



Havwoods Installation Guide: Hand-Grade / Colossal - Long & Wide Planks

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. This document covers fully bonded 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.

Havwoods International, Carnforth Business Park, Oakwood Way, Carnforth, Lancashire, LA5 9FD

Tel: +44 (0)1524 737 000

Fax: +44 (0)1524 737 001

Email: info@havwoods.com

www.havwoods.com

Havwoods Hand Grade & Colossal Planks utilise the finest materials to create stunning super wide, super long flooring planks.

These planks are constructed in a multi-layered construction with a superior WPB birch plywood core. This allows for a stable product which can perform over underfloor heating even in width of 450mm and above.

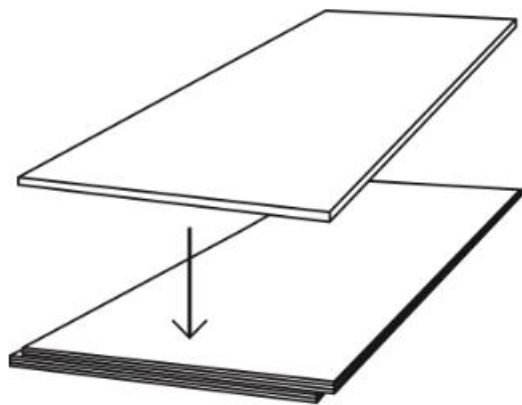
Grading of Havwoods Hand Grade & Colossal planks will vary throughout the range. Sapwood streaks to the edges or veined through the plank should be expected in most planks of this size as well as other features such as medullary rays, knots. Varied grain structure should be expected as these are all naturally occurring structures within the tree and these large sections will show the full variety of natural structures and variations.

Colour variation between boards is dependent on grading and the processing of the finish. Natural variation is a beautiful feature of wood and will always be present. Processes such as the use of reactive stains and unfinished-look products will highlight this variation more, whereas warmer pigments have a harmonising effect on the raw material variances.

All elements of the Hand Grade planks are bespoke and processes, such as brushing, can be selected across the products within the range from fine to deep texturing, in order to meet the needs of the project. This is also the case for sanding and ageing or distressing of the plank surface.

With such large products, there is a tolerance of thickness between planks, but every plank is machined for thickness from the base to eliminate lipping between elements. This guarantees alignment of planks on the topside through the T&G joint. This also guarantees that the top layer will not be below 4mm in thickness on any plank. Any difference is accommodated by the glue bed on the underside of the planks.

Havwoods Hand Grade planks must be bonded to a suitable substrate (more details below) using Marldon MXA100 adhesive with a 4mm/B6 trowel (or larger) or Bona Titan Adhesive applied with a Bona Trowel type 1500 F/G at a consumption of c.1500g/m².



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 40% - 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%(±1%), 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. Underfloor heating must be switched off during installation.

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 levels can 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.

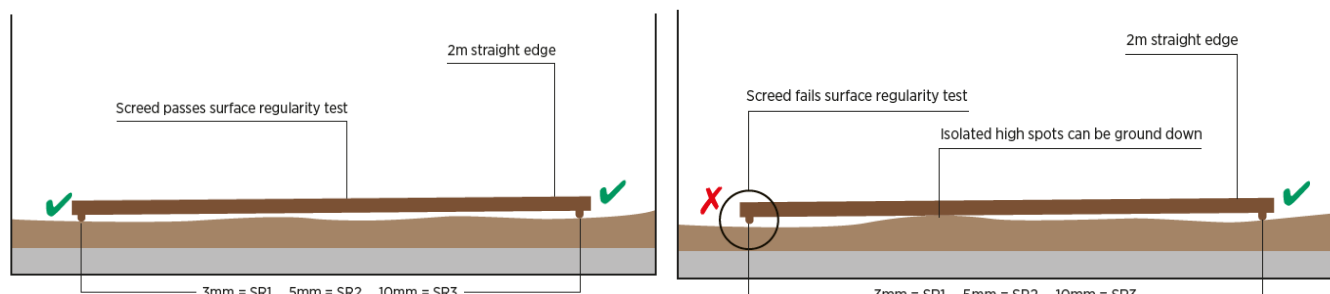
Wood will naturally change in size during seasonal variations in temperature and humidity.

During summer the humidity is generally at its highest level, hence the wood joins 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 joins. This occurrence is not a manufacturing or installation fault.

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 installed using a glued down method, a structural substrate of adequate density must always be in place beneath the floor finishes. Please consult Havwoods if there is any question relating to substrate suitability. All Havwoods XXL Plank Installations must be bonded to the substrate using Bona Titan Adhesive.



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.

Moisture Testing is carried out using a Hygrometer or Carbide method.

