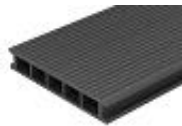


Installation Instructions of Hybrid Composite Systems

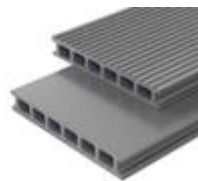


Elements of TIMBERNESS terrace system:

boards



CITY



SELECT



FOREST PLUS

finishing strips



COMPOSITE STRIP



ALUMINIUM STRIP



FOREST PLUS STRIP

joists



LOW-PROFILE JOIST



STANDARD JOIST



ALUMINIUM JOIST

**kit for
assembly of
aluminium
joist**



HORIZONTAL
ANGLE BAR



VERTICAL
ANGLE BAR



ALUMINIUM JOIST
JOINT



SELF-TAPPING
SCREW

**kit for
assembly of
boards**



STARTING CLIP



T-CLIP



M-CLIP



T-CLIP FLAT



SELF-TAPPING
SCREW



SCREWDRIVER
BIT

**OMEGA kit
for assembly
of strips**



PVC CONNECTOR
SELECT/CITY



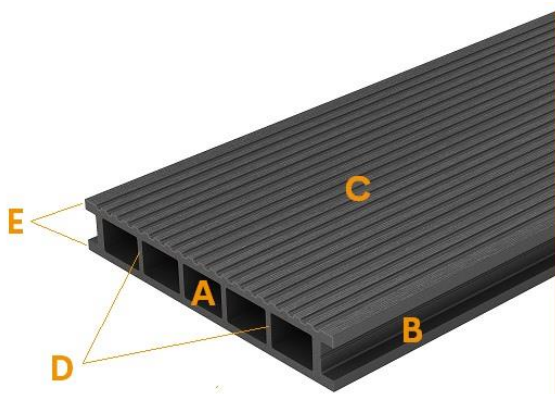
PVC CONNECTOR
FOREST PLUS



OMEGA
SLIDING CLIP



STEINLESS
STEEL SCREW



- A - front of board
- B - side of board
- C - top of board
- D - ribs
- E - tongues

PLEASE NOTE: Before the terrace installation, a base must be prepared in compliance with the requirements of the construction art as defined for this type of project. The manufacturer is not liable for any damage or destruction resulting from improper base preparation.

1. Important informations

- Prior to assembly, please read these instructions, because a terrace not assembled in compliance with the manufacturer's instructions is not covered by the warranty and any claims resulting from damage or destruction of materials due to improper use of the system components will be rejected.
- Before assembly, make sure that the product complies with the specifications of the order and check it carefully for defects.
- The terrace should be installed using boards from the same batch. Boards from different batches might have slightly different colours.
- Timberness hybrid composite systems are dedicated for mounting outdoors. Their properties do not allow their use as structural materials.
- The terrace should be installed in good weather conditions, at a temperature not lower than 0°C.
- The surface of the mounted terrace should have a 0.5% – 2% slope depending on the project specifics or location. The slope in the terrace must be in line with the direction of the boards' grooving. This will allow water to drain freely from the surface.
- Standard joist has two profiled sides for T-Clips assembly. This allows the use of joist height and width – 4 or 5 cm interchangeably.
- The FOREST Plus board should be installed only with the use of system aluminium joists and a dedicated set for installing the FOREST Plus boards.
- If the terrace is installed on concrete posts and in places where it is not possible to fix the joists to the ground, e.g. in the case of an inverted roof structure with waterproofing, use system aluminium joists. In such cases, the use of the low-profile or standard joists is excluded.

- The joists must be spaced at no more than 40 cm edge-to-edge. If, however, the specifics of the project require, e.g. the terrace will be part of a public facility or will be exposed to heavy use for other reasons, it is recommended to decrease the spacing between the joists to 35 cm edge-to-edge.
- The spacing between the first two and the last two joists (fixed at the edges of the terrace) must be no more than 25 cm edge-to-edge.
- When mounting Timberness hybrid composite systems, adequate spacing (clearance) should be maintained, both between system components and between system components and fixed objects (e.g. the wall of the building). Respectively:

clearance joist – joist	6 mm
clearance joist – fixed element	10 mm
clearance board – board	8 mm
clearance board – fixed element	8 mm
clearance strip – strip	5 mm
clearance strip – fixed element	5 mm

These values are minimal and relate to standard commercial length. Elements longer than 4 m require a gradual increase of clearance in proportion to the length of expansion – 2 mm for each additional meter.

