

SINGLE STAVE BLOCKS, HERRINGBONE, LAYING INSTRUCTIONS

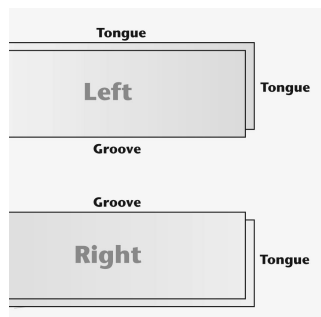


Figure 1

1. GENERAL INFORMATION

Single Stave Blocks, also named Herringbone flooring are together with other pattern floors a traditional type of wooden flooring which has been used for centuries. Different traditions for laying and treatment of the floors have been established by craftsmen in different countries and Junckers has great respect for these traditions.

Therefore, this document is to be seen as Junckers' guidance on laying and finishing treatment of single stave blocks in selected patterns.

Junckers single staves have gone through a thorough quality control process at the factory – it is however, important also to check for errors and defects before and during the installation.

The staves are delivered untreated and require sanding and surface treatment after installation. Find more information in section 16 - Surface treatment.

Depending on the chosen floor pattern, the staves are supplied in packs marked with right and left hand staves (see figure 1). It is important to keep the staves separate until installation. e.g. both right and left hand staves are used to install a herringbone pattern.

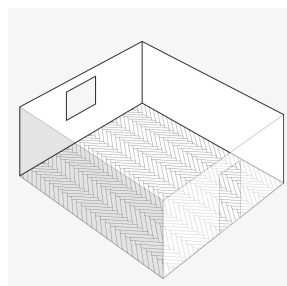
In order to make it simple for the contractor and floorlayer and at the same time create a classic solid hardwood floor, Junckers offers a complete system solution for the installation of pattern floors. On the following pages you find all products for use in the installation process.

STAVE DIMENSIONS:

15 and 22 mm short stave:
58.3 x 467.6 mm

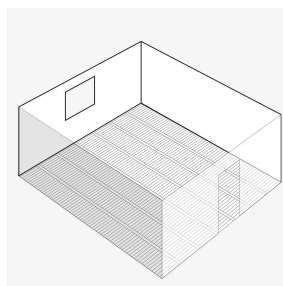
15 and 22 mm long stave:
62.1 x 623.5 mm

Junckers single stave blocks are used for the following floor patterns:



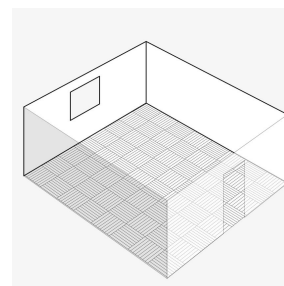
SINGLE HERRINGBONE

Uses: Right and Left hand staves in all dimensions



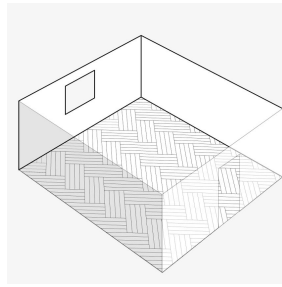
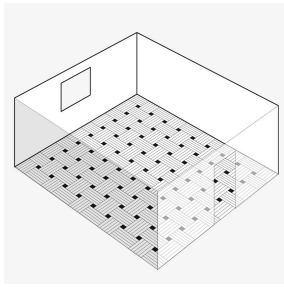
LADDER

Uses: Right hand staves in all dimensions



SQUARE BASKET

Uses: Right and Left hand staves in all dimensions



ENGLISH

Uses: Right and Left hand staves, size 22 x 58,3 x 467,6, and pattern-blocks in 88 x 88 mm

FOUR STRIP HERRINGBONE PATTERN

Uses: Right and Left hand staves in all dimensions (shown with short length staves)

2. BEFORE DELIVERY - RH IN THE BUILDING

Before the materials are delivered, the relative humidity in the building must be within the range expected when in use, eg 35-65 %, and the temperature must be approximately 20 °C.

If the above temperature and relative humidity levels cannot be met, we ask you to contact Junkers before delivery. The staves should be delivered 1 or 2 days before installation is due to begin. Parquet staves for patterns such as herringbone, square etc. must not be unwrapped until immediately before laying as it is important that they are as close to the manufacturing condition as possible.

3. ENVIRONMENTAL CONDITIONS

In order to keep moisture related movement of the floor to a minimum, the humidity should be stable for extended periods of time and the humidity range, i.e. the difference between the lowest and the highest relative humidity during the year, should not exceed 25 to 30 percentage points.

