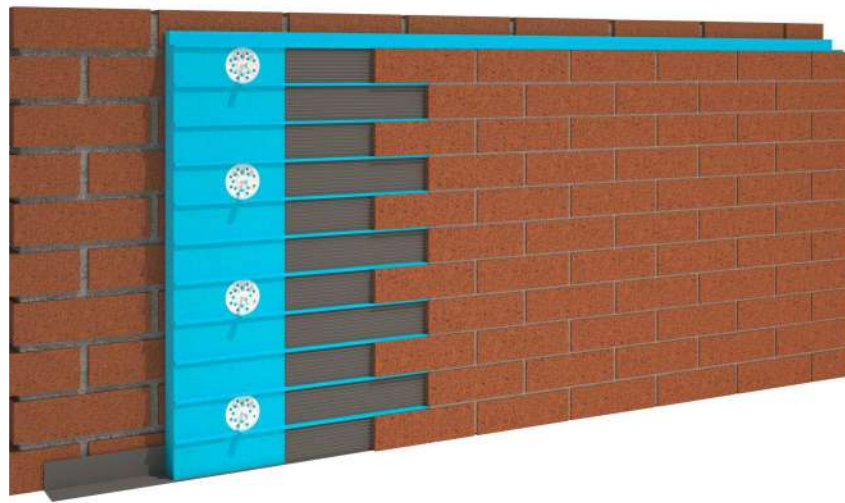


CANDIWALL[®]

SYSTEM

External Thermal Insulation Composite System with
Brick Slips



TECHNICAL INSTALLATION MANUAL



LABORATÓRIO NACIONAL
DE ENGENHARIA CIVIL

DH 958

CANDIGRÉS[®]

CERAMIC

CANDIWALL[®]

SYSTEM

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Candiwall System

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Before starting the description of the application process of the Candiwall System, it is important to remember some advice for the correct application in work, in order to reduce errors and imperfections that could compromise the duration of the system:

- The surface must be clean, otherwise proceed to the removal of dust, dirt, traces of oils, loose parts, etc..
- You must verify that the bracket is level, otherwise you should proceed to its leveling and correction.
- The process of the application must be performed at temperatures between +5 and + 30 °C
- It is not advisable to apply in periods of rain.
- The deteriorated parts of concrete must be restored with mortar for specific rehabilitation of concrete.
- The presence of old paintings, to stress partially or discard, involves the complete removal of the same.
- In the case of ceramic tiles, if broken, they must be removed and the bracket must be adjusted to be ready for application of the Candiwall system .

Calculation of the necessary material

TOTAL SURFACE AREA=10 Sq.mt

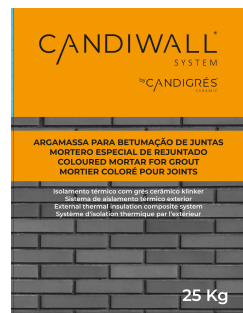
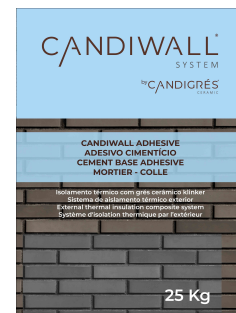
CORNER HEIGHT= 2+2 LINEAR MT
(BOTH SIDES)

4 X 1/3 = 1,33 AREA COVERED BY
CORNERS

TOTAL AREA= 10 - 1,33
= 8,67 Sq.mt

Each Sqm of Candiwall System® consist:

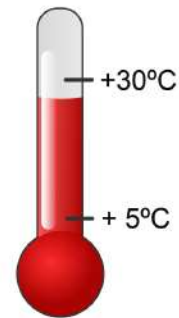
- ❑ 1 Sqm of Candiwall Board (Insulation)
- ❑ 1 Sqm of brick slips (classic or prestige)
- ❑ 6 Kg of Candiwall Adhesive
- ❑ 3,5 to 5 Kg of Candiwall Grout
- ❑ 10 Plastic Sleeves with steel spike



PRELIMINARY OPERATIONS

TEMPERATURES

Installation must be carried out at air temperatures between +5°C and +30°C.