- The FOREST Plus board has two usable sides: flat and grooved. The wood grain pattern is embossed on the flat side.
- The SELECT board should be laid grooved side up. However, there is a possibility of brushing on special order, allowing the use of the other, flat side of the boards.
- The CITY board has only one usable side – grooved and brushed.
- In case of necessity of cutting composite boards or strips, it is recommended to use circular saws used for cutting PVC or aluminium.
- Where necessary, it is permissible to install a board with an end not supported by a joist (from the front). However, the distance from the front to the support cannot be greater than 3 cm.
- In exceptional cases, other aluminium or wooden joists that are not part of the system may be used, provided that the required parameters are ensured.

- The distance between the longer sides of the boards is constant, resulting from the construction of the Timberness system clips and equals 7 mm (T-Clip Flat), 5,8 mm (M-Clip) or 5 mm (T-Clip)..
- System T-Clips have a convexity at the screw hole. This allows for fixing the clips in specially contoured spots on the joist. Make sure there is a perfect fit between boards and clips, which will guarantee secure fixing of boards.
- T-Clips Flat are designed for the installation of boards on joists which are not part of the Timberness system. The flat part of the clip should adhere closely to the joist.
- The system's M-Clip is designed for the installation of the boards on the system's aluminium joists. It can also be applied with joists from outside the system (except wooden joists).

clip	clearance	adjustment to joists		
		system's composite	system's aluminium	other (from outside the system)
T-Clip	5 mm	✓	✓	
T-Clip Flat	7 mm			✓
M-Clip	5,8 mm		✓	✓

2. Installation of joists on different bases

a) concrete base (standard screed)

Any of the system's joists can be used for this type of base. Composite joists (low and standard) should be supported along their entire length. The joists should be arranged parallel to each other and then fixed to the base using wall plugs. The distance between individual fixing points must not exceed 50 cm.

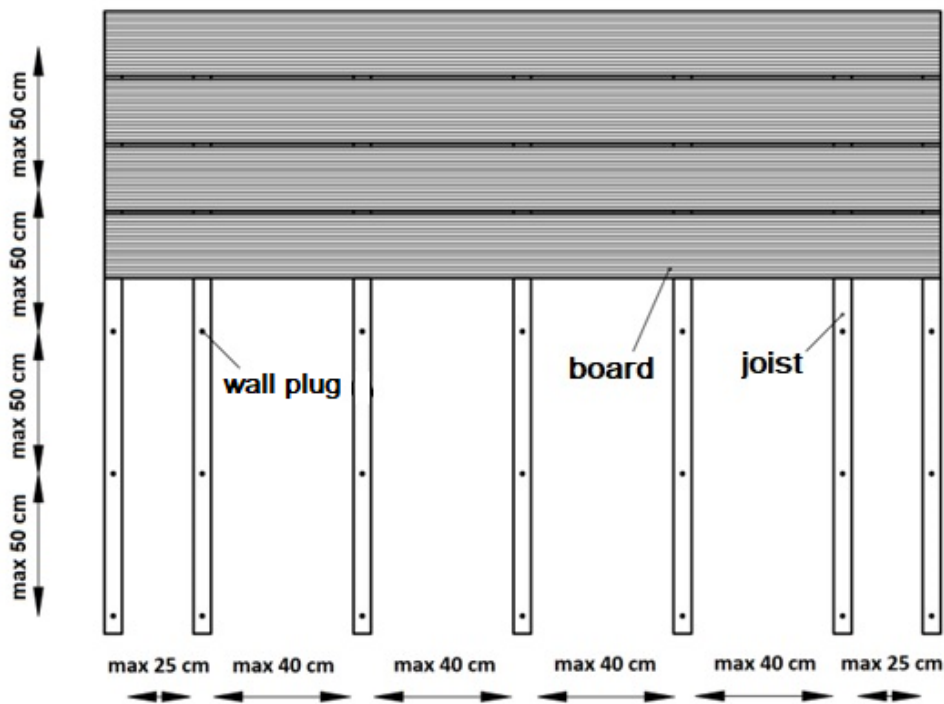


Fig. 1. Installation of the terrace on concrete screed.

b) concrete posts

The system's aluminium joists are recommended for the installation on concrete posts. The joists must be placed upright, to the height of 3.5 cm, and parallel to each other, spaced at no more than 40 cm edge-to-edge. The distance between support points must not exceed 80 cm. Joists placed on concrete posts should be fixed with wall plugs. If connecting the joists head-to-head (extending the joists), the Timberness system's aluminium connectors must be used. The connector should be inserted into both connected joists so that they interface in the middle of the connector's length. Then, fasten both joists to the connector using self-tapping screws (commercially

available), fixed in the side walls of the joist. The connector must not be shorter than 20 cm.

