



DECKING INSTALLATION GUIDANCE MANUAL
for
SOLID DECKING BOARDS



Date **04/02/2022**

INSTALLATION GUIDANCE FOR DIFFERENT SUBSTRUCTURES & DIFFERENT CONNECTION TYPES



Photo 1

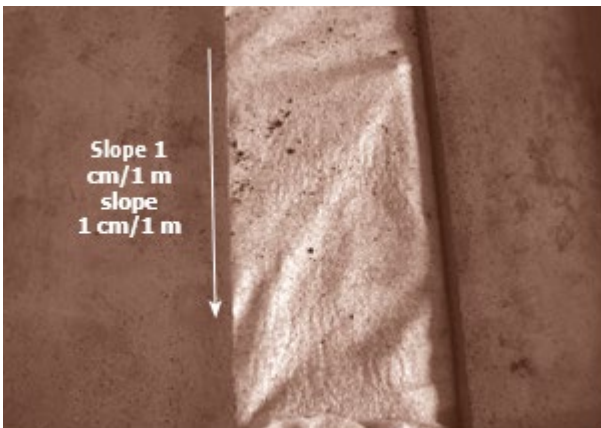


Photo 2

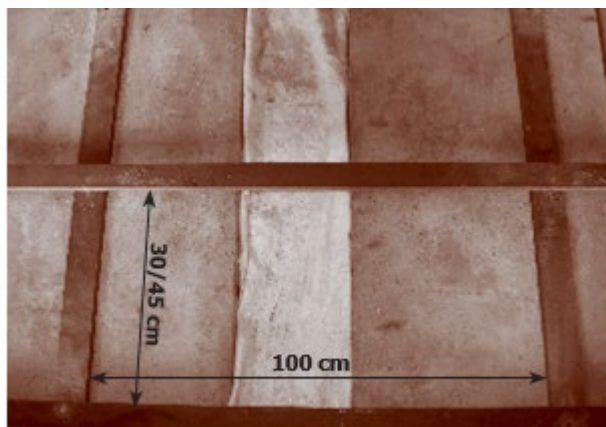


Photo 3

1) substructure installation

Fundamental substructure characteristics:

- Structurally self-supporting or fixed to the ground
- Durable wood exterior with fibres suitable for the best possible anchoring of the screws.
- Maximum linearity.
- Sizes suitable for the type of installation.
- It must not be subjected to ground "sinking" phenomena. It must be raised off the ground in such a way so as to allow for proper water drainage, which will improve its durability.

1.1) Installation on unstable ground: soil or sand/gravel

a) Onto soil

Preparing the ground:

1. Excavate to the required depth, based on the desired height for the floor.
2. Spread the nonwoven fabric over the soil to prevent grass regrowth [see Photo 1].
3. Lay suitable cement tiles or concrete slabs (hereinafter referred to as structural supports), in the quantities needed for the desired structural load, based on the thickness and type of material to be used for the substructure (be sure to have your calculations checked by an architect, surveyor, engineer, etc.). If using cement tiles, these must be laid in such a way so as to give the flooring a slope of about 1 cm per linear meter, in order to ensure that the water will drain properly off the slats [see photo 2].

installing the joists for the substructure:

- 1) In order to ensure the stability of the deck's surface, the substructure's framework must be two-fold: the lower joist boards should be spaced at 100 cm [see Photo 3] and anchored to the posts using dowels [see photo 4], while the upper joist boards should be laid at a right angle to the lower joists and fastened
- 2) with screws, with a maximum centre distance of 45 cm in the case of visible screws, or 30 cm in the case of installation with clips [see photo 3].
- 3) In order to render the structure even more stable and to prevent dirt from accumulating inside the space below the deck, it is recommended to fill the space with ballast up to the height of the substructure itself.
- 4) Exotic woods often come in varying lengths, in multiples of about 30 cm. In order to facilitate installation and reduce off-cuts to a minimum, it is recommended to maintain a centre distance of
- 5) the same length, or else 45 cm.