Examples of humidity ranges are: 25-50 %, 35-65 % RH.

The instructions below are based on the range 35-65 % RH.

If site conditions should vary from the above, it is advisable to contact Junkers Technical Service Department.

4. BEFORE INSTALLING THE FLOOR

The building must be weathertight. The heating system must be installed and tested and should be in operation during the heating season. Cast concrete elements, screeding and other wet trades which can contribute moisture to the building, eg tiling, plastering and priming of paintwork, must also be completed.

5. UNDERFLOOR HEATING

Junkers single stave blocks can be used in connection with underfloor heating systems which will provide an even temperature distribution. The temperature on the surface of the parquet staves should not exceed 27 °C. The underfloor heating must be switched off for 2 days before installation is started; after installation it is raised slowly by maximum 5 °C every second day.

However, the working temperature for the glue must be minimum 15 °C. With underfloor heating the gaps which typically appear in a wooden floor during the heating season will be larger than with heating from radiators.

6. SUBFLOORS

General information:

The staves can be

- Screwed, nailed or glued to a subfloor of plywood / existing wooden floor
- Screwed or glued to a chipboard base.
- Glued down to a concrete or screeded subfloor.

The moisture content of a wood based subfloor must not exceed 12 % and for concrete/screeded subfloors it must not exceed 65 % RH.

When screwing or nailing, a 500 g/m² floor cardboard is to be inserted between the wooden subfloor and the staves in order to minimize creaking between the staves and the subfloor. Each stave is fixed by secret nailing/screwing at a 45° angle with at least 2 nails or screws per stave.

Fastening to subfloor: 15 mm staves:

- Junckers J-nails or 45 mm T-nails for nail gun.
- For screwing use 35 mm Monta-Flex screws.
- For gluing use Junckers Parquet Glue.

Fastening to subfloor: 22 mm staves:

- Junckers J-nails or 65 mm T-nails for nail gun.
- For screwing use 45 mm Monta-Flex screws.
- For gluing use Junckers Parquet Glue.

For screw fixing it may be necessary to pre-drill (use a drill with a slightly smaller diameter than the screw).

All subfloors must be completely cleaned from grease and dirt before laying the staves.

Solid parquet staves from Junckers must NOT be glued in tongue and groove. However, staves which are shorter than 100 mm may occasionally be glued in the heading joints at walls or borders and in the tongue and groove at the last row of staves at the wall

Existing wooden floor:

The staves should be laid so that their longitudinal direction is perpendicular to the existing floor boards. In order to achieve the correct surface tolerance, the subfloor can be levelled by planing, filling or by fixing minimum 15 mm thick plywood to the base. If plywood is used, the original laying direction can be used. It is important that the existing wooden floor has been properly fixed without loose boards or protruding fastenings.

Plywood floor:

Plywood sub floors must be a minimum 18 mm thickness with battens at maximum 520 mm centres. If plywood is being fixed to an existing timber base, 12 mm thickness may be used. Tongue and grooved jointed plywood must be glued together in accordance with the manufacturer's instructions.

Chipboard floor:

Flooring grade chipboard 22 mm can be used and laid on battens with maximum support centres of 600 mm. If the chipboard is laid on an existing floor, it must be approved chipboard of minimum 16 mm. The boards must be fitted according to the manufacturer's directions and must be glued in the tongue and groove joints.



PARQUET GLUE
For gluing of Junckers
hardwood floors

Concrete/screed

When gluing, it is not possible to use a conventional damp-proof membrane. It is therefore very important to ensure that the surface of the subfloor is smooth, clean and dry. The residual moisture in the subfloor must thus not exceed 65 % RH, which must be checked by measuring. For more information see technical data sheet C 1.3 General information gluing down floors, section "Measurements of moisture in subfloors".

In case the floor installation needs to be conducted, with a moisture content between 65-95 % RH in the concrete subfloor, or in case of underfloor heating, apply Junckers Liquid Moisture Barrier before gluing. For more information see technical data sheet "Liquid Moisture Barrier" H 6.5.