PLEASE NOTE: If you choose to use aluminium or wooden joists that are not part of the Timberness system, these will not be covered by Timberness manufacturer's warranty. Any inadequate preparation of the terrace supporting structure with the use of such joists may result in defects of the terrace or even cause damage to the terrace.

It is possible to use levelling systems enabling permanent union of the joists with the ground.

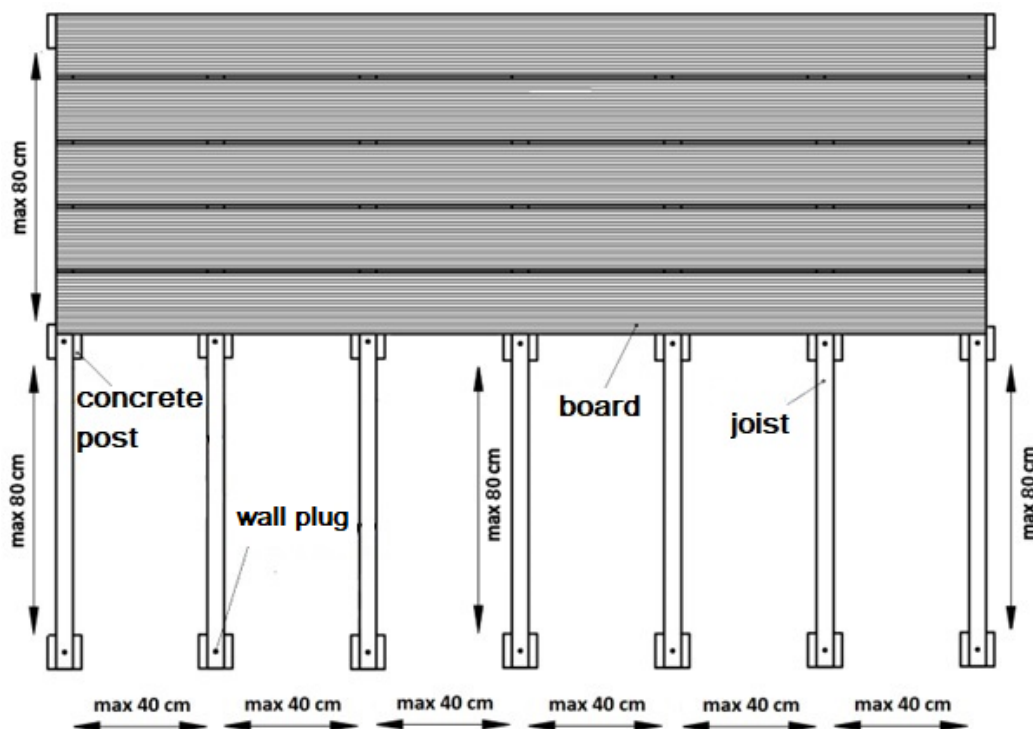


Fig. 2. Installation of a terrace on concrete posts.

c) a terrace on a balcony or an inverted roof structure with waterproofing

In a situation where a surface does not permit the installation of joists using wall plugs, e.g. due to the use of waterproofing, you can lay the terrace without fixing it permanently to the ground, i.e. build the so-called floating terrace. However, you need to observe the following rules and work with utmost care. The terrace base must form a strong and durable structure, preventing any free motion during use.

