



HAVWOODS
INTERNATIONAL

Havwoods Installation Guide: Nailed/Screwed Down Installations

These guidelines are designed to complement the current British Standard BS8201 or the relevant standards in the country of installation.

Safety must be paramount on every installation. All electrical equipment must be PAT tested and labelled and all cutting tools such as jigsaws, circular and bench saws must have guards fitted and cutting must be carried out on a suitable bench. You must also wear suitable work wear and remove or make safe any loose items such as jewellery. Safety is your responsibility.

The installer must be suitably trained and knowledgeable with wood flooring installations.

Engineered wood flooring can be installed as a floating floor, fully bonded or nailed/screwed down. This document covers nailed/screwed down installation. The following topics are covered by this document, for further information or for advice on any subject not covered here, please contact Havwoods:

Environmental Conditions

Subfloor Preparation

Installation

Underfloor Heating

HVAC heating/climate control

Floor Protection

N.B The final responsibility for the installation lies with the installer. It is the duty of the installer to inspect materials prior to installation and notify Havwoods of any potential material defects prior to installation. Installed materials are deemed to have been accepted.

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ENVIRONMENTAL CONDITIONS

The building must be watertight with all windows and doors fitted and all wet trades complete before taking delivery of materials and before any wood flooring installation can take place.

Always check the ambient room temperature and humidity which should be maintained at a constant level, between 18°C (64°F) and 22°C (72°F) with a relative humidity, between 45% - 65%RH prior to, during and for the whole life of the wood flooring. Try to avoid extremes of low or high temperatures as this will negatively affect the stability of the wood flooring.

Acclimatise the wood flooring in the room where the wood is to be fitted for at least 72 hours prior to the installation. The timber material should be maintained in their original packaging in this period. Only remove the materials from their packaging just before installation. The wood should be stored out of direct sunlight, away from walls and radiators and on battens fully supporting the wood to prevent a build of heat on the bottom boards.

Acclimatising is used to balance the wood flooring with the environment in the installation area.

If the temperature of the wood is at an equilibrium balance (the same as the room) and the moisture level of the wood is 8%(±2%) then you can assume that the timber does not require any further acclimatisation.

Keep the room temperature constant by using the heating set at minimum 15°C (59°F) or if there are problems with the permanent heating other forms of heating such as convector heaters can be used.

Do not use gas-type heaters as these will generate extra moisture in the air.

Infra-red type heaters do not generally warm the fabric of the room or the wood, they tend to only warm the person or item close to the heater.

Low humidity can cause the wood to shrink and high level to cause expansion. Common causes of low humidity are using the heating at too high temperature, open fires and wood burners. High humidity is commonly caused by poor ventilation.

We recommend using a Digital Gauge, which can be purchased through Havwoods, to monitor the humidity and temperature level that can be easily adjusted by either placing moisture in the room (plants that are watered regularly or receptacles of water) or ventilating the room to reduce high levels of humidity. A humidifier/de-humidifier can also be used to control the atmosphere.

As a general rule, rooms/areas should be adequately ventilated to prevent a build of moisture in the environment. Care must also be given to rooms that are only heated when in use and with the heating switched fully off at other times. This can cause a build-up of humidity if the room is closed and not ventilated immediately after usage. The build of humidity / moisture will generally increase the moisture level of the wood flooring. The next time the room is used, the heating can dry out the moisture in the surface of the wood, causing cupping.

Wood will naturally change in size during seasonal variations in temperature and humidity.

During summer the humidity is generally at its highest level, hence the wood joints should be reasonably tight together. During the winter, when heating is commonly used, the humidity levels are generally lower and will produce small gaps between the joints.

This occurrence is not a manufacturing or installation fault.