Pic A

- 6) It is essential to make sure that the end of each deck board lies on one of the joists, meaning that the end of the subsequent board will need to be fastened to the joist using 2 clips, exclusively with
- 7) 4 holes/hooks [see Pic A], or 4 screws [see Photos 5 and 6]. For installation with two-fold framework, the substructure must be built using 38x70 mm joists in exotic wood.

1.2) installation upon concrete screed

installing the joists for the substructure:

- a. As a general rule, the joists for the substructure must be twice as thick as the decking. It is essential to make sure that water is able to drain off easily and that the substructure provides for adequate ventilation.
- b. The joists must also be laid in such a way so as to give the flooring a slope of about 1 cm per linear meter, in order to ensure that the water will drain properly off the slats.
- c. The joists must be raised off the ground in order to better ventilate the substructure itself, as well as to allow rain water to pass beneath. In order to prevent the wood from rotting in the long run, the joists should not make contact with the ground. In order to do this, we recommend using joist spacers (please refer to the price list), which can also be used as levelling elements in order to ensure the proper slope of the flooring.
- d. The centre distance between each of the joists should never exceed 45 cm if using visible screws, and 30 cm if using clips.
- e. Exotic woods often come in varying lengths, in multiples of about 30 cm. In order to facilitate installation and reduce off-cuts to a minimum, it is recommended to maintain a centre distance of the same length, or else 45 cm.
- f. It is essential to make sure that the end of each deck board lies on one of the joists. This means that the end of the subsequent board will need to be fastened to the joist using 2 clips, exclusively with
- g. 4 holes/hooks [see Pic A], or 4 screws [see Photos 5 and 6]. For installation with two-fold framework, the substructure must be built using 38x70 mm joists in exotic wood.
- h. Installation upon concrete screed allows the joists to be fastened to the ground: this can be done using dowels or glue.



Photo 4

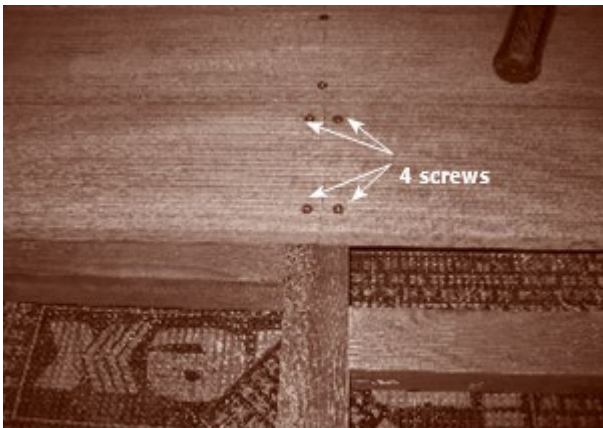


Photo 5

1.3) installation upon waterproofing membrane

installing the joists for the substructure:

- a. As a general rule, the joists for the substructure must be twice as thick as the decking. It is essential to make sure that water is able to drain off easily and that the substructure provides for adequate ventilation.
- b. The joists must also be laid in such a way so as to give the flooring a slope of about 1 cm per linear meter, in order to ensure that the water will drain properly off the slats.
- c. The joists must be raised off the ground in order to better ventilate the substructure itself, as well as to allow rain water to pass beneath. In order to prevent the wood from rotting in the long run and to prevent the formation of cuts or abrasions in the tar sheathing, the joists should not make contact with the ground. In order to do this, we recommend using joist spacers or pieces of tar sheathing, which can also be used as levelling elements in order to ensure the proper slope of the flooring [see photo 7].