- 1) In the case of the so-called floating terrace, it is recommended to use the system's aluminium joists. Composite joists (low and standard) must not be used.
- 2) Regardless of the arrangement, aluminium joists must always be placed upright, i.e. to a height of 3.5 cm.
- 3) In the case of connecting the joists head-to-head (extending the joists), the Timberness system's aluminium connectors must be used. The connector must be inserted into both connected joists so that they interface in the middle of the connector's length. Then, fasten both joists to the connector using self-tapping screws (commercially available), fixed in the side walls of the joist. The connector must not be shorter than 20 cm.
- 4) Regardless of the method selected, laying the joists must start with the edge joists (outermost joists) and the longest sections of the joist. All the other joists must be spaced accordingly.
- 5) Two methods of laying the joists are permitted, i.e. a lattice and a single frame.

LATTICE

- The basic and manufacturer-recommended method of preparing the terrace supporting structure is to build a lattice using the system's aluminium joists.
- Assembly of the lattice should start with arranging the lower joists spaced at no more than 80 cm edge-to-edge. The joists should be aligned with the desired direction of the boards.
- Then, the upper joists must be placed on top of the lower joists and perpendicularly to them, spaced at no more than 40 cm edge-to-edge. This does not apply to the first two and the last two upper joists where the spacing between the joists should not exceed 25 cm.
- The upper and lower joists must be fixed together at their intersection points using vertical angle bars. Use single angle bars to connect upper and lower joists around the edges of the terrace and two angle bars at all other intersection points. Angle bars must be fastened to the joists using system's farmer screws.

- It is allowed to use farmer-type self-tapping screws (commercially available) to connect joists (instead of the system's angle bars). Then, drill through the top of the upper joist, insert the screw through the hole and fix the lower and upper joists together with the self-tapping screw. **PLEASE NOTE:** When using screws, ensure that the holes created in the joists do not coincide with the locations of the T-Clips that will be used to attach the boards to the joists.
- It is recommended to use height-adjustable brackets to level the structure. Alternatively, use rubber pads for this purpose.

