

# Havwoods Guide for Underfloor Heating

These guidelines are designed to complement the flooring installation document.

## UNDERFLOOR HEATING (UFH)

We advise using a water pipe UFH systems that is set into a screed or electric type set into a smoothing compound under wood flooring.

Electric cable systems must have a minimum of 8mm coverage above the cables using a flexible fibre-reinforced smoothing compound.

Heating elements (pipes or cables) should not be in direct contact with the reverse of the plank or the underlay. This is to avoid over-drying of the timber materials through direct transfer of heat into the wood. Electric mats or water pipes that are placed on top of screeds in routed panels must have a distribution board fitted above them to ensure an even heat distribution to the underside of the engineered board. This is typically a layer of plywood, particleboard or dry-screed panel. Aluminium spreader plates sit below pipes and do not offer separation of heating elements from the underside of the flooring.

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.

Havwoods' engineered floors which are stated as being suitable for use over UFH systems can be installed on electric or water-fed underfloor heating systems BUT the construction and joint profile of the product will dictate suitable installation methods.

Underfloor Heating systems must not generate temperatures above 27°C in the timber floor surface.

Plank and herringbone format floors with a click joint may be installed over UFH in a floating installation or fully bonded to the substrate.

Tongue and groove profile floors in all formats must be installed fully bonded to the substrate with a suitable flexible adhesive where UFH is present.

Chevron, Versailles panels and other parquet patterns must be bonded to the substrate, regardless of joint type, unless advised by Havwoods on a project-specific basis.



Havwoods solid timber floors are not suitable for installation over UFH unless otherwise specified.

There are 5 main types of UFH systems which are discussed below:

- Hot water pipe systems embedded in a screed
- Hot water pipe systems in overlay panels
- Hot water pipe systems beneath a suspended/structural deck
- Electric foil or carbon mat systems
- Electric loose cable or sticky mat systems

*N.B: The final responsibility for the installation lies with the installer. If there is any doubt about product suitability, it is the duty of the installer to check with Havwoods staff before installing any Havwoods timber floor on an underfloor heating system.*

Below recommended flow temperatures are general recommendations only and a Heating Engineer should be consulted regarding the R-value/TOG of the substrate construction and chosen floor covering when determining the exact flow or operating temperature of the UFH system.

FLOW TEMPERATURES OF >45°C ARE NORMALLY NOT APPROPRIATE WHERE TIMBER FLOORS ARE TO BE INSTALLED

## **HOT WATER PIPE SYSTEMS**

The most common issues experienced with water pipe UFH systems are due to moisture ingress into the timber floor from the substrate or from excessive heat generated from the heating system. Generally, the flow temperature at the manifold for a water pipe UFH system should not be above 40°C for an embedded system or 35°C for an overlay panel or suspended timber deck system.

Havwoods recommend that surface temperature probes are installed to provide a cut-off when the surface exceeds 27°C.

### ***WATER PIPES EMBEDDED IN A SCREED: recommended flow temperature of c.40°C***

Tongue and Groove profiled timber floors must be fully bonded with a suitable flexible timber floor adhesive (Marldon MXA200) when installed over UFH. This is because the effect of UFH on the D3 type adhesive normally used for floating installations of T&G floors can result in gapping between planks over time.

Click System profiled plank format floors may be floated on an underlay or fully bonded to the substrate over embedded UFH. Click system herringbone pattern floors must be bonded to the substrate unless otherwise agreed with Havwoods.



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](mailto:info@havwoods.com)  
[www.havwoods.com](http://www.havwoods.com)

**Wood that Works.**

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Subfloor Moisture and Commissioning of UFH: it is a requirement that underfloor heating systems be commissioned prior to the installation of floor coverings. This is detailed in BS8201 and BS8204 national requirements. Failure to commission the UFH system by bringing the system up to temperature over several days, leaving to run for 5 days and then cooling down over several days means that deep-lying moisture may remain in the screed which will be released when the heating system is turned on. The release of this moisture can cause damage and floor failure. Always record substrate moisture levels prior to flooring installation.

Any substrate above 65%RH / 2.0%CM for bonded installations or above 75% RH/2.5%CM for floated installations requires a surface applied DPM prior to timber floor installation. Anhydrite screeds with UFH should not be above 0.3%CM.

It is Havwoods recommendation that an Epoxy (Marldon MXS140) or Polyurethane liquid DPM (Marldon MXS150) be applied to the screed surface prior to timber flooring installations over embedded UFH systems. Where a floating installation of a click plank is to be carried out, a 250 micron polythene layer that's overlapped by 150mm at joints and taped with vapour tape can be used in place of a liquid DPM if preferred before the underlay and flooring are installed.

