

# IF ISOHEMP



## IMPLEMENTATION GUIDE

The insulating **hemp block** for **building & renovation**.



# INTRODUCTION

Choosing the right building materials is of primary importance. The criteria that guide your choices or those of your client include **the technical performance of the building, ease of implementation and the impacts on the environment and health.**

You have decided to use an uncompromising solution, IsoHemp blocks, and will soon benefit from their many advantages: **water and thermal regulation, acoustic insulation, protection and fire resistance in a natural material.**

We have designed this guide to give you the best possible insight into the use of IsoHemp blocks.

Nevertheless, this guide can never replace the professional reference standards which are the sole guarantor of the correct execution of building work (DTU 20.6 and Eurocode 6)

You can also rely on our team of experts to guide you through the implementation of your project. Our technical department is always available to answer your questions.



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# USAGE PRECAUTIONS

## STORAGE OF HEMP BLOCKS

Storage precautions for IsoHemp block pallets: 6 months outdoors or 2 years indoors. The blocks must be protected from rain but not wrapped in plastic film or tarpaulins.

## STORAGE OF BAGGED PRODUCTS

Bagged IsoHemp products (Prokalk lime, HempBag, Adhesive Mortar and PCS) must be stored indoors and protected from moisture. Always follow the validity dates of the products.

## ISOHEMP ADHESIVE MORTAR

IsoHemp Adhesive Mortar – only this product is perfectly suited to the laying of blocks. To ensure good adhesion of the Adhesive Mortar, do not use the product if the temperature is lower than 5°C or higher than 30°C.

## PHANTOM JOINTS

In order to avoid the appearance of phantom joints in the rendering, always clean away any adhesive protruding from the hemp block masonry.

## FILLING

In order to avoid any humidity 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

Provide minimum 20 cm support on each side of the masonry. For lintels of more than 2 m, provide a support of 30 cm on each side.

Do not exceed the permissible load (see table).

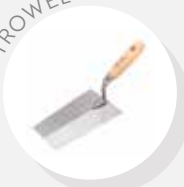
Direct the concrete of the lintels upwards.

Transport and handling: the lintels must always have their concrete upwards and be transported by the ends.

# IMPLEMENTATION **EQUIPMENT**

To ensure the correct laying of **IsoHemp blocks**, it is advisable to use the following equipment:

TROWEL



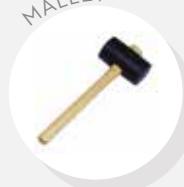
ADHESIVE COMB



RENDERING GRATER



MALLET



SLOT-DRILLING MACHINE



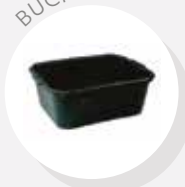
CONCRETE MIXER



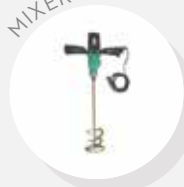
LEVEL



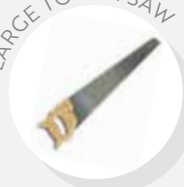
BUCKET



MIXER



LARGE TOOTH SAW



ALLIGATOR SAW



BANDSAW



## OPENING AND PROTECTION OF **PALLETS**

1



Remove and store the protective honeycomb.

2



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

**TIP**

Use the **protective honeycomb** to protect your masonry at night or during inclement weather.

# BASE COURSE LAYING

## IN INDOOR MASONRY

Make sure that the top course of the substrate is dry, clean and level before starting the laying.

1



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

2



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

3



Glue the vertical joint and apply the next block. Adjust with a mallet if necessary to obtain a 3 mm vertical slim joint.

4



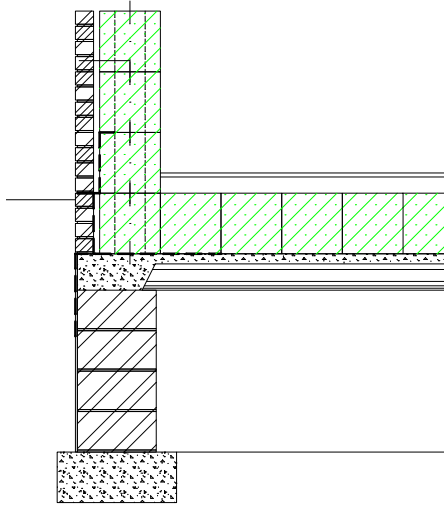
It is essential for this base course to be perfectly level. Check the perpendicularity and wait for the mortar to dry.