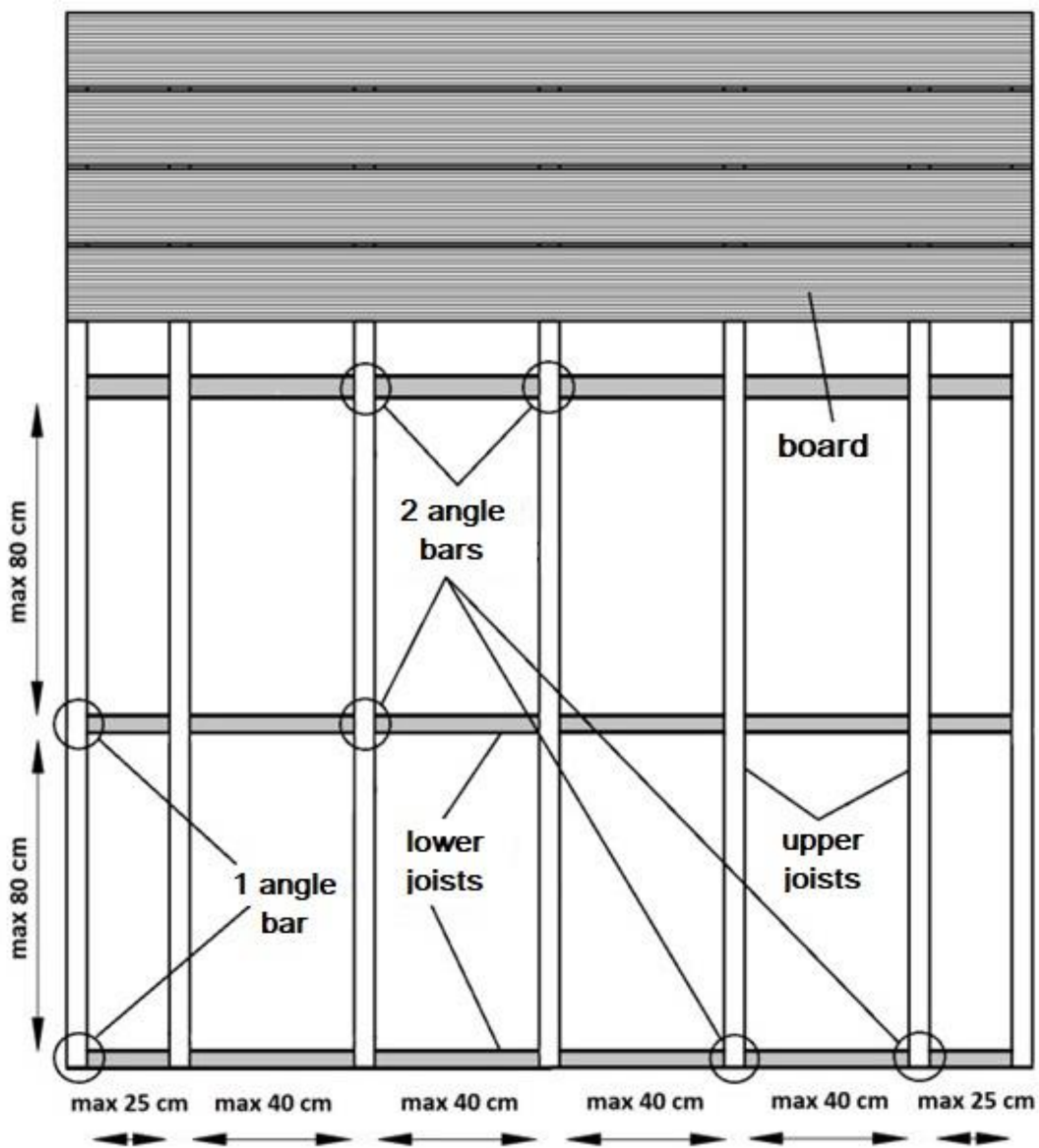


Fig. 3. Installation of the lattice.

SINGLE FRAME

- An alternative to the aluminium joist lattice is a single frame construction. In contrast to the lattice, the single frame is made of one layer of joists, thanks to which the terrace supporting structure is half the height of the lattice. The single frame is made of long joists and short transverse joists connecting them.
- The construction of a single frame begins with the laying of long joists. The joists must be aligned with the desired orientation of the boards. They must be spaced at no more than 100 cm edge-to-edge.
- Next, the joists already laid must be joined with the transverse joists, cut to the length equal to the spacing between the long joists. The transverse joists must be placed at right angles between the long joists, starting from the terrace edges, at 40 cm intervals, edge-to-edge. This does not apply to the first two and the last two rows of joists where the spacing between the joists should not exceed 25 cm.
- The joists are connected using horizontal angle bars. It is recommended to use two angle bars to connect joists at the edges of the terrace and four angle bars at all other places where the joists meet, except for the corners of the structure, where only one angle bar is used. The angle bars should be fixed to the joists using the system's farmer screws.
- It is recommended to use rubber pads to level the single-frame structure.

When you install a floating terrace, you may use aluminium or wooden joists that are not part of the Timberness system but they are not covered by the manufacturer's warranty. Please note that selecting joists of inadequate parameters may result in the supporting structure being unstable. This in turn may cause damage to the terrace.