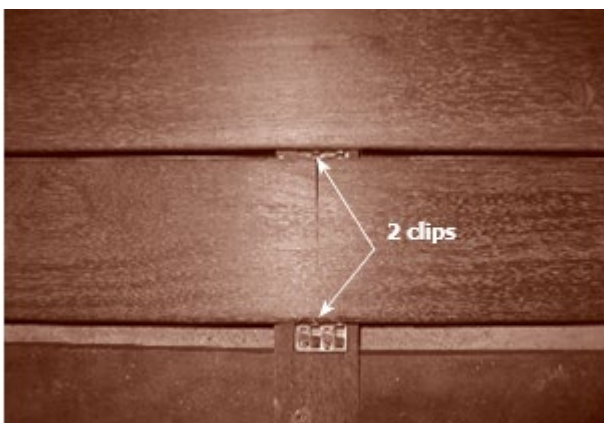


Photo 6



Photo 7

- It is essential to make sure that the end of each deck board lies on one of the joists. This means that the end of the subsequent board will need to be fastened to the joist using 2 clips, exclusively with 4 holes/hooks [see Pic A], or 4 screws [see Photos 5 and 6]. For installation with two-fold framework, the substructure must be built using 38x70 mm joists in exotic wood.

In the case of installation upon waterproof screed or tar sheathing, it is obviously impossible to fasten the joists directly to the ground. Rather, they must be installed by creating a self-supporting structure with braces, as described below:



Photo 8

1. In order to create the self-supporting structure, cross beams must be created using the joists for the substructure.
2. The length of the cross beams is defined by the centre distance between each of the joists, which should never exceed 45 cm in the case of installation using visible screws, and 30 cm in the case of installation using clips. Exotic woods often come in varying lengths, in multiples of about 30 cm. In order to facilitate installation and reduce off-cuts to a minimum, it is recommended to maintain a centre distance of the same length, or else 45 cm. [see photo 8]
3. The first joist must be straight. In order to creating the bracing, the cross beams are fastened perpendicular to it using 6x70 mm stainless steel Torx-head or similar screws. The cross beam is fastened to the end by perforating the supporting joist [see photo 9].
4. Next, install the subsequent joist. If curved, the joist will be straightened once fastened to the cross beams.
5. Continue in this manner until the entire substructure has been completed, offsetting the cross beams in order to facilitate their installation [see photos 8 and 10].



