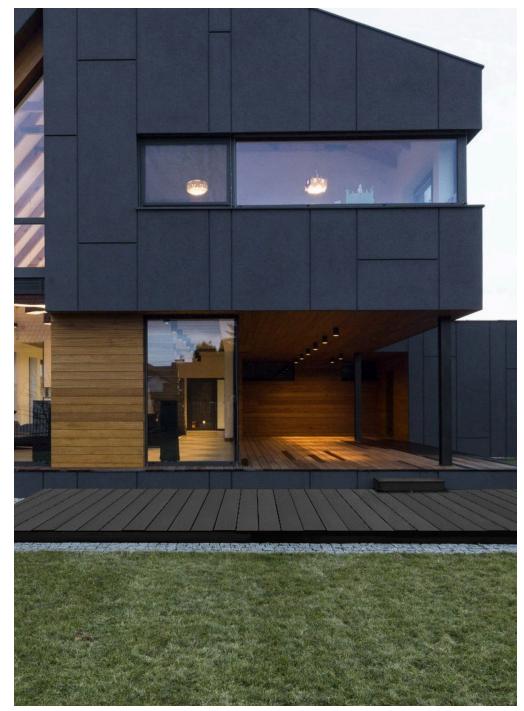


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- 2. Types of a terrace board and its components
- 3. Protective equipment and tools required for installation of the terrace system
- 4. Storage and transportation of the board and its components
- 5. Basic requirements to the foundation
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- 7. Main stages of installation of the terrace system
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THE BEST OF TWO AREAS

Welcome to the world of the innovative Bruggan® board, where technologies have enhanced and improved all what we love about nature.

Bruggan® composite board is made of 60% hardwood flour, 30% pure HDPE polymer and 10% various stabilizing additives that give the material its durability and environmental resistance.

Bruggan® formula includes only hardwood flour, debarked and dried to a specific moisture level.

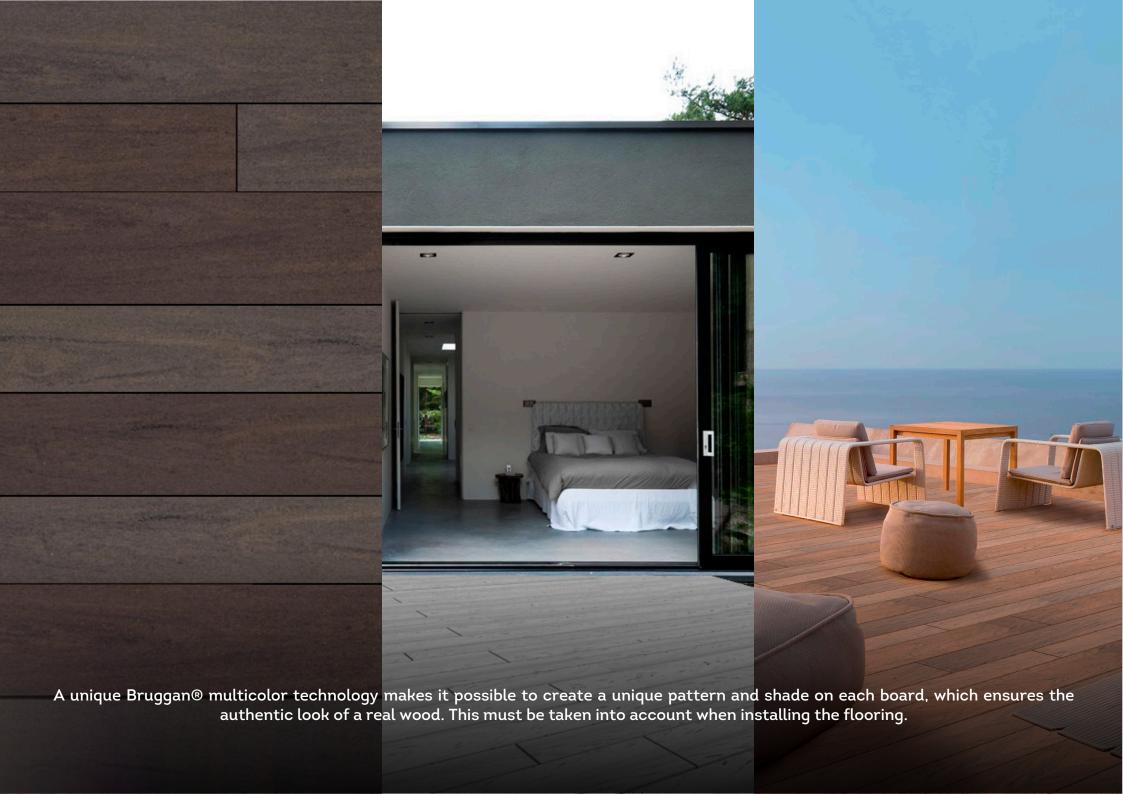
Coniferous woods are not used in the composition because of their softness, a large amount of resins and tannins. This distinguishes Bruggan® board from a standard composite and makes it more qualitative and more durable.

WHAT DOES WPC CONSIST OF?



Also, all products undergo multi-level laboratory quality control from incoming raw materials to testing each released batch of the product.

In addition, Bruggan® material can be 100% recycled.







All Bruggan® products are constantly tested in various world laboratories and have quality certificates from different countries.

SKZ -Testing GmbHFriedrich-Bergius-Ring Würzburg GERMANY

You may also notice some color difference between the skirting/corner planks and the decking, especially if you install the boards with the ribbed side facing up. After a short color stabilization, this difference will be minimized.



1.1 MATERIAL CHARACTERISTICS

MV = arithmetic mean; SV = most critical single value

Profiles meet the requirements DIN EN ISO 15534-1/-4

1) =The value is taken from the technical specifications (or standards) of the manufacturer.

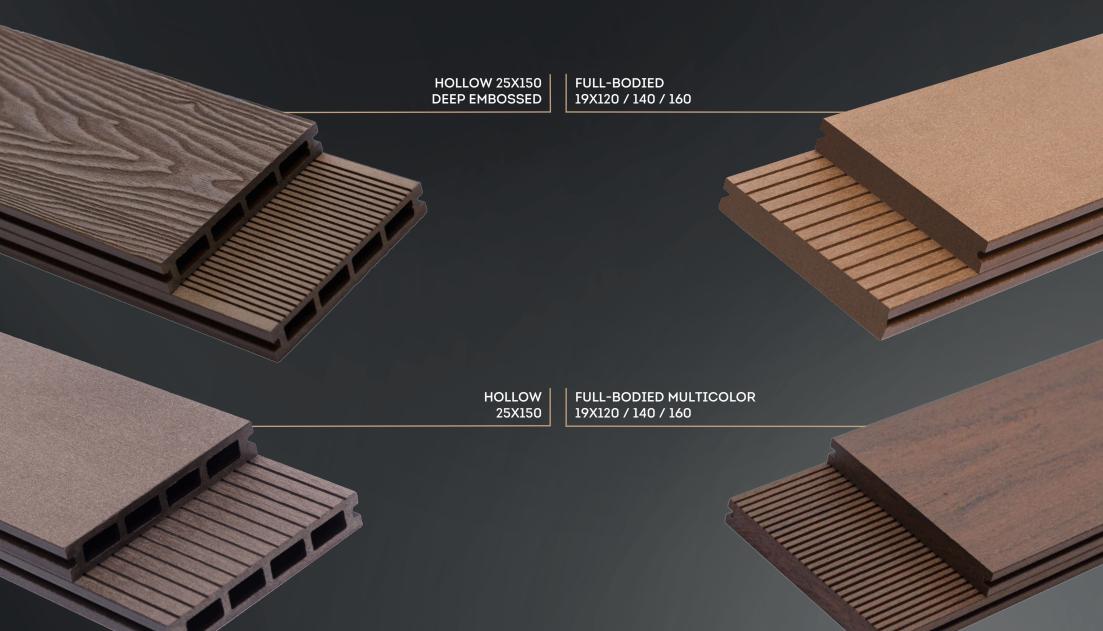
| Characteristics | Test result, MV/ S | SV | Required MV/ SV | Test method | |
|--|----------------------------------|---------------------------------------|------------------------|--|--|
| Density, kg/m³, no less | 1,3 | | | | |
| Mass of a unit of length, g/m | 3100 / 3200 | | 3200 ¹⁾ | EN 15534-1: 2014 + A1: 2017, ch. 6.5 и 6.6 | |
| Deviation from straightness, mm | 0,3 / 0,4 | | ≤ 0,5 ¹) | EN 15534-4: 2014, ch. 4.4 | |
| Deformation (ship), mm | 0,1 / 0,2 | | ≤ 3 ¹) | | |
| Impact strength (impact test by falling mass), mm | Longest noticeable surface crack | no cracks | no cracks | EN 15534-1: 2014 + A1: 2017 EN 15534-4: 2014, ch. 4.5.1 | |
| | Maximum depth of residual dent | 0 / 0,1 | < 0,5 | | |
| Slip resistance | Rating group C > 30° | | Rating group C≥ 24° | EN 15534-1: 2014 + A1: 2017, ch. 6.4.3 EN 15534-4: 2014, ch. 4.4 | |
| Modulus of elasticity in bending | Deflection s | 6,3 / 6,7 | ≤ 10 / ≤ 13 | EN 15534-1: 2014 + A1: 2017EN 15534-4: 2014, ch. 4.5.3 | |
| | Residual deflection sr | 4,6 / 4,8 | ≤ 5 | | |
| Bend Properties | Breaking load, H | Deflection under load 500 N, mm | | EN 15534-1: 2014 + A1: 2017, ch. 7.3.2EN 15534-4: 2014, ch. 4.5.2 | |