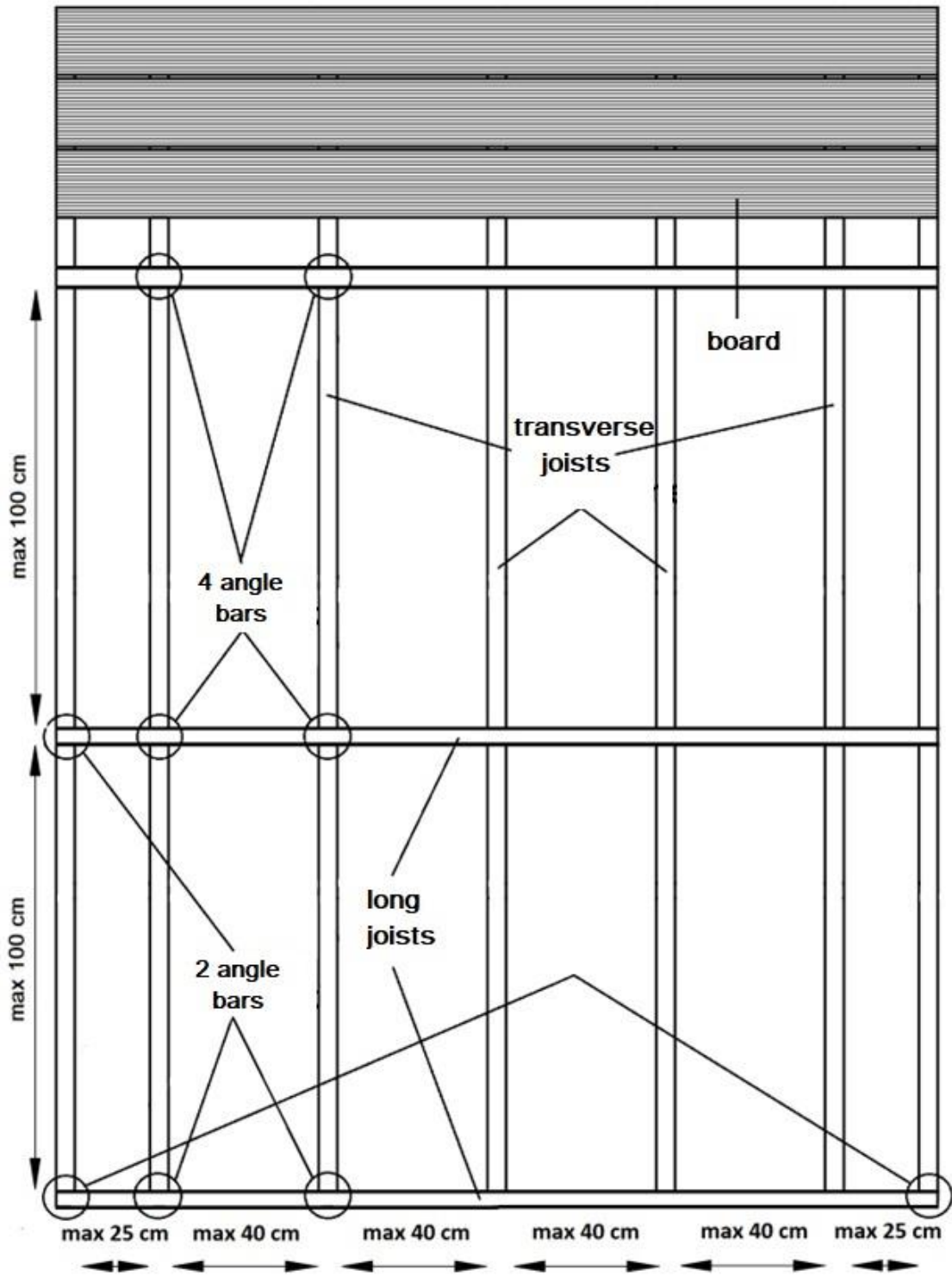


Fig. 4. Assembly of the single frame.

3. Installation of a composite system terrace

a) installation of joists to a fixed base

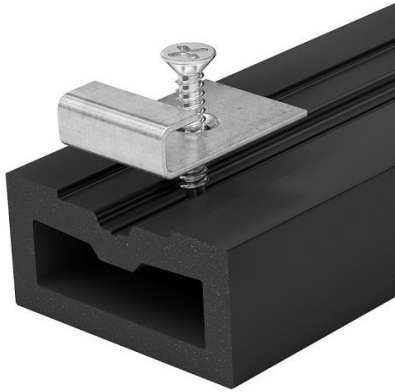
Arrange the joists on the base, the plain face down (for the system's composite joists). The grooved face of the joist is used to house the assembly clips and must face up. The joists should be lined parallel to each other and spaced at no more than 40 cm edge-to-edge. Please note that the spacing between the first two and the last two joists should not exceed 25 cm edge-to-edge. Where a joist end butts against a wall, other fixed element or another joist, leave a clearance (10 mm for a wall or other fixed element, 6 mm for another joist). Joists should be arranged perpendicular to the desired direction of the boards.

PLEASE NOTE: In case of standard joists, keep in mind that the width and height of the joist may be used interchangeably. Before fixing joists to the base make sure that all joists are arranged at the same height.

When you use standard joists, there is a possibility to finish the terrace with composite strips fixed to the front of composite boards in a reinforced way – fastened in two points (not only to the board but also to the joist). This solution is recommended for terraces intended for heavy use (e.g. in public places). Make sure that the joists forming the outer limit of the terrace are arranged so that the outer side (where finishing strips will be fixed) has marks in the form of two parallel lines. These marks will facilitate the mounting of the Omega sliding clips later. Details of this method of mounting the strips are given in section 4a ("reinforced mounting of composite strips").