SURFACES

Surfaces must be clean otherwise it is necessary to remove dust, dirt, traces of release agent, crumbling and ruined areas, etc. by washing with clean water at low pressure.

If there is old paint and/or coatings, should verify the adhesion to the substrate, and then decide whether to remove it or not.

If there is a ceramic covering it is necessary to thoroughly map the area to assess whether there are any detached bits that need to be removed. In doubt, perform a substrate test with the aid of a hammer in order to check the status.



PRELIMINARY OPERATIONS

It will also be necessary to evaluate whether to proceed with hydrosandblasting, depending on the presence or absence of glazed or glass surfaces, with the removal of these particles you will obtain a better surface for the adhesive to stick to.



Make sure the substrate is flat and level it using mortar if necessary. On specific protruding elements, such as concrete edges or out of plumb brick elements, remove any excess.



Application

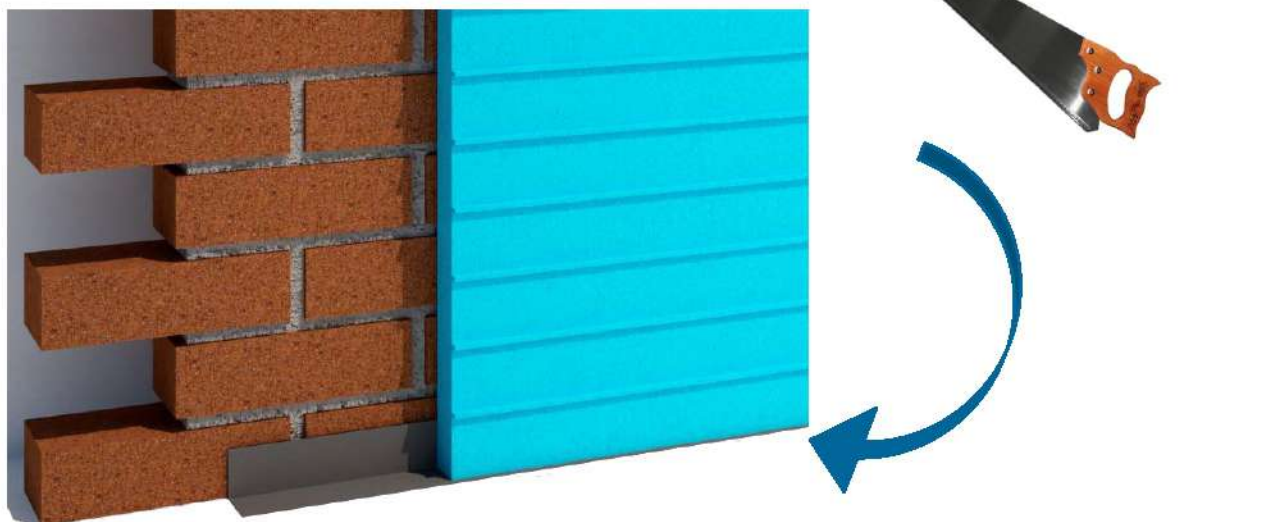
Stage 1

Startup Profile

Startup profiles may be used to fit the Candiwall board at the desired thickness, in this case the profile should be enlarged more 15 mm (thickness of the brick slip) .

When installing the first layer of Candiwall boards, on the profile startup, cut the half-wood fit for a perfect alignment.

Use an machinery to cut it, or an hand saw.