Photo 9



Photo 10

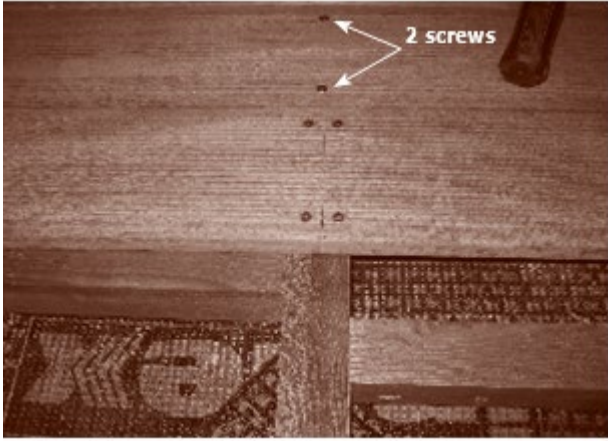


Photo 11

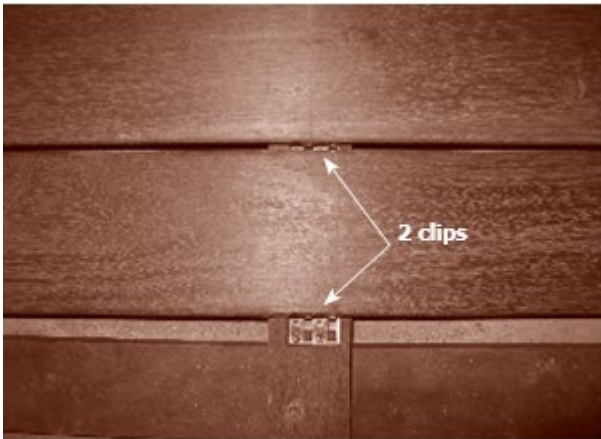


Photo 12

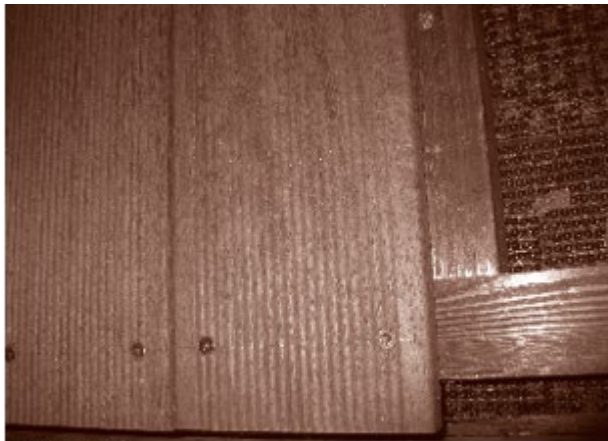


Photo 13

2) installing the deck boards

general rules and considerations:

- Unless furnished pre-oiled, the deck boards must be washed in order to prevent coloration due to the tannin of the wood, and above all to remove any residual dirt that may have accumulated during processing/transport/storage.
- Each board must be fastened using 2 screws or 2 clips at each joist junction in order to improve stability and reduce dilation [see photos 11 and 12].
- The end of each deck board must be supported by a joist and fastened to the joist using 2 clips, exclusively with 4 holes/hooks [see Pic A], or 4 screws [see photos 5 and 6].
- The deck board should never protrude from the joist by more than 3 cm [see photo 13].

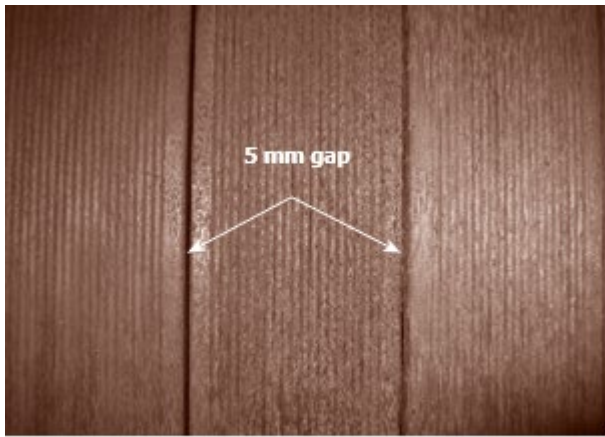


Photo 14

- 1) The lateral distance (gap) between each deck board must be 5 mm in order to allow for the wood's natural expansion. [see photo 14]. In the case of installation with screws: use appropriate spacers.
- 2) In the case of installation with clips: the 5 mm spacing is provided by the clips themselves.
- 3) Deck boards from 45 to 80 cm in length must be supported by 3 joists. For shorter or longer boards, the general rule of a centred distance of less than 45 cm applies.
- 4) if the boards are not purchased pre-buttet at the ends, cut to size at 90° angles, or else in a male and female (m/F) format, this operation must be carried out before installing each board and before applying the protective product [see photo 15].
- 5) **the actual width of each supplied board may differ from the indicated width by up to 5%, which is typical for wood products. For this reason, claims concerning the imperfect alignment of the boards with the butt joints will not be heeded.**
- 6) For the reasons indicated above, it is recommended to install the boards with a slight offset in relation to the butt joints, or rather in a staggered fashion. This solution provides for the best possible compromise between aesthetics and functionality.

additional requirements for installation using clips:

- Unlike the case of installation using visible screws, the boards are extremely difficult to replace in the case of installation using clips. For this reason, when using clips, the boards must be carefully checked for defects (i.e. cracks, splits, knots, uneven textures, etc.) prior to installation.