Use $\varnothing 6$ wall plugs (generally available) to fix joists to a concrete base. In order to screw down the joists pre-drill the upper and lower side of the joist with a 6 mm drill bit. The resulting upper hole must be drilled again, this time using a drill bit with a diameter of 8 mm to allow the dowel through. The dowel length should be at least 45 mm. Insert the wall plugs into holes made in the concrete, then screw the joists down to the base. The spacing between the wall plugs should be 40 cm.

b) fixing the starting clips to the joists



The installation should start with fixing a starting clip to each joist on one side (the one from which we will start laying the boards).

Fig. 5. Fixing the starting clip.

In case of using double joists, the clips must be fastened to both joists. Starting clips should be mounted in such way as to align the shorter bent part with the beginning of the joist. The convexity at the screw hole must be carefully fitted into the specially shaped spot on the joist. Use the stainless steel self-tapping screws attached to the assembly kit to fix the starting clips.

c) mounting the boards



Slide the first board to the starting clips fixed earlier so that the bottom tongue of the board presses against the clip (the tongue must be inserted under the upper part of the clip).

Fig. 6. Mounting the first board.



Fig. 7. Mounting the next boards.

Next, insert the longer side of the appropriate assembly clip in between the board and the joist from the side where the next board will be fixed. Make sure to position the clip correctly – it should be inserted under the board from the side which permit comfortable access to the opening for the screw. The T-Clip Flat should be used with joists from outside the system. It may be inserted under the board either way.

Gently push the clip to the board to ensure optimal fit. This maintains a constant clearance between the boards (the clearance depends on the clip selected). Screw the clips to the joist with stainless steel self-tapping screws attached to the assembly kit.

When fixing the boards, take care to ensure the best possible alignment of the board front with the side surface of the joist – it will guarantee an easy and aesthetic installation of the finishing strips.

It is also important to allow sufficient space (clearance) between the board fronts and walls or other fixed elements. The clearance should be 8 mm. For boards longer than 4 m, gradually increase the clearance depending on the length of the board – 2 mm per 1 m of the board. The need for such increase results from the longitudinal material thermal expansion.

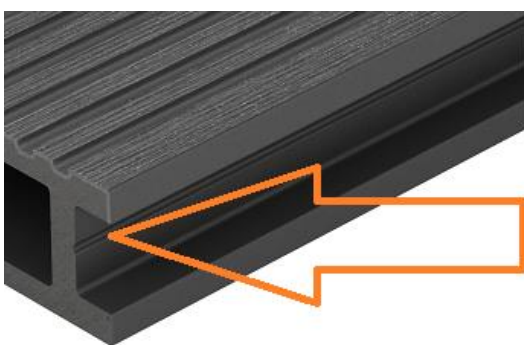


Fig. 8. The mark located on the side of the boards.

While installing following boards, pay attention to the mark located on the side of the boards.

The mark should be pointing in the same direction for all the boards. If any of the boards is fixed with the mark pointing to a different direction, its colour shade may appear brighter or darker than the others.

d) connecting boards front-to-front

In a situation when the terrace project requires front-to-front board connection, use double joists. Joists should be arranged so that each of the boards rests on a separate joist in the place where they connect. Do not forget to allow a proper clearance between boards (see table on page 4). It is also necessary to use additional T-Clips at the ends of the connected boards. It is forbidden to connect the boards on both joists with a single clip.

e) longitudinal cutting of boards

If there is a need to cut the boards along their length, cut them so that the newly formed board tongue has a length of 8 mm (measured from a chamber rib). A shorter tongue will make it impossible to fix the board to the joist with a (mounting) clip.

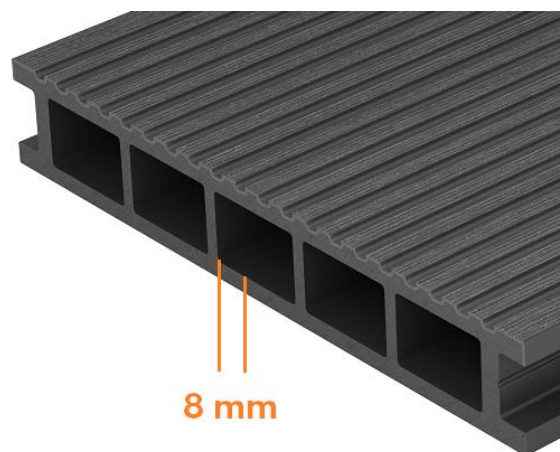


Fig. 9. Longitudinal cutting of the boards.

f) mounting of the last board

When mounting the last board on the terrace it is not possible to use a clip. Therefore, you must fix it to the joist using stainless steel self-tapping screws supplied with the assembly kit, screwing them at an angle of 45° through the lower board tongue.

