technical developments in prefab building with straw

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Wouter Klijn

2022

INTRODUCTION

Straw building is a growing topic within the sustainable building world. As the interest from consumers went up, offers got to adapt to another scale. Innovation is a necessary way toward a wide range of possibilities to use straw in building.

This document will show you a range of prefab straw innovations that contribute to the success and rising popularity of the straw construction sector.

COMPANIES & CONCEPT PRESENTATION

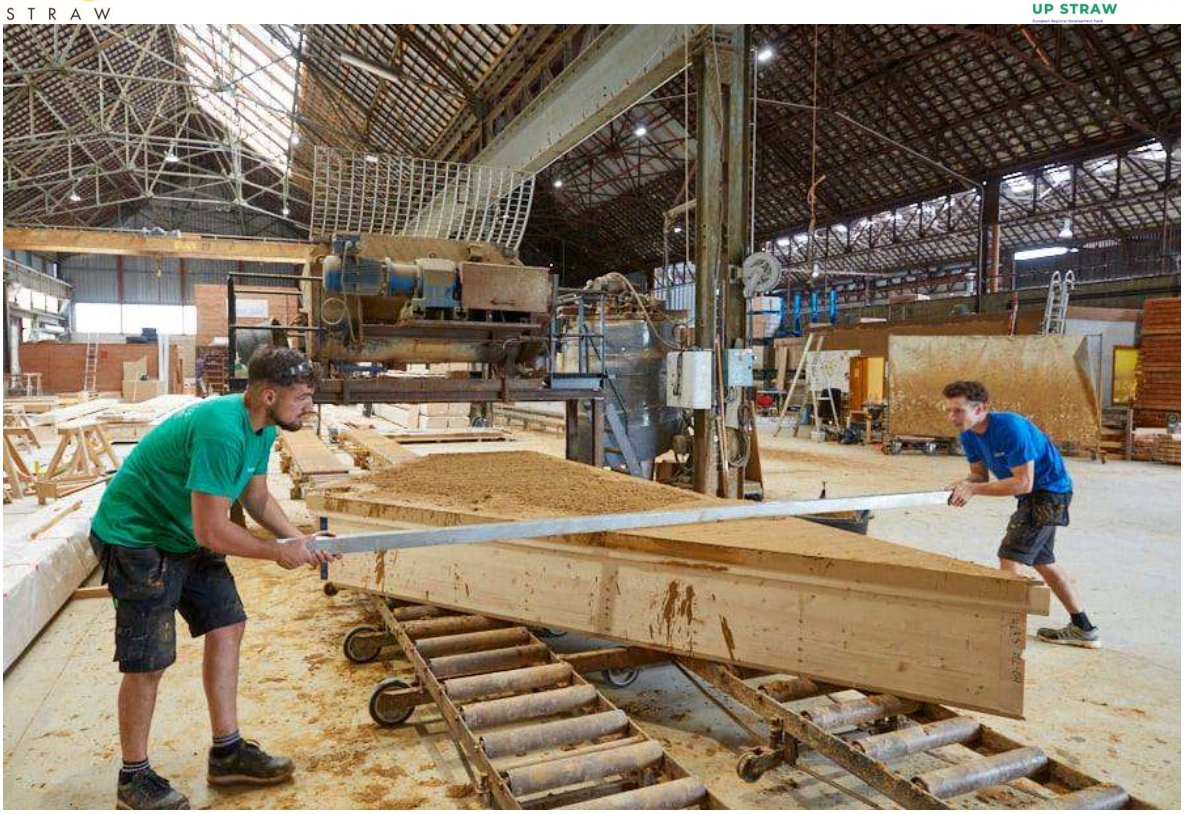
Paille-Tech (BE)

Rue de Saint-Gobain 7
B-5150 Franière
Belgique
https://www.pailletech.be

https://www.facebook.com/Waldoradotv/videos/188292723351476

For more than 10 years, Pailletech has been developing prefabricated straw walls with a clay plaster applied in the workshop. For some years now, the company has also been offering to construct turnkey buildings as a general contractor.

