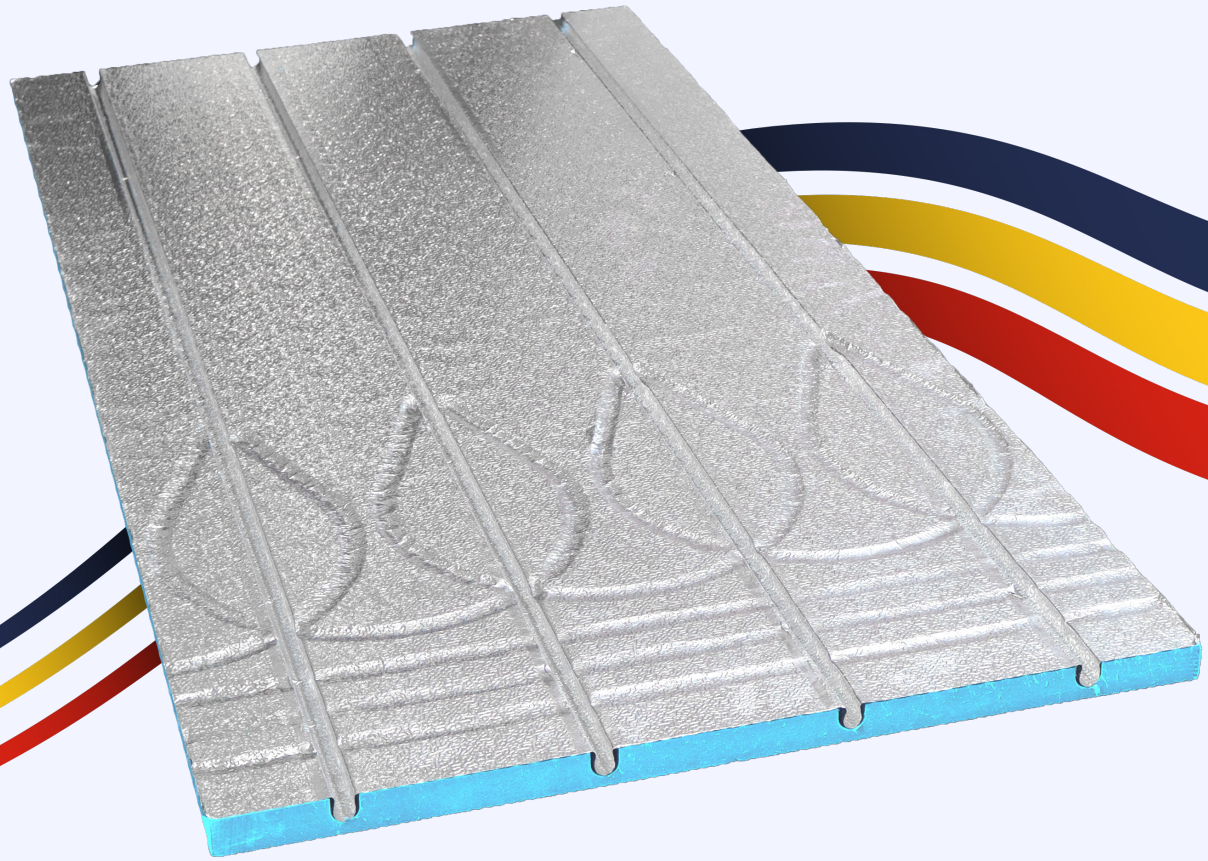
# Henco

## Installation guide
## XPS-system

UFH-DRY-1625-100C
UFH-DRY-1625-150C



**Henco Industries NV**
**Belgium**

Toekomstlaan 27
2200 Herentals

+32 14 28 56 60
info@henco.be

## 1 Introduction

This system is designed for low-temperature surface heating and cooling. The panels are made from XPS (extruded polystyrene) with an aluminium layer to ensure optimum heat transfer, and measure 1200x600x25. The centre-to-centre distance between the pipes is determined by the type of panel; there are two variants available:

- 100mm (UFH-DRY-1625-100C)
- 150mm (UFH-DRY-1625-150C)

*For more detailed information about the panels, see the technical data sheet.*

## 2 Installation: general points

We recommend installing this system in **two stages**:

1. Start by positioning and bonding the XPS panels.
2. Once the adhesive has cured sufficiently in accordance with the manufacturer's instructions, you can start installing the underfloor heating pipework.