LIQUID MOISTURE BARRIER

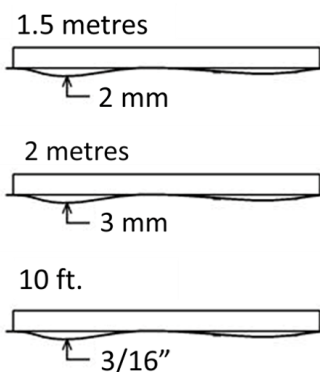
Different types of subfloors in same floor area:

If several types of subfloors make up the same floor area, the subfloor must be of uniform elasticity and flatness to ensure that the final flooring is of a consistent nature.

Glue Down method

The first row of staves is used to set out the rest of the floor and can be fitted with our normal adhesive but it must be thoroughly set before the main field of the floor is installed.

- For gluing the floor use Junckers Parquet Glue.
- The adhesive is applied using the Junckers notched Glue Spatula leaving a thin glue coat on the floor between the glue tracks.
- Hold the spatula at an angle of 45° and with the side marked "2" turned downwards.
- Use approximately 0.5 litre per m², depending on the absorption capacity, structure and flatness of the subfloor.
- Only apply sufficient adhesive so that the laying of the staves can be finished within 20 minutes.



7. FLATNESS OF THE SUB FLOOR

The subfloor must be levelled so that any deviations in the flatness do not conflict with the requirements of the method stated below.

Straight edge:

The subfloor must be flat with a maximum deviation of 2 mm under a 1.5 m straight edge.
(UK: 3 mm under a 2 m straight edge).
(US: 10 ft. under a 3/16" straight edge).

Deviations are measured as gaps under the straight edge. The surface must be smooth. Any irregularities must be corrected by grinding or by using a self levelling compound.

8. 10-BOARD MEASUREMENT

For some patterns, eg. Ladder pattern, where staves are laid in parallel over large areas, it may be necessary to include some expansion allowances within the floor between staves. The amount of expansion allowance to be left is described as the "10 board measure" which is the measurement across 10 staves including expansion gaps.

The 10-board measurement for Junckers single stave blocks laid in a ladder pattern or similar (at RH between 35-65 % and a temperature between 18-22 °C):

Short staves, 58.3 mm: 584.0–584.5 mm

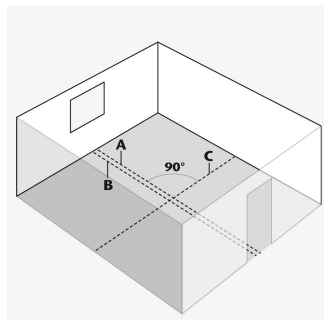
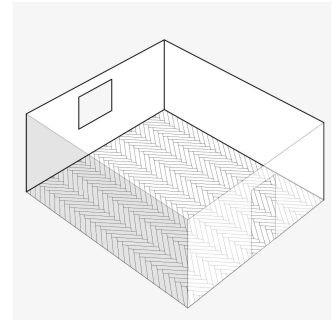
Long staves, 62.2 mm: 623.5–624.0 mm

9. DISTANCE TO WALLS AND EXPANSION GAPS

Depending on the size of the room, an expansion gap of 12-15 mm at walls and fixed installations should be left in order to allow the natural movement of the floor to take place. Junckers can supply matching skirting, quadrant or scotia mouldings to cover this gap. Alternatively the gap can be filled with Junckers cork or rubber strip.

We recommend that expansion gaps are established in the following cases: Where there are large variations in temperature and humidity, with particularly large floor areas, or where the floor is naturally divided by doors etc. Furthermore, any structural movement joints in the sub floor of the building must be taken up through the wooden floor if this is glued down to the subfloor.

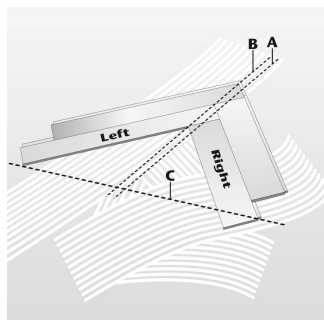
10. LAYING INSTRUCTIONS HERRINGBONE PATTERN



10A. Herringbone

The two centre lines in the room (lines A and C) are marked by a chalk line or string at an angle of 90° to each other.

A working line is drawn with a string or chalk line (line B) 1/3 of the stave width to the left of the centre line.

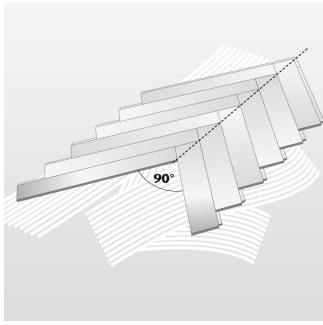


10B. Herringbone

The corners of the staves must be in line with the working line (line B).