This innovation is important because the plaster, which is a classic finish for straw constructions, requires a lot of time to lay and dry. This workshop installation improves the quality and speed of the installation.



Modcell (UK)

Hamilton House
80 Stokes Croft
Bristol, Uk BS1 3QY

https://modcell.com

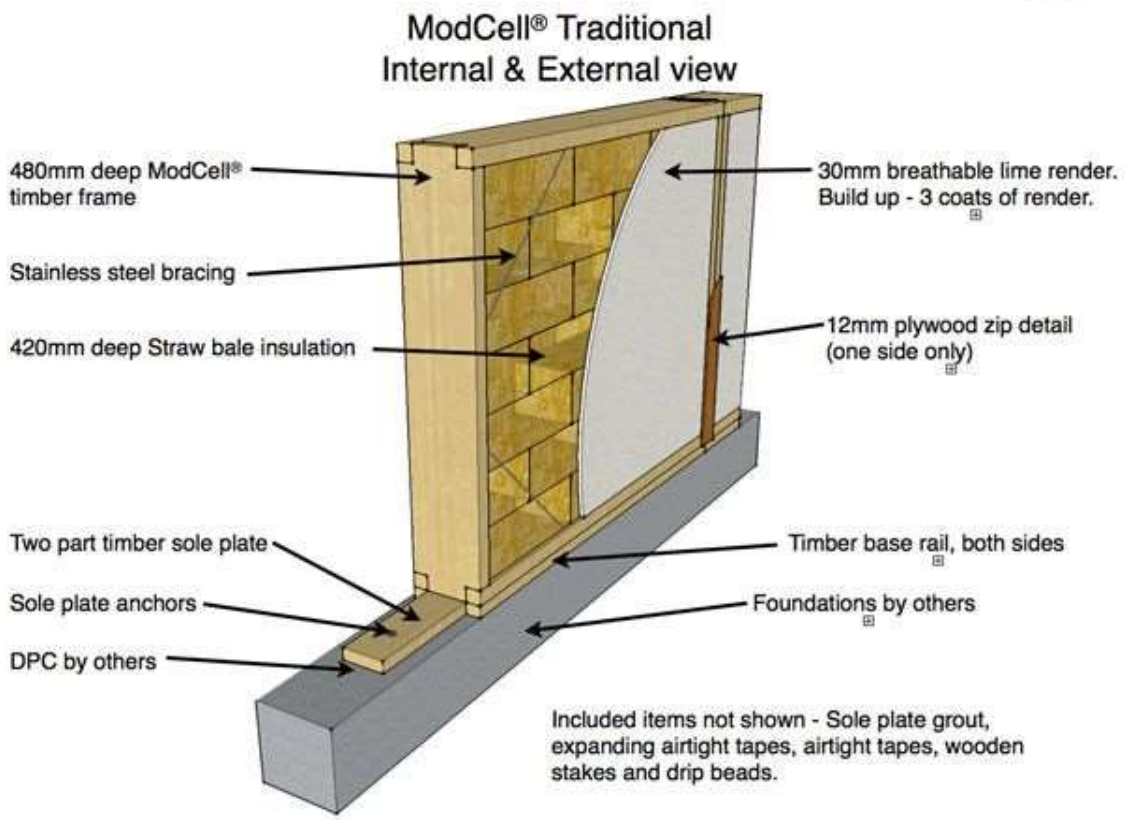
ModCell® is one of the first products to make large-scale, carbon-negative building a commercial reality. The ModCell® system utilises the excellent thermal insulation qualities of straw and timber to form prefabricated panels, made in either a local Flying Factory™ or regionally located fabrication units

ModCell® allows super-insulated, high-performance, low energy 'passive' buildings to be built using renewable, locally sourced, carbon sequestering, sustainable building materials.