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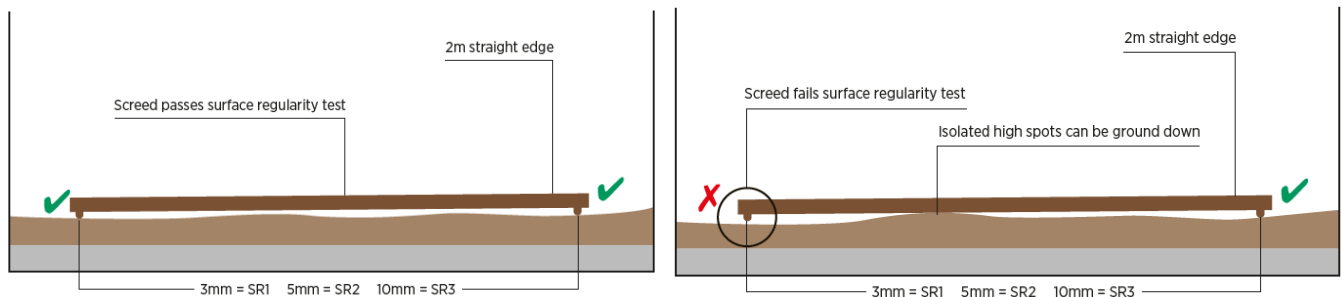
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SUBFLOOR PREPARATION

The subfloor must be sound, dry, free from contamination and flat to British Standard SR1 tolerance: maximum 3mm of level variance under a 2m long straight edge, at any point across the subfloor.

Where a wooden floor is to be fixed directly to bearers with nails or screws, the level should be assessed by placing a 2m straight edge or level across and along bearers to assess levels. Please consult Havwoods if there is any question relating to substrate suitability.



Screeded Substrates

Cementitious (sand and cement) / Calcium Sulphate (Anhydrite):

The subfloor must be sound with no friable areas, free of laitance and dry. The moisture content of solid sub-floors must be checked in accordance with British Standards Annex A.

Solid sub-floors can be overlaid with plywood of at least 18mm for nailed installations. All plywood should be fixed with screws and plugs at maximum 200mm centres. Plywood can also be fully bonded.

The sub-floor must be measured for moisture content. This is carried out using a Hygrometer set on top of the screed or by inserting a sleeve into the screed.

For screed substrates, the moisture reading must be less than 75% Relative Humidity (RH).

Where there is a cementitious substrate, if the reading is above 75% RH and below 95% RH, we recommend using the Marldon MXS 140 two-part epoxy damp proof membrane (DPM). The DPM must be applied in accordance with the manufacturer's instructions. Marldon MXS 140 DPM (or any other epoxy DPM) cannot be used on anhydrite-type screeds.

Do not drill and screw through a liquid membrane.

Timber Substrates

The timber sub-floor and/or bearers must be sound, tested for vertical movement (which should be less than 5mm) and dry, tested using a spike-type meter. The moisture content of the subfloor should be less than 14% and within $\pm 2\%$ of the wood floor being installed.

All suspended wood floors must have suitable through ventilation normally delivered by air bricks in the outside walls.

Any wood sub-floor that has a higher moisture level than 14% should be investigated. They must also be free of infestations such as wood-rotting fungi and wood boring insects.

Note: We recommend using an asphalt impregnated paper on wood and solid sub-floors, to reduce/prevent residual moisture affecting the wood flooring.

Unsuitable Substrates

A nailed/screwed floor must be fixed into suitable structural bearers or a plywood/chipboard layer of 18mm+ thickness. Generally, other substrates are unsuitable for this installation type.