Please follow the recommendations below:

- The panels must be **fixed** to the substrate at all times. This is not only to ensure correct installation, but also so that, when the heating system is in use, the XPS system will behave as a uniform whole during expansion and contraction.
- The quality of the **subfloor** is very important! It must not only be dry and dust-free, but also completely level. The panels have a rigid structure and cannot compensate for any unevenness. If they are installed on an uneven or non-level subfloor, the tubes may come out of the panels or the floor finish may come loose. If necessary, the surface can be levelled or sanded first.
- Try to fit the **joints** between the panels as tightly as possible and, if necessary, seal them with aluminium tape.
- The **high compressive strength** of these XPS panels means they can easily withstand normal floor loads in residential applications. For other applications, it is always necessary to check that the overall floor structure meets the relevant specifications.
- Always fit **edge insulation** to all wall sections before installing the panels.
- Depending on the size and layout of the rooms, **expansion joints** may be required. These will be determined by the type of floor finish. Always follow the manufacturer's instructions in this regard.
- Existing structural **construction joints must** always be carried through the entire floor structure. It is not permitted to bridge these joints with XPS panels, levelling compound, gypsum fibre boards or floor finishes.
- Lay all the panels in accordance with Henco's **installation plan** and cut them to size where necessary. Where additional service pipes are required, use a hand router or a 16mm heat knife to cut additional grooves. We recommend laying out the entire 'puzzle' first before you start bonding the panels to the subfloor, to avoid mistakes.

# 3 Bonding and sealing by application type

The type of adhesive you can use will depend on the subfloor at the site and the chosen floor finish. Below is an overview of the most common subfloors and finishes.

An MS polymer adhesive, commonly known as parquet adhesive, is often recommended here. In most cases, this is the best choice as it provides good adhesion to a wide range of building materials and is highly resistant to vibrations and thermal expansion. An example of a suitable brand of this type of adhesive is **Bostik Wood H500 MAXI BOND.** Henco does not have any partnerships with adhesive manufacturers; the adhesive is purchased by the panel fitter.

**PROCESSING TYPES**

- 3.1 Sand-cement subfloor + finished with flat slabs
- 3.2 Concrete subfloor + finished with flat slabs
- 3.3 Sand-cement subfloor + finished with levelling compound
- 3.4 Concrete subfloor + levelling compound
- 3.5 Sand-cement substrate + direct tiling
- 3.6 Wooden subfloor
- 3.7 Insulated subfloor
- 4 Wall heating
- 5 Ceiling cooling

## 3.1 Sand-cement substrate + finished with flat slabs

This is likely to be the most common scenario. The gypsum fibreboard provides a flat, hard surface on which to lay the floor finish and will stabilise the floor.

**SUBSTRATE REQUIREMENTS**

- Sufficiently compressive, stable and load-bearing
- Sufficiently dry, dust-free and grease-free in accordance with the adhesive manufacturer's specifications
- No curing compound must be present
- Sufficiently level in accordance with the tolerances of the floor finish and the adhesive manufacturer
- No active cracks

**PRIMER**

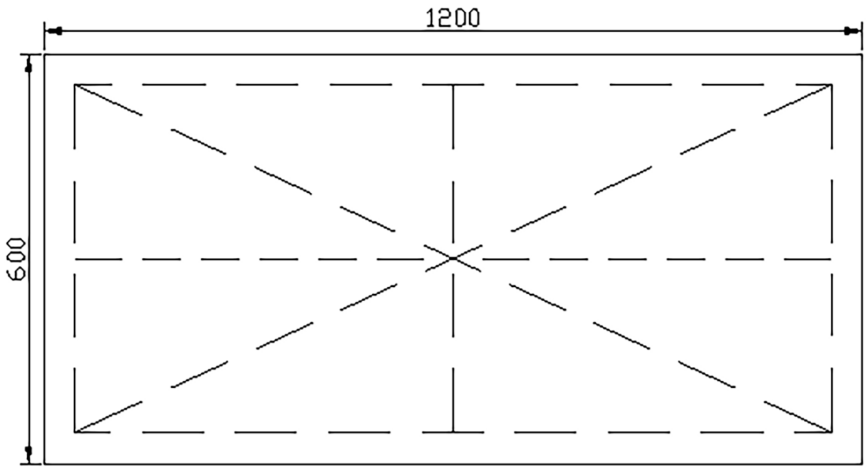
A sand-cement screed is an absorbent substrate, which means it may be necessary to apply an acrylic primer first. Always follow the adhesive manufacturer's instructions when doing so.