In order to regulate the laying direction of the starting row, the centre line (line C) can be used as regulating line for the corners on the right and left staves, respectively (see figure).

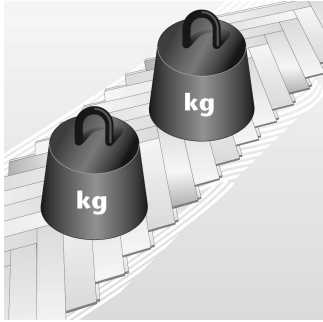
Left staves are laid to the right and right staves are laid to the left.



10C. Herringbone

During the entire laying it is very important to make sure that the staves are at an angle of 90°.

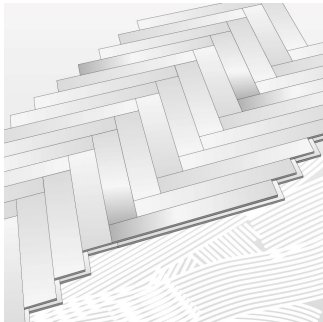
Particularly at the starting rows (the two first rows of staves which are laid down through the room) it is important that these rows are exactly at an angle of 90°.



10D. Herringbone

When the starting row has been laid it is recommended to leave the glue to dry over the night, before the floor laying continues. Do not forget to remove excess glue from the floor.

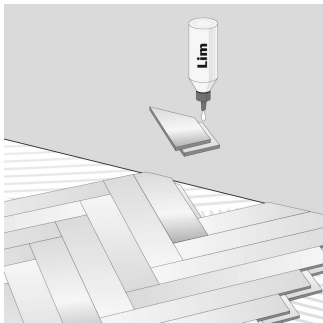
It is advisable to load the floor continuously during laying to ensure a good bond between staves and sub floor. Some contractors use packs of flooring or adhesive containers for this purpose.



10E. Herringbone

When the starting row is dry, you can continue laying the herringbone pattern.

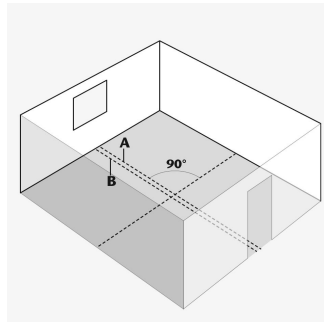
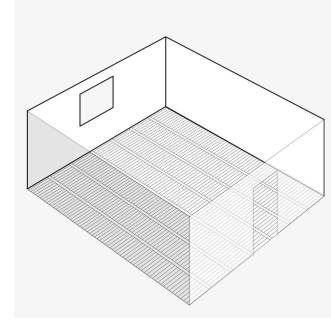
Only apply sufficient glue that the laying of the staves can be finished within 20 minutes.



10F. Herringbone

If the staves are cut at the border or wall so that they are shorter than 100 mm, the tongue and groove joints of the staves must be exceptionally well glued.

11. LAYING INSTRUCTIONS LADDER PATTERN

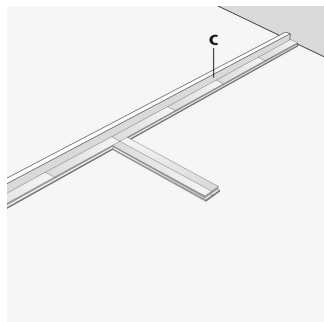


11A. Ladder

The centre line of the floor is marked by a string or chalk line (line A).

The size of the "cuts" at the walls is measured starting from the centre line. The size of the "cuts" at each side of the room will depend upon the width of the room and if the centre line of the floor passes through a ladder "stringer" or ladder "steps" (shown here starting in the middle of a stringer).

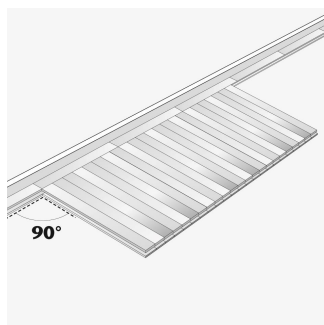
A working line (line B) is drawn half a stave width to the left of the centre line.



11B. Ladder

In order to make sure that the first rows of staves do not move during laying, a supporting strip of wood can be screwed temporarily to the subfloor along the working line (line B).