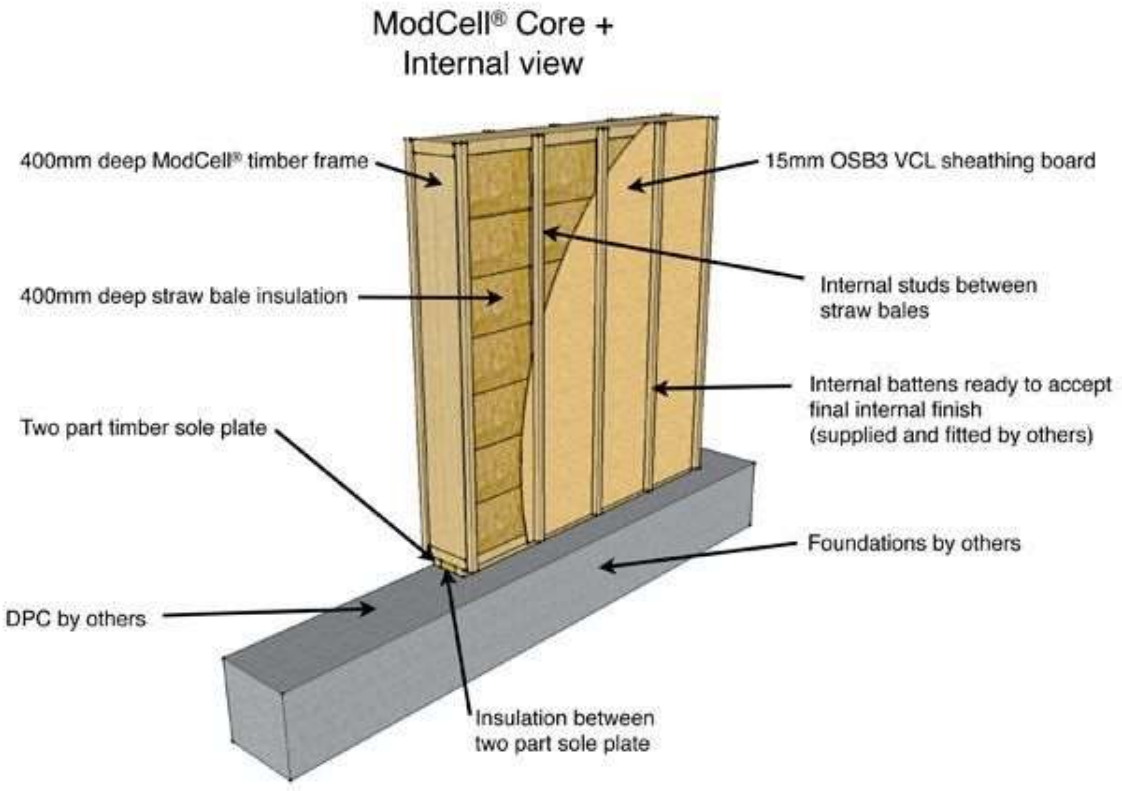
ModCell® is designed for use in offices, schools, housing and commercial buildings.

This innovative, offsite-manufactured wall and roof cladding system can be quickly and efficiently installed, creating buildings with thermal performance higher than the current building regulations require.

This super-insulated system, combined with our airtight details, means that buildings constructed using ModCell® panels can meet the demanding PassivHaus specification. As a result, ModCell® buildings can have zero heat requirements, saving money and CO2 emissions.


ModCell® Traditional
Internal & External view
480mm deep ModCell® timber frame
Stainless steel bracing
420mm deep Straw bale insulation
Two part timber sole plate
Sole plate anchors
DPC by others
30mm breathable lime render. Build up - 3 coats of render.
12mm plywood zip detail (one side only)
Timber base rail, both sides
Foundations by others
Included items not shown - Sole plate grout, expanding airtight tapes, airtight tapes, wooden stakes and drip beads.