## BONDING

2 options:

- **A** Combable MS polymer adhesive. Apply a thin, full-surface coat of adhesive. Use a B3 or B6 adhesive comb for this. (first choice)
- **B** Low-expansion PU adhesive foam suitable for flooring/panels:

Bond the panels according to the pattern below. Never apply individual dots, as the PU adhesive will still expand slightly. This will prevent localised indentations. Do not apply the adhesive in ridges that are too thick to prevent the panels from buckling. Press the panels down firmly after installation.




## FINISH

When finishing XPS panels using a dry method – that is, with a flat board – we always recommend using gypsum fibreboard. These boards have excellent properties for underfloor heating applications, such as good thermal conductivity, low weight, dimensional stability, acoustic comfort, limited thermal expansion and moisture-regulating properties.

To bond the gypsum fibreboard to the XPS panels, we recommend an elastic MS polymer adhesive, applied over the entire surface. Use a B3 or B6 notched trowel for this.

As MS polymer adhesive bonds well to aluminium, a primer is not required. First wipe the top of the panels with a cotton cloth to ensure they are completely free of grease and dust.

Most floor finishes can be laid on top of the gypsum fibreboard.

- Tiles
- PVC/LTV
- Parquet
- Laminate flooring
- ...

This does not mean that all these floor finishes can simply be laid straight away!

There may always be a need for decoupling mats, subfloors or specific adhesives or primers. Always follow the manufacturer's recommendations in this regard. Henco cannot comment on all types of floor finishes available on the market.

## 3.2 Concrete subfloor + flat slab finish

A concrete substrate is technically very similar to a sand-cement substrate, meaning that the system remains largely the same. The main difference lies in the surface of the concrete layer. This is less absorbent and smoother, which means the primer/adhesive cannot bond as effectively. Certain compounds may also be present, preventing the adhesive from bonding properly.

### SUBSTRATE REQUIREMENTS

- Sufficiently compressive, stable and load-bearing
- Sufficiently dry and dust-free in accordance with the adhesive manufacturer's specifications
- Completely free from curing compounds, formwork oil, cement skin or sintered layers
- Sufficiently level in accordance with the tolerances of the floor finish and the adhesive manufacturer
- No active cracks

### PRIMER

On a normal, absorbent concrete floor, it may be necessary to apply an acrylic primer. Always follow the adhesive manufacturer's instructions for this (similar to a sand-cement screed).

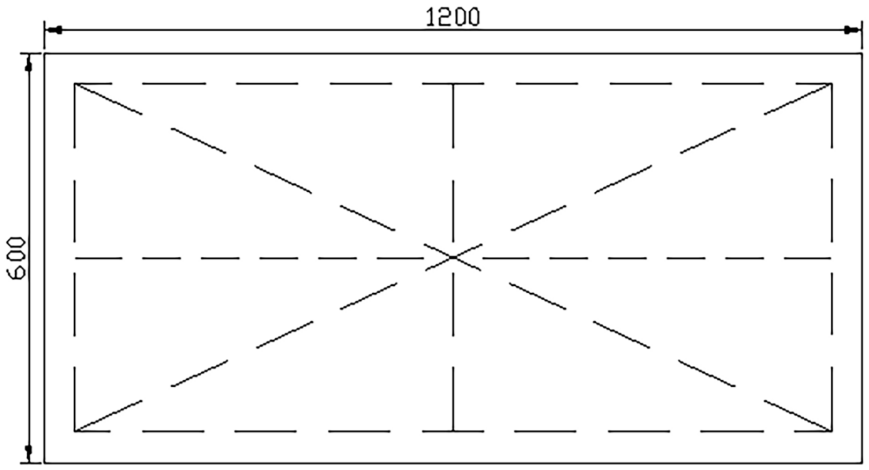
For smooth/dense concrete floors, we recommend roughening the surface. An acrylic primer cannot be applied directly to a polished concrete floor. In some cases, you may switch to an epoxy primer. Please consult the manufacturer for advice.

### BONDING

As with 3.1 (sand-cement substrate), there are two options:

- **A** Combable MS polymer adhesive. Apply a thin, full-surface coat of adhesive. Use a B3 or B6 adhesive comb for this. (first choice)
- **B** Low-expansion PU adhesive foam suitable for flooring/panels:

Bond the panels according to the pattern below. Never apply individual dots, as the PU adhesive will still expand slightly. This will prevent localised indentations. Do not apply the adhesive in ridges that are too thick to prevent the panels from buckling. Press the panels down firmly after installation.