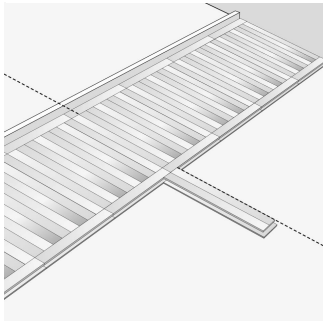
The first stringer (c) in the ladder pattern is glued down along the working line (butted against the supporting strip of wood) to the full length of the room.



11C. Ladder

The ladder steps are glued down at an angle of 90° to the stringer. It is very important to check that the steps are perpendicular to the stringer in order to achieve a good result.

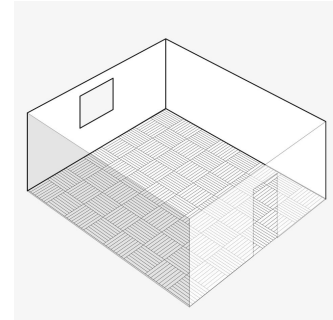
It is advisable to load the floor continuously during laying to ensure a good bond between staves and sub floor. Some contractors use packs of flooring or adhesive containers for this purpose.



11D. Ladder

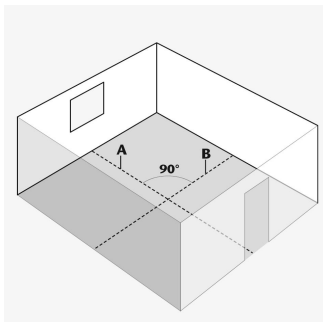
The steps on each side of the stringers must be laid directly opposite each other; you can secure this by marking with a string or chalk line.

12. LAYING INSTRUCTIONS SQUARE BASKET PATTERN



12A. Square basket

The two centre lines in the room (lines A and B) are marked with a chalk line or string at an angle of 90° to each other.

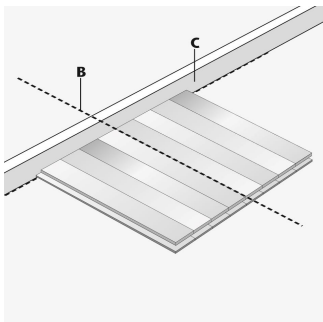


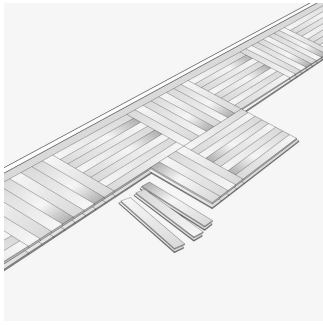
12B. Square basket

To make sure that the first squares do not move, a supporting strip of wood can be temporarily screwed to the subfloor (C).

The size of the square at the walls is measured starting from the centre line. You can either start with a whole or a half square from the centre line (shown here with a half square from the centre line B).

For best results the part squares at the walls should be larger than a half square.

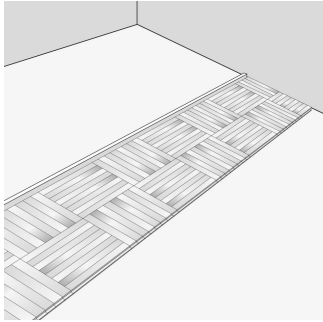




12C. Square basket

The staves are glued down in squares laying at an angle of 90° to each other. Alternate right and left staves.

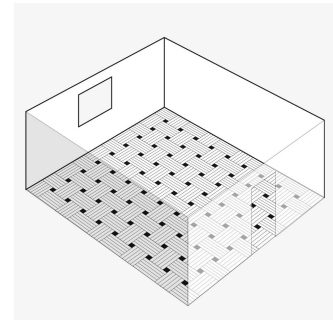
It is advisable to load the floor continuously during laying to ensure a good bond between staves and sub floor. Some contractors use packs of flooring or adhesive containers for this purpose.



12D. Square basket

The squares are laid through the entire room before the next row of squares is started.

13. LAYING INSTRUCTIONS ENGLISH PATTERN



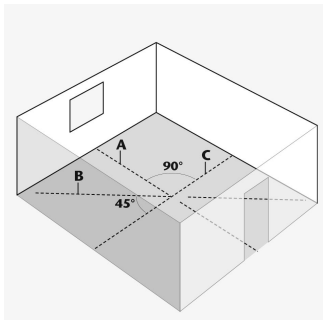
13A. English pattern

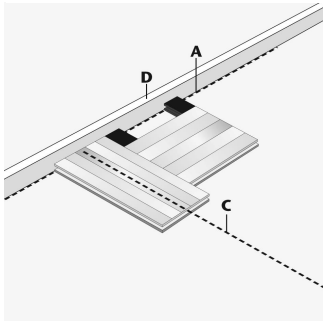
The floor can be laid at an angle of either 90° or 45° in the room (lines A and B, respectively).