KNOWLE WEST MEDIA CENTRE


ModCell® Core +
Internal view
400mm deep ModCell® timber frame
15mm OSB3 VCL sheathing board
400mm deep straw bale insulation
Internal studs between straw bales
Internal battens ready to accept final internal finish (supplied and fitted by others)
Two part timber sole plate
Foundations by others
DPC by others
Insulation between two part sole plate

Active Home (FR)

Activ Home
LIEU DIT LA MITTE
03190 REUGNY
France

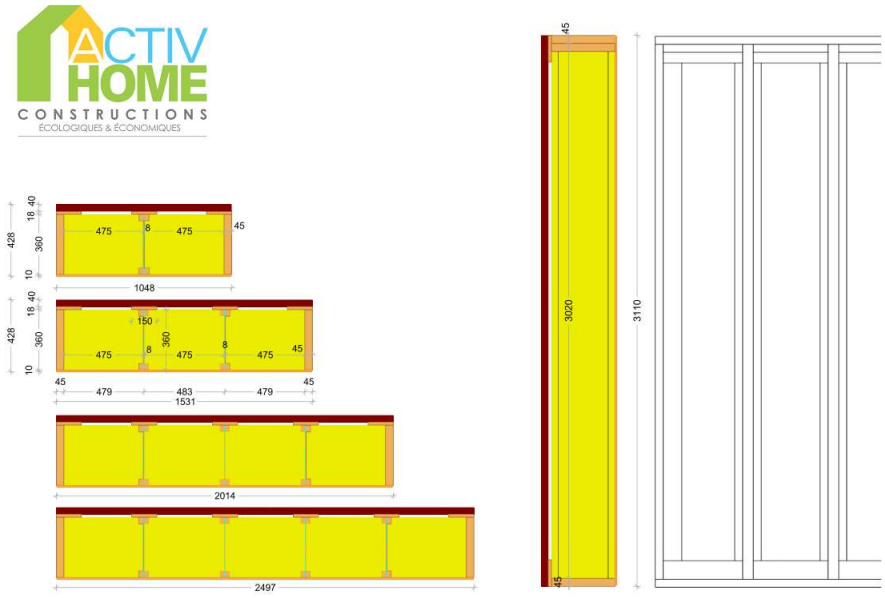
https://www.activ-home.com

https://www.youtube.com/watch?v=VVy8TiDIH14

https://www.youtube.com/watch?v=lZGS8B-i7co

Active Home is a French company that launched another way of developing the straw bale construction sector. They build a device that is dedicated to wood construction companies. The device help them to introduce straw bales into a wood frame with an industrial device that puch bales between wood beams.

ACTIV HOME is not intended to build houses. Our primary mission is to sell our process of manufacturing constructive materials.