**FINISH** The same as for 3.1: sand-cement substrate.

When finishing XPS panels using a dry method – that is, with a flat board – we always recommend using gypsum fibreboard. These boards have excellent properties for underfloor heating applications, including thermal conductivity, weight, dimensional stability, acoustic performance, thermal expansion and moisture regulation.

To bond the gypsum fibreboard to the XPS panels, we recommend an elastic MS polymer adhesive, applied over the entire surface. Use a B3 or B6 notched trowel for this.

As MS polymer adhesive bonds well to aluminium, a primer is not required. First wipe the top of the panels with a cotton cloth to ensure they are completely free of grease and dust.

Most floor finishes can be laid on top of the gypsum fibreboard.

- Tiles
- PVC/LTV
- Parquet
- Laminate
- ...

This does not mean that all these floor finishes can simply be laid straight away!

There may always be a need for decoupling mats, subfloors or specific adhesives or primers. Always follow the manufacturer's recommendations in this regard. Henco cannot comment on all types of floor finishes available on the market.

## 3.3 Sand-cement substrate + levelling compound finish

Another option for finishing the panels is to pour a layer of levelling compound over them. This is quicker to install and more cost-effective, but places slightly higher demands on the bonding and finishing, as the levelling compound has a low build-up height and is therefore prone to cracking.

**SUBSTRATE REQUIREMENTS**

- Sufficiently compressive, stable and load-bearing
- Sufficiently dry and dust-free in accordance with the adhesive manufacturer's specifications
- No curing compound must be present
- Sufficiently level in accordance with the tolerances of the floor finish and the adhesive manufacturer
- No active cracks

## PRIMER

A sand-cement screed is an absorbent substrate, which means it may be necessary to apply an acrylic primer first. Always follow the adhesive manufacturer's instructions when doing so.

## BONDING

Combable MS polymer adhesive. Apply a thin, full-surface bond. Use a B3 or B6 adhesive comb for this.

**A levelling compound finish behaves differently to a flat panel, which is why we only recommend applying a full-surface bond.**

## FINISH

Before you can level the panels, a primer must be applied. This is both to improve adhesion and to protect the aluminium.

The aluminium top layer is a non-absorbent, smooth surface. Use a quartz-filled bonding primer (contact primer) for this. This will create a rough surface for better adhesion of the levelling compound. Choose a primer that is compatible with the levelling compound to be used.

The levelling compound must:

- Be fibre-reinforced
- Be suitable for underfloor heating
- Be suitable for thin layers
- Have high compressive strength
- Have limited shrinkage

The minimum layer thickness must comply with the manufacturer's specifications for the levelling compound. In practice, this will often be around 10 mm above the aluminium top layer.

## FLOOR FINISHING

Most floor finishes can be laid on top of the levelling compound.

- Tiles
- PVC/LTV
- Parquet
- Laminate
- Self-levelling floor
- ...

This does not mean, however, that all these floor finishes can simply be laid directly onto the screed! There may always be a need for decoupling mats, subfloors or specific adhesives or primers. Always follow the manufacturer's recommendations in this regard. Henco cannot comment on all types of floor finishes available on the market.

# 3.4 Concrete subfloor + levelling compound

A concrete substrate is technically very similar to a sand-cement substrate, but there are a few important differences that affect the choice of primer and adhesion.

## SUBSTRATE REQUIREMENTS

- Sufficiently compressive, stable and load-bearing
- Sufficiently dry and dust-free in accordance with the adhesive manufacturer's specifications
- Completely free from curing compounds, formwork oil, cement skin or sintered layers
- Sufficiently level in accordance with the tolerances of the floor finish and the adhesive manufacturer
- No active cracks

## PRIMER

On a normal, absorbent concrete floor, it may be necessary to apply an acrylic primer. Always follow the adhesive manufacturer's instructions for this (similar to a sand-cement screed).

For smooth/dense concrete floors, we recommend roughening the surface. An acrylic primer cannot be applied directly to a polished concrete floor. In some cases, you may switch to an epoxy primer. Please consult the manufacturer for advice.

## BONDING

Combable MS polymer adhesive. Apply a thin, full-surface bond.
Use a B3 or B6 adhesive comb for this.