Board position

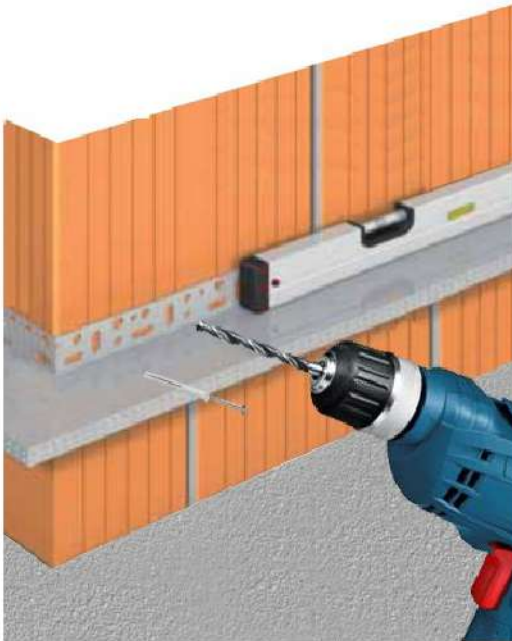
It is important that the insulation board is in the correct position: the half-wood fit must be in the " L " position, the longer part of the fitting is applied next to the support, to avoid water infiltrations from outside to the inside



Application

Startup Profile

Fixing Profile

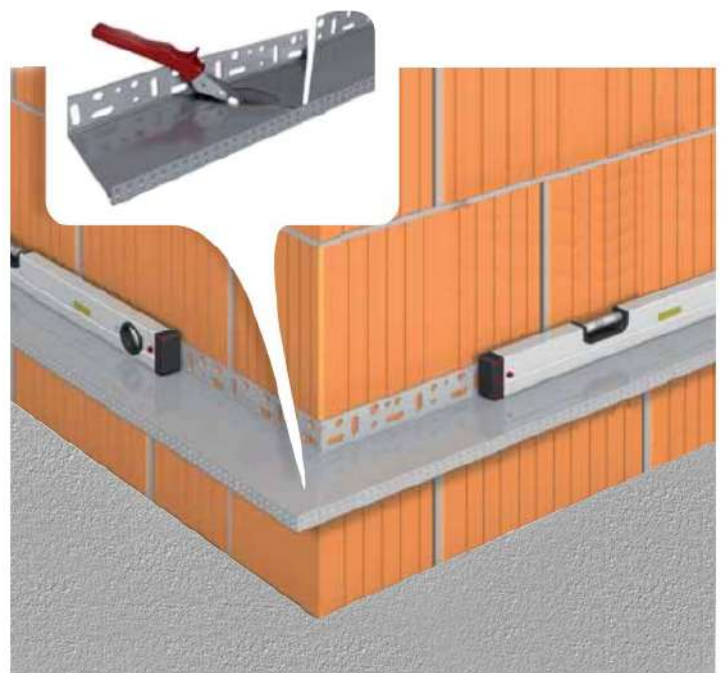


The startup profile must be aligned and leveled at the time of fixation.

The startup profile must be 2-3 cm above the ground, at least.

Making corners

In the corners of buildings, it is necessary to build a connection between base profiles, which can be obtained by either suitably shaping profiles, or using a corner-shaped base profile.



Application

Stage 1

Startup Profile

Connecting profiles and spacers

To perfectly join base profiles together, it is possible to use connecting profiles.



Base on an existing floor



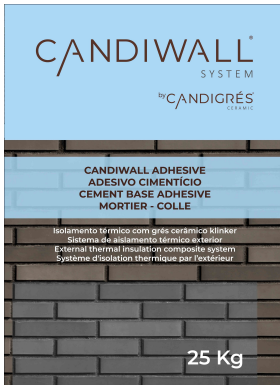
In these cases the candiwall insulating board lies directly on the existing base cutting the half-wood fit for a perfect alignment.

Application

Stage 2

Candiwall Adhesive Application

Preparation of Candiwall Adhesive



Knead 25 kg CANDIWALL ADHESIVE with 6 to 6.5 L of clean water. Use a slow mixer, until have a consistent mass, homogeneous and without lumps. Let the mass rest 5 minutes, then mix again before starting the application.



The adhesive should be applied into the insulation board in continuous bonding with metal trowel 8/10 mm (Fig. 1), or ribbon (circular cord least 3 cm away from the edges) - and in between, spots of adhesive as shown in figure 2. Once the insulation board is pressed against the substrate make sure that at least 60% of the surface has adhesive.



Fig. 1



Fig. 2

The adhesive is always applied to the insulation board never on the substrate.