The middle of the floor at the two end walls is marked by a string or chalk line (line A or line C).

In the following, the floor is shown laid at an angle of 90°.

The squares consist of 5 staves with 4 insert blocks.



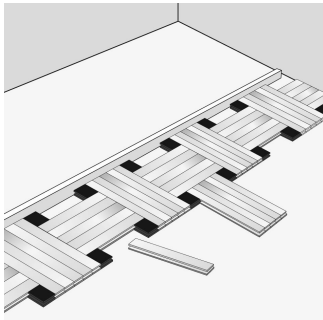


13B. English pattern

To make sure that the staves do not move, a supporting strip of wood (D) can be temporarily fixed along the working line (line A).

The size of the square at the walls is measured starting from the centre lines. You can either start with a whole or a half square from the centre line (here shown with a half square from the centre line and a whole square from A).

It is important that the staves are laid at an angle of 90° to the working line. Alternative staves of right and left staves.



13C. English pattern

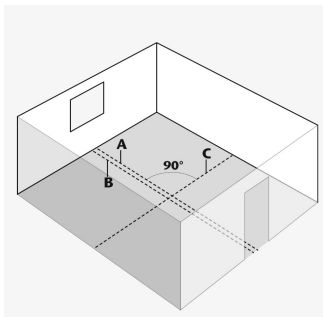
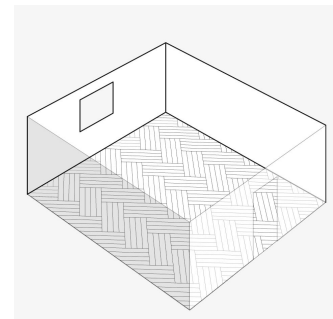
The starting row (the first row of squares with blocks) is laid through the entire room before the next row of squares is started.

During laying it is important to check that the squares are set out accurately.

The pattern blocks are delivered with groove on all sides. Loose tongues are used on sides where the blocks abut the groove side of the staves.

It is advisable to load the floor continuously during laying to ensure a good bond between staves and sub floor. Some contractors use packs of flooring or adhesive containers for this purpose.

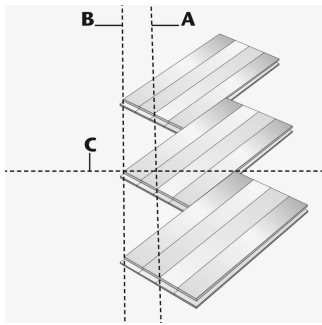
14. LAYING INSTRUCTIONS FOUR STRIP HERRINGBONE PATTERN



14A. 4-strip herringbone

The two centre lines in the room (lines A and C) are marked by a chalk line or string at an angle of 90° to each other.

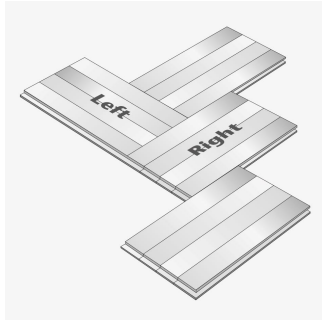
A working line is drawn by a string or chalk line 82 mm left of the marking (line B).



14B. 4-strip herringbone

The starting row (the first row in blocks of 4 staves) is laid down through the room. The corners of the staves must be in line with the working line (line B). Particularly at the starting row it is very important that the staves are 100% square. Line C can be used to check the angle by ensuring that the corners be in line with this (see figure).

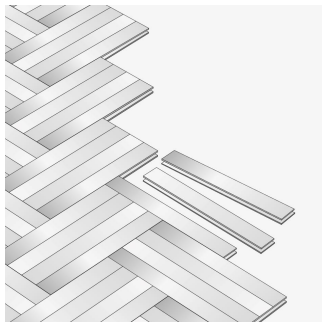
When the starting row has been laid it is recommended to leave the glue to dry over night, before the floor laying continues. Do not forget to remove excess glue from the floor.



14C. 4-strip herringbone

When the glue in the starting row is dry, laying can continue.

