HØRNING
FLOORS FOR GENERATIONS

End Grain Mosaic

Installation Guide

Beautiful, resistant, and easy to install.

HØRNING End Grain Mosaic consists of small, square blocks that are cut against the grain.

This results in an extremely durable floor, particularly recommended for high traffic areas.

Upon delivery, the end grain mosaic has already been laid in cube patterns, glued onto a mesh. This makes for simple, effective fitting.

Highlighted Features:

- A *Wholehearted* pledge to use the remains of the log, reducing waste in the production
- A simplified installation compared to traditional End Grain Mosaicing
- 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 most 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.*

NB: As the surface of end grain mosaic is cross-cut timber, it readily absorbs moisture from the air or from floor cleaning. Therefore, direct exposure to moisture should be avoided. The surface must be saturated with a suitable oil before any form of cleaning. Cleaning must only be carried out using a well-wrung mop.

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

End grain flooring moves in both longitudinal and transverse directions and must be allowed to move "within its own position" during use throughout the various seasons, as buildings are subject to fluctuations in temperature and relative humidity.

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. Because end grain flooring consists of cross-cut timber, the orientation of the growth rings is visible. The magnitude and direction of movement will vary depending on whether the grain orientation of the individual block is tangential or radial.

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As a realistic average for a range of end grain flooring for oak, larch, and pine, a practical average value of 2.2 mm per metre can be applied in the **tangential grain direction** for each 1% change in the wood's moisture content. In the **radial grain direction**, the dimensional change is approximately half of this value.

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.

NB: Gluing of wood blocks to cast subfloors requires particular attention, as the pretreatment of cast subfloors is demanding, and there is a risk of adhesion failure, since concrete floors – especially the upper wear layer – are often more porous. Responsibility for correctly executed cast subfloors lies solely with the contractor.

After correct and documented drying, the surface must be machine-sanded so it is free from laitance, burrs and irregularities. The surface is then primed to improve adhesion. When the primer has dried, the blocks can be installed.

When using porous, self-levelling compounds, such as anhydrite, the strength must be sufficient for fully gluing of the blocks, and the surface must be free of loose material and thoroughly primed to ensure adequate adhesion. Underlying concrete layers must be dry so that moisture does not migrate upwards through the levelling compound and cause moisture damage in the end grain mosaic.

Where there is a risk of rising damp, e.g. on ground-bearing slabs, installation of block mosaic should be avoided unless the moisture barrier is selected and executed according to the instructions of a moisture specialist and the adhesive/primer supplier.

Hørning recommends conducting an adhesion test in the form of a pull test, which should show a durability of at least 2.0 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 +/- 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 End Grain Mosaic 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.**

When installing on floating, water-resistant plywood, the total thickness of the wood panels must be twice the thickness of the wooden floor. The plywood must be glued in tongue and groove.

When using a double-layer panel floor, the joints must be staggered. The two layers of plywood panels must be screwed together using suitable wood screws in a 50 × 50 cm grid pattern. The complete wood-panel construction must be able to withstand a tensile strength of at least 2.0 MPA.

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, a moisture barrier must always be installed on ground slabs and cast concrete floors to protect against residual construction moisture.

8. Installation Direction

Floor types such as strips and mosaic parquet achieve the most harmonious appearance when the installation begins from the centre of the room. Measure the floor area and determine the number of full sheets/units in each direction. The remaining length is divided in two to determine the size of the adjustment pieces.

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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 sheets from several packages to give the floor a harmonious appearance.
NB: Open only one package at a time.

Cut door frames so the parquet can go under them.

10. Gluing

The wooden floor must be fully glued. It is recommended that the wooden floor be fully glued onto a panel subfloor.

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

Table of Recommended Qualities:

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. 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.

12. Filling

All untreated products without tongue and groove must be filled with HØRNING MASTIC E850.

13. Sanding

HØRNING End Grain Mosaic is delivered untreated.

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

Remove the spacers when the adhesive has cured.

Sanding should begin immediately after the adhesive curing time has been reached, or after the screwing is completed, so that surface treatment can be carried out without unnecessary delay.

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 factory-oiled floors 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.