Masonry in IsoHemp blocks

Generality

The masonry will be installed so that it is straight and plumb, in accordance with the rules. They must comply with all the regulations and standards (including the Eurocodes). The stability plans define the characteristics of the masonry elements (blocks) as well as the mortar. These must be scrupulously respected. The mortar used on site is subject to approval by the architect and the design office. The technical data sheets for the masonry units and mortar will be sent to the architectural and stability offices for approval, at least 15 working days before they are used.

The walls will be joined together by harpooning the elements. If this is not possible, a strap connection will be used, to be approved by the design office. The elements must be assembled (or matched) with alternating vertical joints (overlapping) to ensure that the masonry is monolithic. The masonry must be protected from the weather as it is built.

Masonry with glued hemp concrete blocks

Hemp blocks are made in Belgium. They are self-supporting masonry units but cannot play a structural role. They are made from hemp shives and a mixture of air and hydraulic lime. The hemp shives have a grain size of between 2 and 20 mm. The concrete is made up of +/- 80% hemp shives, the remainder being lime and the water used to hydrate the binder. The product is molded, pressed, hardened and air-dried without energy input. The blocks are 60 cm long and 30 cm high, 36 cm wide blocks are 20 cm high and 30 cm and 36 cm wide blocks have vertical mortise and tenon joints. They are manufactured in variable widths ranging from 7.5 cm to 36 cm.

The dry bulk density of the blocks is between 306 and 374 kg/m³. Compressive strength greater than 0.22 MPa. Thermal conductivity λ is 0.071 W/mK. The dimensional tolerances of the blocks are +4/-4 mm on the length and width and +1/-1.5 mm on the height in accordance with standard NBN-EN-772-16. The manufacturer has an ATG on the masonry elements.

Installation must strictly comply with the manufacturer's instructions. The contractor is deemed to have read the manufacturer's documents specifying the installation technique, such as "the installation guide". The architecture and design offices may require the contractor to undergo on-site training with the manufacturer, who will provide a certificate of attendance and specify the persons present.

The hemp blocks are glued together using the adhesive mortar prescribed by the manufacturer. The first bed of blocks should be laid in a full bath of traditional mortar or glued to a dry level. The blocks must be protected from the risk of damp. To this end, a waterproof membrane to protect against the risk of rising damp and/or other types of damp must be correctly positioned at the points indicated by the architect and in accordance with the architect's plans. It is recommended that the hemp block masonry be started at least 20 cm above ground level.

The hemp blocks are glued using a suitable glue comb, but also according to the thickness of the elements used. The glue joint should be +/- 3mm thick. Blocks 30 cm and 36 cm wide will be glued using two strips of adhesive mortar on the extremities, 7.5 cm and 9 cm wide respectively. The 30 cm & 36 cm wide blocks will not be glued vertically because of the vertical mortise & tenon profiles. The vertical joints at the corners will be glued. Any out-of-tolerance areas will be smoothed out using a block scraper suitable for the material. Before gluing, the contractor will brush the surface to be glued to remove any loose material. The blocks should be cut using a suitable tool and in accordance with the manufacturer's instructions. Either a hand saw, an alligator saw or, ideally, a band saw will be used.

Hemp block dimensions:

- **Thickness:** 7.5, 9, 12, 15, 20, 25, 30 et 36 cm
- **Width:** 60 cm
- **Height:** 30 cm

Characteristics and performance:

- **Dry bulk density**: 340 kg/m³ +-10%
- **Compressive strength**: fmean > 0,22 MPa
- **Thermal conductivity**: λ_{ui} : 0,071 W/mK
- **Water vapour resistance factor**: μ < 2,8
- **Coefficient of thermal dilatation**: 15,3 10^{-6} m/mK

Walls thickness 7,5 cm ; QP m²

Characteristics: see architectural and stability plans and manufacturer's specifications.

