



Installation Guide

The insulating hemp block
for building, renovating
and partitioning

The choice of building materials is of the utmost importance. **Technical performance of the building, ease of installation, impact on the environment and health:** there are so many criteria that have guided your choices or those of your client.

With IsoHemp hemp blocks, you have opted for a solution without compromise. Soon you will experience their many advantages: **water and thermal regulation, acoustic insulation, thermal inertia, fire resistance, ...**

We have designed this guide to give you a practical overview of the use of IsoHemp hemp blocks, so you can start building and renovating yourself.

In case you need help, you can always count on our team of experts to guide you in the execution of your project. Our technical department is at your disposal to answer your questions.



Naturally Efficient

Watch our video tutorials



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2 Safety precautions

• Storage of hemp blocks

Precautions for storing pallets of IsoHemp hemp blocks: The pallets should be protected from rain but not wrapped with plastic film or tarpaulin. The blocks must be able to breathe.

Outdoor storage time:

Covered pallet: **6 months**

Opened pallet during construction: **3 months**

Hemp block masonry with completed roof: **1 year with max. 1 winter**

• Storage of products in bags

IsoHemp products in bags (Prokalk, HempBag, HL Mix, adhesive mortar and PCS), must be stored indoors and protected from moisture. Make sure to respect the expiry dates of the products.

• IsoHemp Adhesive Mortar

Only this product is perfectly suitable for the laying of hemp blocks and guarantees good masonry.

For good adhesion of the adhesive mortar, do not use the product if the temperature is below 5°C or above 30°C.

• Ghosting masonry

To avoid ghosting masonry in the plastering, systematically clean any adhesive that protrudes from the hemp block masonry. The joints must never be slathered or spread!

• Filling

To avoid any moisture problems, filling is recommended when constructing hemp block masonry against an existing wall that is not perfectly vertical, both in interior and outdoor renovation.

• Lintels

A minimum support of 20 cm on each side of the masonry. For a lintel of more than 2m, provide a support of 30 cm on each side. The lintels are not load-bearing, they only support the upper masonry triangle. Do not exceed the permissible load (see table). Point the concrete in the lintels always upwards.

Transport and handling: the lintels should always be transported with the concrete upwards and handled by the ends.

Storage: the lintels must be stored horizontally.



3 Equipment

To ensure that the **IsoHemp hemp blocks** are properly installed, it is recommended to use the following equipment:



Tip

This equipment must be in your possession during onsite training by the IsoHemp instructor.

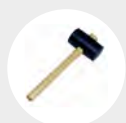
The essentials **ISOHEMP RANGE**



Blocks scraper



Tun



Mallet



Adhesive trowel comb



Level



Large tooth saw

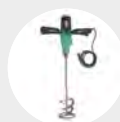
The recommended



Slot-drilling machine



Concrete mixer



Mixer



Alligator saw



Band saw

Pallets Opening and protection



1 Remove and keep the protective cover to protect the walls being built in the evening in case of rain.



2 At the end of the day, protect and cover your opened pallets.

4

4.1 Laying the base course

The IsoHemp blocks must be protected against capillary rise and heavy rain. Depending on the situation, choose one of these solutions:

- **On a sealing membrane**

Make sure that the base course is dry, clean and level before starting the laying.

The first course should be laid on fresh mortar or fixed on a dry base. It is absolutely necessary to lay a waterproofing membrane under the first block in case of risk of rising damp.



1 Find the highest point of the slab with a laser or water level.



2 The IsoHemp blocks must be protected from capillary rise. Apply a sealing tape (of the DIBA type) going up a couple of cm along the IsoHemp block.



3 Apply a uniformly spread mortar bed 1 to 2 cm thick.



4 Glue the vertical joint (except for the blocks of 30 and 36cm with tenon and mortise joints) and lay the next block. Adjust with a mallet if necessary to obtain a 3 mm vertical slim joint.

5 **It is essential for this base course to be perfectly level.** Check the perpendicularity and wait for the mortar to dry before continuing the masonry.

- IsoHemp adhesive mortar can be used on even surfaces without the risk of rising damp.
- On flat wooden surfaces, suitable foam adhesive can be used.





• On a rot-proof substrate

The first course must be laid at least 20 cm above the natural ground level. If necessary, start the hemp block masonry on a rot-proof and resistant insulating block (cellular concrete or cellular glass) to protect the blocks from capillary rise, after having laid a waterproofing membrane (see previous point).



• On an angle bars

- Use an angle bars when other solutions are not feasible, or the foundation is not adequate. Do not exceed the permissible loads of the angle bars (see website).
- Make sure the load-bearing wall is strong.
- Fix the base angles firmly into the wall at least 20 cm above the external floor level.
- Fix each block to the angle using a screw with a diameter of 6 mm and a minimum length of 80 mm.
- Then mechanically fix each block to the existing wall with a hook or a connecting bracket after ensuring correct alignment.

4.2 Cutting and adjustment

IsoHemp blocks are very easy to cut. To minimize losses and waste, use the broken or chipped blocks to make the necessary cuts and adjustments.



- Alligator saw

Fast cutting and easy handling

⚠️ Precautions:

Do not use a reciprocating saw as you can't achieve proper cuts with them.



- Band saw

Recommended for larger projects for perfectly square cuts, rounded corners or precise angles.



- Manual saw

Satisfactory result in case of small projects.

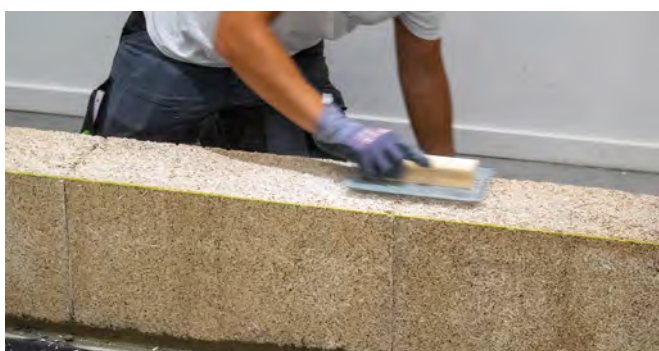
4.3 Laying the next courses



1 Only IsoHemp Adhesive Mortar is to be used for gluing. If not, IsoHemp cannot be held responsible for any damage to the masonry. Please follow the instructions on the bags of Adhesive Mortar.