- On a flat surface with no risk of rising humidity, IsoHemp adhesive mortar can be used.
- On a wooden support, suitable adhesive foam can be used.



## IN OUTDOOR MASONRY

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



### ON WATERPROOF MEMBRANE

- Start laying the hemp block masonry to protect the blocks from capillary rise, after installing a waterproof membrane. Be sure to raise it by at least 15 cm.



### ON A ROT-PROOF SUBSTRATE

- Start laying the hemp block masonry on a rot-proof and resistant insulation block to protect the blocks from capillary rise, after having laid a waterproof strip (see previous point).



### ON A BRACKET

- Use a substrate bracket when other solutions cannot be considered or the foundations are not suitable.
- Ensure the sufficient strength of the load-bearing wall.
- Securely anchor the substrate brackets in the wall at least 15 cm from the external floor level.
- Fix each block to the bracket using a 6 mm diameter screw and 80 mm minimum length.
- Then mechanically anchor each block to the existing wall using a hook or a connecting square after ensuring the correct alignment.

# LAYING OF THE SUBSEQUENT COURSES

1



Lay using IsoHemp Adhesive Mortar.

## TIP

If the air temperature is high, make a more liquid mixture or sprinkle the blocks with a little water to prevent too rapid setting of the glue.

2



Prepare the Adhesive Mortar with 7 to 8 l of water per bag of 25 kg – usable for 1 hour.

## TIP

The Adhesive Mortar should be very fluid and almost liquid, having a yogurt-like consistency.

3



Find and abrade the high points.

4



Remove dust from the support.

5



Apply the adhesive using a notched trowel 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.

8



Place the block on the adhesive for masonry in 3 mm slim joints after taking care to glue the surfaces of the block (double gluing).

9



Adjust with a mallet and check the levels.

10



Remove excess adhesive using the trowel.

## FINAL COURSE LAYING



- Cut the blocks to leave a maximum of 2 cm between the blocks and the ceiling.
- Seal the space with hemp concrete, mortar, flexible insulation or a bonding foam.



# CUTTING AND ADJUSTMENT

IsoHemp blocks are very easy to cut. To minimise 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 or handsaw, as they do not allow good cuts to be achieved..



## **BAND SAW**

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



## **MANUAL SAW**

Satisfactory result in the case of small projects.

# MASONRY FIXATION

The hemp block masonry must always be attached to the load-bearing structure. In the case of the Hempro system, mechanical fixation is not applicable. Provide 5 fixations per m<sup>2</sup> (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.



### CONNECTING BRACKET

For use in particular in association with wooden structures.

- Screw the bracket into the wall or wood.
- Fix it to the block with a screw 6 mm in diameter and 80 mm minimum length.



### HEMP BLOCK DOUBLE MASONRY STRUCTURE

- Use the Adhesive Mortar to glue the hemp blocks to the first hemp block masonry structure.
- Connect the two hemp block masonry structures using masonry hooks.



**TIP**

Combine the two hemp block masonry structures by staggering them with a minimum overlap of the thickness of the block.



# 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 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.

# LINTELS

## AND BAY WINDOW PASSAGE

Select one of these 2 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 a minimum support of 20 cm on either side of the bay and 30 cm for lintels measuring over 2 m.

#### TRANSPORT AND HANDLING

Lintels must always be stored and transported with the concrete side facing upwards. Wedges must always be used to support the lintel at the ends during storage. Always handle the lintels by the ends. They must never be lifted by the middle of them.