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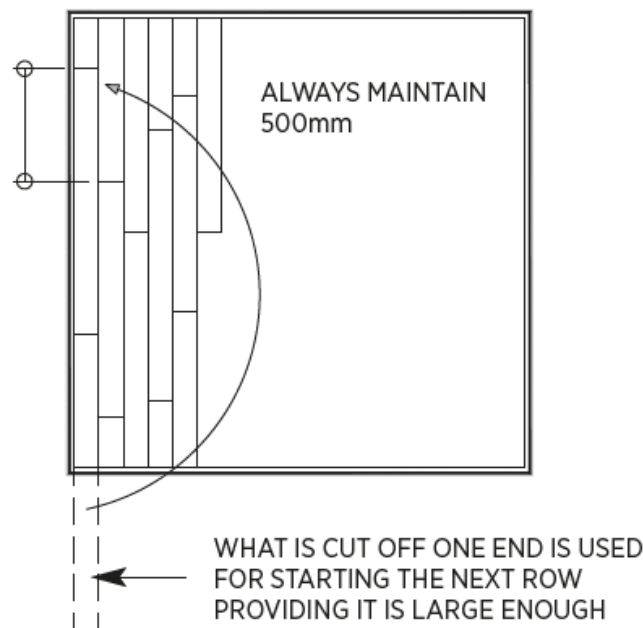
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INSTALLATION

Plank format flooring is designed to be installed in a randomly staggered pattern where the off-cut from the end of the previous row is used to start the following row, provided its length is equal to at least half the width of the plank. If another pattern is required for the project, then Havwoods must be consulted prior to order of the materials.



In order to achieve a harmonious blend of tones throughout the floor, material should be taken from several packs and mixed during the installation. Working from 3-4 packs at a time creates a blend of tones from the variation in the raw material. Colour variety is inherent to all wooden floors and is a key feature in the choice of real wood material for any interior scheme.

It is also important to keep the atmosphere constant during and for at least 24 hours after the installation (particularly overnight) when temperatures can drop causing variations in the atmosphere and may not allow the glue to cure effectively in glued T&G installations.

Always create an unfilled expansion gap of a minimum 12mm on areas of less than 25 m² and a minimum of 15mm on larger areas.

Areas in excess of 10 linear meters x 8m width of the boards may require extra expansion between the boards and intermediate expansion in the length. Expansion gaps can be covered using a skirting board or beading/scotia.

Threshold profiles should be installed in all doorways, arches or narrow sections that lead from one room/area to the next. Perimeter details which do not allow for a skirting or scotia must have a threshold detail which covers the expansion gap.

These thresholds must allow for the required expansion and contraction. Door frames and architraves can be undercut to allow the wood to slide underneath, still allowing for the expansion.

Note: Never undercut newel posts as these are structural sections of the stairs.

Specific to Timber Subfloors

Use suitable tongue screws rather than nails when fixing to chipboard or OSB substrates.

The sub-floor should be a minimum of 18mm thick and of a suitable density to hold a 50mm floor nail when fired at 45°. Nails should be at least 2 1/2 times the thickness of the wood flooring. Care should be taken with underfloor services.

As a guide, a 50mm nail driven into an 18mm thick board at 45° into an 18mm thick sub-floor would penetrate below the board by approximately 2mm.

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The wood flooring should be nailed along the plank length at spacing of 200mm to 250mm and not within 50mm of the end of each board in order to avoid splitting the tongues.

Note: Mechanical nail guns can and do tighten the boards together. If you are installing areas that require intermediate expansion or to ensure the boards are not over-tight together, we suggest using a pneumatic nail gun as these do not normally apply sideways pressure when the nail is driven in.

Nailing to Timber Bearers (Joists and Battens)

Only products of a minimum 18mm thickness are classed as structural and may be fixed directly to bearers.

The bearers should be structurally sound and free from any disease, insect infestation or, rot. The bearers must conform to BS 8201 and have a moisture content not exceeding 14%. The distance/spacing between battens and joist will be partly determined by the wood flooring being fitted and the intended loads that are expected. Heavy loading may require a thicker board and or overlay the bearers with a suitable plywood.

Header joins which span between joists and battens can be made, providing the boards on either side of the join are fully spanning the bearers. Ideally, fit another bearer under the header join. Header joins should be a minimum of 300mm apart on adjoining boards.

Note: on large areas we recommend starting in the middle of the area and fitting a false tongue when reversing the boards in the opposite direction. This evens out the movement of the boards.

For detailed installation advice and training on best practices, Havwoods Academy training courses are available. Please contact Havwoods for further information.