2 Prepare the Adhesive Mortar with 7 to 8 l of water per bag of 25 kg. Make sure to add the adhesive mortar to the water – and not the other way around. The mix is usable for 1 hour.



3 Find and smooth the high points.



4 Remove dust from the support.



5 Apply the adhesive mortar using an IsoHemp adhesive trowel comb over the entire horizontal surface of the already laid block to seal the joint.



6 Lay the blocks in staggered joints (minimum 1/3 of the length of the block).



7 Glue the vertical surface in case the blocks don't have tenon and mortise joints.




8 Place the blocks on the adhesive mortar for masonry in 3 mm slim joints.



9 Adjust with a mallet and check the levels.



10 Remove excess adhesive using the trowel.

 **Caution:** These joints may be visible through the plaster after a few years = ghosting joints.

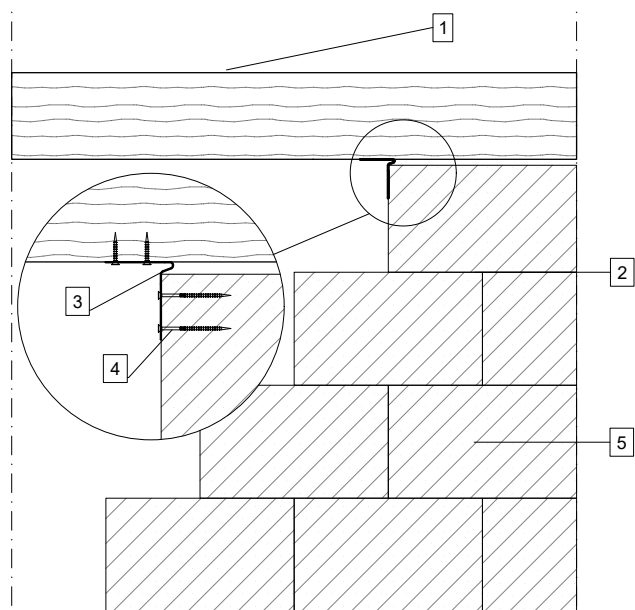


Good joint treatment



Bad joint treatment

4.4 Laying the final course



• In doubling

- Cut the blocks to leave a maximum of 2 cm between the blocks and the ceiling.

• In partition walls

- Use a wall/ceiling connection bracket.
- The partitions will be held in place at the top with EQLI-PLA.

Seal the space with hemp concrete, mortar, flexible insulation or a bonding foam.

1. Floor

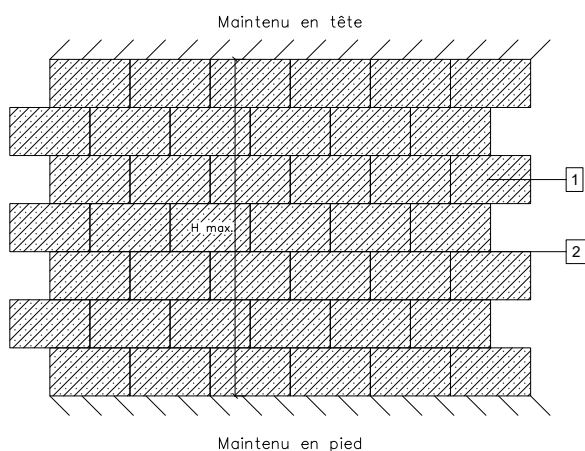
2. Glued joint

3. EQLI-PLA bracket 1 piece in the joint thickness for blocks from 9 to 15cm and 2 pieces in the joint thickness for blocks from 20 to 36cm

4. IsoHemp screw VISO6-100

5. IsoHemp block

4.5 Slenderness ratio



1. IsoHemp block

2. Glued joint

Thickness (cm)	Max. height (m)
9	2,50
12	3,20
15	4,00
20	5,20
25	6,50
30	8,00
36	8,50

4.6 Fixing the masonry

The hemp block masonry must always be fixed to the supporting structure. When using the Hempro system, mechanical fixation is not applicable. Allow for 5 fixations per m² (i.e. +/- 1 per block).

Mechanical fixations



• Masonry hook

Preferred solution for doubling of masonry

- Fix the hook to the existing wall at the height of the block so that it can be confined in the Adhesive Mortar, after lightly pushing it into the block using a hammer.
- For interior renovation, we recommend 3 fixations per m². For exterior use, on the other hand, 5 fixings are necessary according to the ATG.



• Connecting bracket

To be used particularly in combination with a wooden structure.

- Screw the bracket into the wooden column (two brackets per column every two rows, unless otherwise specified by the engineering office).
- Fix it to the block with two IsoHemp screws with a diameter of 6 mm.



• Hemp block double masonry structure

- Connect the two hemp block walls using 5 fixations per m².
- The masonry must be bonded using suitable fixations (EQLI - see Catalogue). For further information, please contact the technical department.



Tip

Join the two hemp block masonries by staggering them with an overlap of at least the thickness of the block.

4.7 Filling for doubling of existing walls

In interior or exterior renovation of old buildings, when the hemp block masonry was laid against an uneven wall, it is necessary to fill the empty space between the existing wall and the hemp block wall with a suitable mixture.



- 1 Manually fill in the space between the existing wall and the blocks gradually.
- 2 Use the ready-made HL Mix or a light mixture of ProKalk lime and HempBag hemp according to the specification sheet, i.e. one bag of ProKalk for each HempBag.
- 3 Do not leave any air gaps to avoid possible moisture problems at the interfaces of the different materials.

Tip

In case of a renovation, given the limited space available, the insulation of the battens will be done with a cork panel between 2 and 4 cm thick. This will also be used to close the gap between the existing masonry and the IsoHemp counter wall. Note: If a greater thickness is available, the cork board can be replaced by a 7.5 cm thick IsoHemp block.

5.1 Lintels and bay window passage

Select one of these two solutions to support the masonry at openings:



• Lintels

Choose your lintel

Choose your lintel according to the desired thickness and the bay opening to be covered. Provide minimum support of 20 cm on either side of the bay and 30 cm for lintels measuring over 2 m.