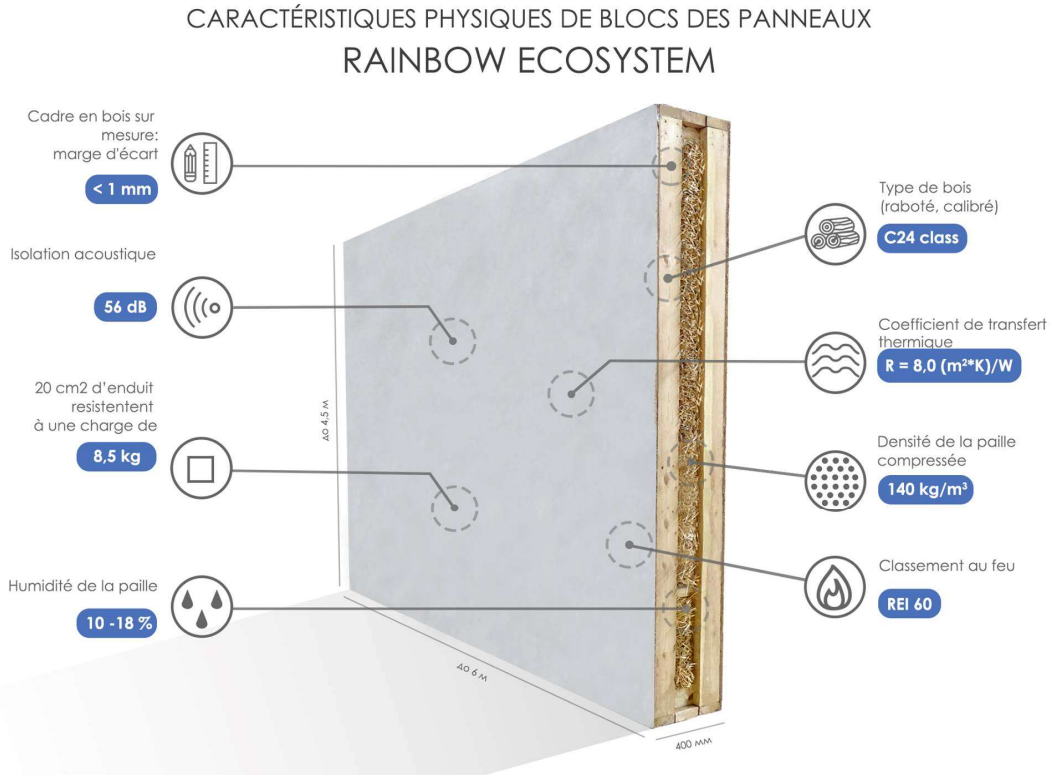
Rainbow Ecosystem

st. Raisy Okipnoy street 2
Kiev, Oekraïne
https://rainbowecosystem.com

Raphael Petit, founding president of Rainbow Ecosystem : We manufacture loadbearing biosourced blocks for the construction of ecological and passiv buildings.

https://www.youtube.com/watch?v=Fq91aSiX4Ac&t=57s

Our values: listen, observe, grow up, innovate, reuse, recycle, reduce, resist, don't accept unacceptable, do more with less, respect ecosystems + the others + ourse lves. Find opportunities in adversity. Be flexible, target simplicity, integrate excluded and follow our hearts. Think other worlds are possible.

