



Whalebone

Engineered - Installation Guide

HØRNING Engineered Whalebone is available with 4/6 mm wear layer.

Available in a selection of prefinished colours in oil or lacquer, or can be supplied unfinished.

Highlighted Features:

- An exclusive large scale format for spacious interiors
- An exceptionally durable solid wooden floor, crafted to last for generations
- Documented sustainability credentials towards certifications such as BREEAM, DGNB, and LEED through EPDs and Eurofins

If you have any questions or need advice, please don't hesitate to contact us.

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1. Receipt of Goods & Quality Control

Conduct a thorough inspection of the received flooring and any accessories. Check the goods for defects and deficiencies before signing the delivery note.

Upon delivery, the building must be enclosed, dry, and heated. The indoor climate must be within the applicable tolerances. The products must be brought inside immediately and must not be stored outside under any circumstances.

The flooring should be acclimatised in the room where it will be installed. Any claims for visible defects must always be made in writing before installation, but no later than 8 days after receipt. *An installed floor is considered an approved floor.*

2. Preparation

The temperature in the rooms must be consistently between **18-24°C** and the relative humidity always between **35-65%** both before, during, and after installation. Low humidity, i.e., 35% RH or lower, increases the risk of cracks in the wooden floors, which is not covered by the warranty.

The building must be closed, heating systems installed and operating. The residual moisture in the concrete subfloor must be a maximum of 85% and a maximum of 65% with underfloor heating. All work that can add moisture to the building must be completed before the installation of wooden floors begins, e.g., masonry and painting work.

Wooden floors and any adhesive must be acclimatised in unopened packaging in the rooms where they will be installed for **2-3 days** or until the floors' temperature matches the room temperature, which may take longer than 72 hours.

If the work continues over several days, any opened packages must be sealed during extended breaks so they are sealed until the work resumes.

3. Underfloor Heating

Most underfloor heating systems today are of a type that can be used with wooden floors. The system must ensure an even temperature on the floor surface. Heating pipes must not be in direct contact with the wooden floor. The system must be pressure tested and regulated, the hose distribution in all areas must be checked, and thermostats must be functioning. The supply must be automatically controlled and have a safeguard to ensure the supply temperature is not exceeded.

Underfloor heating systems in concrete floors must have been operational for at least 2 weeks before installing the wooden floor with a supply temperature of a maximum of 25 degrees.

NB: The supply temperature must be reduced to a maximum of 20 degrees at least 2 days before installation begins. Underfloor heating systems in dry underfloor heating plates can be started after the wooden floor is installed.

The underfloor heating system must be started slowly to avoid damaging the wooden floor. The supply temperature should be gradually increased no earlier than 72 hours after the wooden floor installation is completed and in a manner that increases the temperature by 1-2 degrees per day. During the first week, the supply temperature must not exceed 25 degrees. Subsequently, the supply temperature can be increased by up to 5 degrees every second or third day until the desired surface temperature is reached.

The room temperature must be 18-24 degrees both before, during, and after installation. The surface temperature of the floor must never exceed 27 degrees - not even under carpets or furniture. Higher temperatures increase the risk of damage to the wooden floor due to greater movements in the wood in the form of shrinkage and expansion, which is not covered by the warranty.

NB: Wood species such as maple, beech, birch, jatoba, and wenge may react to underfloor heating with more significant movements than other wood species, which can lead to increased cracks both in and between the individual floor components, which are natural and therefore not covered by the warranty.

4. Acoustics & Sound Absorption

Impact sound acoustics can be improved by using HØRNING Acoustic Underlay on the subfloor. HØRNING Acoustic Underlay is fully glued to the subfloor with the same adhesive used for glueing the floor. Use the correct adhesive trowel depending on residual moisture. The adhesive under the acoustic underlay must cure for at least 48 hours before the floor is fully glued to the surface of the acoustic underlay. HØRNING Acoustic Underlay is a specially developed product for installation under fully glued wooden floors.

NB: HØRNING Acoustic Underlay is not a moisture barrier.

5. Shrinkage & Expansion

The moisture content in wooden floors will always seek to balance with the relative humidity (RH) and temperature of the air. The wood absorbs and releases moisture with changes in relative humidity. This occurs in all wooden floors, but the movement of the wooden floor in the form of shrinkage and expansion depends on the product type, wood species, thickness, and surface treatment.

In practice, it is often necessary to know how much a floorboard or an entire floor shrinks or expands. Due to the cross-laminated construction, movement in engineered wood flooring will typically be between 0.05-0.1% for each percentage change in the wood's moisture content.