Transport and handling

The lintels must always be stored or transported with the concrete facing upwards. Handle the lintels by the ends: never lift them from the middle!

Storage

Store the lintels indoors and horizontally. The lintel should be supported at the ends by brackets when stored.

Placing the lintels

Fix the lintel to the hemp block masonry using Adhesive Mortar. The concrete must be directed upwards so that it is covered by the block masonry that it supports.



• Bracket for bay window passage

Use of brackets when lintels cannot be considered: for renovations, mainly with a low height to be insulated or for bays higher than 2.4 m.

- Install the appropriate brackets for the thickness of the block at the junction between 2 IsoHemp blocks every 60 cm.
- Connect the block and the bracket mechanically using a screw of diameter 6 mm and length 80 mm.



Tip

To guarantee a better finish quality, trim a few millimeters from the block to fit the bracket.



- Lintels table

References	Window opening max. (cm)	Dimensions (cm)			Weight max. (kg)
		L (Length)	e (Thickness)	h (Height)	
9 cm thickness					
Lin09-120	80	120	9	20	31
Lin09-160	120	160	9	20	42
Lin09-200	160	200	9	20	52
Lin09-240	180	240	9	20	63
12 cm thickness					
Lin12-120	80	120	12	20	35
Lin12-160	120	160	12	20	46
Lin12-200	160	200	12	20	58
Lin12-240	180	240	12	20	69
15 cm thickness					
Lin15-120	80	120	15	20	51
Lin15-160	120	160	15	20	68
Lin15-200	160	200	15	20	85
Lin15-240	180	240	15	20	102
Lin15-300	240	300	15	20	127
20 cm thickness					
Lin20-120	80	120	20	20	69
Lin20-160	120	160	20	20	92
Lin20-200	160	200	20	20	115
Lin20-240	180	240	20	20	139
Lin20-300	240	300	20	20	173
25 cm thickness					
Lin25-120	80	120	25	20	75
Lin25-160	120	160	25	20	100
Lin25-200	160	200	25	20	125
Lin25-240	180	240	25	20	150
Lin25-300	240	300	25	20	187
30 cm thickness					
Lin30-120	80	120	30	20	80
Lin30-160	120	160	30	20	107
Lin30-200	160	200	30	20	134
Lin30-240	180	240	30	20	160
Lin30-300	240	300	30	20	201

IsoHemp SA declines all responsibility for misinterpretation of this table. If in doubt, please contact the IsoHemp technical department.

5.2 Carpentry and frames

Doors, frames, thresholds, and windowsills can be screwed and/or glued directly onto the hemp block masonry.



Installation of window frames

- As with any other type of masonry, refer to the frame manufacturer's recommendations for installation.
- The windowsill can be placed directly on the hemp block masonry.
- Depending on the surface of the openings, fix the frame in the hemp or in the concrete post.

Tip: Make the battens

There are several options:

- 1 Cut out the desired batten directly from the hemp block.
- 2 Glue a cut-out batten to the hemp block.

Caution

Windowsills must exceed min. 5 cm from the facade and must have a side elevation.



Fixation of shutters and louvres

- As with any other type of masonry, refer to the manufacturer's recommendations for installation.
- The shutter box must be fastened directly under the lintel with a seal.
- The louvres can be fixed directly in the hemp block masonry using a seal.

5.3 Grooving and cladding



1 Create the grooves using a grooving machine.



2 Finish the opening manually.



3 Fix the boxes and electrical cable ducts.



4 Collect the waste from your hemp block cuttings and grind it. Then mix it with ProKalk binder at a 50/50 ratio. Moisten the resulting mixture with water to obtain a homogeneous, slightly moist mixture. Fill the cavities with the mixture.

Tip

Do not make too much of the mixture, as the time of use is limited to +- 30 minutes.

5.4 Attaching objects



• Wood screw – 18 to 37 kg per fixation

Use a wood screw with a minimum length of 80 mm directly in the wall (no pegs).

- **8*80 mm** - Load support of maximum 18 kg per fixation point
- **10*80 mm** – Load support of maximum 37 kg per fixation point



Tip

To avoid cracking the plaster, a pre-hole can be made with a thin drill bit.



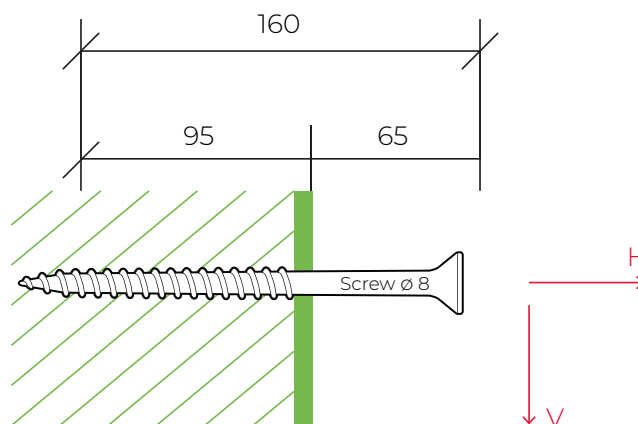
• Sealing – 50 kg per fixation

Create the fixations by sealing with products available on the market and according to the manufacturer's instructions. After drilling the hole, make sure to vacuum up the hemp dust before sealing.

- Valid for blocks from 12 cm thick.
- Minimum anchorage depth 90 mm.

• Table of admissible loads

	Axial charges	Transversal charges
Ø 6	18 daN (kg)	26 daN (kg)
Ø 8	34 daN (kg)	37 daN (kg)





6.1 Hempro system

The Hempro system is a mono wall construction system using (non-load bearing) IsoHemp blocks with a reinforced concrete post and beam structure encased in the masonry. With the Hempro system, there is no need to add an extra layer of insulation, as the blocks are both constructive and insulating (in compliance with current standards).

The hemp blocks are used as formwork for the reinforced concrete post and beam structure. The columns are cast in drilled blocks and the beams in U-blocks.