Application

Stage 2

Candiwall Adhesive Application

You should always avoid

The use of Candiwall adhesive in the top of the Candiwall board, this process will lead to the formation of thermal bridges and imperfect union between the plates.
too long exposure of the adhesive, thereby avoiding the creation of skins that can compromise the adhesion of it.



The Candiwall Adhesive should never be used to stabilize the substrate, its thickness should not exceed 10mm.

For more details of the Candiwall Adhesive see the data sheet.

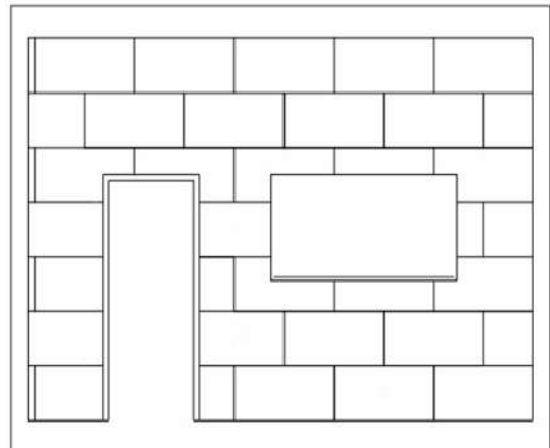
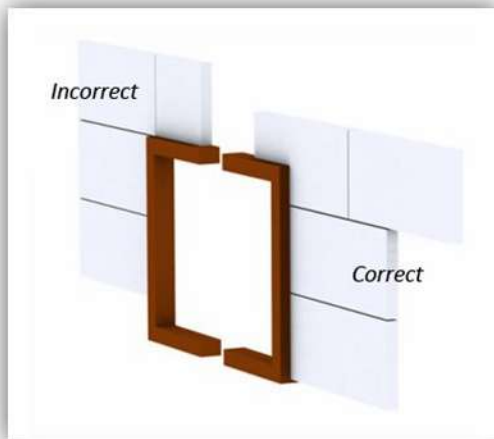
Application

Stage 3

Placing Insulations Boards

Pay attention to how insulating boards are stored on the building site. Avoid exposure to atmospheric agents and protect boards from direct sunlight in particular. XPS boards are particularly sensitive to the action of direct sunlight. Installation must therefore be carried out away from direct sunlight. Otherwise, it is advisable to shield scaffolding with tarpaulins.

The insulation boards are placed end to end in horizontal rows from the base wall, and the reference level defined by the profile startup. The boards must be laid with joints staggered, either in the current zone, or in the corners (Fig. 3).



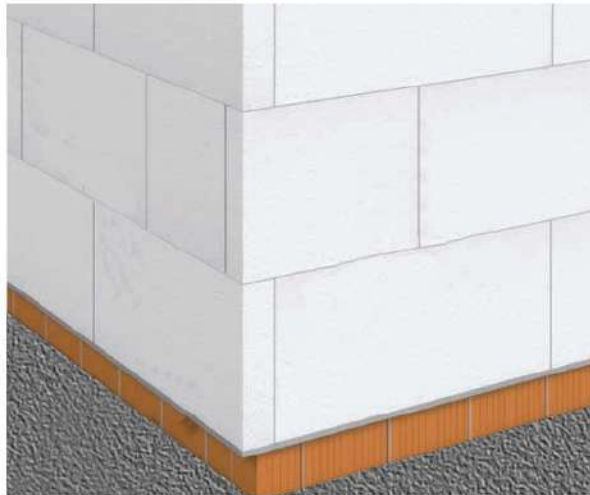
In case of rain during installation, you should avoid water infiltration below the insulating layer.

Application

Stage 3

Placing Insulations Boards

At corners, boards must be alternated so as to ensure stress absorption. Be particularly careful not to use adhesive on panel heads. Boards must be glued together in corners using a polyurethane adhesive when thickness exceeds 18 cm. Boards pieces with a width of over 15 cm are allowed but must never be used at corners, and only on solid surfaces.



Any joints between boards must be filled with strips of insulating material. For less than 4 mm joints, you can use the polyurethane foam filler.



The candiwall adhesive should never be used to fill gaps between boards.