Profiles meet the requirements DIN EN ISO 15534-1/-4

1) =The value is taken from the technical specifications (or standards) of the manufacturer.

| | Weather resistance | | | | | | | |
|---|---|----------------|--------------|-----------------------------|---|--|--|--|
| | Δ L* | Δ a * | | $\Delta \mathbf{b}^{\star}$ | EN 15534-1: 2014 + A1: | | | |
| Color change | 6,2 | 0,3 | -1,7 | -/-/- | 2017, ch. 8.1EN 15534-4: 2014, ch. 4.5.5 | | | |
| Moisture resistance under cyclic climatic loads, % | 3,6 / 8,9 | | | ≤ 20 / ≤ 30 | EN 15534-1: 2014 + A1: 2017, ch. 8.3.2EN 15534-4: 2014, ch. 4.5.3 | | | |
| | | Cold water, %: | | | | | | |
| Thickness change | 0,8 / 0,9 0,7 / 0,9 | | | \leq 4 / \leq 5 | EN 15534-1: 2014 + A1: | | | |
| Width change | | | | \leq 0,8 / \leq 1,2 | 2017, ch. 8.3.1EN 15534- 4: 2014, ch. 4.5.5 | | | |
| Change in length | | | | \leq 0,4 / \leq 0,6 | 4. 2014, CH. 4.3.3 | | | |
| Weight change | | 0,1 / 0,3 | ≤7/≤9 | | | | | |
| Boiling water test: - Weight change, % | 0 / 0,2 0,4 / 1,0 | | | ≤ 7 /≤ 9 | EN 15534-1: 2014 + A1: 2017, ch. 8.3.3EN 15534-4: 2014, ch. 4.5.5 | | | |
| | | | | | | | | |
| Coefficient of linear thermal expansion: | | | | | | | | |
| Coefficient of linear thermal expansion along the length; longitudinal direction | one value 36,4 x 10-6 one value 127 x 10-6 | | | \leq 50 x 10 ⁶ | EN 15534-1: 2014 + A1: 2017, ch. 9.2EN 15534-4: 2014, ch. 4.5.6 | | | |
| Coefficient of linear thermal expansion along the length; transverse direction | | | | ≤ 50 x 10 ⁶ | | | | |
| Bearing capacity of the board with a distance between the supports of 366 mm, kgf | 410 | | | ≥ 300 | 2014 + A1: 2017 | | | |

BOARD PROFILES BOARD PROFILES



LOGSOGS

CLIPS CLIPS

Stainless AISI 304 steel clips, A2 brand

LAG BRUGGAN |

40X30X2200

STARTING



STANDARD



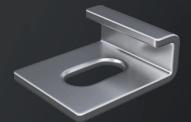
REINFORCED LAG BRUGGAN 53X43X2200 53X43X3000