#### 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 millimetres from the block to fit the bracket.



References	Window opening max. (cm)	Dimensions (cm)			Weight max. (kg)	Linear load max. (N/m)
		L (Length)	e (Thickness)	h (Height)		
<b>9 cm thickness</b>						
Lin09-120	80	120	9	15	24	2.900
Lin09-160	120	160	9	15	31	2.200
Lin09-200	160	200	9	15	39	1.800
Lin09-240	180	240	9	15	47	1.500
<b>12 cm thickness</b>						
Lin12-120	80	120	12	15	25	3.900
Lin12-160	120	160	12	15	32	2.900
Lin12-200	160	200	12	15	40	2.400
Lin12-240	180	240	12	15	48	2.000
<b>15 cm thickness</b>						
Lin15-120	80	120	15	15	36	4.900
Lin15-160	120	160	15	15	47	3.700
Lin15-200	160	200	15	15	59	2.900
Lin15-240	180	240	15	15	70	3.700
Lin15-280	220	280	15	15	81	3.200
Lin15-300	240	300	15	15	87	2.900
<b>20 cm thickness</b>						
Lin20-120	80	120	20	15	41	6.500
Lin20-160	120	160	20	15	53	4.900
Lin20-200	160	200	20	15	66	3.900
Lin20-240	180	240	20	15	79	4.900
Lin20-280	220	280	20	15	91	4.200
Lin20-300	240	300	20	15	98	3.800
<b>25 cm thickness</b>						
LIN25-120	80	120	25	15	55	8.200
LIN25-160	120	160	25	15	73	6.100
LIN25-200	160	200	25	15	91	4.900
LIN25-240	180	240	25	15	110	6.100
LIN25-280	220	280	25	15	128	5.300
LIN25-300	240	300	25	15	137	4.900
<b>30 cm thickness</b>						
Lin30-120	80	120	30	20	73	9.800
Lin30-160	120	160	30	20	98	7.400
Lin30-200	160	200	30	20	121	5.900
Lin30-240	180	240	30	20	146	7.400
Lin30-280	220	280	30	20	170	6.300
Lin30-300	240	300	30	20	182	5.900

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

# CARPENTRY AND FRAME

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



## FRAME LAYING

- 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.

## PRECAUTIONS

Windowsills must protrude min. 5 cm from the façade and must have a side elevation.

## TIP

Cut the rabbets **directly in the hemp blocks** when laying them.



## 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.



# HEMPRO SYSTEM

With the Hempro system, no other insulating materials are required. Construct your entire building only with IsoHemp blocks, which are used as formwork for the post-beam concrete support structure.

## 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 p. 4.
- **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 the U-shaped block
- Avoid working when the outside temperature is **below 5°C or above 30°C** to guarantee the adhesion of the 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.

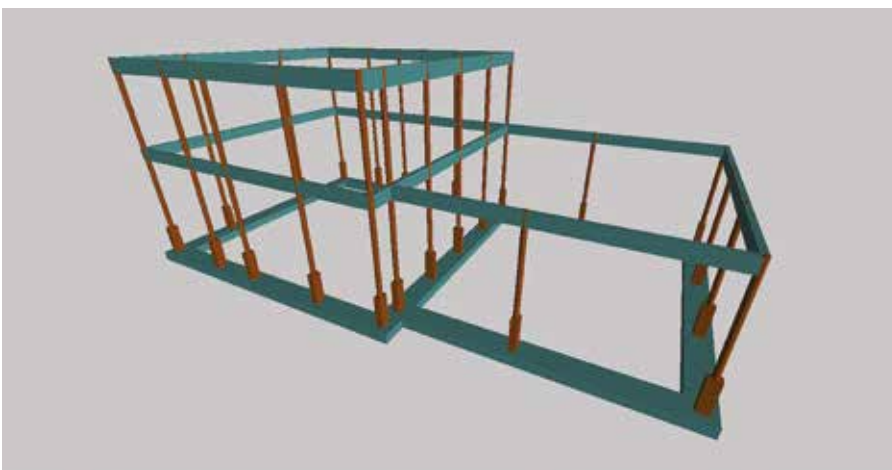


Diagram illustrating the concrete structure of the Hempro system, from the sole to the collar brace supporting the roof.