Application

Stage 3

Placing Insulations Boards

The Candiwall Board as a half-wood fit, ensuring the insulation between boards.



This must be assembly correct to guarantee that doesn ' t exist water infiltrations from outside to the inside.

Application

Stage 3

Placing Insulations Boards

As the panels are being laid, they must be tapped with a wooden or plastic trowel to make them adhere to the substrate as much as possible. It is important to often check the flatness of the entire surface with a straight edge. Small differences in flatness between boards can be carefully adjusted.



Placing the adhesive on the board



Placing the board in the substrate



Board adjustment



Leveling the boards

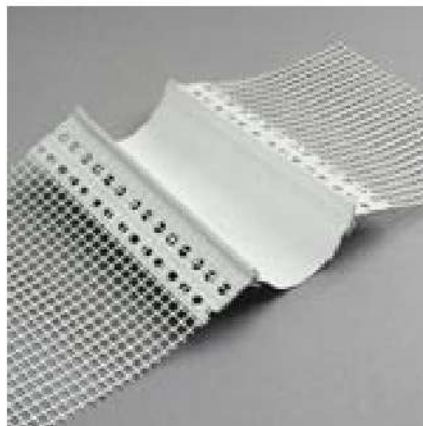
Application

Stage 3

Placing Insulations Boards

Expansion joints

Structural expansion joints must be incorporated into the layer of outer insulation, laying boards so as to leave a gap of approximately 2 cm. Place a strip of rock wool between panels as an insulator and filler. Apply the reinforced base coat to the insulating board sides and to the first 15/20 cm area of the board front. Insert an expansion joint maintaining an overlap between joints of at least 10 cm.



Connection to projecting elements

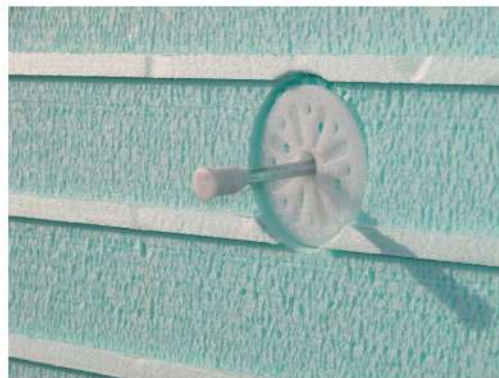
When there are fixed, projecting elements in the wall (beams, windowsills, doors, windows, etc.), and you want to make a connection with the insulating boards with a view to waterproofing against driving rain, it is advisable to apply the adhesive side or mastic glue of the pre-compressed sealing strip directly to the protruding element on the outer-most part of the insulating board, respecting the thickness of the insulation.

Application

Stage 4

Placing of mechanical fasteners

The main function of the anchors is not to absorb the panel adhesion or bearing stresses but to allow for stability of adhesion over time, which may be affected by an improper preparation of the substrate and by wind stress. Ultimately, adhesive is used to counter forces that are parallel to the substrate, while anchors work to counter forces that are perpendicular to the substrate.



We would like to underline that the height of the building and its geographical location affect the number of anchors required for the application. This is especially true for the outermost areas of a building, more subjected to the force of wind. At least 9 anchors/m² should be applied to surfaces; one anchor should be installed at each corner, and at least one anchor in the centre of the panel.