LOCKING

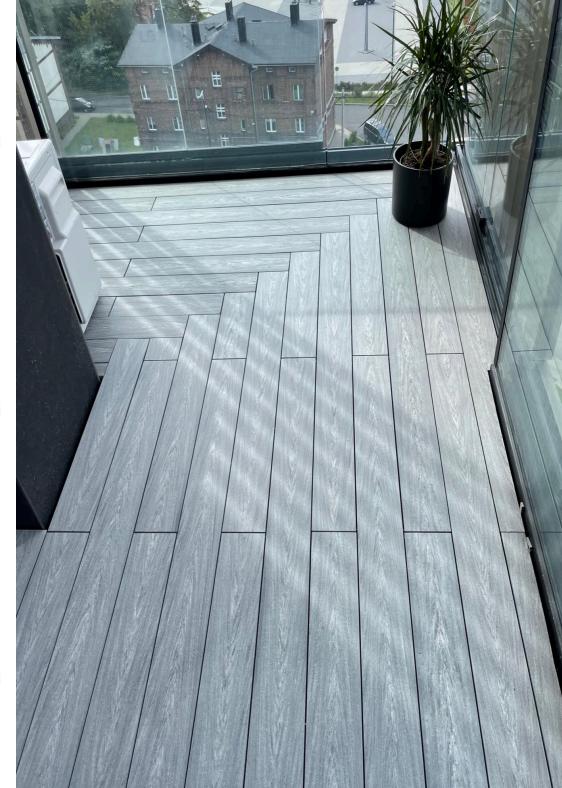


REINFORCED LOAD-BEARING BEAM 53X43X2200 53X43X3000

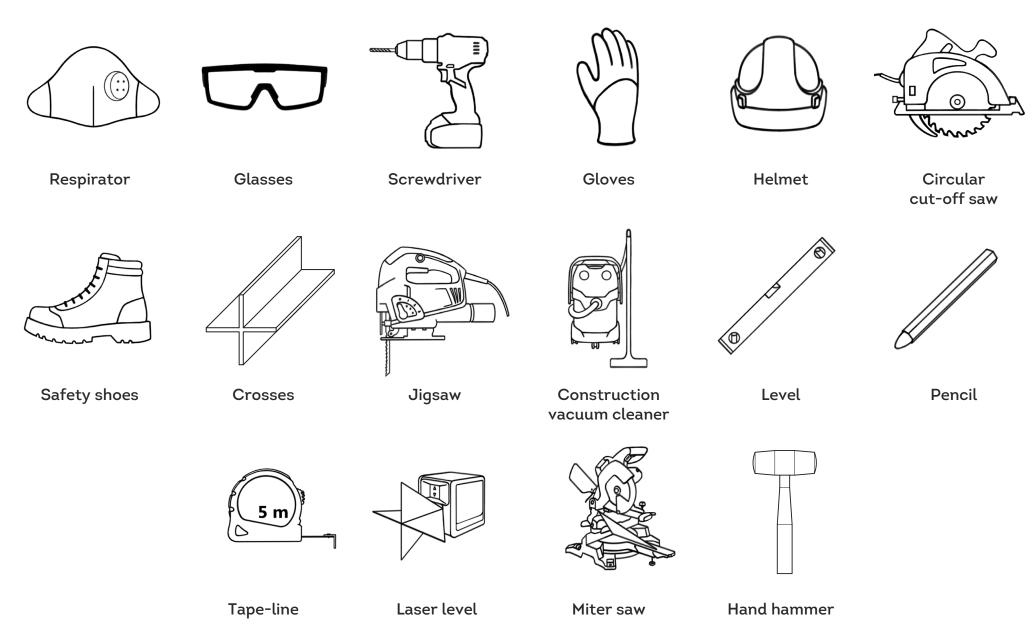
FINISH







3. PROTECTION AND TOOLS REQUIRED FOR MOUNTING THE TERRACE SYSTEM



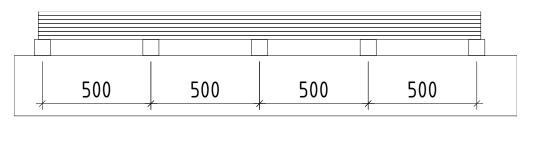
4. STORAGE AND TRANSPORTATION

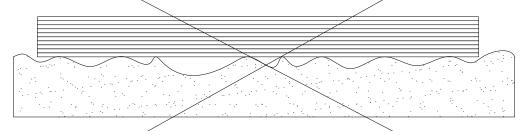
- Store Bruggan® products in dry, ventilated areas away from sunlight.
- Store and transport Bruggan® products only in a horizontal position.
- Long panels (more than 2 m) must be carried by two people.
- Products must be unloaded with care.
- Make sure the products are securely fastened during transportation.
- The board can easily slip off and leave light streaks and hooks on the surface.
- The distance between the supports must be a maximum of 0.5 m.
- Partial storage of product pallets outdoors may result in discolouration of the board. The part of the board that will be exposed to weather conditions (rain, ultraviolet) may slightly change color.

We recommend that all material be delivered to the construction site in advance. This is necessary for the adaptation and acclimatization of the material. The minimum acclimatization time is 48 hours. During this time, the material adapts to environmental influences (humidity, temperature, exposure to sunlight). We remind you that the recommended ambient temperature for installation is from +5 to +28C.

Before the decking board and all components are delivered to the construction site, it is necessary to prepare a place for warehousing and storage. It is necessary to place the board on a flat, horizontal, dense surface, in close proximity to the installation site.

Before the start and during the installation process, it is necessary to check the compliance of the color and dimensions of the board with your order. The tone of the board may differ in the batch within one tone, but the color must be the same.





5. BASIC REQUIREMENTS TO THE FOUNDATION

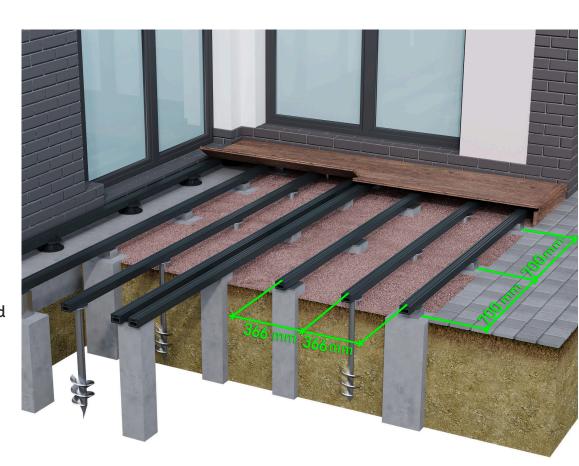
The supporting structure and foundation for the terrace must be:

- Strong enough to withstand the weight of the terrace, people and all objects that are located on it;
- · Protected from decay and insects;
- Must comply with the climatic and seismic requirements of the region;
- Designed by experts to ensure the removal of moisture from under the flooring.

6. BASEMENTS TYPE

- 1. Concrete basement.
- 2.Metal frame.
- 3. Adjustable lags and bearing «Bruggan» beam.
- 4.Combined.

Laying a terrace covering on the ground, or on a sand and gravel cushion is unacceptable.



7. MAIN STAGES OF THE TERRACE SYSTEM INSTALLATION

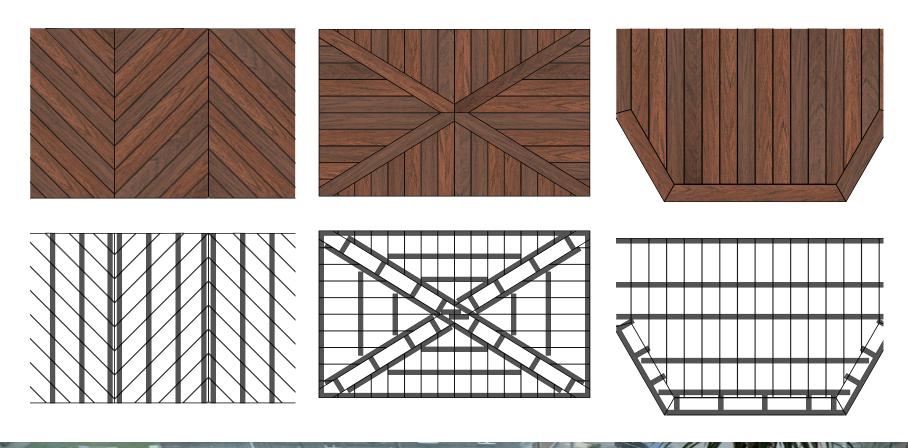
- 1. Prepare a platform for a terrace. Before starting installation, it is necessary to provide a place for unloading and temporary storage (acclimatization) for the board and its components.
- 2. Determine the zero mark (mark of the "clean floor") of the terrace using a laser level.
- 3. Choose the layout of the board, since the laying of the lag directly depends on this. There are various types of board layouts (see Fig. 1, 2, 3 p. 8), in accordance with which lags are installed. The maximum distance between the log axles is 366 mm.
- 4. It is required to ensure free drainage of storm water when the logs are installed directly on a concrete base. If the log is laid on supports, then the supports are installed first, and then the logs on them. See Section 9 on pages 18-28 for how to install the lag on various types of bases.
- 5. Install the starter clips at the beginning of the joist using self-tapping screws.
- 6. Install a board in the fixed starter clips and secure with an intermediate clip using self-tapping screws. It is necessary to observe the end (4-6 mm) and longitudinal (3-5 mm) gaps, because WPC boards have the ability to narrow and expand under the influence of temperature.

- 7. It is recommended to fasten each board in the middle through and through at 45 degrees with a self-tapping screw into a preprepared hole (the hole should be 2 mm larger than the body of the self-tapping screw). Or it is necessary to use special central clips for additional fixation of the middle of the board. This will help you avoid the board moving when it expands due to humidity and temperature.
- 8. In the same way, all other boards of the future terrace are installed.
- 9. The last row of boards is fastened with a finishing clip. Or fasten the edge board through the groove of the board with a self-tapping screw into a pre-prepared hole (the hole should be 2 mm larger than the body of the self-tapping screw).
- 10. If it is necessary to frame the terrace with a WPC corner, then a corner is fastened through with self-tapping screws into a preprepared hole, which should be 2 mm larger than the body of the self-tapping screw with a countersink (for a countersunk screw head).