**A levelling compound finish behaves differently to a flat panel, which is why we only recommend applying a full-surface bond.**

## FINISH

Before you can level the panels, a primer must be applied.
This is both to improve adhesion and to protect the aluminium.

The aluminium top layer is a non-absorbent, smooth surface. Use a quartz-filled bonding primer (contact primer) for this. This will create a rough surface for better adhesion of the levelling compound. Choose a primer that is compatible with the type of levelling compound.

The levelling compound used must:

- Be fibre-reinforced
- Be suitable for underfloor heating
- Be suitable for thin layers
- Have high compressive strength
- Have limited shrinkage

The minimum layer thickness must comply with the levelling compound manufacturer's specifications. In practice, this will often be around 10 mm above the aluminium top layer.

### FLOOR FINISHING

Most floor finishes can be laid on top of the levelling compound.

- Tiles
- PVC/LTV
- Parquet
- Laminate
- ...

This does not mean, however, that all these floor finishes can simply be laid directly onto the levelling compound! There may always be a need for decoupling mats, subfloors or specific adhesives or primers. Always follow the manufacturer's recommendations in this regard. Henco cannot comment on all types of floor finishes available on the market.

## 3.5 Sand-cement substrate + direct tiling

Direct tiling on XPS panels is technically possible, as they have the necessary compressive strength for residential applications, but it is only recommended when the system design requires it and the installation height does not allow for an alternative finish. Keep in mind that for this, the panels must be completely flat and clean throughout. In practice, this is difficult to achieve, as in some places—such as around a doorway or at a manifold—many additional grooves must be milled or filled with granules or similar material. For this reason, we recommend always finishing the XPS panels with a flat sheet or a leveling layer when the installation height allows it. This will not only make it easier to install the tiles but will also make the system more robust to prevent cracks later on. Only when the installation height is extremely limited should you opt to tile directly.

We recommend always using a decoupling mat.

We do not recommend tiles smaller than 15x15 cm or larger than 60x60 cm.

Also avoid ultra-thin tiles.

### SUBSTRATE REQUIREMENTS

- Sufficiently compression-resistant, stable, and load-bearing
- Sufficiently dry and dust-free according to the adhesive manufacturer's specifications
- No curing compound may be present
- Sufficiently level in accordance with the tolerances of the floor finish and the adhesive manufacturer
- No active cracks

### PRIMER

A sand-cement screed is an absorbent surface, so it may be necessary to apply an acrylic primer first. Always follow the adhesive manufacturer's instructions when doing so.

### BONDING

When installing a tile floor, we recommend always using full-surface adhesive application; do not use “bead” application with caulking guns. Caulking guns create hollow spaces, which can cause the panels to sag in certain areas. This increases the risk of tile cracking.

2 options:

- **A** Flexible cement/tile adhesive: Type C2TE S1 or S2.
  S2 is extra flexible and the premium choice of the two. If you are unsure about the stability of the substrate or when working on large, jointless surfaces, it is always best to use S2.
  Apply a full-surface, single-sided bond using a notched trowel (recommended notch size: 10 mm).
- **B** Combable MS polymer adhesive. Apply a thin, full-surface bond.
  Use a B3 or B6 notched trowel for this.

### LAYING THE TILES

Before the tile adhesive can be applied, the panels must be coated with a primer. This is done both to improve adhesion and to protect the aluminum.

The aluminum top layer is a non-absorbent, smooth surface. Use a quartz-filled adhesion primer (contact primer) for this purpose. This will create a rough surface for better grip on the tile adhesive. Make sure the primer is compatible with the type of tile adhesive.

For the tile adhesive, we recommend type C2TE S2, applied in a double-layer application. S2 will better accommodate expansion and reduce the risk of cracking. The double-layer application prevents air pockets.

## 3.6 Wooden subfloor

Wooden subfloors are more challenging than concrete or sand-cement because they are a springy surface with higher thermal properties. As a result, tiles can never be installed directly on top of the XPS panels. For wooden subfloors, we recommend always finishing the panels with a flat sheet; never use a levelling compound.

In this context, the flat panel on top of the XPS panels will provide stability and distribute the load.
The XPS panels must always be secured to the substrate to prevent shifting, maintain flatness, and control thermal expansion.