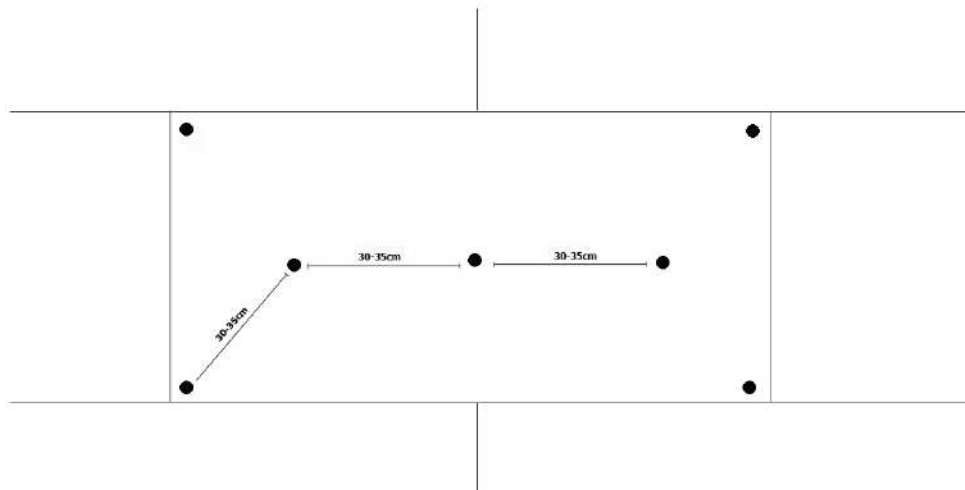
For a building height of more than 25 m, it is necessary to increase this number to 10 anchors/m² in the outermost areas of the building.

Application

Stage 4

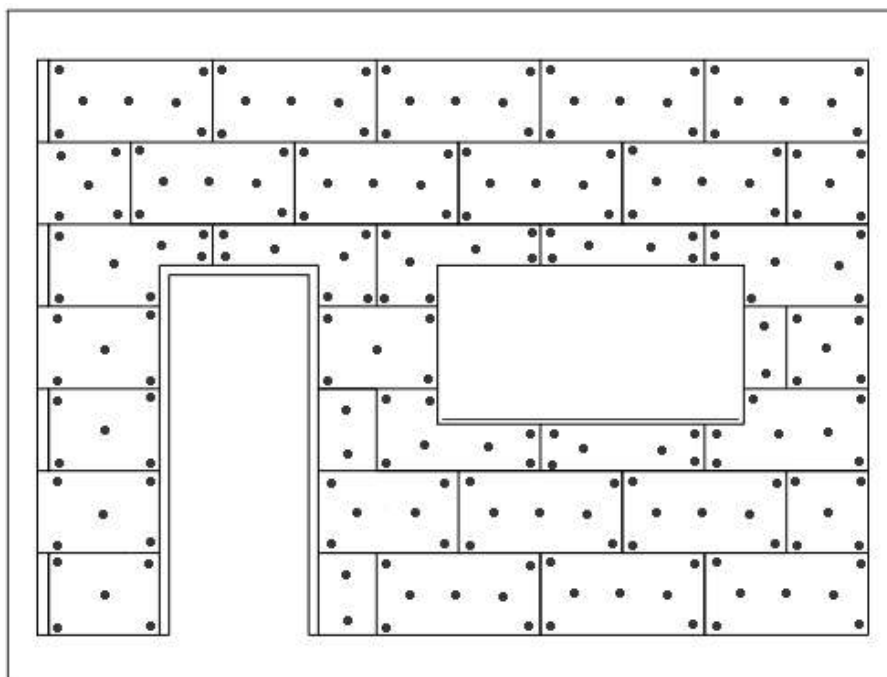
Placing of mechanical fasteners

Normally, we use the X-pattern to anchoring candiwall boards, one fastener in the center, and four other ones 30-35 cm away.



The accounting of fasteners per board is 7 as shown in the figure below, considering a board with 1250mmx600mm.

Application example



Application

Stage 4

Placing of mechanical fasteners

Anchor penetration into the wall surface must match the Anchorage Depth of the anchor (A D) . In order to determine the appropriate length of the anchor, both the thickness of the adhesive (approx. 10 mm) and the thickness of a possible plaster must be taken into account:

$$\boxed{\text{Fastener L (mm)}} = \boxed{\text{Insulation TH + Adhesive TH + Plaster TH + AD}}$$

L Length / TH Thickness / AD Anchorage Depth

Normaly size fasteners used on XPS boards:

Insulation Thickness (mm)	Fasteners Length (mm)
Candiwall Board 30	70
Candiwall Board 40	70
Candiwall Board 50	90
Candiwall Board 60	90
Candiwall Board 80	110
Candiwall Board 100	140
Candiwall Board 120	160

Application

Stage 4

Placing of mechanical fasteners



The fixing of the bushing is a very important step, because we must ensure that they are well secured. In support of concrete, drilling should be done in way of percussive (hammer) , in turn, brick alveolar should proceed in rotary mode, thus ensuring that the brick structure is not damaged. The depth of the hole should be always greater than the length of the bushing.