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6. Cast Subfloor

Cast subfloors, including concrete and anhydrate, must be clean, dry, solid, level, and adhesive. To test the subfloor's solidity, scratch and pull tests can be performed. Hørning recommends conducting an adhesion test in the form of a pull test, which should show a durability of at least 1.5 MPA. Refer to DS/EN 13813.

Use a 2-meter straightedge and thoroughly check the entire area. If there are uneven spots of more than ± 2 mm, these must be corrected.

Documentable measurements must be taken before installation. As there will be a $\pm$ tolerance in moisture measurements in practice, it is recommended to start the installation when the residual moisture is 3-5% below the values indicated below.

The residual moisture in the concrete subfloor must be a maximum of 85%, and a maximum of 65% with underfloor heating. The subfloor must be moisture proof, and rising or penetrating moisture must be prevented. Always use HØRNING Moisture Barrier.

7. Panel Subfloor / Installation on Joists

HØRNING Engineered Whalebone cannot be installed directly on joists.

The maximum joist spacing is 600 mm – or 450 mm for end grain flooring and end grain mosaic – when using a panel subfloor. The panels must be joined over the joists, not between them.

Different types of panel floors can be used, but they do not all have the same stability and tensile strength. Two layers are stronger and more stable than one layer. When installing panels in multiple layers, the joints in the layers must be staggered. The panels must be glued in tongue and groove. Plywood is stronger and more stable than chipboard.

The panel floor must be at least the same thickness as the wooden floor – however, the minimum thickness for waterproof (WBP) plywood is 18 mm or chipboard 22 mm. **Follow the panel supplier's installation guide.**

Joist systems made of other materials such as aluminium or synthetic material must meet the same requirements for strength, solidity, levelness, and adhesion as wood-based joist systems as described in this document.

Combined joist systems such as RAF-raised access floor system must, as a combined solution, meet the same requirements for strength, solidity, levelness, and adhesion as wood-based joist systems as described in this document.

When fastening the combined joist systems to the subfloor, the requirements for the subfloor's solidity and adhesion must be met. This also applies to raised access floor system (RAF system). Follow the subfloor supplier's installation instructions.

To prevent moisture damage to panel subfloors with wood blocks, a moisture barrier must always be installed on ground slabs and cast concrete floors to protect against residual construction moisture.

8. Installation Direction

Wooden floors are usually installed in the same direction as the window light enters the room (i.e., **perpendicular** to the window). In long narrow rooms, the rows should be installed in the length direction of the room. The floor looks best if the strips are installed symmetrically on the floor. Therefore, measure the floor before installation so that the adjustment pieces at the walls are even.

9. Starting

It can be advantageous to fasten a stop strip to the subfloor, installed perpendicular to the walls, so that the rows do not shift in the wet adhesive during installation.

Mix wood flooring from several packages to give the floor a harmonious appearance. Open 3-4 packages, check the boards for any damage and defects. Do not open more packages than can be installed in 1-2 hours, as any moisture absorption can make installation difficult.

Cut door frames so the planks can go under them.

10. Gluing

It is recommended that the wooden floor be fully glued.

The strips are pressed down into the wet adhesive and pushed slightly together, without adhesive coming up between the rows, as this can cause uneven cracking, as the rows' ability to move individually is hindered. Adhesive should not be applied to larger areas than can be installed within approximately 20 minutes. Do not glue in the tongue and groove.

Always use HØRNING Moisture Barrier when fully gluing on cement-based substrates.

For fully glued wooden floors, gluing should be done with HØRNING MS Flexlim III ECO on subfloors with residual construction moisture up to 85% RH without underfloor heating and 75% with underfloor heating. Alternatively, use a similar adhesive type that meets the specified requirements.

NB: HØRNING MS Flexlim III ECO is not a moisture barrier!

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Table of Recommended Quantities:

Product Type	Max. Moisture in subfloor	Underfloor Heating	Min. Applied Litres Per m²	Notched Trowel
Solid Wood Parquet Flooring	Up to 85%	No	0.8 Litres/m²	5
Solid Wood Parquet Flooring	Up to 65%	Yes	0.6-0.8 Litres/m²	5
All Other Solid Wood Parquet Flooring + Engineered Plank	Up to 85%	No	1.0 Litres/m²	6
All Other Solid Wood Parquet Flooring + Engineered	Up to 65%	Yes	0.6-0.8 Litres/m²	5

If adhesive gets on the surface, remove the wet adhesive immediately. Ensure all adhesive is removed so that no adhesive film is visible afterwards.