• Hempro system precautions

- **You must absolutely respect the information** prescribed by the design office as well as the characteristics of the concrete steels and the duly calculated characteristics of the concrete.
- Make sure you **cover and protect** your hemp block masonry at the end of the day - **see p4.**
- **Make sure** that no waste, hemp, etc. is deposited at the bottom of the column of drilled blocks and in the U-blocks to ensure the perfect stability of the columns and beams when the concrete is poured.
- **Ensure** that the hemp block masonry is maintained and propped when pouring the concrete, especially with the U-blocks.
- Avoid working when the outside temperature is **below 5°C or above 30°C** to guarantee the adhesion of the IsoHemp Adhesive Mortar.

1 Placement of projecting reinforcements

The projecting reinforcements must be placed according to the instructions of the design office with regard to the location of the columns.



2 Gluing the Hempro blocks

For Hempro blocks with vertical mortise and tenon joints, only horizontal gluing with IsoHemp Adhesive Mortar is necessary.

This can be done in 2 strips of 7 cm for 30 cm blocks and 9 cm for 36 cm blocks.

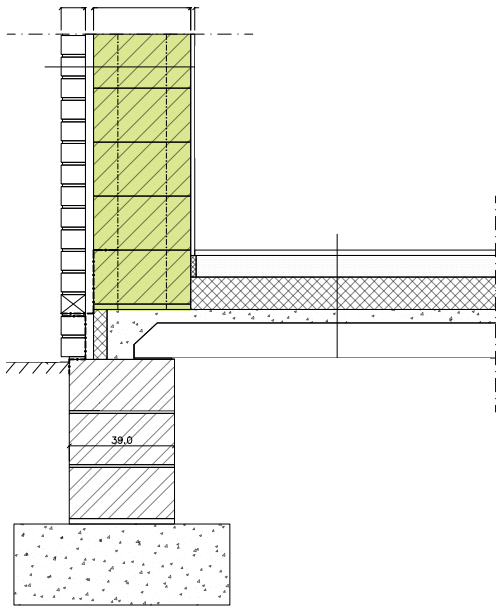


3 Base course laying

Start laying the hemp block masonry to protect the blocks from capillary rise and heavy rain. Apply a waterproofing membrane as recommended in the diagrams below.

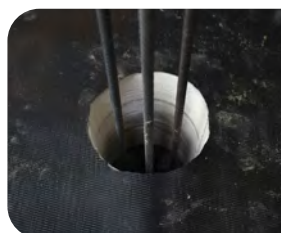
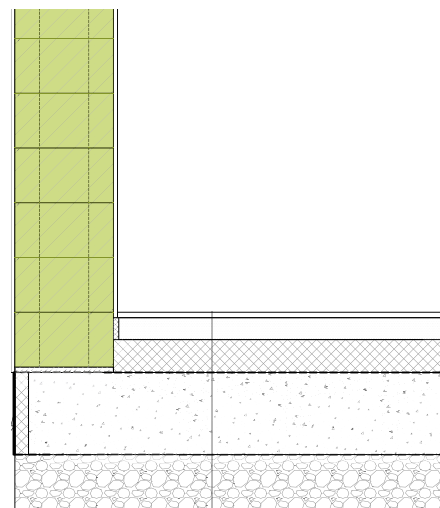
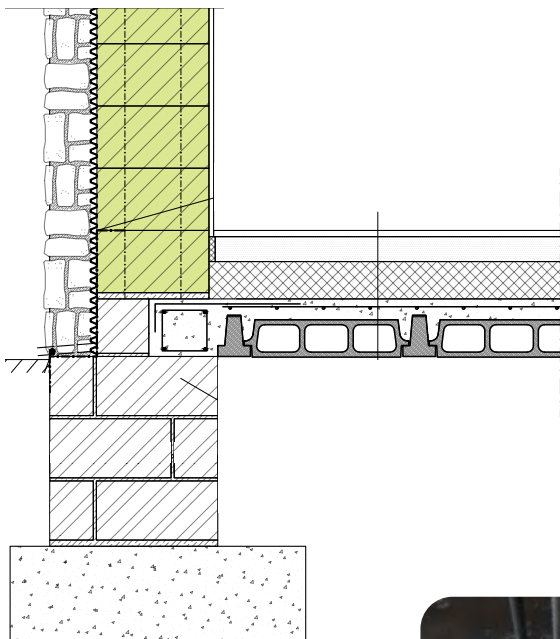
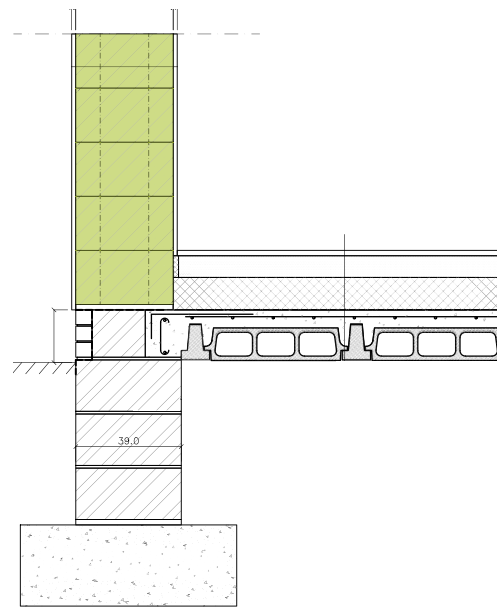
Exterior finish

Facing brick and facing stones



Exterior finish

Mineral plaster



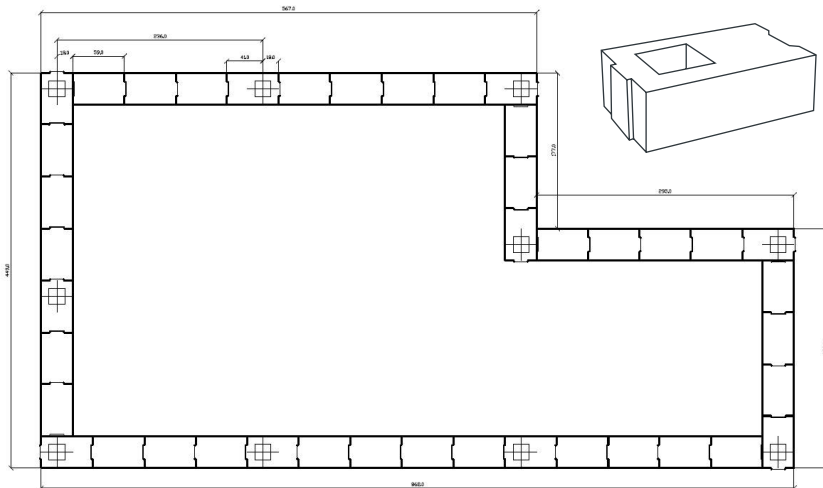
Caution

In the reinforcement, hollow out the band of the exact section of the hole to ensure the perfect continuity of the posts, when the concrete is being poured.