Rotary method for hollow brick substrates



Percussive method for concrete or solid brick substrates.

Fasteners must be applied about 1 day after boards placing, and in any case after the adhesive has hardened, panels are fixed mechanically using special mushroom anchors whose plates have the task of pressing the insulating panel against the substrate, while stems fasten the system to the substrate.

Application

Stage 4

Placing of mechanical fasteners

Steps

Step 1



Drilling with 10mm thickness

Step 2



Downgrade the xps

Step 3



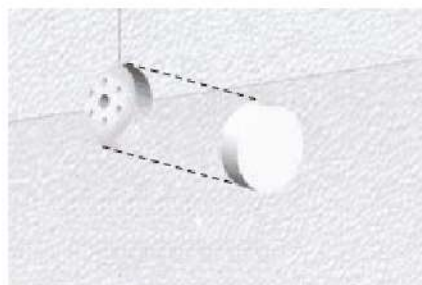
Placing the fasteners

Step 4



Hammer the fasteners

Step 5



Placing the stopper

Application

Stage 4

Placing of mechanical fasteners

Rolling-shutter box

This picture shows the procedure that needs to be followed to install a rolling-shutter box.

Specifically, attention is drawn on the insulation above the rolling-shutter box, non-anchorable, where a generally polyurethane adhesive (highlighted in yellow).



Candiwall Wood Fasteners

Screw-in anchor with plate, for wood and metal sheets



For timber frames and wood substrates use candiwall screw fasteners

For application repeat the previous steps less the step 1 and 4

Application

Stage 5

Fixing the brick slip to the Candiwall Board

For fixing the brick slips to the Candiwall board is used the same adhesive for fixing the insulation to the support, the Candiwall Adhesive.

Approximately 1 week after applying the Candiwall Board, we can start applying brick slips.

Step 1 - Preparation of Candiwall Adhesive



Knead 25 kg CANDIWALL ADHESIVE with 6 to 6.5 L of clean water. Use a slow mixer, until have an consistent mass, homogeneous and without lumps.

Let the mass rest 5 minutes, then mix again before starting the application.

Step 2 - Apply the adhesive in the Candiwall board



With the help of a metal trowel spread candiwall adhesive on the board.

It is recommended not to spread to much adhesive in one time, not exceeding 1 sqm at a time, to avoid adherence problems.

Application

Stage 5

Fixing the brick slip to the Candiwall Board

Step 3 - Stretching the adhesive on the board



Using a 5-6 mm metal trowel stretching the adhesive on the candiwall board, as you can see on the picture.

It is recommended not to spread too much adhesive in one time, to avoid adherence problems.

Step 4 - Placing the Brick Slips - Corners First



To avoid the creation of skins in the cement which can compromise the adhesion, place the brick slips right after stretching the adhesive.

The first step is starting with the corners, in order to avoid pieces cut.

The corners must be laid with joints staggered.



Application

Stage 5

Fixing the brick slip to the Candiwall Board

Step 4 - Placing the Brick Slips - Corners First



For a correct leveling of the wall, go laying the level to correct any imperfection.

Windows Corners - Detail

At windows top, we have several ways of making the finishing, the most applied are these two, using the brick slip corner or brick slip jamb.



The way with brick slip corner



When it is to apply the corner at the top of the window cut the guides on candiwall board, one or two, to make sure the brick slip corner fit well.