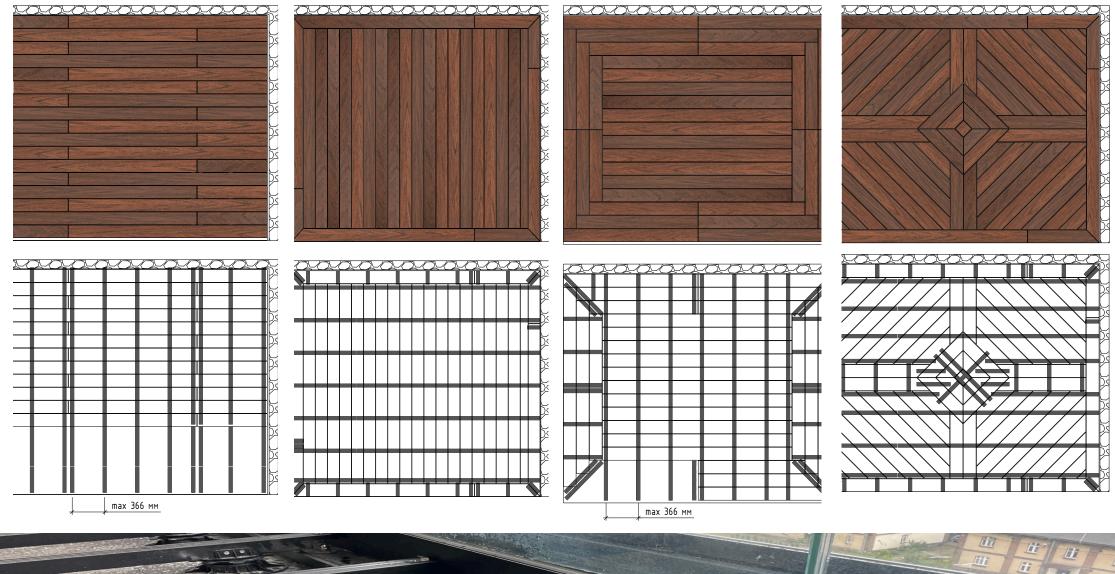


8. MAIN TYPES OF LAYOUTS

Attention, with a terrace height of more than 30 cm, we recommend to install fences. The method of fencing and its fastening must be planned in advance.









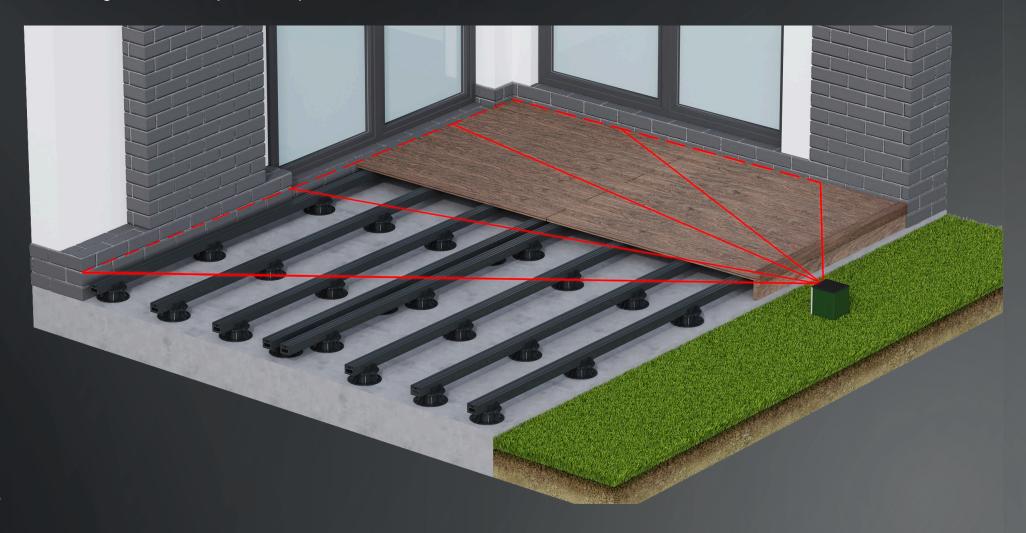
9. MOUNTING THE SUBSYSTEM

9.1 DETERMINATION OF THE ZERO MARK.

Using a laser level (level), it is necessary to determine the level of the subsystem.

When planning the height of the terrace, it is necessary to take into account the heights of adjacent zones and rooms. Pay attention to opening doors and windows.

The height of the subsystem is equal to the «zero mark» minus the thickness of the board.

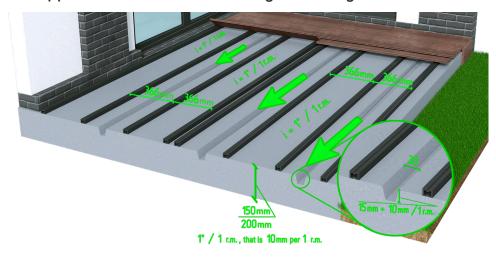




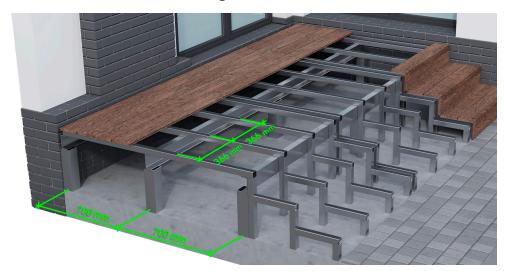
9.2. TYPES OF SUBSYSTEM (FRAME) INSTALLATION

There are two types of subsystem installation:

- 1. Directly with a full body on a concrete base, a standard log is used.
- 2. On supports, a reinforced or strengthened log is used.



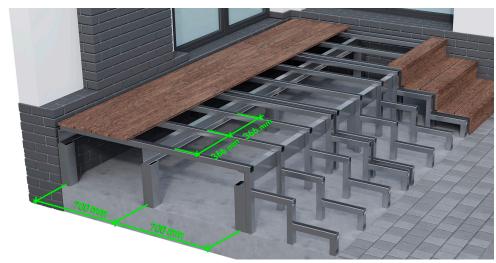
Installation of a standard log to a concrete base



Installation of a metal frame



Installing a reinforced log on adjustable supports



Installing a reinforced log on a metal frame

9.2.1 INSTALLATION OF THE BEAM TO A CONCRETE

A concrete basement must comply with the technical requirements of this facility.

The thickness of the base must be at least 150-200 mm. To ensure the outflow of water, a base slope of at least 1 degree per linear meter (1 cm per 1 running meter) is required. It is necessary to provide ventilation of the subsystem (framework).

To do this, the distance from the base to the bottom of the board must be at least 20 mm (provided due to the height of the log).

In this case, most often, a standard log of 30x40 mm is used, which is installed on a concrete base. With such a system, the entire terrace will repeat the same slope angle as the base.

150mm 200mm

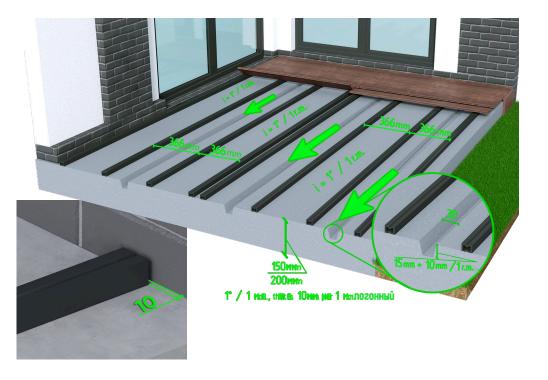
Installation of a standard log on a concrete base with a slope.

When it is not possible to equip a concrete base with a slope (for example, when installing the flooring on an existing concrete pad), then it is necessary to create a system of drainage channels.

The slope of such channel must be at least 1 degree or 10 mm per linear meter of the base, and the minimum start size: 30 mm (width) * 15 mm (height).

A log must be installed at a distance of 10 mm from the enclosing structures. Fastening a lag to a concrete base is not necessary.