4 Laying the next courses



Refer to the previous steps of the Implementation Guide (page 6) to build the hemp block masonry.



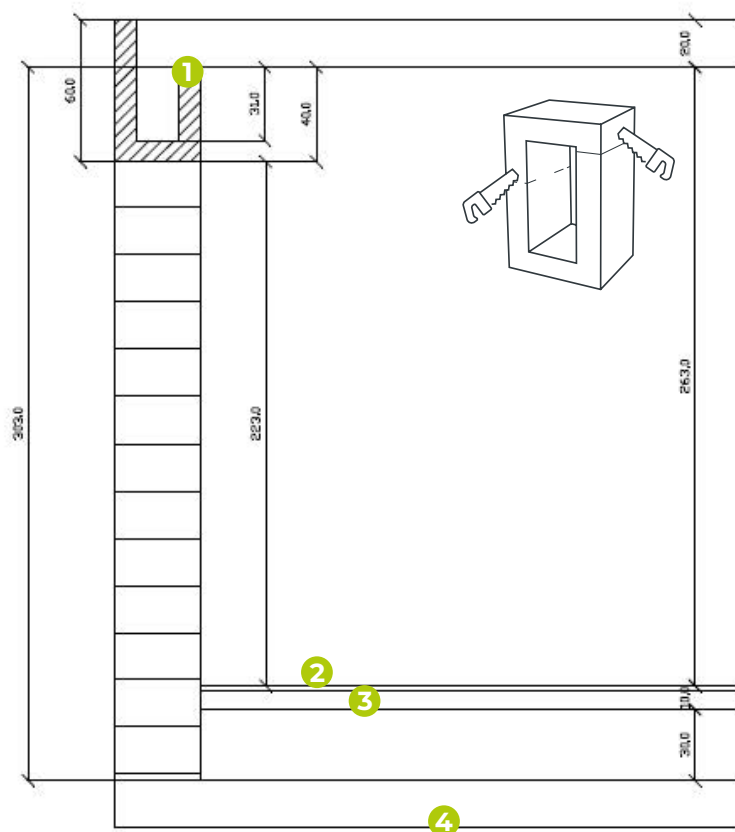
• Laying of drilled blocks

The drilled blocks serve as formwork for the concrete posts to be poured. They ensure the insulation of the columns.



Tip

Be sure to align the holes of the drilled blocks while working on alternate joints.



• Laying of U-blocks

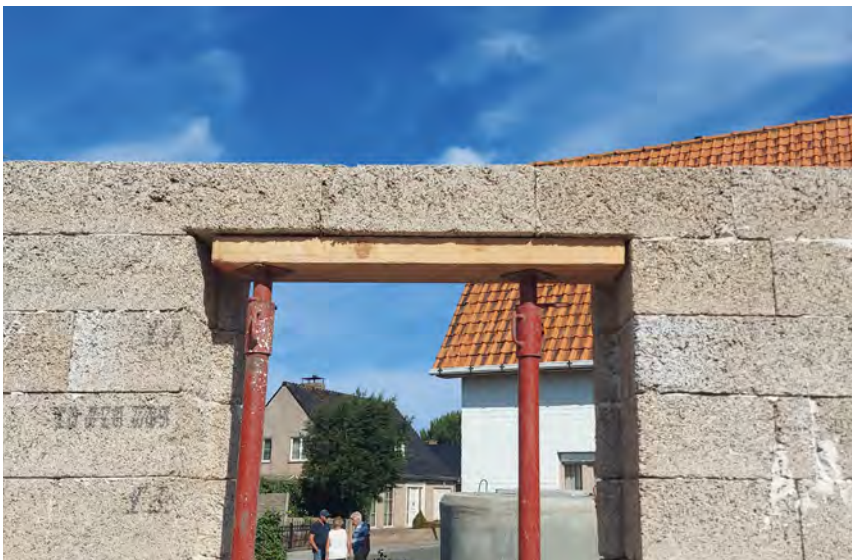
The U-shaped blocks serve as formwork and make it possible to pour the beams on which the floor and roof will be placed. They ensure the insulation of the beams.

- 1 U-block
- 2 Floor
- 3 Floor insulation
- 4 Slab foundation



• Lay of junction blocks

Create the junction blocks from a U-block. After taking the exact measurements, cut and hollow out the U-block to the same crosssection as the reinforced concrete column. Or opt for panels.



• Laying the lintels

Place an IsoHemp lintel in the case where the low level of the reinforced concrete beam (U-block) does not coincide with the high level of the opening or the planned bay.



See [page 14](#) of this guide for more information about lintels.



• Laying reinforcements for columns and beams

Lay and connect the reinforcements in the permanent formwork elements of the beams and columns.

 **Tip**

Position plastic spacers to respect the reinforcement envelopes as envisaged by the engineering office.