The staves are supplied in bundles marked with right and left staves. As the right and left staves are to be laid alternately, it is important to keep the staves separate until the installation begins.



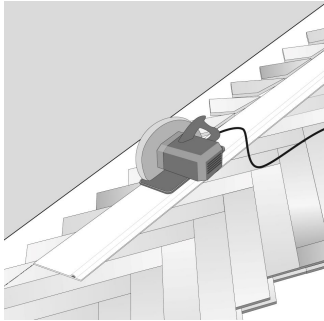
14D. 4-strip herringbone

During the laying process it is very important to make sure that the fields with 4 staves are at an angle of 90°.

It is advisable to load the floor continuously during laying to ensure a good bond between staves and sub floor. Some contractors use packs of flooring or adhesive containers for this purpose.

15. LAYING A BORDER

The floor can be beautifully framed with a border in the same wood species as the rest of the floor or in another wood species if you want more contrast. The description below is for a floor in herringbone pattern.



15A. Laying a border

If the floor is to be finished with a border at the walls, the floor is cut at the required distance from the wall corresponding to the desired width of the edging, eg 5 x the stave width + distance to the wall.

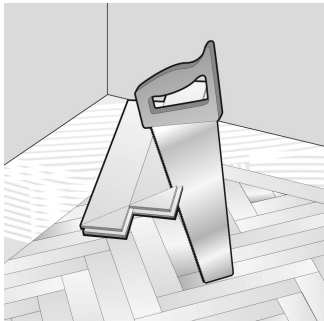
Example with stave width 58.3 mm where a 5 stave border is required: $5 \times 58.3 + 12 \text{ mm}$ to the wall = 303.5 mm.



15B. Laying a border

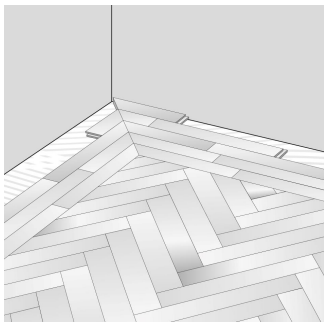
To be able to join the border to the main floor, a groove is cut in the floor edge with a router.

The groove must match the thickness of the tongue of the staves.



15C. Laying a border

Before being glued down, the border staves are cut to form a mitred corner and a groove is routed in the stave edges to enable a loose tongue to be fitted.



15D. Laying a border

Hereafter the staves are glued down to the edging.

It is advisable to load the floor continuously during laying to ensure a good bond between staves and sub floor. Some contractors use packs of flooring or adhesive containers for this purpose.

Before the skirting is fitted, the floor must be sanded and lacquered/oiled according to the section on surface treatment.

16. SURFACE TREATMENT OF SOLID SINGLE STAVE BLOCK FLOORS

A beautiful floor requires a strong and durable surface treatment. There are four alternative methods of surface treatment for a floor laid as stave parquet.

- Lacquer finish
- Oil finish
- Oiling + subsequent lacquering
- Oiling with Hardwax oil

The choice of surface treatment depends on the desired properties and appearance of the finished floor. See directions for and properties of the various options below.

Sanding and filling

Before the surface treatment is started, the floor is sanded and filled to achieve an even and smooth surface.

If the staves are glued down, sanding must be carried out no earlier than 24 hours after gluing.

Use Junckers Prefill til fill the floor.



BASEFILL
Oil-based filler

How to sand the floor

- Floors laid in a pattern are first sanded diagonally and then longitudinally in relation to the grain.
- The entire surface is sanded in the direction from which the light comes.
- Finishing sanding must be done with 120–150 grit paper or a rotary finishing sander with 120 grit sandpaper.
- After sanding, the floor is vacuumed thoroughly to remove dirt and dust, etc.

17. LAQUERING

A lacquer finish is chosen when a hardwearing surface with only a minimum of maintenance is required.

Priming of a lacquered floor

- Apply 1 coat of PreLak in an even layer.
- Sand at the earliest 2 hours later with grit 120-150 mounted on a polishing machine.
- Sanding dust is removed by vacuum cleaning and the floor is wiped with a well wrung out cloth.



PRELAK
Waterbased primer.

Make sure that the primer is applied in an even coat from the beginning. The primer must not be poured out but is to be applied in an even coat with a mohair roller.

If the primer is poured out, there is a risk of discolouring the wood. Oak is particularly sensitive because of a large content of tannin.