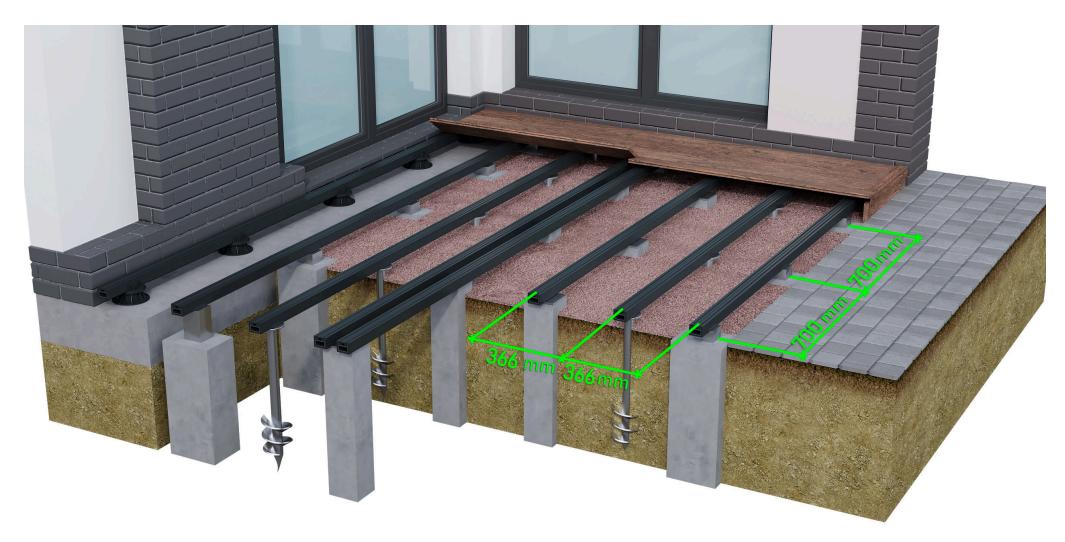
If necessary, turboprops or a dowel-nail system can be used. When attaching the lag to a concrete base, the hydrophobic layer of the base is destroyed.



Installation of a standard log on a concrete base without a slope with a system of drainage channels.

9.2.2 INSTALLATION OF THE LAG TO VARIOUS TYPES OF SUPPORTS

To install a terrace without a slope, it must be raised on supports to the «zero» level. To do this, use a reinforced log, or a metal frame. Logs are installed on plastic, metal, or concrete supports.



Installation of reinforced logs on various types of supports.

9.2.2.1 INSTALLATION OF REINFORCED AND STRENGTHENED BEAM ON PLASTIC ADJUSTABLE SUPPORTS

The difference between mounting reinforced and reinforced logs on plastic supports is only in the distance between the axes of the supports. The recommended maximum distance between the axes of supports for a reinforced log is 400 mm, and for a reinforced one - 700 mm.





Installation of a reinforced log on plastic adjustable supports.

We fix the logs on the installed supports with the help of self-tapping screws DIN7504 P 3.9x25.

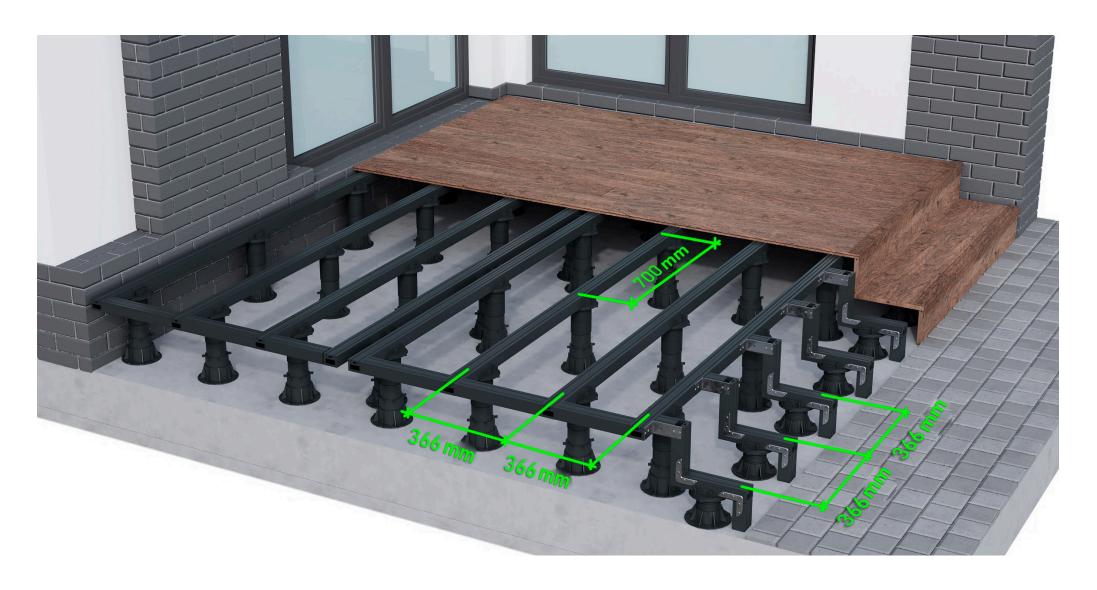
The distance between the axes of the log should be no more than 366 mm.

In places where two ends of the board will converge, we mount two logs, since each end of the board must be attached to the log with a separate clip.

The two ends of the reinforced log must be connected with a galvanized profile that goes inside the log, pushing it out of the previous log by 200 mm and inserting it into the next one, etc. In the place of connection of the two logs, a support must be installed.



During construction of steps and for hemming the end of the terrace, an additional structure made of reinforced logs is used. It is important that when installing the corner, a self-tapping screw enters the body of the reinforcing galvanized log profile.



Installing a reinforced log on plastic adjustable supports with a difference in height. The distance between the axes of the supports is not more than 700 mm.

9.2.2.2 INSTALLATION OF THE METAL FRAME

The design of a subsystem in the form of a metal frame should be carried out by a specialist.

The distance between the axes of the log should be no more than 366 mm.

A metal frame must be primed in two layers and treated with an anti-corrosion coating. A damper (anti-vibration) tape is glued on top of each lag of the metal frame.

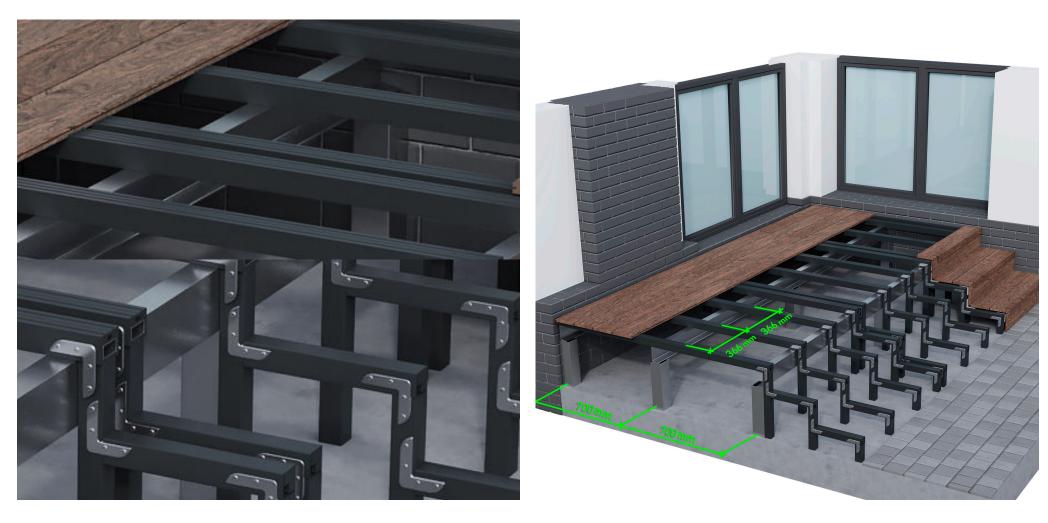
The board is fastened with a stainless clip and a galvanized self-tapping screw with a countersunk head and a drill. You can also use aluminum joists.



Metal frame installation.