• Concrete pouring

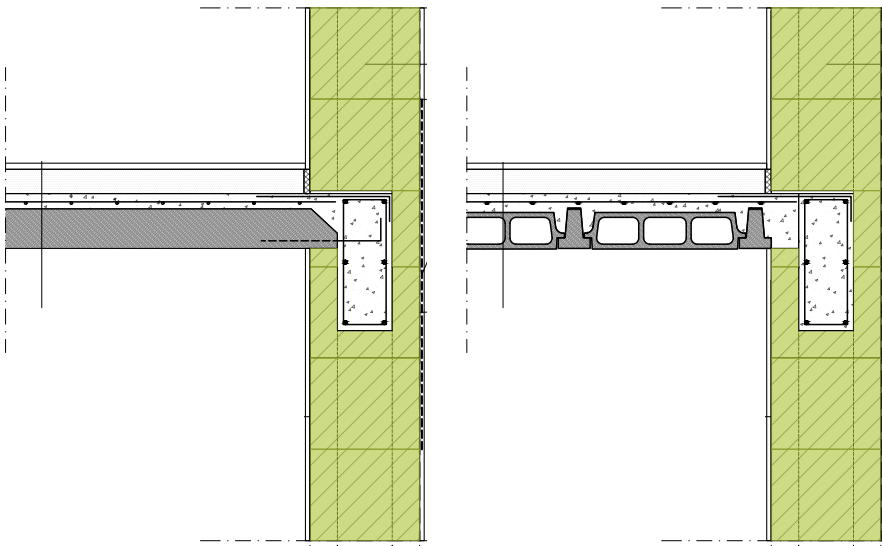
Fill the columns with concrete in accordance with the prescriptions of the engineering office, after having made the necessary formwork and props arrangements for the U blocks and drilled blocks.

We recommend casting in half levels as recommended in Eurocode 8 (Eurocode seismicity of buildings).

 **Tip**

Make a vent at the foot of the columns and clean and clear it of dust to evacuate the air during the concreting of the columns.





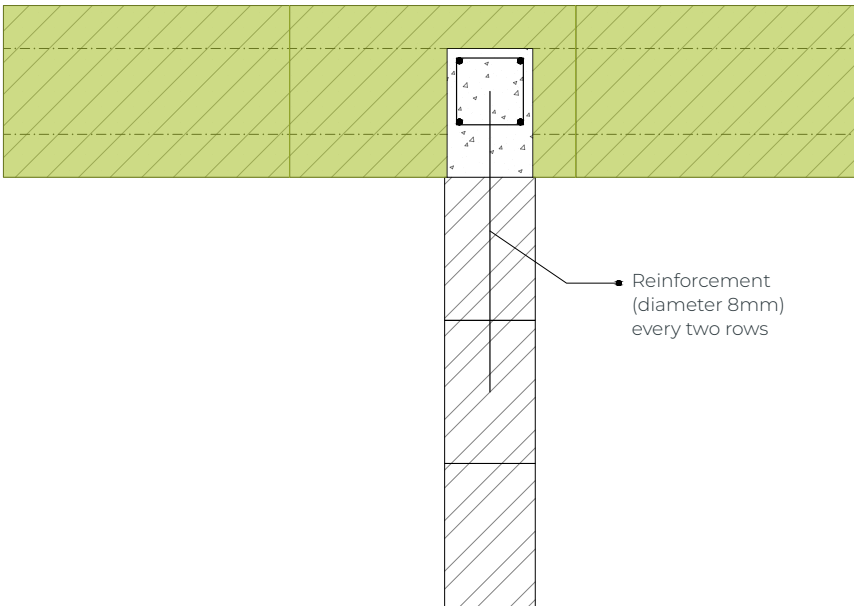
• Floor laying

- The floor rests on the belt beam.
- Support the floor with construction props.
- Pour the concrete in one go for the wall ties and the screed.



Tip

Secure the belt beam during the concrete pouring phase if necessary.



• Interior load-bearing walls

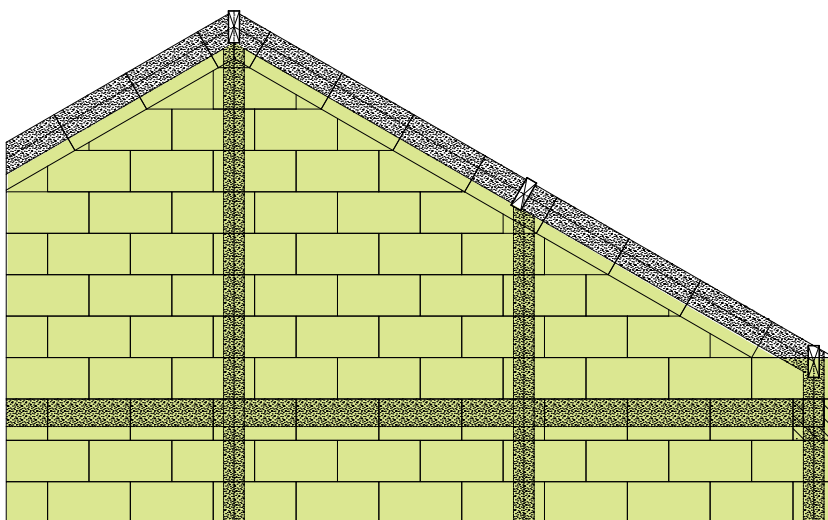
Wherever possible, combine the walls with the posts.



Tip

Cut into the drilled blocks at the level of the column to create a mechanical link with the interior load-bearing wall.

5 Roof



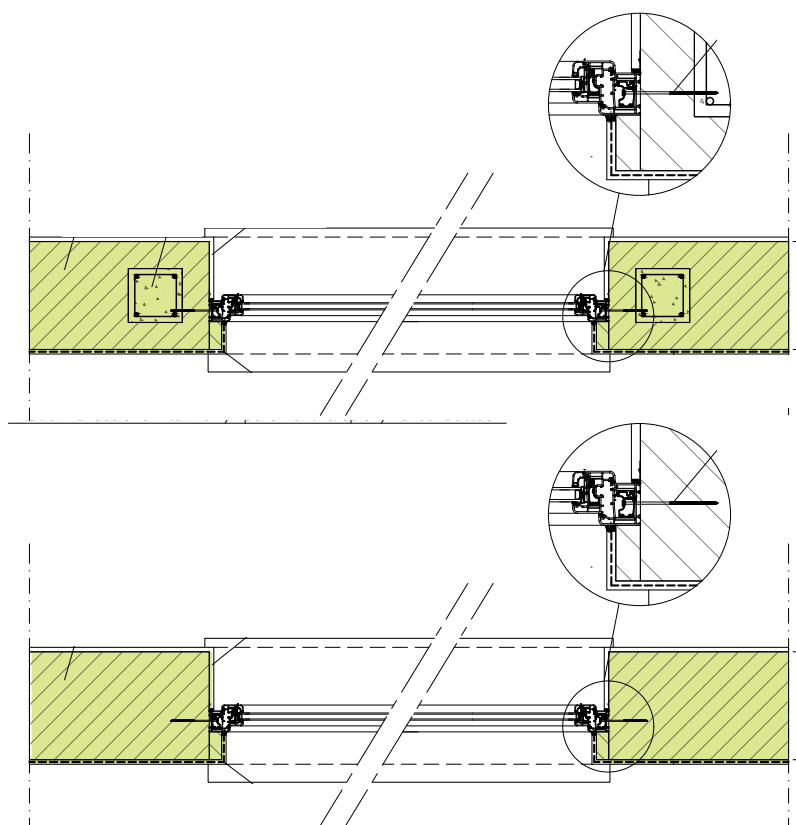
Gables

The load-bearing hemp block gable should be topped with a slope beam using U-blocks or 7 or 9 cm panels. The latter should be connected to the beam-column superstructure of the building.