Finishing treatment of a primed floor

Depending on the anticipated traffic level on the floor, there are 2 alternative types of lacquer for finishing the floor. Both types of lacquer must be applied in an even coat using either a brush, a short haired mohair roller, or a lacquer applicator.

A) Residential and other low-traffic areas

- After priming, the floor is lacquered with 2 coats of ProFinish, coverage rate approx. 10 m²/l.
- Lacquering must take place with an interval of at least 4 hours between coats.
- ProFinish is available in 3 different gloss levels: Ultramatt, matt or silk matt.



PROFINISH
Residential and other low-traffic areas

B) High-traffic areas

- After priming, the floor is lacquered with 2 coats of HP Commercial, coverage rate approx. 10-12 m²/l.
- Lacquering must take place with an interval of at least 4 hours between coats.
- HP Commercial is available in 3 different gloss levels: Ultramatt, matt and silk matt.



HP COMMERCIAL
High-traffic areas

18. OIL FINISH

The oil finish is chosen when you want to enhance the depth of the colour in the wood.

An oiled floor must be retreated more frequently than a lacquered floor but, in return, it is possible to carry out partial repairs on the high-wear areas of the floor. This is difficult with lacquer where repairs are typically carried out by lacquering the entire floor.

Priming of untreated/sanded wood:

In small areas the oil is applied with a cloth, brush or roller. In larger areas the oil is applied by a roller, mop, or nylon pad mounted on a polishing machine.

Larger areas are recommended to be divided into smaller areas, which can be oiled in 30 minutes. Make sure that overlapping edges between the oiled areas do not dry out during treatment.

Moistening the surface prior to oiling is recommended. This improves saturation of the oil and provides a uniform appearance. Use a damp cloth and make sure that the floor is evenly and visibly wetted. Leave to dry until the surface no longer feels damp.

Apply 2 coats of Rustic Oil wet in wet:

- This is done by first applying one coat of oil.
- Wait up to 30 minutes and then apply the second coat.
- Make sure that the oil appears glossy/wet and spread the oil from wet to dry areas, where the oil has been absorbed.
- After 20-30 minutes of processing, and while the oil is still wet, buff the surface lightly with a white nylon pad.
- Finally, remove excess oil with a clean lint-free cloth. Be sure to wipe off all oil to obtain a uniform matt surface.
- Areas with not absorbed dried up oil will discolour the surface.
- Leave to dry for 16-24 hours, before applying the finishing coat of oil.

Finishing with Rustic Oil:

- Sand or scour the surface carefully with fine sandpaper grit 180-220 or a green or black nylon pad.
- Vacuum sanding dust.
- On floors, apply 1 coat of Rustic oil.
- Make sure that the surface is saturated and polish with a clean lint-free cloth until the floor feels dry.
- Oil not absorbed must be removed within 30 minutes after application.



RUSTIC OIL

When using oil, you can choose between clear and coloured oils.

19. OILING + SUBSEQUENT LACQUERING

This solution enhances the depth of the colour in the wood but with the durability and ease of care of lacquer.

Priming of an oiled floor

Follow the instructions in section 11. Priming of untreated/sanded wood.

Finishing with lacquer:

- It is very important that the floor surface is 100 % saturated with oil before lacquering. If not, there is a risk of discoloration.
- Especially about oak: The tannic acid content in this wood species needs extra attention. Therefore, a third layer of oil must be applied before lacquering. Method as described under Section 11 "Finishing with Rustic Oil".
- When the oil is dry, screen with a green pad.
- Vacuum sanding dust.
- Apply one coat of HP Commercial lacquer and leave to dry approx. 4 hours.
- Apply then the final coat of lacquer and leave to dry until fully cured.

After the finishing treatment, the lacquer will have hardened after 72 hours. You can start using the floor carefully after 24 hours.



HP COMMERCIAL

Two-component water-based lacquer
high traffic areas

20. OILING WITH PROFESSIONAL HARDWAX OIL

Professional Hardwax Oil provides a rich and saturated surface finish.

Maintenance is not required as frequently as for traditional oiling but more frequently than for lacquered surfaces.

- Apply Hardwax Oil in an even coat with a roller or brush.
- Remove surplus material using a buffing machine and a soft cloth or pad.
- After minimum 6 hours another coat of oil is applied and buffing is repeated.
- If the floor is not saturated after this treatment, then repeat.
- Lacquer cannot be applied on top of Professional Hardwax Oil.



PROFESSIONAL HARDWAX OIL

Provides a rich and saturated surface
finish