By wooden substrates, we mean:

- OSB
- Plywood
- Wooden plank flooring
- Particleboard

## SUBSTRATE REQUIREMENTS

- Sufficiently pressure-resistant, stable, and load-bearing
- Must show no movement or deflection
- Sufficiently dry and dust-free according to the adhesive manufacturer's specifications
- Sufficiently level in accordance with the tolerances of the floor finish and the adhesive manufacturer

## FIXATION

If the substrate is made of wood, we recommend screwing or gluing the panels in place. You can do both, and in most cases, this will be the best solution.

## FASTENING THE XPS PANELS WITH SCREWS

Screw type: Galvanized steel screws or stainless steel particleboard screws with a countersunk, flat head. Diameter 4–5 mm. Do not use screws that are prone to corrosion.

- 8–10 fastening points per panel to minimize local deformation.
    - 4 corner areas
    - 2 along the center of the long sides
    - 2-4 central fasteners

Stay at least 50 mm from the panel edges to prevent tearing or warping.

If the panel is also glued to the substrate, fewer fasteners may be sufficient.

Avoid tightening the screws too much, as this can compress or deform the XPS and cause localized sagging.

Washer discs can be used to prevent local indentations but will also protrude from the panels, which may make it difficult to secure the flat panel on top of the XPS panels. For this reason, Henco recommends using them only if problems arise during screw installation.

Screws must not be placed in pipe zones.

## BONDING THE XPS PANELS

When bonding the panels to a wooden substrate, we recommend using a combable MS polymer adhesive. Apply a thin, full-surface layer of adhesive. Use a B3 or B6 adhesive comb for this purpose. If required by the adhesive manufacturer, a suitable PU or epoxy primer may be applied.

For wooden substrates, we recommend finishing the XPS panels with a flat gypsum fiberboard. This board must be fully glued to the surface to distribute the load and prevent cracking. In some situations, such as with very large panels (>1200x1200 or long, narrow panels such as 600 x 2400), additional fastening with screws may also be necessary. These screws must then be driven all the way into the wooden substrate.

### BONDING

To bond the gypsum fiberboard to the XPS panels, we recommend a combable MS-polymer adhesive. Apply a thin, full-surface coat of adhesive. Use a B3 or B6 notched trowel for this.

Since MS-polymer adhesive bonds well to aluminum, a primer is not necessary. First, wipe the top of the panels with a cotton cloth to ensure they are completely free of grease and dust.

### FLOOR FINISHING

Most types of flooring can be installed over gypsum fiberboard.

- Tiles
- PVC/LTV
- Parquet
- Laminate
- ...

This does not mean that all these floor finishes can simply be installed directly! Decoupling mats, subfloors, or specific adhesives or primers may always be required. Always follow the manufacturer's recommendations. Henco cannot comment on all types of floor finishes available on the market.

We do not recommend installing a poured floor finish on top of gypsum fiberboard.

## 3.7 Insulation Substrate

When installing XPS panels directly on a layer of insulation, the substrate must meet the following requirements:

- Sufficient compressive strength and compliant with the project's load requirements
- Show no deflection
- Be sufficiently level (sprayed insulation must always be leveled)
- Stable
- No loose granules

By "insulation layer," we mean the following materials:

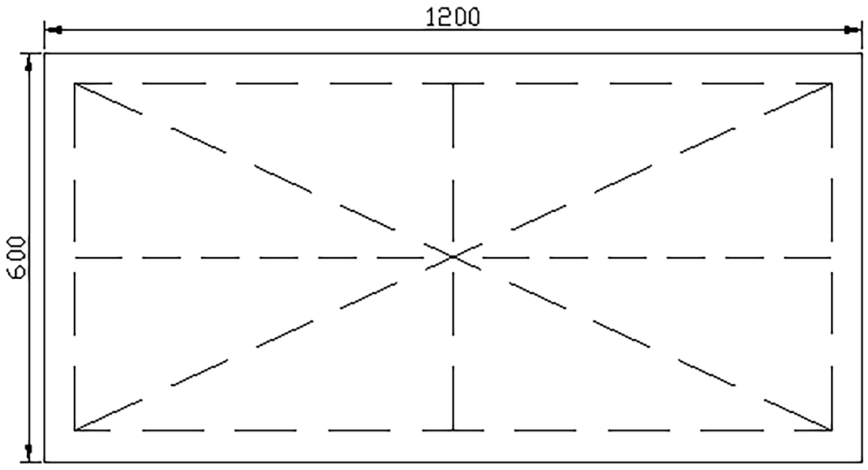
- PUR, PIR, EPS, or XPS boards
- Sprayed PUR or EPS