6 Doors & windows



See [page 17](#) of this Guide for placing doors and windows.



Doors, frames, and (window) sills can be screwed and/or glued directly to the hemp block masonry.

6.2 Timber post and beam construction

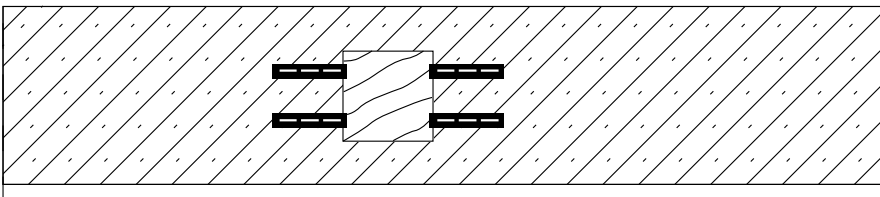


Timber post and beam construction filled with hemp blocks is ideal for achieving carbon neutral walls. This system is the most environmentally conscious.

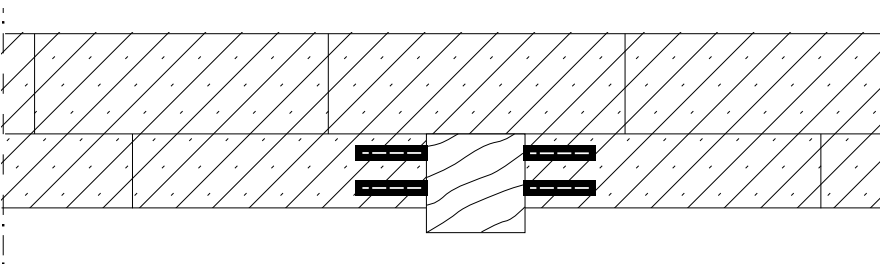
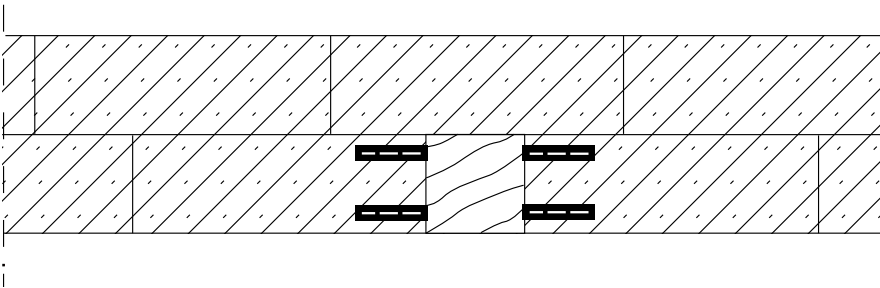
Once the structure and roof are in place, you can easily install the hemp blocks and finish your wall. Depending on the aesthetics you are looking for, you can position the structure in the existing wall or position it inside the house.

Configuration types:

Confined



Visible ext. & int.



Instructions

The fixings used are EQL14 brackets with VIS06-100 screws. The number and position of the brackets are to be calculated by the engineering office.

The second IsoHemp wall must be fixed to the first wall with EQL108 connecting brackets at a rate of 5 pc/m².

6.3 Metal structure



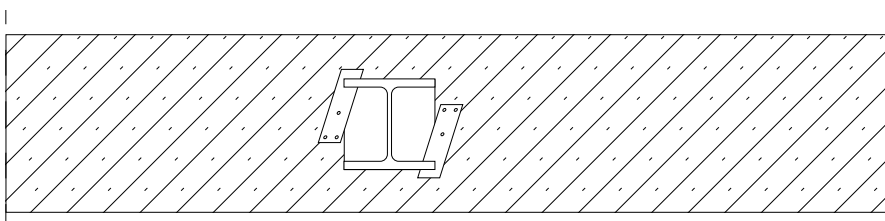
Metal structures offer a great deal of architectural freedom. This technique allows for large window openings, large living spaces, ...

Future renovation possibilities are also simplified.

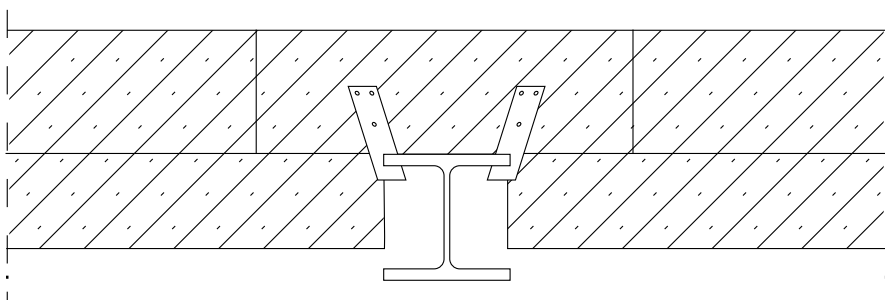
The structure and the roof are assembled beforehand. The hemp blocks are then placed in the spaces between the posts and attached to the structure with suitable fixations.