Application

Stage 5

Fixing the brick slip to the Candiwall Board

Step 4 - Placing the Brick Slips - Corners First

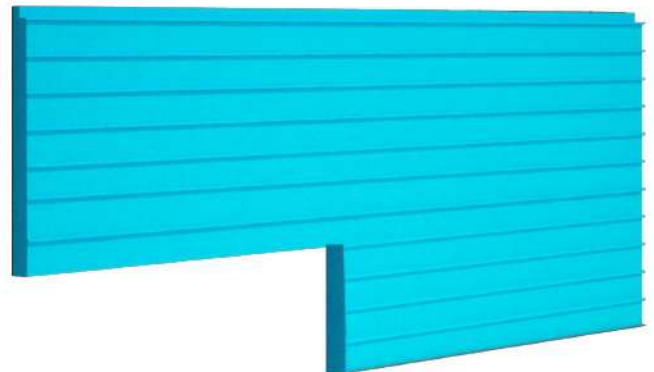
Windows Corners - Detail



The way with brick slip jamb

When it is to apply the jamb at the top of the window only cut the candiwall board to fit at window measure.

There is no necessary to cut guides.



Step 5 - Placing the Brick Slips



After placing the corners, we are able to start applying the brick slips on candiwall board guides.

Brick slips are glued together using candiwall adhesive and applied from the top down, gently pressing and tapping them so that the entire surface is in perfect contact with the adhesive.

Application

Stage 5

Fixing the brick slip to the Candiwall Board

Step 5 - Placing the Brick Slips

Any re-aligning of the bricks must be made within 30 minutes of installation.

After laying the bricks, smooth the product evenly in the joints with a slightly dampened brush. Make sure that brick slips are placed entirely in the adhesive mortar bed and properly sealed.

No gaps or hollows should be formed.



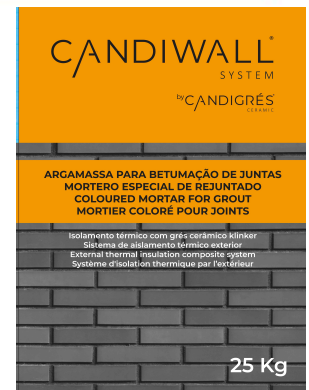
Application

Stage 6

Grouting Brick Slips - Classic

For grouting the brick slips it is used the Candiwall Grout in 20kg bags. There is a range of colors that can be applied.

Approximately 2-3 days after applying the brick slips, can start grouting.



Knead 20 kg CANDIWALL GROUT with 4 to 4,4 L of clean water. Use a slow mixer, until have an consistent mass, homogeneous and without lumps.

Let the mass rest 2 minutes, then starting the application.

After Knead Candiwall Grout, flow these steps

Step 1 - Apply the Candiwall Grout on the Classic brick slip facade



With the help of a Pad Smooth spread candiwall grout on the classic brick slip, pressing the grout against the entire brick slip surface.

It is recommended not to spread to much grout in one time, not exceeding 1 sqm at a time.

Application

Stage 6

Grouting Brick Slips - Classic

Step 2 - Remove the excess of Candiwall Grout on the Classic brick slip



With the help of a metal trowel remove the excess of candiwall grout on the classic brick slip.

This is important to no have many grout wasted and its more easy to clean after.

Step 3 - 1st cleaning the brick slip

With the help of a Grouting Sponge or Pad Smooth, in circular movements remove the excess of candiwall grout on the classic brick slip.

Always use clean water.

The job is easier if you use a bucket as the image below.



Application

Stage 6

Grouting Brick Slips - Classic

Step 4 - 2nd part of cleaning the brick slip



The second part of the bricks cleaning consists of sponge sliding in the direction of the horizontal joint.

With this technique, cleans-up and avoid the previous brick to become dirty.

Always use clean water.

Step 5 - 3rd part of cleaning the brick slip



After 24 hours, perform a general clean with a Grouting Sponge. It can also be use an abrasive pad or sisal fibers.

Always use clean water.

Application

Stage 6

Grouting Brick Slips - Prestige



The prestige brick is textured, and is recommended for grouting using grouting bag or gun, as the image below.



Grouting Gun



Grouting Bag



The joint mortar is the same as the classic brick and the mixing process is the same. As all waiting times are the same.

See page 27 and nexts.

After kneaded Candiwall Grout and passed waiting time, load the gun or bag and begin applying grout in the joints of brick slip.

Not to put mortar on the surface of the brick.

In the end pass a wire brush to remove any excess grout.

