3m x 3.2m weighs approximately 1.7t

### **Are there different finishes available?**

Yes, Uncoloured Lime render, Pigmented Lime render, Lime wash colour finishes and timber cladding. Customers who require alternative finishes should contact us to discuss their requirements.

### **How do you incorporate essential services like plumbing and electricity?**

The frames of ModCell™ can have pre-routed conduit at 150 mm centres when requested. The face of the panel can have this fitted in the factory upon request.

### **Are they load bearing/structural?**

Yes, with some considerations. On commercial buildings ModCell™ is normally

secured to a building frame. For domestic construction ModCell™ can be used for structural load bearing and stabilisation. Normally Modcell™ panels are structural up to 3 stories high. Above this height we would advise the use of ModCell™ panels as a paneling system fixed to a frame.

### **How high can you build with them?**

Structurally up to three stories high.

### **Can I build with a frame?**

Yes, Modcell™ can be used with timber, steel and concrete frames.

### **Do you build them onsite?**

No, ModCell™ is an offsite prefabricated panel system - (see below)

### **Where are they made?**

In order to minimise the embodied energy in ModCell™ Panels we fabricate them in Flying Factories. Instead of using a central fabrication plant and transporting ModCell™ Panels great distances, we work with local farmers to identify a source of straw and a suitable location to assemble ModCell™ panels, normally 5 - 25 miles of the construction site. By using local straw, skills and labour, we are able to keep more of the project's value within the local economy.

### **What quality controls do you have?**

ModCell™ panels are entirely manufactured and assembled under controlled conditions in flying factories. The quality of each panel is uniform and signed off at various stages during manufacture. ModCell™ is delivered to site as closed panels with a two-layer base coat of lime render. RH and moisture levels are measured at the factory gate.

### **What is the lead time?**

16 weeks from confirmed order.

### **How long do they take to install?**

ModCell™ is delivered to site in nominal 3m x 3.2m panels. To offload from low loader and secure on to building is typically a 15 minute operation giving an install rate of 38.4 sqm per hour. Complexity/simplicity of project will impact on this rate. Final finish coat of render is done at a later date and each panel takes half an hour. This can be achieved off of a cherry picker, or more usually from a scaffold.

### **What equipment is needed to install them?**

On construction site – Crane or telescopic lifting device. Scaffolding or cherry picker.

### **Can I buy them in kit form?**

No. Currently manufacturing quality controls prevent the manufacture outside of factory environments. Although we are happy to engage with community groups and individuals who want to assemble panels. This would be after appropriate training and supervision.

### **Do you supply to self builders?**

This is dependent on the size of the development and will reviewed on a case by case basis. Additional traveling distances from flying factories may have an effect on cost per unit and an increase in CO<sub>2</sub> emissions.

### **Can you help me with my design?**

Yes ModCell™ are able to offer a number of additional services to the developer. These include:

Supply only  
Supply & Fit  
Design & Supply  
Design, Supply & fit  
Consultancy and CPD training

### **How long do they last?**

Life cycle is a minimum of 75 years. At end of life they can be easily reused or disassembled. Lime can be re-used. Straw, hemp and wood are biodegradable and can be used as biomass. Hemcrete can be crushed and mixed into soils. All metal fixings can be recovered and recycled. There are a number of strawbale buildings throughout the world, some of which are over 120 years old.

### **How long is their warranty?**

ModCell™ offers up to a 25 year warranty.

### **How much do they cost?**

£200-£280 per square metre.

### **Where can I get my building insured?**

There are a number of insurance brokers who offer insurance, an example is M & DH Insurance Services Ltd ([www.mdh-insurance.co.uk](http://www.mdh-insurance.co.uk)).

### **Do you supply complete building packages?**

ModCell™ are able to offer a number of different packages. These vary from supply only, supply and fit, supply design and fit. ModCell™ can supply the package that best meets your needs, just ask. BaleHaus™ is our whole house solution.

### **Where can I see one?**

There are a number of sites around England and Wales. These include:  
York EcoDepot, York, England.  
Archimedia, Knowle West, Bristol, England.  
Torfaen EcoBuilding, Cwmbran Wales.  
Faculty of the Built Environment, University of West England, Bristol, England.

### **If your question is not answered here please contact us and we will be pleased to help you.**

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