Configuration types

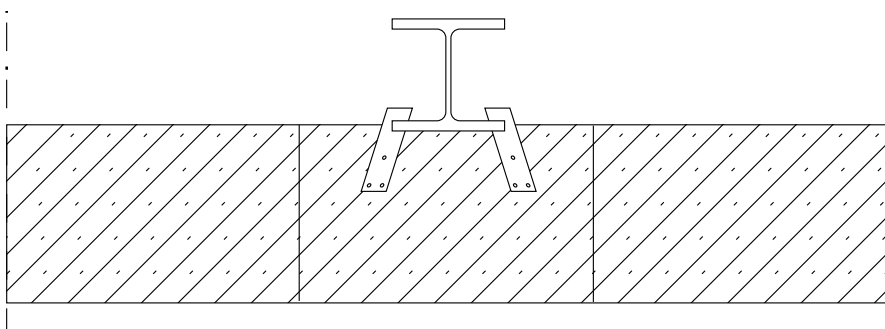
Confined



Semi-visible



Visible ext. or int.



Instructions

The fixings used are EQLI-IPE connectors with VIS06-100 screws.

The number and position of the connectors are to be calculated by the engineering office.

6.4 Timber framework



Timber frame constructions improve the insulation of the wall. The space between the wooden columns is filled with insulating wool or a similar material.

This technique requires two important points of attention:

- Insulate the frameworks to avoid thermal weaknesses in the timber.
- Provide thermal inertia to compensate for walls that are too light and uncomfortable.

Laying a hemp block against the timber frame immediately solves these two points.

The combination of timber frame and hemp blocks is therefore the right solution for a sustainable and comfortable house.

The IsoHemp wall is fixed to the timber frame with EQLI08s at a rate of 3 pc/m², 2 VIS06-100 per EQLI08.



Hemp block construction doesn't rule out any finish.
On the contrary, the possibilities are extremely varied.

7.1 Exterior



• Mineral plasters

Plasters should be mineral and used in combination with a lime binder. Cement binders are not recommended. We recommend the use of performance plasters with known and constant characteristics. It is imperative to scrupulously respect the plaster manufacturer's instructions for use. In case of doubt, please contact our technical department. The application is carried out in 2 layers: a corrective coating and a finishing coating (for a total thickness of 15 to 25 mm).



• Cladding (wood, panels, etc.)

Fix the cladding directly to the hemp blocks previously protected by a rain barrier or an exterior plaster body.

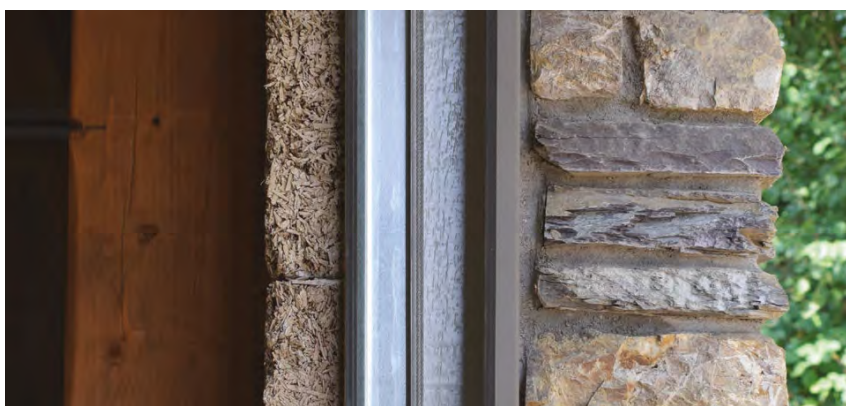
Tip

The different layers will be laid in this order: hemp block + lathing + rain screen + counter-lathing + cladding. The latter will be fixed with IsoHemp screws in accordance with the engineering office's specifications.



• Bricks or briquettes

Provide a 3 cm ventilated space between the blocks and the bricks according to the manufacturer's instructions. Glued briquettes can be laid directly on IsoHemp blocks, always following the manufacturer's instructions.



• Natural or local stones

Mechanically attach the stones to the IsoHemp blocks.

The requirements, list and technical data sheets of materials compatible with IsoHemp blocks is available on request from our technical department.



 **Tip**

A crawl space can be created in some cases – validate your project with our technical department.

7.2 Interior



- PCS natural plaster or plaster-based coatings

ISOHEMP RANGE

For a wall with a smooth, modern finish that is ready to paint, select a natural plaster permeable to water vapour to enjoy all the qualities of hemp blocks.

 **Tip**

The IsoHemp natural PCS coating is applied both manually and mechanically. Refer to the data sheet for the application according to the professional standards.

 **Tip**

It is advisable to put a mesh at the junction of two different materials.



- Clay base

ISOHEMP RANGE

For thermal, water and acoustic regulation. To be applied in one or two layers according to the manufacturer's instructions.



• Lime plaster

For a breathable and water vapour permeable wall offering a variety of renderings. To be fixed in one or two layers according to the manufacturer’s instructions.



• Other options: tiles, wood panelling, slabs, etc.

For other types of finishes, such as tiling in bathrooms, wood panelling or even slabs, glue or attach them directly to the hemp blocks.

When tiling a shower or bath area, it is imperative that a waterproof coating is applied to the PCS previously laid on the IsoHemp masonry.



Tip

For finishing advice, contact the IsoHemp technical department.

Floor insulation with IsoHemp blocks is a durable solution that provides both summer and winter comfort. It is advisable to lay the insulation on a stable and dry substrate. If there is a risk of rising damp, a waterproofing membrane must be laid. The blocks must be dry before the insulating complex is laid. Above this insulating complex, a screed (dry or wet) will be laid before the covering. In the case of a wet screed, you must be careful to ensure that the moisture in the screed does not migrate into the insulation.



- 1 Check that the foundation is watertight before placing the block on stabilised soil or concrete slab.



- 2 Lay the blocks against each other.



- 3 Lay a reinforced compression screed of min 6 cm.



- 4 This results in a surface ready to receive your finish of choice.

⚠ It is important that the IsoHemp blocks are dry before laying the screed.



💡 Tip

Lay the hemp blocks before the service ducts. To facilitate the passage of these ducts, you can use blocks with a smaller thickness.





We take care of your project as if it were our own. Let's discuss it!

Our team will help you to make your project a lasting success: preliminary study, design advice and support on your building sites.

Want to build with hemp? Contact us:

Technical and design service



UK HEMPCRETE

ukhempcrete.com/contact-us/

+44 (0)1629 34 31 43

Product sales



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+44 (0)1629 34 34 20

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