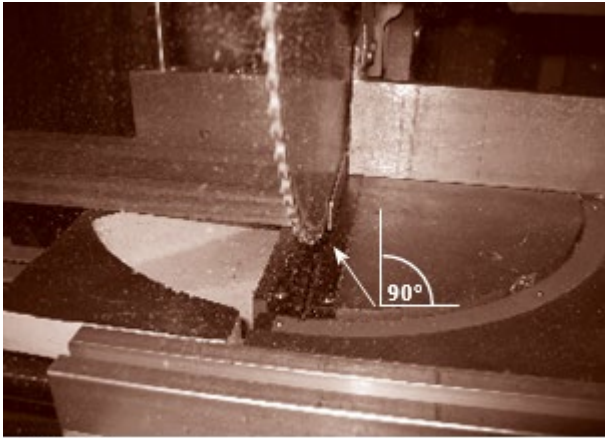


Photo 15

Finishes and accessories

1. Butting (cut to size at 90° or in m/F formats)

As indicated in the general rules, the decking is normally not furnished butted. This operation must normally be carried out before installing each board and before applying the protective product.

Customers can however explicitly request the butting of the material [please refer to the price list].

2. pre-oiling

After installation, it is a good idea to wash the flooring and to subsequently oil it with two coats of oil for outdoor applications once it has dried (after about 72 hours).

Regularly washing and oiling the decking once or twice a year will preserve the wood's original colour and prevent it from greying. It is also possible to purchase pre-oiled deck boards.

This does not preclude the necessity to oil the floor of the deck [see photo 16]

3. ship decking effect

Some customers want their deck floor to have a "ship's decking" effect. This can be achieved in two different ways:

- a) by inserting the black gasket. The gasket should always be applied with an excess of about 20 cm for each meter of the gap into which it is inserted, as the gasket itself tends to shrink after about 10 days following its installation. The excess gasket can be cut off once the shrinkage has taken place. **it is recommended to only use the black interlocking**
- b) ship-effect gasket with Fsc heat-treated teak and ash wood materials. This is because the size variation of other wood materials could, in certain cases, cause the gasket to collapse inside the gaps or, conversely, prevent the wood from naturally expanding, thus resulting in impractical and/or unpleasant aesthetic effects.



Photo 16

- a) by applying single-component polyurethane resin. In order to make use of this solution, the deck boards must be laterally processed using the concealed milling technique. It is also extremely important that the flooring be sloped in order to ensure proper water drainage.

procedure:

The surfaces to be treated must be thoroughly cleaned, dried and degreased. Use a paint brush to apply a thin film of U-PRIMER 199 DC along the gap between the deck boards.

The SiMP-Seal 55 sealant must be applied after the minimum drying time of at least 120 minutes has passed, and no more than 24 hours following the application of the U-PRIMER 199 DC.

SiMP-Seal 55 sealant is a Silyl-Terminated Polymer-based single-component elastic adhesive which, once extruded, polymerises with the atmospheric moisture to form a high-performance, high-modulus and permanently-elastic adhesive. The products utilized and the application procedures are identical to those employed for the construction of ship floors.

• installation with visible screws

a) Foreword:

Installation using visible screws is always preferable as it allows for the flooring to be fastened to the substructure in the best possible manner and limits any possible board movements, which are generally much more likely when the installation is carried out using clips. Installation using screws also allows for the flooring to be easily inspected in all its parts, as well as for the boards to be easily replaced.

In order to prevent the screws from being visible on the surface, they can be hidden using caps made from the same type of wood as the deck boards themselves [please refer to the price list].

While this solution will increase the overall cost of the flooring (for the caps and the relative labour costs for their installation), it allows for the screws to be hidden from sight without compromising the stability of the flooring.