9.2.2.3 A COMBINED FRAME INSTALLATION

The principle of creating a combined frame is the same as for a metal frame, only instead of a metal profile pipe, a reinforced strengthened log is used. It does not need to be painted and glued with a damper tape. The board is attached in the same way using a stainless clip and self-tapping screws. The steps are mounted using log sections, galvanized corners and self-tapping screws. It is necessary to ensure that the screws enter the body of the galvanized profile.



Installation of the board on a combined structure (metal frame and reinforced strengthened WPC log).

10. INSTALLATION OF A TERRACE BOARD

Remember that a composite deck board has all the properties and advantages of wood. The board is prone to linear expansion under the influence of heat and moisture. Maximum linear expansion 0.2% (2 mm per 1 linear meter). This gives us need to limit the length of one board and provide for an end gap between the boards. With a board length of 2-3 meters, a gap of 4-5 mm is required. Accordingly, with a board length of 4 meters or more, a gap of 6 mm or more is required.

| | End and longitudinal gaps with different board lengths | | | | | | | |
|---------------------------------|--|---------------------|----------------------|---------------------|----------------------|---------------------|----------------------|---------------------|
| Mounting temperature, ° C | Board length 6000 mm | | Board length 4000 mm | | Board length 3000 mm | | Board length 2200 mm | |
| | End clearance | Longitudinal gap | End clearance | Longitudinal gap | End clearance | Longitudinal gap | End clearance | Longitudinal gap |
| Below 10 | 8 | 4 | 7 | 4 | 6 | 4 | 5 | 4 |
| Above 10 | 6 | 4 | 6 | 4 | 5 | 4 | 4 | 4 |
| Above 22 | 4 | 3 | 5 | 3 | 4 | 3 | 3 | 3 |

Also, it is necessary to keep gaps (thermal seams) from all surfaces (walls, fences, etc.). The end gap from the edge of the board to the enclosing structures should be 10-20 mm.

A longitudinal gap from the board to the enclosing structures must be at least 10 mm.

Before starting installation of the board, it is necessary to check the horizontal level of the entire area.

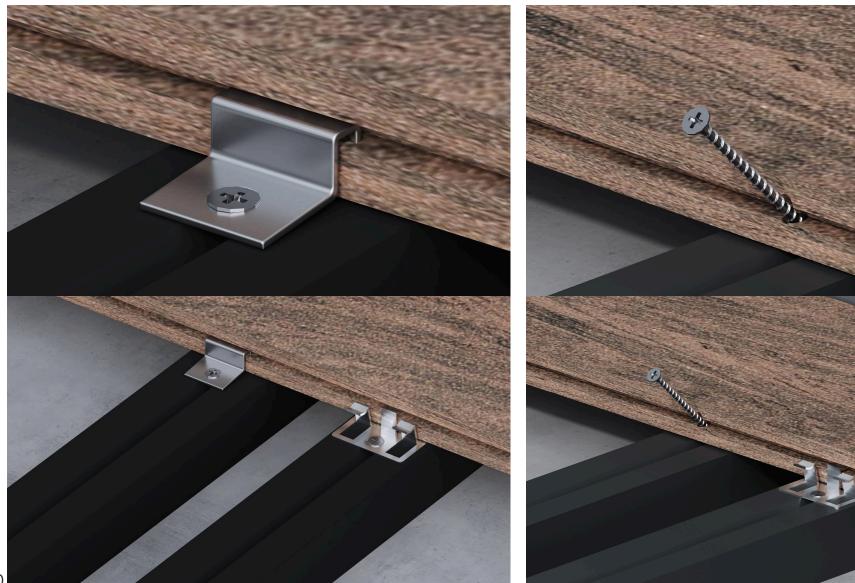
A starting clip is fixed on a pre-prepared log system using a self-tapping screw 3.9x25 DIN7982 (ISO 7050) with a countersunk head. Next, boards are installed in the starting clips with a corresponding groove and fixed with an intermediate clip installed on each log. It is necessary to observe end and longitudinal gaps (4-6 mm). It is convenient to do this with mounting crosses for tiles (after fixing, you can remove them).



The self-tapping screw must meet specified parameters:

The diameter of the working part is 3.9-4.2 mm, the length is 25-35 mm, the cap is hidden. The self-tapping screw should enter the log at an angle of 90 degrees to the base.

On the central log to the center of the board at an angle of 45 degrees, we screw the self-tapping screw through, previously drilling a hole 2 mm larger than the diameter of the body of the working part of the self-tapping screw, or we install a special central clip. This will help us avoid the board from moving when expanding due to humidity and temperature.

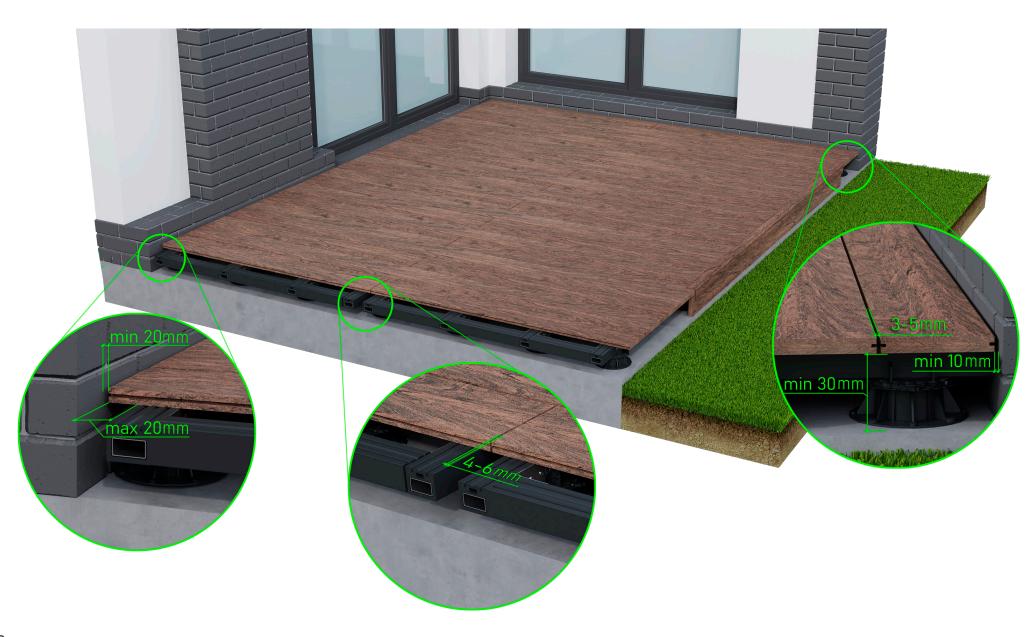


At the place of convergence of two boards, at the end of each board, it is necessary to install a clip in order to avoid loss of board fixation during a temporary change in length.

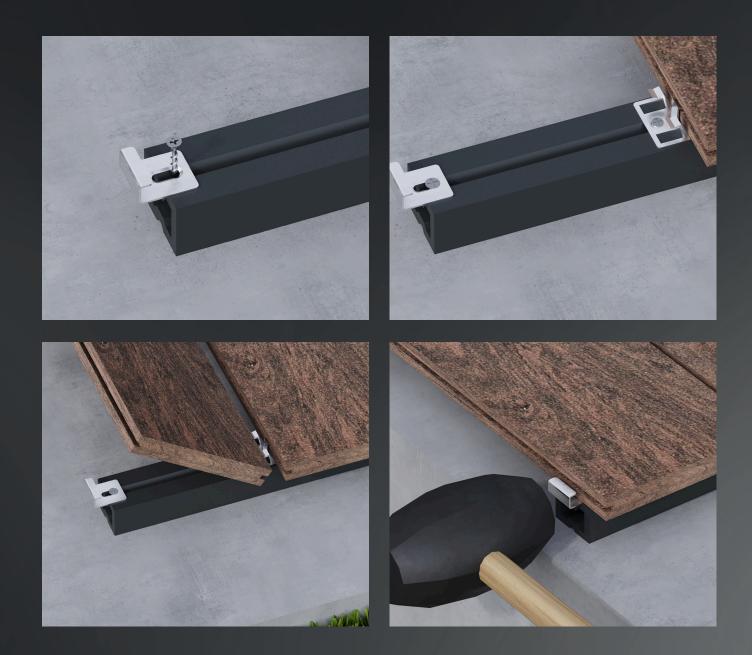
We continue the installation of boards until the end of the row. Repeat the installation procedure for all subsequent rows.