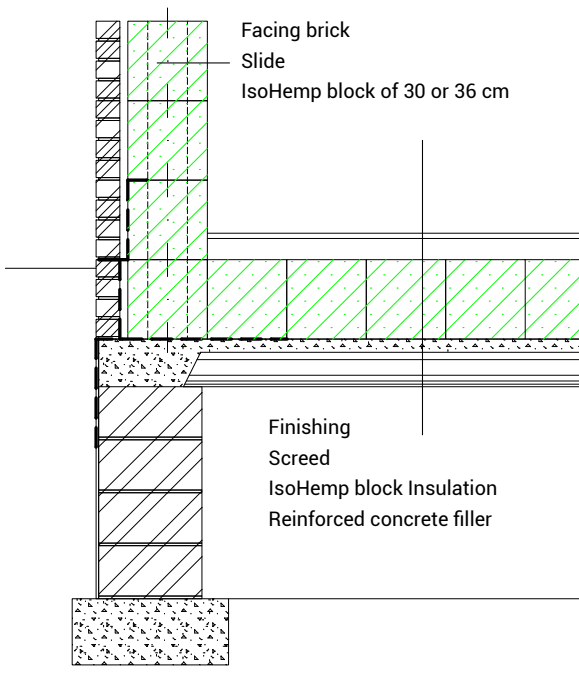


## 2 BASE COURSE LAYING

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..

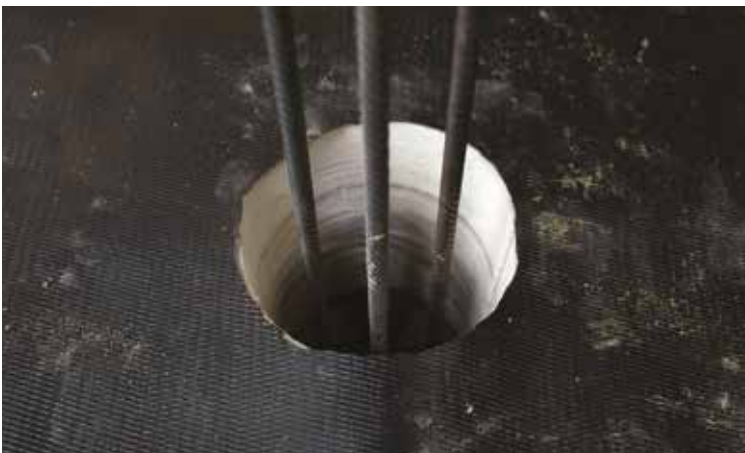
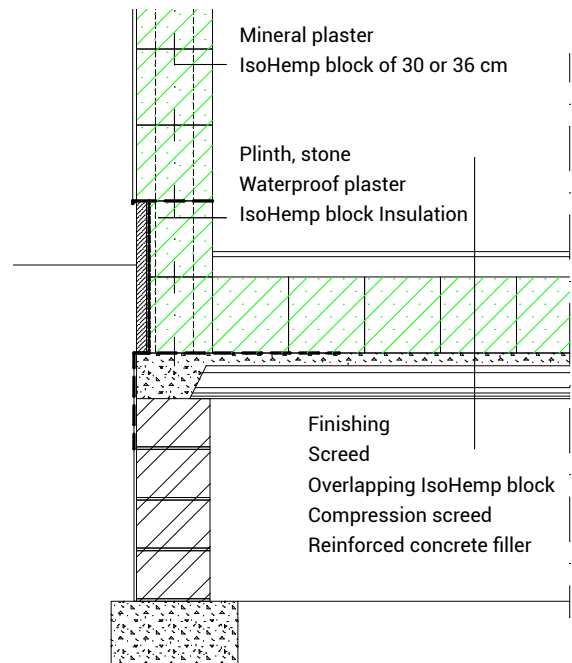
### EXTERIOR FINISH

Facing brick



### EXTERIOR FINISH

Mineral plaster



### PRECAUTIONS

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.



## 3

**LAYING OF THE SUBSEQUENT COURSES**

Refer to the previous steps in the laying guide (page 7) for 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.



### **LAYING OF JUNCTION BLOCKS**

Create the junction blocks from a drilled block.

After taking the exact measurements, cut and hollow out the drilled block of the necessary section using an alligator saw.



### **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 12 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 design office.