B) recommended joists and screws

Joists

- Dual-layer impregnated larch wood, cross section 42x45 mm.
- Exotic wood, cross section 20x60/70 mm.
- Exotic wood, cross section 38/70 mm.
- Aluminium, cross section 30x40 mm, wall thickness 2.5 mm.

screws

- 4.5x35 mm AISI stainless steel countersunk Torx Tx 20 screws.
- 5.0x45 mm AISI stainless steel countersunk Torx Tx 20 screws.
- 3.9x32 mm AISI stainless steel drill screws (for aluminium substructure joists).
- 6.0x80 mm AISI stainless steel Torx T30 screws (for bracing).

• approximate quantities per m² with a centre distance of 45 cm

- With bracing: 3.5 m of joists, 50-60 screws + 10 screws for fastening the braces.
- Without bracing: 2.8 m of joists, 50-60 screws.
- With two-fold framework: 3.8 m of joists, 50-60 screws + 5 screws for fastening the two frames.

• d) installation process

Due to the nature of the solid wood, the deck boards may be curved.

up to a maximum tolerance of 5 mm per linear meter.

In order to maintain the linearity of the screws and the gaps between the deck boards, it is important to adhere to the following procedure:

- 1) Install the first row of boards, which must be made up of perfectly straight planks, and immediately fasten them to each joist using two screws [see photo 17].
- 2) The screw must be positioned at least 2 cm from the end and/or sides of the board in order to prevent cracks and splits.
- 3) **a countersunk pilot hole must always be drilled in the boards and joists in order to allow for the screws to be inserted.** The pilot hole must be equal to the diameter of the screw [see photo 18].
- 4) If the board is curved, the unfastened end of the board will have to be pushed up against the board in the previous row.
- 5) The gap may therefore initially appear to be irregular, but will subsequently be spaced correctly (see points 7 and 8 below) once the boards are permanently fastened to the joists of the substructure by the screws.



Photo 17

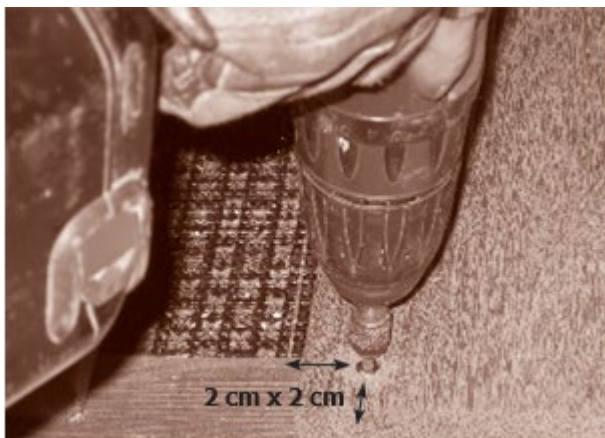


Photo 18

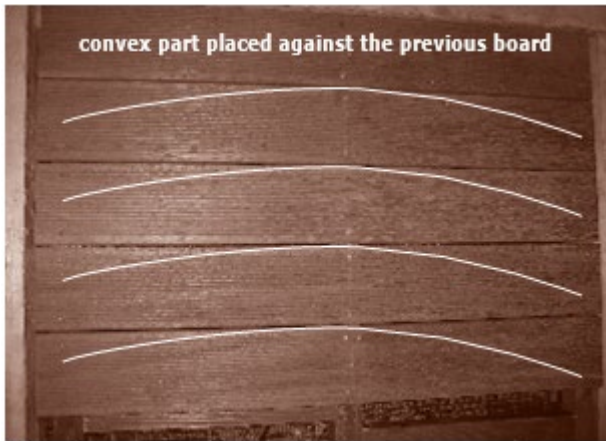


Photo 19

- 6) If curved, the deck boards beyond the first row must be installed with the convex curvature against the first board, and so on [see photo 19].
- 7) The deck boards beyond the first row must initially **ONLY BE FASTENED AT THE ENDS**. Be sure to make use of the appropriate spacer (5 mm), [see photo 20].
- 8) Continue with this procedure until the flooring has been completed.