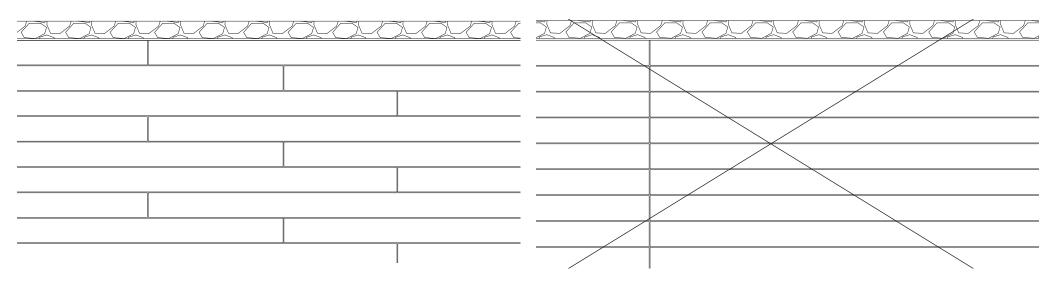
Do not forget about the gap between the last board and the wall or any other limitation.



It is recommended to fasten the last row of boards with a finishing clip, which is achieved with a mallet. It is also possible to fasten through the groove at 45 degrees in a pre-drilled hole 2 mm larger than the diameter of a self-tapping screw body.

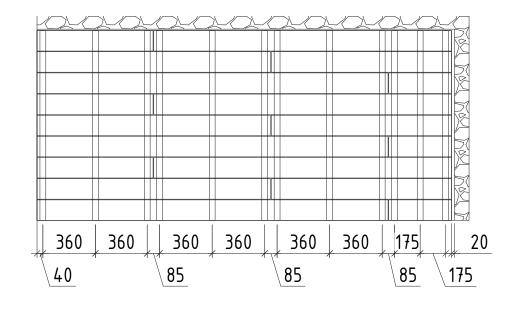


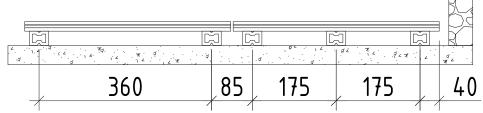
We recommend avoiding the junction of two boards in the following rows and making offsets by one or more boards.



When using a 200 - 350 mm piece of board, we recommend using an additional support. Any part of the board must be fixed in three or more points of support.

A WHOLE STRUCTURE OF THE LAG MUST BE IN THE SAME PLANE. CHECK FLAT REGULARLY.





11. INSTALLATION OF STEPS OUT OF TERRACE BOARD 11.1 INSTALLATION OF STEPS OUT OF SOLID BOARD

Before installation, the boards are mounted on logs with a 366 mm distance between the log axes. A backup log is attached to the risers, for attaching galvanized corners that were previously mounted to the end board. Next, the edge board is attached. Galvanized corners 60x60 mm are attached to the bottom of the outer board, using self-tapping screws, then, using self-tapping screws, we fasten the board with the corner to the duplicate log. One edge of the board is fastened with an intermediate clip, the other - with a corner.





Next, we fasten a starting clip and insert the groove of the board into this clip, and press it with the starting clip as well.

After that, we lay the board and fasten it with an intermediate clip. Then we repeat fastening of the extreme board with the help of galvanized corners.









The radius (rounded) edge of the step is made by milling the edge of the board.



11.2 INSTALLATION OF STEPS OUT OF HOLLOW BOARD

Installation of the steps of a hollow board is carried out similarly to a solid one.



12. INSTALLATION OF THE TERRACE SYSTEM TO AN OPERATING ROOF

When mounting on the roof, it is necessary to remember about the prohibition of direct fastening of any material directly to the roof.

When working directly on the roof, it is necessary to ensure complete cleanliness and not to leave any metal objects on the roof, especially hardware, board cuttings, etc.

On the roof, adjustable supports are usually used.

Before starting installation, it is necessary to determine all the main parameters: direction of the board, final height, direction of water flow, opening doors, etc.

When installing on the roof, all the rules for installing a terrace system apply.





13. INSTALLATION OF THE TERRACE SYSTEM TO THE BALCONY

When installing terrace systems to a balcony, you must follow all the rules for installation on flat surfaces. If the balcony has waterproofing, in order to avoid breaking the hydrophobic layer, you should follow the rules for fastening to the roof.

When installing on a balcony, when determining the finishing height of the terrace system, it is especially important to pay attention to the opening of doors and the height of the fences (railings) of the balcony (the minimum height of the balcony fence from the finishing height of the terrace should not be less than 1 meter)





14. INSTALLATION OF THE DIFFERENT WIDTH BOARD

When installing different-width and single-width boards, the same installation rules apply.

In one row, it is necessary to install boards of the same width. We recommend to alternate rows with different board widths. For example, 120/140/160 or 140/120/160.



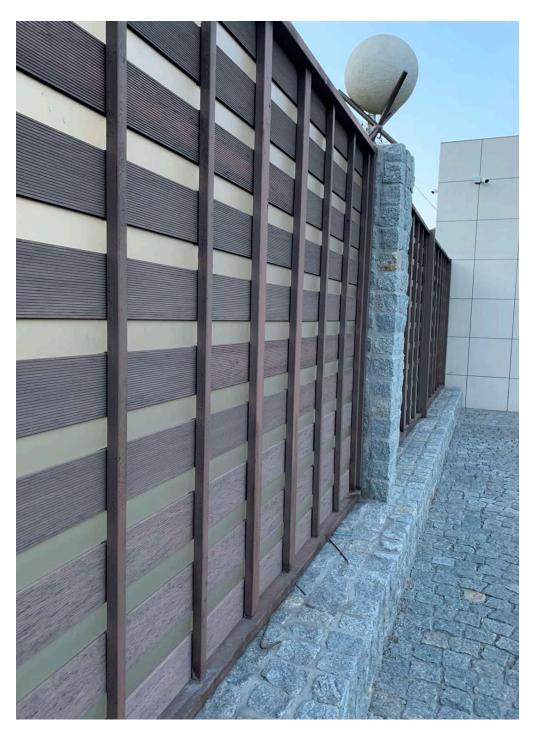




15. INSTALLATION OF ENCLOSURE (FENCE)

When installing a fence, the standard rules for installing a decking board apply.