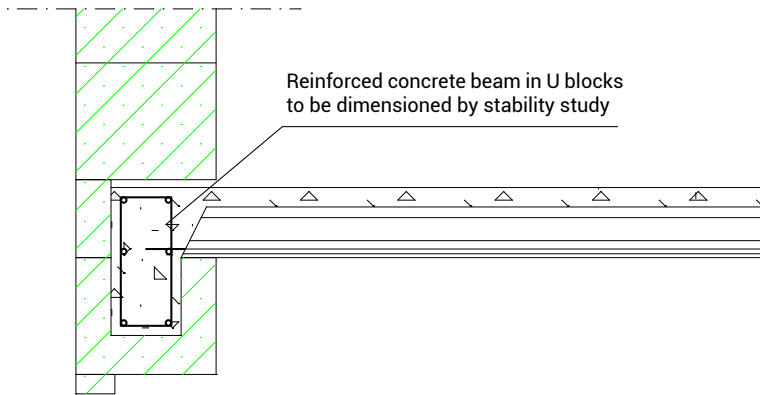
### CONCRETE POURING

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.

#### TIP

Make a vent in the foot of the columns to evacuate the air when pouring concrete into the columns.

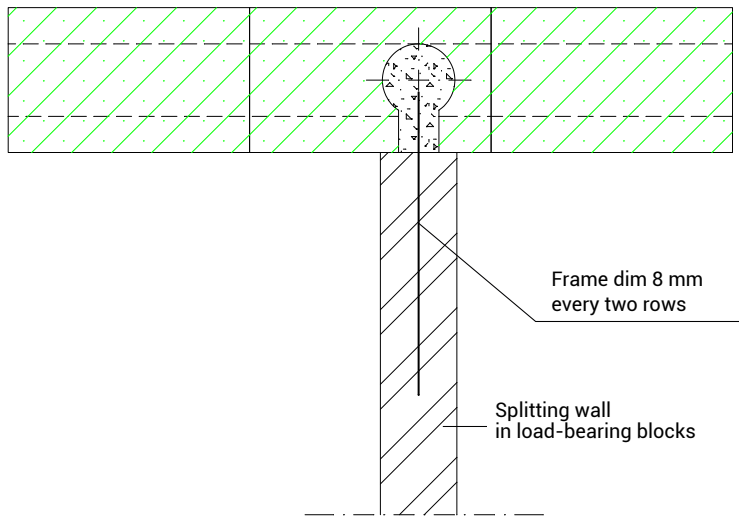




### FLOOR LAYING

- The floor rests on the collar brace
- Support the floor with props.
- Pour the concrete in one operation for the wall ties and the screed.

**TIP** Secure the collar brace during the concrete pouring phase if necessary.



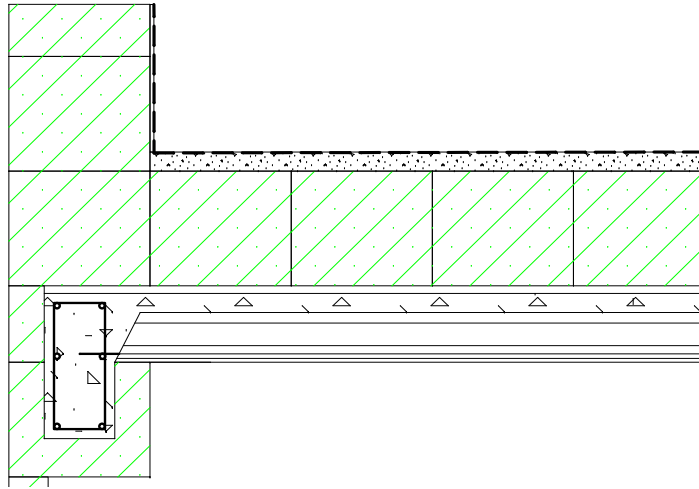
### INTERIOR LOAD-BEARING WALLS

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.