For screed substrates, the moisture reading must be less than 65% Relative Humidity (RH) or (1.8%CM) for glued down installations over UFH.

Where there is a cementitious substrate, if the reading is above 65% 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.

A poured or pumped screed rarely achieves the required SR1 levels and it is recommended that a self-levelling compound be used prior to timber flooring installation. Self-levelling compounds also provide a more uniform surface for the best level of adhesion to the flooring.

If bonding directly to a screed, first prime the subfloor with an acrylic or polyurethane floor primer to ensure maximum bond strength and eliminate uneven drying of the adhesive due to varying substrate porosity. Havwoods recommend Marldon Universal Primer MXS120 for all screed types.

Structural movement joints in the concrete must be mirrored in the finished timber floor using a suitable flexible expansion detail.

Note: For advice on the installation of Havwoods products over screeds with embedded or overlaid Underfloor Heating, please also see below section on Underfloor Heating.

Timber Substrates

The timber sub-floor must be sound, tested for vertical movement (which should be less than 5mm) and tested using a spike-type meter to ensure that they are dry. 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.

Solid timber floors bonded to a timber subfloor require a substrate of plywood in an equivalent or greater thickness than the solid flooring which is to be installed.

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Suitable timber substrates for engineered floors are flooring-grade plywood and cement particle boards. Timber substrates can be bonded to directly with the recommended **Bona Titan Adhesive** provided that they are sound, level to SR1 level requirements and free from contamination.

For existing suspended timber floors (where planks are securely fixed to joists/bearers), these can be over-boarded with flooring-grade plywood of a minimum 6mm thickness, fixed at 300mm centres, in a direction perpendicular to the run of the existing planks. Any loose sections of the existing planks must first be secured and any repairs to the existing bearers completed before over-plying may be considered.

Kingley bitumen paper can be sandwiched between the plywood and the wood sub-floor to reduce/prevent residual moisture affecting the wood flooring or adhesive.

Note: For advice on the installation of Havwoods products over timber substrates with incorporated Underfloor Heating Pipes, please also see below section on Underfloor Heating.

Dry Screed Panels

Structural or overlay dry screed flooring panels are generally suitable substrates for Havwoods timber flooring. It is not normally necessary to prime before fixing to screed panels with Marldon MXA100 / Bona Titan MXA200 adhesive.

Raised Access Floors

Havwoods Floors may be bonded to new steel-encapsulated raised access floor panels using Marldon MXA100 adhesive. This is provided that any contaminants, such as oil residues from the manufacture of the panels, are removed prior to installation.

All access floors must have pedestals adjusted to remove any rocking action and be levelled, with pedestals locked in position, to best avoid the potential for deflection in the finished flooring. Access panels should be fixed to pedestals.

Existing raised access panels must be thoroughly cleaned and degreased with appropriate cleaning agents to remove any adhesive residues and other contaminants prior to direct installation of Havwoods timber flooring. If all existing contaminants can't be removed, then the access panels may be over-boarded with flooring-grade plywood of a minimum 6mm thickness, suitably fixed at centres of no wider than 300mm.

The wood should be fully bonded to the prepared sub-floor using the recommended Marldon MXA100 / Bona Titan Adhesive.

This should be applied using a notched trowel (please see adhesive manufacturer's instructions for trowel notch size). Always lift an occasional board to see if there is 100% coverage to the back of the board, if not then increase the notch size.

Be sure to install into wet adhesive and break the installation down into workable areas which can be installed within the open working time of the adhesive. If the adhesive is allowed to skin-over then it must be scraped from the subfloor and fresh adhesive laid.

Avoid standing or kneeling on elements which are sitting on wet adhesive as they may shift and result in gaps within the finished floor.

Note: Do not use adhesive to level a sub-floor.

In order to achieve a harmonious blend of tones throughout the floor, materials should be mixed during the installation. Mix the material from the pallet(s) during the installation to create 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 perimeter expansion gap of a minimum 12mm on areas of less than 25 m² and a minimum of 15mm on larger areas.

Place spacers between the boards and the wall to keep the expansion gap whilst the adhesive is curing.

If the installation is over more than one day, strap or wedge the last row to prevent movement overnight. Weight (you will have packs of boards at this stage) down the last few rows to prevent them from lifting off the adhesive. If the boards do not close easily, you may need to use a knocking block or lever bar to assist in the placement. If you are installing a click system board fully bonded, locate the header join first at an angle and then lower the long join so that the short join is over the groove (longer protrusion). Once laid, use a knocking block or lever bar to knock the join into place.

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.