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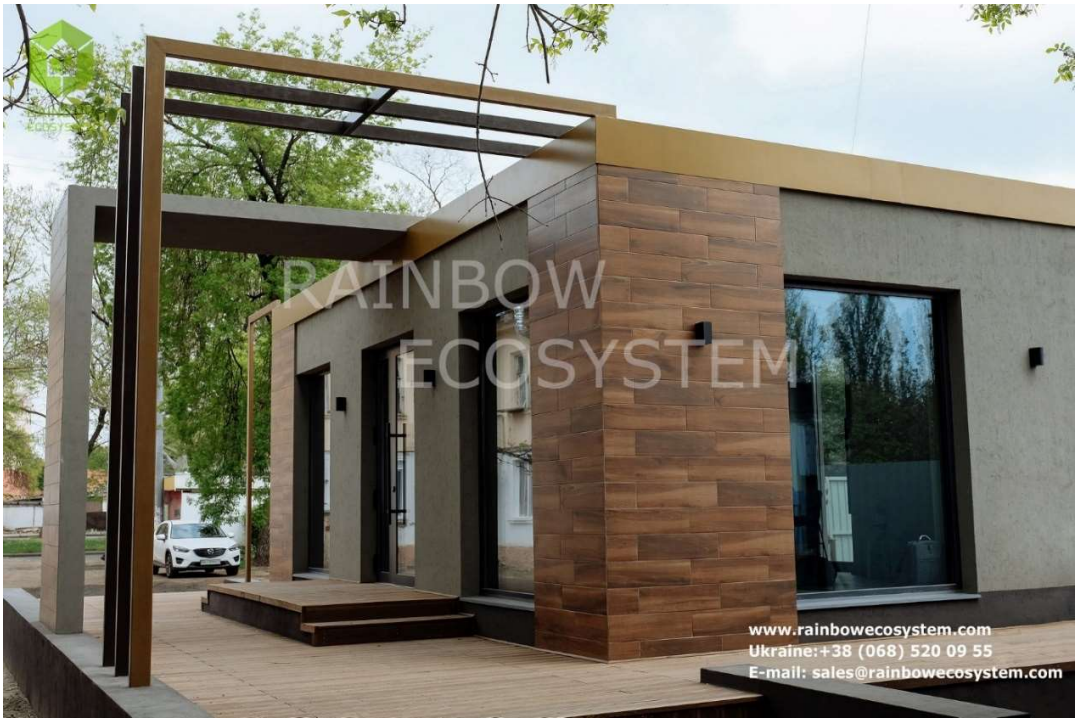
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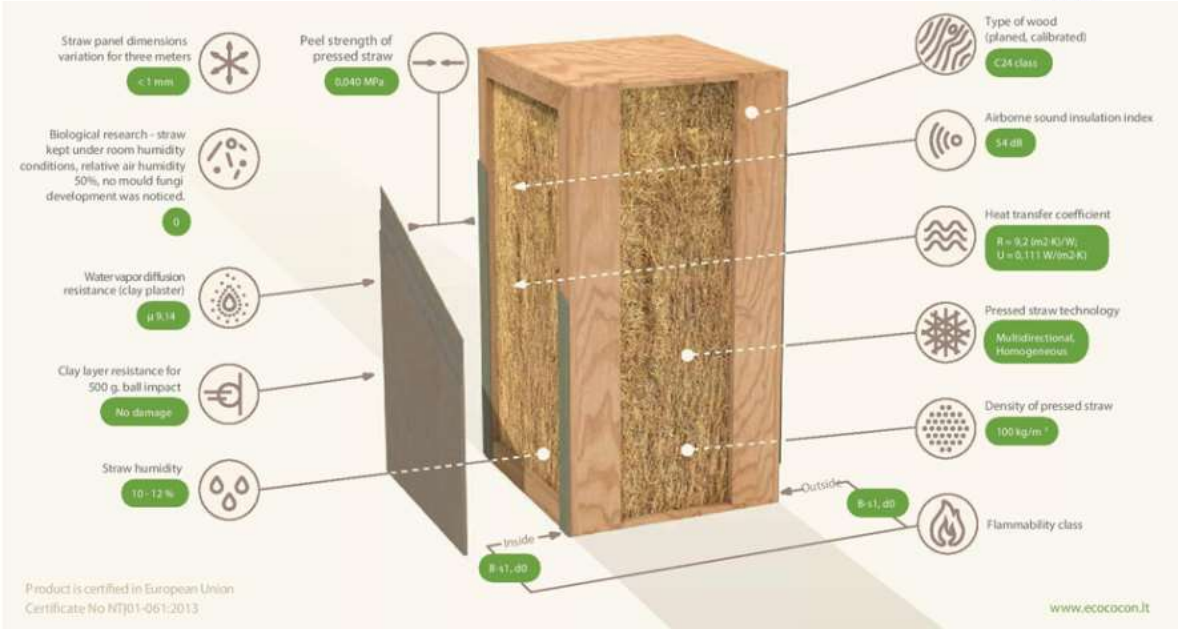
Ecococon

Záhradnícka 60
821 08 Bratislava
Slovakia

https://ecococon.eu

EcoCocon is an international company that manufactures an innovative straw-based construction system. Their unique straw wall panels contain 98% natural renewable materials and have excellent insulation properties. The system holds several certificates including the German Passive House standard.

EcoCocon strives to make plant-based construction mainstream and promotes solutions that are healthy both for people and the planet.