Wall thickness 9 cm ; QP m²

Characteristics: see architectural and stability plans and manufacturer's specifications.

Walls thickness 15 cm ; QP m²

Characteristics: see architectural and stability plans and manufacturer's specifications.

Walls thickness 20 cm ; QP m²

Characteristics: see architectural and stability plans and manufacturer's specifications.

Walls thickness 25 cm ; QP m²

Characteristics: see architectural and stability plans and manufacturer's specifications.

Walls thickness 30 cm ; QP m²

Characteristics: see architectural and stability plans and manufacturer's specifications.

Walls thickness 36 cm ; QP m²

Characteristics: see architectural and stability plans and manufacturer's specifications.

Prefabricated lintels for hemp block masonry ; QP ml

ISOHEMP prefabricated lintels are designed to support the masonry triangle above it. They cannot take loads from a floor. The load-bearing element is made of reinforced concrete and, depending on the thickness is covered with an L or a U of hemp concrete. They are made in Belgium and prefabricated in a factory.

Characteristics: see architectural and stability plans and manufacturer's specifications.

Doubling an existing wall

Hemp blocks should be used to line an existing wall, either from the inside or the outside. They should be assembled in accordance with the above specifications. A space of +/- 3 cm must be left between the existing wall and the masonry made of hemp blocks. This space will be filled progressively, primarily with hemp concrete aggregates. However, a mixture of hemp shives, hydraulic lime and air lime can also be made on site using a lime mixture preformulated in the factory specifically for this purpose and shives delivered in bulk. The blocks will be mechanically fixed to the existing walls using connecting hooks pegged into the existing masonry at a rate of 5 pc/m².

Column-beam load-bearing system confined within the thickness of the masonry

In the case of load-bearing masonry, a structure made up of posts and beams is built and enclosed in the thickness of the masonry. This structure may be made of reinforced concrete (HEMPRO), steel or wood. It must comply with the stability plans. In the case of a reinforced concrete structure, the posts will be reinforced and cast in drilled hemp blocks. For 30 cm wide masonry, the holes will be 15 cm square. For masonry 36 cm wide, the hole is 18 cm square. The drilled blocks (see our catalogue) are glued together to form a " disposable " formwork. Extreme care must be taken to ensure that the posts are correctly aligned in the drilled blocks. Great care must be taken when concreting these elements. If necessary, they will be maintained at the charge and under the responsibility of the contractor. The quality of the concrete, steel and coating will comply with the stability plans and the special specifications for reinforced concrete structures. During concreting, the speed prescribed by the manufacturer must be respected, but always ≤ 50 cm/hr.

The beams are made from U-shaped blocks which, unless otherwise specified by the design office, are centred on the columns. For beams higher than the U-shaped elements, these are raised using 7.5 cm IsoHemp blocks for 30 cm walls and 9 cm for 36 cm walls. These blocks provide insulating reinforcement, eliminating thermal bridges. Great care must be taken when concreting these elements. If necessary, they will be maintained at the charge and under the responsibility of the contractor. The quality of the concrete, steel and coating will comply with the stability plans and the special specifications for reinforced concrete structures. During concreting, the speed prescribed by the manufacturer must be respected, but always ≤ 50 cm/hr. The quantities and characteristics of the reinforcement and concrete are given in the section on reinforced concrete works in the same special specifications, as well as on the stability plans.

In the case of a metal or wooden structure, the masonry of hemp blocks is an infill between the posts and beams. These structural elements are encased using U blocks, which are laid vertically around the columns and horizontally around the beams. For beams that are higher than the U-blocks, the latter are raised using specially adapted elements. The Isohemp masonry will be connected to the structure using angle-type anchors in accordance with the structural stability study.

Walls thickness 30 cm ; QP m²

This item includes drilled blocks and U-blocks.

Walls thickness 36 cm ; QP m²

This item includes drilled blocks and U-blocks.

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Find our latest fact sheets on www.isohemp.com

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