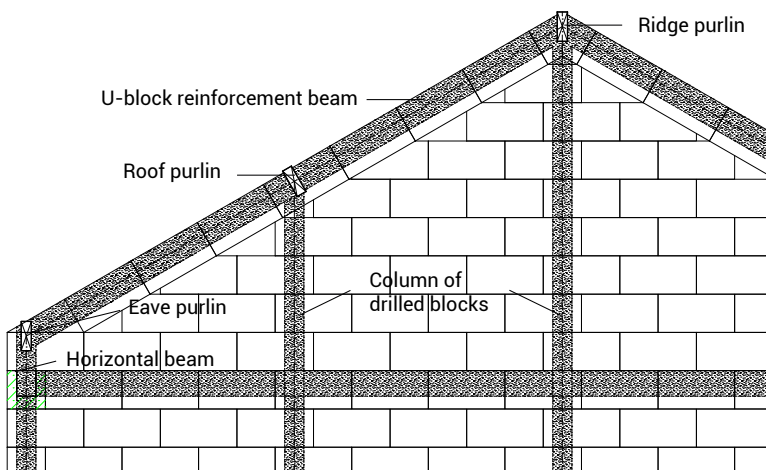
## 4

## ROOF



### FLAT ROOF

In the case of a flat roof with insulation made of hemp blocks, place the blocks on the filler. Then create the roof screed and lay the waterproofing membrane.



### GABLES

In the case where the hemp block gable is load-bearing or carries the roof loads, make a crawling beam using U-blocks.

Combine this crawling beam with the beam-column superstructure of the building.

## 5

## DOORS & WINDOWS



See page 14 of this guide for the placement of doors and windows

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

# GROOVING AND CLADDING

1



Drill the holes with a hole saw.

2



Create the grooves using a grooving machine.

3



Finish the opening manually.

4



Fix the boxes and electrical cable ducts. Re-seal the channels and holes with a suitable sealant (natural plaster, etc.).



**TIP**

Be sure to use a **sealing mortar compatible** with the chosen finish.



# FINISHES

The possibilities for finishes are numerous.

## EXTERIOR



### MINERAL PLASTERS

Moisten the surfaces to be coated the day before (and a second time on the same day if the weather is hot and dry).

Apply in 2 layers: a corrective coat and a finishing coat (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.



### BRICKS OR BRIQUETTES

Provide a 4 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.



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



## NATURAL OR LOCAL STONES

Mechanically fix the stones to the IsoHemp blocks.



### TIP

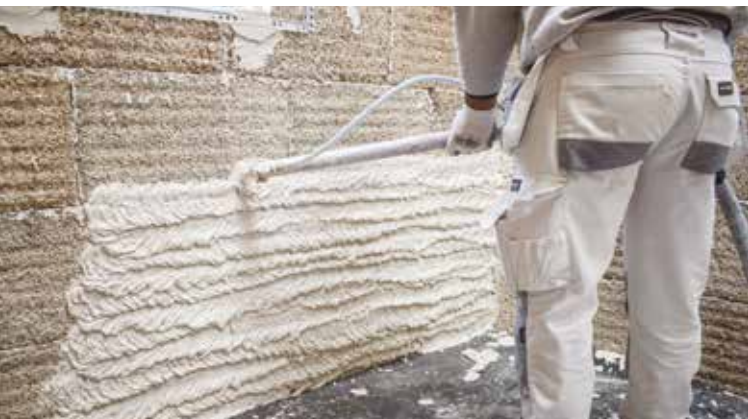
A ventilated vacuum can be created in some cases – validate your project with our technical department.

## INTERIOR



## PCS NATURAL COATING OR PLASTER-BASED COATINGS

For a wall with a smooth, modern finish that is ready to paint, select a natural coating 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.



## **LIME COATINGS**

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.



## **CLAY COATINGS**

For thermal, water and acoustic regulation. 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.



**TIP**

For finishing advice, **contact the IsoHemp technical department.**



# FIXATION OF OBJECTS



## WOOD SCREW – 15 TO 25 KG PER FIXATION

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

- 8\*80 mm – Load support of maximum 15 kg per fixation point
- 10\*80 mm – Load support of maximum 25kg 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.

- Valid for blocks from 12 cm thick.
- Minimum anchorage depth 80 mm.

# SOIL ISOLATION

1



Check the tightness of the foundations before laying the block on stabilised soil or a concrete slab.

2



Lay the blocks against each other.

3



Lay a reinforced compression screed of min. 6 cm. This results in a surface ready to receive your finish of choice.

4



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



## TIP

### Lay the hemp blocks before the service ducts.

To facilitate the passage of these ducts, you can use blocks with a smaller thickness or U-shaped blocks if the soil insulation created was 30 cm to ensure that the ducts can be guided through easily.



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With the support of the European Regional Development Fund