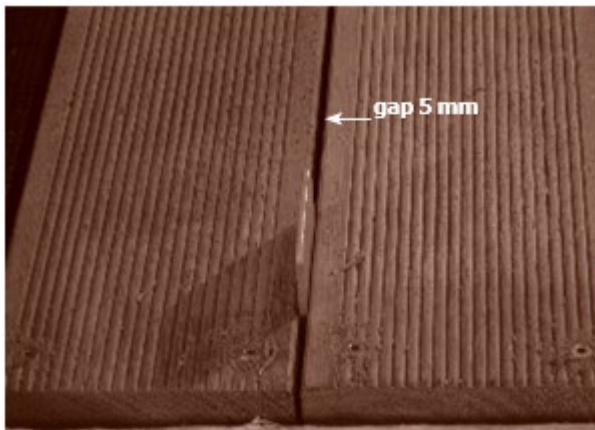


Photo 20

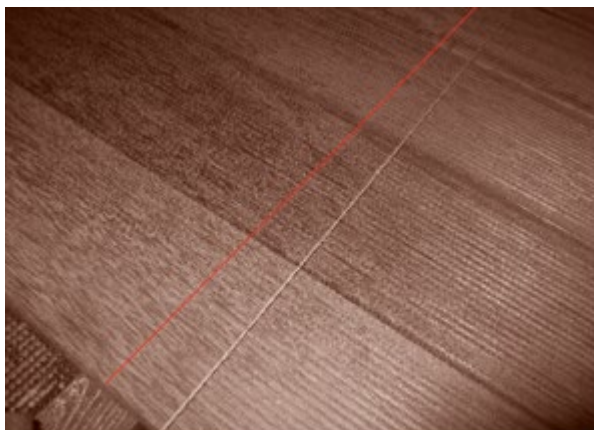


Photo 21

- 9) When finished, use a chalk liner to mark straight lines for fastening the rows of screws to the joists of the substructure [see photo 21].



Photo 22

- 10) The curved boards must be repositioned using a lever in order to render the gap between each board uniform [see photo 22].

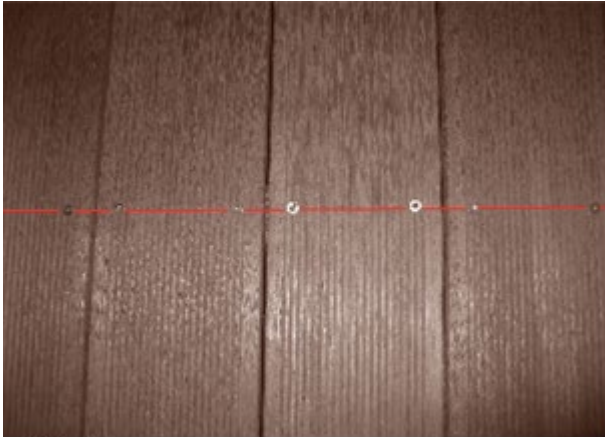


Photo 23

- 11) Once finished the boards can be screwed to the joists of the substructure using the line previously marked with the chalk liner[see photo 23].

2.1) installation with clips

a) Foreword:

The second method for installing the decking is that which makes use of clips. This method leaves no fastening screws in view, thus rendering the final result more aesthetically pleasing for some people.

In certain cases, on the other hand, this system can be risky because the clips do not fasten the flooring to the substructure in the best possible manner.

Despite being resistant to the atmospheric agents, mould and insects, most of the wood materials used for exterior flooring need to be fastened directly to the substructure in order to guarantee their stability. If this is not the case, the boards are more likely to become deformed, thus compromising the floor's overall stability.

Therefore, notwithstanding the legitimate desire of the customer or designer to obtain the most aesthetically pleasing solution, certain technical aspects that can have a profound effect upon the customer's expectations must also be taken into account.

like any decking expert or installer, Wallbarn only recommends using clips with wood materials of proven stability, or rather teak, ipê, heat-treated Fsc ash, Fsc X-treme Bamboo or Fsc kebony.