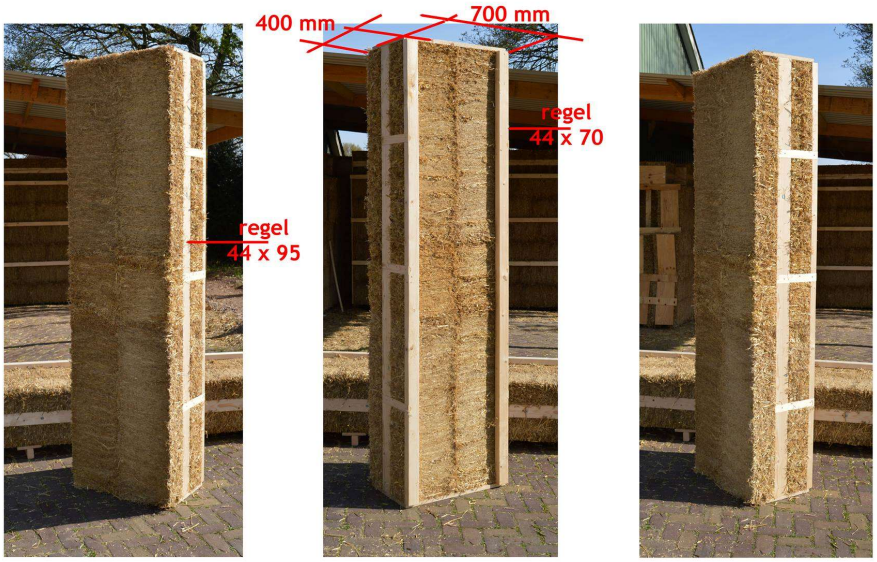

Straw panel dimensions variation for three meters
< 1 mm
Peel strength of pressed straw
0,040 MPa
Biological research - straw kept under room humidity conditions, relative air humidity 50%, no mould fungi development was noticed.
0
Water vapor diffusion resistance (clay plaster)
μ 9,14
Clay layer resistance for 500 g. ball impact
No damage
Straw humidity
10 - 12 %
Type of wood (planed, calibrated)
C24 class
Airborne sound insulation index
54 dB
Heat transfer coefficient
R = 9,2 (m2·K)/W; U = 0,111 W/(m2·K)
Pressed straw technology
Multidirectional, Homogeneous
Density of pressed straw
100 kg/m³
Outside
B-s1, d0
Flammability class
Inside
B-s1, d0
Product is certified in European Union
Certificate No NTJ01-061:2013
www.ecococon.lt

Straw Blocks Systems

Diepenheimseweg 50
7275 AR Gelselaar
Nederland

www.strawblockssystems.nl

These building elements are composed of pressed straw blocks. Construction parts of wood or other materials are on the outside or in the middle of the element, which depends on the use. We make elements for corner, wall, floor and roof solutions in various measurements, with a standard thickness of 40 cm. This means that the building has a shell of 40 cm. pressed straw! The exterior of all our elements is provided by default with a layer of loam with a minimal thickness of 1 cm, which complies with the norms of fire delay. Because of this, the elements will also be dust free and slightly damp resistent. We can finish the building off with all sorts of material, such as wood, loam or other materials. Our blocks and elements are made in an efficient way and assembled into a complete building (shell of the house). Because of this, we can produce highly qualitative and inexpensive buildings.




MERCOM


EUROSCAFFOLD
EUROSCAFFOLD

Lorenz Systeme

Lorenz GmbH
Am Steinbruch 16
04425 Taucha

Germany

https://lorenzsysteme.de

The mechanically prefabricated wood-thatch system is suitable for the construction of new buildings and for the heat and cold insulation of existing buildings.