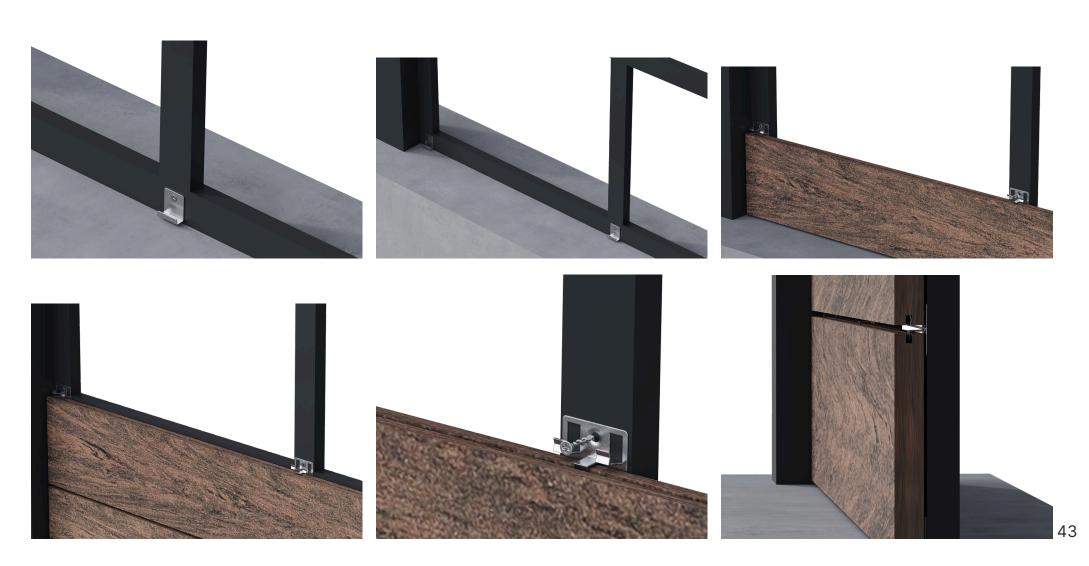




INSTALLATION OF ENCLOSURE (FENCE)

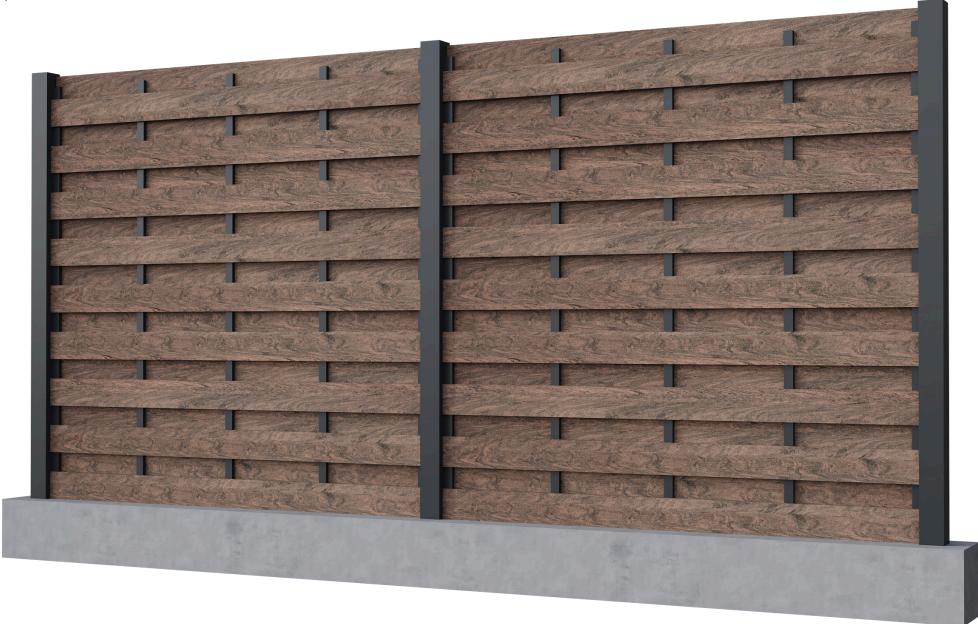
Option 1

On a pre-welded and installed metal crate with a pitch of 400 mm between the axes of the horizontal profiles in the lower part, we fasten the starting clip using a galvanized self-tapping screw. We insert the first row of the board into the starting clip with a corresponding groove of the board. Next, we fasten an intermediate clip with a self-tapping screw, we also insert the second row of the board. We repeat the installation to the top of the crate, fasten the edge of the board with the help of a finishing clip.



INSTALLATION OF ENCLOSURE (FENCE)

Option 2



INSTALLATION OF ENCLOSURE (FENCE)

Option 2

On a pre-welded and installed metal crate with a pitch of 400 mm between the axes of the horizontal profiles in the lower part, we fasten the starting clip using a galvanized self-tapping screw. Next, we fix a finishing clip with a distance equal to the width of the docks. We insert the first row of the board into the starting clip with the corresponding groove of the board and fix it with the finishing clip. On the reverse side of the crate, we repeat the installation with an offset in board width. Repeat the installation to the top of the crate.

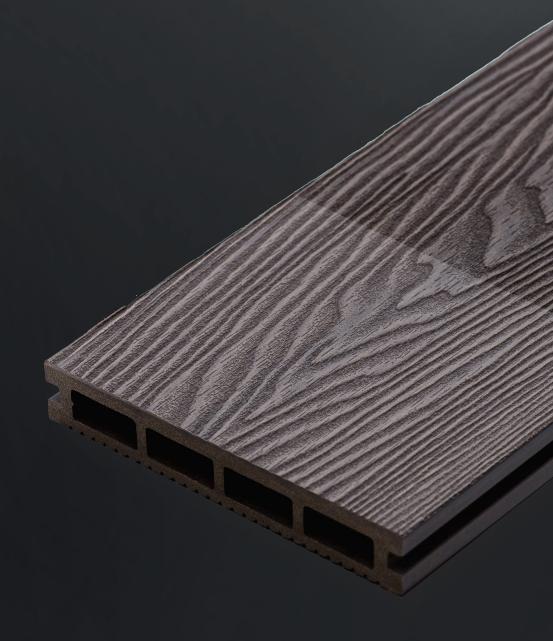


16. COLORS LORS

All composite materials, as well as products that are made from them, are exposed to natural weathering. During the first 3-6 months after installation, Bruggan® may become lighter than its original color when exposed to UV light. This process is the result of UV stabilization on the surface of the boards.

After initial stabilization, minimal color change is observed.

At the transition point of the terrace, which is in the open sun, and, partially, the covered section of the terrace, so-called "water" spots can form. This effect results from exposure to lignin, a natural ingredient in wood that can be washed away by rain. This effect is negligible on surfaces that are more exposed to solar radiation. "Water" stains do not adversely affect the quality of the decking and are not considered a defect.



17. ADDITIONAL MOUNTING ITEMS

Corner joints of the board



ADDITIONAL INFORMATION

The results of testing the point load on the board and the log, after which it begins to deform (installed on supports with a distance of 360 mm.):

- Board BRUGGAN® Multicolor 410 kgc;
- BRUGGAN® Elegant Light 3D board 457 kgf.
- Standard WPC log 234 kgf;
- Aluminum log with a section of 40x20x2 mm. 436.8 kgf;
- Reinforced bearing lag BRUGGAN® 515.1 kgf;
- Reinforced BRUGGAN® load-bearing log 754.8 kgf.

The recommended distance between the log axles is 366 mm.

The terrace system is a modern innovative system that provides a safe, long-term, comfortable pastime. Follow requirements and instructions. Observe safety regulations during installation.

18. RULES FOR THE CARE OF THE TERRACE BOARD

- 1. Timely remove debris from the surface of the board, food leftover and other ingredients.
- 2. Wash the board with water at least once a month. Thoroughly rinse off the detergent and do not allow it to dry on the board.
- Use specialized decking detergents. Avoid using any detergents containing chlorine and acids.
- 4. Wash off grease and food stains immediately with warm soapy water.
- 5. Remove stains from grease, coffee, wine and other coloring food products with fine sandpaper, and if the dirt is extensive, use a special grinder.
- 6. Keep the gaps between the boards clean. Do not allow them to be clogged with debris, as this leads to a violation of air circulation and water flow under the flooring.
- 7. Do not place hot objects and metal products with rust on the material. Keep charcoal from barbecues, fireplaces, etc. away.
- 8. Under the legs of the furniture located on the terrace, place rubber or silicone pads.
 - 9. Do not use metal shovels or sharp-edged tools to remove