#### **WATER PIPES IN OVERLAY PANELS: *recommended flow temperature of c.35°C***

Tongue and Groove profiled timber floors must be fully bonded with a suitable flexible timber floor adhesive (Marldon MXA200) to an intermediate heat distribution layer when installed on overlay panel UFH. The proximity of the pipes to the back of the timber floor in this type of system can lead to hot spots on the floor surface and cause localised over-drying, shrinkage and cracking.

By introducing an intermediate heat distribution layer of min. 6mm thickness between the tops of panels/pipes and the timber floor, the heat will be more evenly spread, and these issues can be avoided. Suitable intermediate layers are; a fibre-reinforced flexible levelling compound, dry screed board, fibre-cement panels, plywood and P5 chipboard. A cementitious material (levelling compound or screed or fibre cement board) will provide lower thermal resistance and is preferable.

Click system profiled floors should also be installed onto an intermediate layer (as above), whether being floated on an underlay or fully bonded on overlay panel UFH systems.

*N.B Any intermediate layer (other than a levelling compound) should be fixed with a suitable adhesive or screw-fixed at close centres of no more than 300mm to the overlay panel. An aggregated primer may be necessary prior to any levelling compound application in order to provide a physical key over panels.*

**WATER PIPES BENEATH A SUSPENDED/STRUCTURAL DECK: *recommended flow temperature of c.40°C where a void is present between pipes and deck / recommended flow temperature of c.35°C where pipes are in contact with the underside of the deck.***

18mm+ thickness Tongue and Groove planks can form a structural deck by being nail or screw-fixed through the T&G as a hidden fixing directly to bearers/joists, provided that either a void is present between heating pipes and the underside of the deck or the pipes between bearers are encased in a cementitious compound. If pipes will be in contact with the underside of the deck, then a structural layer of min.18mm thickness T&G screed board, Plywood or P5 chipboard should first be installed.



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](mailto:info@havwoods.com)  
[www.havwoods.com](http://www.havwoods.com)

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Any T&G plank which is <18mm in thickness or is in a format other than a plank (i.e., a patterned floor) must be fully bonded with a suitable flexible timber floor adhesive (Marldon MXA200) onto a structural layer of min.18mm thickness T&G screed board, Plywood or P5 chipboard.

Click system profiled plank format floors should also be installed onto a structural layer (as above), whether being floated on an underlay or fully bonded on this type of UFH system. Click system herringbone pattern floors must be bonded to the substrate unless otherwise agreed with Havwoods.

## **ELECTRIC UNDERFLOOR HEATING SYSTEMS**

The most common issues experienced with electric UFH is the wrong type of joint profile or floor format being chosen to suit the type of UFH system or excessive temperatures being generated from a system with too high output for timber flooring.

Always choose an Electric System that has an incorporated cut-off to prevent surface temperatures of 27°C being exceeded.

### **FOIL MATS & CARBON FILMS: *recommended output of <150w***

Click System profiled plank format floors may be floated on an underlay over electric foil mats or carbon film UFH.

Tongue and Groove profiled timber floors are not normally appropriate with this type of system. The effect of UFH on the D3 type adhesive normally used for floating installations of T&G floors can result in gapping between planks over time. Patterned floors must be fully bonded to the substrate and that is not possible here unless 12mm Jumpax CP is installed over the foil mat to provide a floated substrate for bonded installations.

### **LOOSE CABLE & STICKY MAT SYSTEMS: *recommended output of <200w***

All products listed by Havwoods as appropriate for installation over UFH are suitable for installation over these types of system. Cables should be installed to the subfloor and then covered with a fibre-reinforced levelling compound to a suitable depth so that a minimum of 6mm depth of levelling compound is present between cables and the underside of the timber floor. The timber floor can then be installed to this substrate.

Tongue and Groove profiled timber floors must be fully bonded with a suitable flexible timber floor adhesive (Marldon MXA200) when installed over UFH.

Click System profiled plank format floors may be floated on an underlay or fully bonded to the substrate this type of UFH. Click system herringbone pattern floors must be bonded to the substrate unless otherwise agreed with Havwoods.

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

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.



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](mailto:info@havwoods.com)  
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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.

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.*



Carnforth Business Park  
Oakwood Way  
Carnforth  
Lancashire LA5 9FD  
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Fax: +44 (0)1524 737 001  
Email: [info@havwoods.com](mailto:info@havwoods.com)  
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