The trowel must always be held at a 45-degree angle during application. The adhesive must form a full-coverage film when the wooden floor is pressed down. Insufficient adhesive will result in the wooden floor not being adequately secured and moisture from the subfloor may rise unintentionally. Place sandbags or weigh down with other heavy objects on pressure distributing planks/boards (especially along the edges) until adhesive has cured. The floor must not be walked on during the adhesive curing process, i.e., loading must only take place 48 hours after installation.

11. Screwing & Nailing

If a solution is desired that allows the floors to be dismantled and **reused**, the wooden floor can be screwed into the subfloor of sufficient thickness to ensure adequate holding strength – however, minimum 20 mm plywood.
Follow the panel supplier’s installation guide.

Screwing must be done using suitable floor screws with partial threads with a minimum length of 2 times the thickness of the wooden floor. See the table below. Screwing can be done vertically or concealed.

When screwing hardwood floors such as oak and ash, as well as exotic hardwoods, pre-drilling is required using a drill bit with a diameter of 70–80% of the screw’s outer thread diameter.

When screwing from above into solid oak or ash planks of 20–22 mm, the pilot hole depth must be 7–8 mm. For planks of 23–30 mm, the pilot hole depth must be 10 mm.

When screwing into chipboard subfloors, the screws must be long enough to penetrate through the underside of the chipboard. Nails and staples must not be used on chipboard, as the risk of creaking and insufficient adhesion is high.

For choice of screws and nails, refer to point 15.

12. Joints, Distance to Walls, etc.

There should normally be a minimum distance of 10 mm between wooden floors and walls, pipes, stairs, fixed installations, etc. Use spacers and leave them in place until the adhesive is completely dry. The rule for calculating the expansion joint is 1.5 mm per meter width of the floor, but always a minimum of 10 mm.

Wooden floors expand and contract depending on the room’s climate. In some cases, an expansion joint is necessary. This applies, among other things, to:

- Where there are expansion joints in the subfloor.
- At fixed door frames and walls in cases where the floor is installed through several rooms – 20 mm joint.
- In areas with climatic variations on the floor surface, e.g., if there is only underfloor heating in part of the area.

Some projects may require specific distance specifications. Contact Hørning for more information.

Expansion joints and gaps are filled with a permanently elastic material, such as HØRNING cork strips, sealant, or by using a special profile. Always follow the manufacturer’s instructions.

13. Sanding

HØRNING Engineered Whalebone is typically delivered with surface treatment. If the product is delivered untreated, follow the instructions below.

Before sanding begins, the building must be enclosed, dry, and heated.

Remove the spacers when the adhesive has cured.

Sanding of untreated fully glued floors can begin no earlier than 2-4 days – in some cases up to 7 days after installation, depending on the room’s climatic conditions and the adhesive curing time.

NB: If the untreated floor is not surface-treated without undue delay, it must be covered with suitable floor paper. The covering must be vacuumed before removal.

Always finish with a minimum of grit 120. Always use suitable and well-maintained equipment.

Always deliver the floor flat and even without noticeable transitions between strips/planks. The sanded floor should appear without visible sanding marks or transitions between surfaces and edges/corners.

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14. After Installation

Surface treatment must be carried out without undue delay after sanding. An untreated floor will always be at risk of reacting to the climatic surroundings as long as the surface is not sealed.

Surface treatment of the floors after installation is carried out according to the manufacturer's instructions, and it must be ensured that the oil or lacquer is completely cured before the floor is covered or walked on. Always protect the floor carefully with floor paper or other suitable material. Should further construction take place after installation and surface treatment, the floor must be thoroughly protected from dirt and pressure marks.

Hørning recommends that pre-oiled floors from factory are always re-treated with maintenance oil for the best result. However, this does not apply to UV-oiled floors. As the oil cures upon contact with air, the surface must not be washed or exposed to water for at least 14 days after installation/latest oiling. Always use small amounts of water!

Lacquered floors are washed with a neutral non-maintenance detergent. That is, a pH value of 7-9 in diluted form. It is advantageous to use a well-wrung cloth, preferably of the microfiber type, to minimise the chance of overdosing water, which always damages a wooden floor.

Always clean the floor thoroughly before use.