UNDERFLOOR HEATING (UFH)

We do not generally advise installing using a nailed or screwed method over underfloor heating. When installing over UFH, use a fully bonded installation method or choose a product with a click system locking profile for a floated installation.

COMMISSIONING & USAGE of HEATING, VENTILATION and AIR CONDITIONING (HVAC) SYSTEMS

This relates specifically to the transition from construction-phase environmental conditions to normal operating conditions where Havwoods timber floors are to be installed.

The concern relating to this project type is detailed in the expected Equilibrium Moisture Content (EMC) in the timber material as dictated by its environment:

Construction-Phase Environment Example

Temperature: 15°C

Ambient Relative Humidity (RH): 60%

EMC: 11.14%

Operational Environment Example

Temperature: 21°C

Ambient RH: 35%

EMC: 6.95%

Under the example transition above, the timber flooring will lose over 4% of moisture content once the environmental control system is brought into operation. This equates to ~1% of dimensional contraction (typical 0.22% dimensional change per 1% change in EMC). If this transition is made too quickly, the timber will be subjected to a high level of stress and this can result in surface cracking, gaps between timber elements, distortion of timber elements and other undesired actions.

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Because of this, there is a requirement to bring the heating/ac system into operation slowly in order to allow staged-adaptation of the timber to the environment. This should be done as follows:

- Environmental conditions measured and recorded, and the temperature of the system set to that which is present in the environment at that time.
- The system should be allowed to operate at this temperature for at least 24 hours. RH should be monitored and recorded in the environment in this time.
- No more than 2°C increase in the system per 24-hour period with recordings to be made of RH.
- System brought up to operating temperature with each stage recorded and documented over several days with RH to also be recorded.
- An environmental measure should be in place (such as a LogTag temperature and humidity device) to monitor RH and provide an alert when RH levels fall below 35% so that plants or other moisture sources may be introduced.

The optimum performance of the timber flooring will remain between 40-60% RH and between 18-22°C due to the 8% ($\pm 2\%$) moisture content at the time of manufacture. The above process is designed to prevent failure of the timber flooring under sudden exposure to altered environmental conditions. BS8201:2011 states that acceptable seasonal gapping can be expected.

Requirements for temporary heating, during the installation at construction phase, in colder months to be operational 24 hours a day remain. All efforts should be made to achieve temperatures of 18°C at the time of timber flooring installation and until the project completion. If RH levels are found to be above 65% at the time of installation, works should be postponed until ventilation and/or dehumidifiers have been introduced in order to provide suitable installation conditions.

FLOOR PROTECTION

When Havwoods floors are installed in a construction environment, they should be adequately protected in order to prevent damage from any following trades.

Havwoods recommend that a layer of building paper or another suitable breathable membrane is first installed prior to an impact protection layer. The building paper should be installed over the whole floor area and overlapped at joins before being taped on the surface, ensuring not to tape the protection to the wood floor surface. An impact protection layer of fire-retardant hardboard can then be installed over the building paper, leaving the hardboard 50-100mm short of the perimeter to allow ventilation of moisture.

Caution should be taken if using corrugated plastic floor protection (i.e. Corex) because this is non-permeable to moisture and can cause construction moisture to be trapped in the timber, leading to excessive expansion or telegraphing of the floor surface. If this type of protection must be used, always install a layer of overlapped building paper (or another suitable breathable layer) first and ensure Corex is not left on the floor for any extended period.

Any floor protection should be lifted regularly, ideally every 2-3 weeks, to allow ventilation to the floor on projects with elongated periods between flooring installation and project completion.

Never tape flooring protection directly to the flooring surface because tape adhesive can cause irreparable damage to the floor finish. Overlap paper layer and tape sheets to one another and/or walls and tape impact protection to the paper layer.

Never run underfloor heating systems while floor protection is in place because the protection layers can trap moisture or generate elevated surface temperatures, potentially leading to problems such as excessive expansion or over-drying and shrinkage of the wood material respectively.

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