In cases where these products cannot be used, an alternative is placing a low-density foam strip (low density meaning it can easily be crushed between your fingers) leaving it approximately 2mm below the height of the wood floor and then use a flexible acrylic mastic-type filler, or similar, to bridge over the foam.

All 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 Plank Format Installations

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. If another pattern is required for the project, then Havwoods must be consulted prior to order of the materials.

When planning the area, try to balance the board width against the two most prominent walls, considering focal points such as fireplaces. You must always try to have at least half a board at each opposing wall because smaller width boards are difficult to fit and may not give the adequate level of finish, particularly if the wall is not straight.

We recommend dry-laying the first two or three rows and adjusting the first row to the wall contours and adjusting for the width you have planned. Make sure you have at least twice the width measurement of the board in distance between header joins. Once done, mark a glue line on the sub-floor and move the boards whilst applying the adhesive. Immediately place the boards into the adhesive, which must be prior to the adhesive skinning over.

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Only water pipe UFH systems set into a screed or pipes set below a structural deck are appropriate as subfloor heating with Havwoods Long & Wide Planks.

Note: Some systems can create hot spots (when rugs or other items not on feet are placed directly onto the wood floor) which will negatively affect the stability of the wood flooring.

To ensure the surface of the wood flooring does not exceed 27°C (81°F), we recommend temperature probe(s) be installed within the subfloor build up to regulate the surface temperature. These should be located in each room / zone.

Note: Wall mounted, or free-standing thermostats placed >500 mm off the floor surface can allow higher temperatures at floor level.

Embedded UFH Systems in Screeds

Prior to delivery, the underfloor heating must be commissioned and have been working for at least three weeks. Our advice is to gradually build up the UFH temperature by 10°C per day to maximum (50°C+ flow temperature) for the first 5 days, run for 3-5 days and then allow the heating to cool gradually to the off position. Cooling generally takes 3-5 days.

We would recommend carrying out at least two cycles to ensure any moisture is released. Once these cycles have been undertaken, switch off the heating and any artificial drying aids four days prior to setting and taking humidity readings. Never take humidity (or any other moisture tests) readings with the heating or other drying aids (such as de- humidifiers) on.

UFH Systems Beneath a Structural Deck

Unlike embedded water pipe subfloor heating systems, those heating systems situated beneath a structural deck are not generally commissioned prior to the installation of the floor coverings.

Where commissioning is to be undertaken with Havwoods flooring installed over this type of system, the below steps should be followed in order to prevent the occurrence of an excessive moisture and temperature gradient between the Havwoods timber flooring and the surrounding environment and/or substrate:

- All screeds situated beneath bearers should be tested for moisture to ensure that they do not have levels higher than 75%RH (2.5%CM)
- The environment should be tested and recorded to ensure that the environmental RH remains in the range of 45-65%.
- Floor protection must always be lifted prior to the commissioning process and should not be placed on the flooring at any stage while the heating system is in operation.
- Flow temperature should be set at the lowest possible setting and not above 30°C in the first instance.
- Temperature should be increased by a maximum of 2°C per day or 5°C every 3 days if the controls do not allow adjustments in 2°C increments.
- Surface temperature readings should be taken and recorded in the morning and evening of each day during the commissioning process to ensure that a surface temperature of 27°C is not exceeded in the flooring.

Once the maximum flow temperature has been established to ensure surface temperatures are within permissible levels, tamper-proof controls should be implemented to ensure that this upper flow temperature is not exceeded.

Underfloor heating systems should be connected to a surface probe routed into the underside of the flooring or surface of the structural deck to give true surface readings. Those systems controlled by ambient thermostats generally offer an inadequate measure of control.

The care manual handed to the end user should highlight the requirement for heating systems to be increased gradually when moving into the colder months.

Information on the thermal conductivity/resistance of Havwoods products is available from Havwoods.

Any information on the function of underfloor heating systems or exact calculations relating to thermal resistance or conductivity of the flooring build-up as a whole must be provided by the supplier of the heating system or the heating engineer.

The most critical time for the wood flooring is during and for 48 hours after the installation. Allowing the temperature or humidity to alter, particularly overnight when temperatures can drop, can cause excessive dimensional changes in the wood.

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We recommend using alternative heat sources to the UFH during the installation period and that UFH systems should remain off for the installation period and for at least 48 hours after the installation. When bringing the UFH back into operation, increase the temperature by a maximum of 2°C (3.5°F) each 24-hour period until the normal room temperature is reached.

Note: This also applies when using the UFH after periods of not being used. We would also recommend a cool down period using the same formula 2°C (3.5°F) each 24-hour period until switched off. Always set the heating to a frost temperature of minimum 12°C (54°F) when not in full usage.

Version 1

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.

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% (±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.

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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.

Plastic Floor protection should not be used on wood products.

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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