For other types of wood, it is recommended to avoid the use of clips and to make use of visible screws which, when installed with due professionalism, will ensure excellent stability over time as well as highly-appreciable aesthetic results.

B) recommended joists and screws

Joists

- Dual-layer impregnated larch wood, cross section 42x45 mm.
- Exotic wood, cross section 20x40 mm.
- Exotic wood, cross section 20x60/70 mm.
- Exotic wood, cross section 38x42 mm.
- Exotic wood, cross section 38x70 mm.
- Aluminium, cross section 30x40 mm, wall thickness 2.5 mm.

screws

- M 4.5x20 mm AISI stainless steel countersunk Torx Tx 15 screws (for 20 mm thick wooden joists)
- M 4.0x30 mm AISI 304 stainless steel countersunk Torx Tx 15 screws (for 38-42 mm thick wooden joists)
- M 3.9x16 mm AISI stainless steel Torx drill screws (for aluminium substructure joists).
- M 6.0x80 mm AISI A2 stainless steel countersunk Torx T30 screws (for bracing)

c) types of milling

Unless otherwise indicated, the boards are generally not milled unless necessary. This process can be carried out by the mill, please ask for more details. For installations using clips, Wallbarn can offer three types of milling which are respectively defined as "Symmetric", "Classic" and "Concealed".

d) approximate quantities per m² with a centre distance of 30 cm



symmetrical milling



classic milling



concealed milling



Photo 24



Photo 25

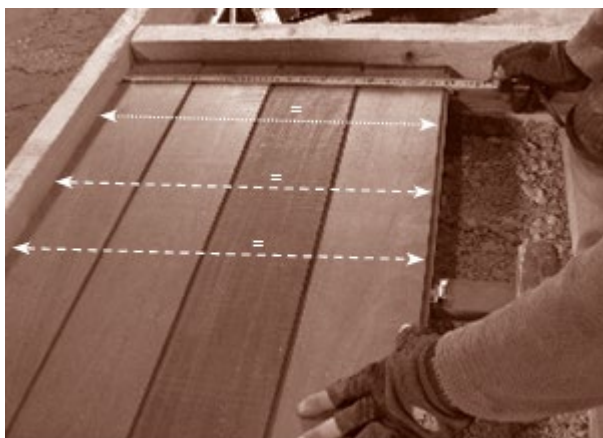


Photo 26

- With bracing: 4.5 m of joists, 25-35 clips, 2 screws for each clip + 10 screws for fastening the braces.
- Without bracing: 3.5 m of joists, 25-35 clips, 2 screws for each clip.
- With two-fold framework: 4.5 m of joists, 25-35 clips, 2 screws for each clip + 5 screws for fastening the frames.

e) installation process

Due to the nature of the solid wood, the deck boards may be curved up to a maximum tolerance of 5 mm per linear meter.

The procedure below must be followed in order to maintain the linearity of the floor:

- 1) Install the first row of boards, which must be made up of perfectly straight planks, and immediately fasten them to the joists. The first row of boards must be fastened to the external edge using screws, as they naturally cannot be fastened using clips. The clips must then be inserted on the side that's not fastened to the edge, in correspondence to the joists. [see photo 24].
- 2) The subsequent boards must be installed in such a way so that the milling enters all the way into the clip, until resting directly against it.
- 3) Insert the second row of clips, taking care to insert the clips themselves all the way into the milling on the boards.
- 4) Use a hammer if necessary [see photo 25].
- 5) Proceed in this manner, checking after every 5 rows of boards that the distance between the first and last board is perpendicularly constant [see photo 26].
- 6) If the distance is not constant, check to make sure that the boards are perfectly parallel before continuing in order to avoid off-square alignment or poor gap continuity.

.. Continue with this procedure until the flooring has been completed.