### BONDING

In most cases, a primer will not be necessary, unless specifically recommended by the adhesive manufacturer. 2 options:

A. Combable SMP/MS polymer adhesive. Apply a thin, full-surface coat of adhesive. Use a B3 or B6 adhesive comb for this. (first choice)

B. Low-expansion PU adhesive foam suitable for floors/panels:
Apply the adhesive to the panels according to the pattern below. Never apply isolated dots, as the PU adhesive will still expand slightly. This prevents localized indentations. Do not apply beads that are too thick to prevent the panels from buckling. Press the panels firmly into place after installation.




**FINISH**

As a finish for XPS panels on an insulated subfloor, we recommend a flat gypsum fiberboard, fully bonded with MS polymer adhesive.

Most floor finishes can be installed on top of the gypsum fiberboard.

- Tiles
- PVC/LTV
- Parquet
- Laminate
- ...

This does not mean that all these floor finishes can simply be installed directly! There may always be a need for decoupling mats, subfloors, or specific adhesives or primers. Always follow the manufacturer's recommendations! Henco cannot comment on all types of floor finishes available on the market.

We do not recommend leveling or tiling directly onto XPS panels when used as an insulation substrate, as they exhibit relatively high deformation and low rigidity, which increases the risk of cracking.

## 4 Wall Heating

Henco XPS panels can also be used for wall heating/cooling. Unlike a floor system, the panels are not exposed to foot traffic or point loads. With wall systems, the focus is primarily on ensuring adequate mechanical fastening, minimizing deformation of the wall structure, and achieving a crack-free finish. Depending on the type of wall, there are several different finishing options available.

### 4.1 Directly on a solid wall

By "solid wall," we mean:

- Concrete
- Concrete blocks
- Calcium silicate brick
- Brick
- Aerated concrete

### FIXATION

The panels should preferably be mechanically fastened using appropriate anchors and screws. The exact number of fasteners can be adjusted depending on the substrate, the panel dimensions, and the intended finish. Typically, you should aim for around 6–8 fastening points.

For example: 4 corners and 2 center points

Stay at least 50 mm away from the panel edges to prevent tearing or warping.

Gluing the panels with an MS polymer adhesive is also possible and can reduce the number of anchors needed. Gluing alone is not recommended for vertical applications.

### FINISH

It is best to finish the surface directly with reinforced gypsum plaster. To do this, follow the instructions provided by the plasterer. The aluminum top layer of the XPS panels provides a smooth surface, so it is usually recommended to apply an adhesion primer before applying the plaster. To do this, follow the instructions provided by the plaster manufacturer.

## 4.2 Wood-frame wall or metal-stud wall

### FIXATION

The XPS panels are installed against the drywall and should preferably be mechanically fastened to the underlying wooden or metal studs. Fastening the panels exclusively to the drywall is not recommended.
It is also possible to bond the panels using an MS polymer adhesive, which can reduce the number of screws required. Bonding alone is not recommended for vertical applications.

### FINISH

Gypsum board walls always have a slight flex and are more susceptible to vibrations and thermal expansion. For this reason, we recommend finishing the XPS panels with gypsum fiberboard instead of applying a layer of plaster directly. This can be done by gluing or securing with screws. The gypsum fiberboard serves as the direct finishing surface for paint, wallpaper, decorative plaster, or tile work. Always follow the instructions provided by the manufacturer or installer of the finish material.

## 5 Ceiling Cooling

Henco XPS panels can also be used for ceiling cooling.
Below, you will find our preferred method of installation.

### FIXATION

For a concrete ceiling, it is recommended to first mechanically fasten an OSB panel approximately 18 mm thick using suitable anchors and screws. The OSB panel serves as the supporting structure to which both the XPS panels and the finishing panels are attached.

The XPS panels are mechanically fastened using wood or particleboard screws with a diameter of approximately 4.0 to 4.5 mm, with at least 6 fastening points. The screws must be anchored at least 12–15 mm into the OSB panel.

### FINISH

The XPS panels are finished with gypsum board or gypsum fiberboard. The finishing panels are screwed through the XPS panels and into the OSB panel.

The gypsum board or gypsum fiberboard serves as the direct finishing surface for paint, wallpaper, or other suitable ceiling finishes.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Toekomstlaan 27
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+32 14 28 56 60
info@henco.be