Due to the mechanical prefabrication, the DD series combines consistently high dimensional accuracy with an exactly specified pressing pressure of the straw - right into the corners.

https://youtu.be/J3z4brYqgXI

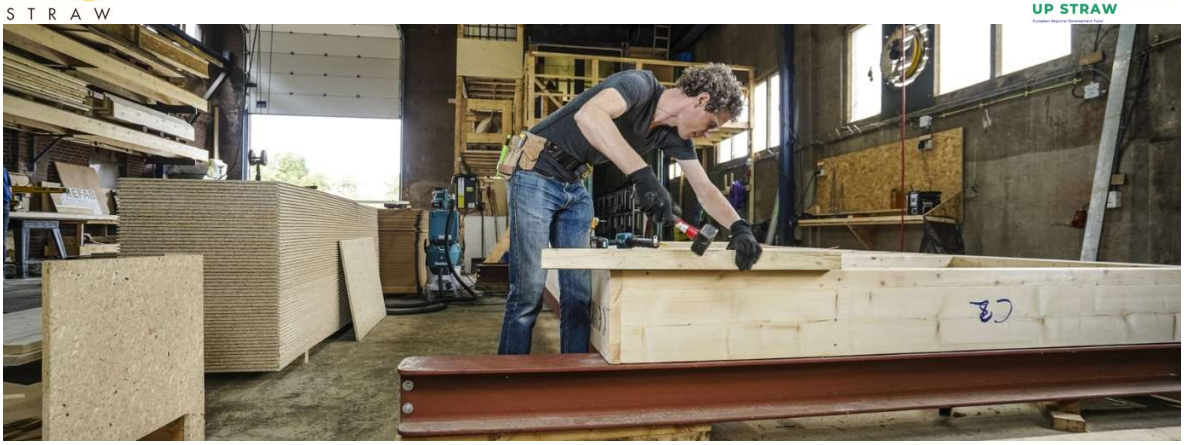
Prefab Strobouw

Dokstraat 9
9636 AX Zuidbroek
Nederland

https://www.prefabstrobouw.nl

Natural, sustainable and healthy building of beautifully designed houses in which it is pleasant and comfortable to live. And that for a competitive price. That is what we have in mind with Prefab Strobouw. In our concept we combine practical knowledge of construction with high-quality and certified materials for the construction of the complete outer shell of the house.

With the invention of the baler, which pressed straw into manageable bales, the use of straw as a building material really began. Because straw bales have been used ever since to build walls: like large bricks between a wooden skeleton. The next step in professionalization was the innovation of straw blowing. A large machine blows small shreds of straw into the wall to achieve the same effect as with a straw bale. This not only allows us to work faster, but it is also possible to make all thicknesses and shapes



Stro Box

Rielerweg 102
7416 ZJ Deventer
https://www.strobox.nl

The StroBox is a building element from which a house can be built. It can be used for walls, roof and floor. As the name suggests, it is essentially a wooden box with straw pressed into it. The StroBox is a revolutionary new method of building with straw. The method makes building with straw accessible to both professionals and individuals.

The StroBox is a box made of fire-resistant, breathable and FSC certified wood, filled with straw from local farmers. This makes the StroBox ecological, sustainable and circular. The box is prefabricated and is dimensionally stable and can be ordered in almost any shape, making it a pleasant product to build with. With the straw box you build a healthy, comfortable and energy-saving home. Building with straw boxes is no more expensive than the current regular construction.

CONCLUSION

The growing number of companies that are active in the market of prefabricated straw elements is showing the believe in building with straw on a larger scale. And the diversity of the available product makes clear that there is not one way of building with straw. This gives to challenge to do it even better in your own way.

CONTACT

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This study has been done within the Interreg European program UP STRAW.

Interreg is one of the key instruments of the European Union (EU) supporting cooperation across borders through project funding. Its aim is to jointly tackle common challenges and find shared solutions in fields such as health, environment, research, education, transport, sustainable energy and more.

Found more about UP STRAW and Interreg here :

https://www.nweurope.eu/projects/project-search/up-straw-urban-and-public-buildings-in-straw/