4. Mounting the finishing strips

PLEASE NOTE: due to the differences in the structure of boards, use the dedicated PVC connectors, CITY / SELECT or FOREST Plus respectively, to fit the finishing strips. Other parts necessary for the assembly, i.e. OMEGA sliding clips and self-tapping screws, are universal and can be used for all types of board

a) fitting the finishing strips to the board front

To fit the finishing strips to the board fronts, use the dedicated PVC connectors (depending on the board type – CITY / SELECT or FOREST Plus), stainless steel OMEGA sliding clips and system stainless steel self-tapping screws.



Fig. 10. Mounting the finishing strip.

The fitting starts with the fixing of the PVC connector to the board with a glue for rigid PVC. Please note the protruding parts of the connectors (teeth) at the bottom, which should be directed downward. After coating the board interior chambers with glue, insert the connectors into them.

Place the OMEGA sliding clip's flat side on the PVC connector, ensuring the alignment of the screw holes in both elements. Fix the OMEGA clip to the PVC connector using the dedicated screws.

The PVC connectors with OMEGA clips should be installed at a distance of 35 cm apart, measured from the outer edges. Make sure there are always clips at the ends of the strips.

After installing the OMEGA sliding clips, put the strip to them with the profiled side and, after adjusting, fit it by pressing – to “click”. Keep in mind that the height of the masking strips needs to match the height of the structure. When assembling composite strips, pay attention to the mark placed on one of the strip sides, which should always be at the bottom of the profile.

Reinforced (double) assembly of composite strips

Where the terrace is exposed to heavy use (e.g. in public places), and standard joists are used, it is possible to further protect the composite strip by the installation of two OMEGA sliding clips. Then one of the clips is fitted to the board in a standard way, and the other to the joist. In this case, before fitting the strips fix an additional OMEGA sliding clip to the joist using self-tapping screws. It is then necessary to use marks (two parallel lines) located on the side of the joist. After putting the OMEGA sliding clip to the joist, the mark's lower line should be exactly in the middle of the screw holes. This will allow adjusting the masking height to the height of the structure. After fixing all the clips put the strip to them with the profiled side and after adjusting to the two (upper and lower) rows of OMEGA clips fit it by pressing – to “click”. With this method you must remember to arrange the outermost joists in such a way that the markers are visible on the outside (see point 3a). While fixing the boards to the joists you should take care to ensure best possible alignment of the board fronts and the joist side surface.

b) assembly of finishing strips to the board long side

When mounting strips on the long side of the board use the appropriate dedicated PVC connectors, OMEGA sliding clips and stainless steel self-tapping screws. The PVC connector should be placed in the board side groove, with the flat side of the connector on the outside, in such a manner that the protruding parts of the connector (teeth) point down. To facilitate subsequent steps the connector may be fixed to the board with a small amount of glue. Then place the OMEGA sliding clip on the PVC connector, aligning the screw holes in both parts. Fix the OMEGA clip and the PVC connector to the board using the supplied stainless steel self-tapping screws.

The PVC connectors and the OMEGA clips should be installed at a distance of 35 cm apart, measured from the outer edges. Make sure there are always clips at the ends of the strips.

After installing the OMEGA sliding clips, put the strip to them with the profiled side and, after adjusting, fit it by pressing – to “click”. Keep in mind that the height of the

masking strips needs to match the height of the structure. When assembling composite strips, pay attention to the mark placed on one of the strip sides, which should always be at the bottom of the profile.

c) connecting the finishing strips front-to-front

In a situation where it is necessary to connect the composite strips front-to-front, it is recommended to cut the strips at an angle of 45° and install them by connecting strips with opposite angles – thus making the clearance between the strips less visible. The minimum clearance between the strips is given in the table on page 4.



Fig. 11. Connecting the finishing strips front-to-front.

The above strip assembly system does not interfere with the longitudinal thermal expansion and maintains optimal terrace aesthetics, because it is done without screws visible on the outside. In addition, it means easy removal of the strips or their replacement in case of damage. Just gently pry the strip at the end and then remove it from the next clip.

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