Extend Lifespan

To maintain a nice surface and minimise the need for maintenance, underlays should be placed under office chairs. All chair and table legs, as well as other objects that can scratch or mark the surface, should be fitted with felt pads and rubber wheels. Remember to regularly inspect and clean the felt pads and replace them if they become worn. Be aware that latex-containing pads, mat backs, and black rubber wheels can discolour the surface of the wooden floor. Avoid any form of soiling. Use mats at entrance doors, etc. Vacuum and clean the floor regularly after use.

The installation guide is based on many years of experience and accommodates the most normal conditions in most building constructions.

Hørning assumes no legal responsibility in connection with this advisory information. If you are unsure how to install the floor, contact Hørning.

Always ensure compliance with local standards.

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FSC® and/or PEFC available upon request.
Eurofins Indoor Air Comfort Gold certified.
EPD available upon request for selected products.

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15. Dimensions of Screws & Nails

Minimum dimensions for screws, lost head nails and nails when fixing Engineered Whalebone flooring to subfloors.
Chipboard subfloors must always be fixed using screws. Hardwood must be pre-drilled.

Floor Type				Floor Thickness				
Solid Douglas / Pine	Subfloor	Note	Fixings	14-16 mm	20-22 mm	23-25 mm	28-30 mm	32-35 mm
	Joists/Battens		Screws - concealed ¹	-	4.2 x 45 mm	4.2 x 55 mm	4.2 x 75 mm	4.2 x 75 mm
			Screws - from above	-	-	-	5.0 x 60 mm	5.0 x 60 mm
			T-nails	-	1.6 x 63 mm	-	-	-
			Ring-shanked machine nails	-	2.1 x 50 mm	2.8 x 63 mm	2.8 x 63 mm	2.8 x 75 mm
	Panel Subfloor	Plywood, chipboard, and timber boards	Screws - concealed ¹	4.2 x 35 mm	4.2 x 45 mm	4.2 x 55 mm	4.2 x 75 mm	4.2 x 75 mm
		Plywood, chipboard, and timber boards	Screws - from above	-	-	-	5.0 x 40 mm	5.0 x 40 mm
		Not for chipboard	T-nails	1.6 x 45 mm	1.6 x 63 mm	-	-	-
		Not for chipboard	Ring-shanked machine nails	2.1 x 40 mm	2.1 x 50 mm	2.8 x 63 mm	2.8 x 63 mm	2.8 x 75 mm
Solid Oak / Ash	Subfloors	Note	Fixings	14-16 mm	20-22 mm	23-25 mm	28-30 mm	32-35 mm
	Joists/Battens	Not for chevron or whalebone	Screws - concealed ¹	-	4.2 x 45 mm	4.2 x 55 mm	4.2 x 75 mm	4.2 x 75 mm
		Not for chevron or whalebone	Screws - from above	-	-	5.0 x 60 mm	5.0 x 60 mm	-
		Not for chevron or whalebone	T-nails	-	1.6 x 63 mm	-	-	-
		Not for chevron or whalebone	Ring-shanked machine nails	-	2.2 x 45 mm	-	-	-
	Panel Subfloor	Plywood, chipboard, and timber boards	Screws - concealed ¹	-	4.2 x 45 mm	4.2 x 55 mm	4.2 x 75 mm	4.2 x 75 mm
		Plywood, chipboard, and timber boards	Screws - from above	-	-	5.0 x 40 mm	5.0 x 40 mm	-
		Not for chipboard	T-nails	-	1.6 x 63 mm	-	-	-
		Not for chipboard	Ring-shanked machine nails	-	2.1 x 50 mm	-	-	-
Engineered Castleplank	Subfloors	Note	Fixings	14-16 mm	20-22 mm	23-25 mm	28-30 mm	32-35 mm
	Joists/Battens	Not for chevron or whalebone	Screws - concealed ¹	-	4.2 x 45 mm	-	-	-
		Not for chevron or whalebone	Staple ²	-	12 x 50 mm	-	-	-
		Not for chevron or whalebone	Ring-shanked machine nails	-	2.1 x 50 mm	-	-	-
	Panel Subfloor	Plywood, chipboard, and timber boards	Screws - concealed ¹	-	4.2 x 45 mm	-	-	-
		Not for chipboard	Staple ²	10 x 45 mm	12 x 50 mm	-	-	-
		Not for chipboard	Ring-shanked machine nails	-	2.1 x 50 mm	-	-	-

1. For concealed fixing, screws of flexible type or flooring profile screws are recommended.
2. Strips applied with adhesive.

Follow the panel supplier’s installation guide.