UNDERFLOOR HEATING & COOLING GUIDE

READ THESE INSTRUCTIONS THOROUGHLY BEFORE BEGINNING INSTALLATION. IN ADDITION TO THESE INSTRUCTIONS, WE RECOMMEND THAT THE INSTALLER FOLLOWS ANY ADDITIONAL INSTALLATION GUIDELINES SET FORTH BY THE RELEVANT NATIONAL WOOD FLOORING ASSOCIATION.

1. GENERAL INFORMATION ABOUT WOODEN FLOORING OVER UNDERFLOOR HEATING AND - COOLING.

WOODlife's engineered flooring and underfloor heating and – cooling (UFH/C) go well together. But for this to work, the indoor temperature must vary only gradually and to a limited extent to prevent the wood from shrinking or expanding too much. A subfloor heating system is a 'slow' system: it takes longer for a room to reach the right temperature and for the heat to leave the room again. The heating behavior of the occupants is very important: the more stable this is, the better.

Too much heat causes the wood to dry out and shrink. Rapid and major fluctuations in the temperature may damage the floor. Practical matters also play a role: rugs and carpets on the floor and cupboards with no space underneath can also cause heat to build up, possibly resulting in shrinkage joints and cracks.

2. APPLICATION OF WOODLIFE FLOORING

WOODlife's engineered flooring consists of a top layer of solid wood, 4.5 or 6.5 mm thick, which is glued onto a 12-, 15-, or 18-mm birch plywood at the factory. For the following wood species, both 16- and 21-mm engineered flooring can be used in combination with UFH/C either as the main source of heat or as additional heating. Per wood specie we have pointed out a maximum width that can be used over UFH/C; please find these maximized widths in the table below. Elm is not suitable over UFH/C.

SPECIES	MAX WIDTH
OAK	380 mm
ASH	220 mm
DOUGLAS	300 mm
WALNUT	260 mm

The instructions you will need to follow are provided below.

NOTE: You must be very careful about making sure you adhere to the requirements imposed in terms of the climatological conditions. If the humidity in the room does not achieve the values stipulated, the chances of cracks forming in the top layer will increase significantly. Cracking because of this is not covered by the guarantee.

3. INSTALLATION METHODS

Option 1:

The boards can be glued directly onto the cement screed. Make sure that the cement screed is form-retaining and level. We recommend at least D20 cement. The flatness can be checked: the maximum height difference over 2 meters is 2 mm.

If you opt to glue the floor directly onto the cement screed (Option 1), we recommend that you take the following steps:

- → In case the cement screed is not firm, but sandy, one should apply a primer and, if necessary, a liquid moisture barrier as well. You can do this, for example, by first applying one coat of primer and then applying a second coat crosswise; this will act as a sufficient moisture barrier.
- → Using WOODlife PE90 adhesive you should glue the boards on top within 24 hours with the help of a toothed T69 steel adhesive comb (or a B11 trowel).
- → Make sure that pressure is applied to the boards for 24 hours after being glued into place using at least a 20kg weight per m².

Option 2:

If the subfloor does not satisfy the above requirements, an (oak) mosaic intermediate floor should be installed. The engineered floor can then be glued and blind nailed onto this intermediate floor. If you opt for installation using a mosaic intermediate floor (Option 2), you should take the following steps:

- → Glue a mosaic intermediate floor onto the cement screed using the WOODlife PE90 adhesive.
- → Once the adhesive has set, sand the intermediate floor until it is even.
- → Then glue the boards on top using the WOODlife PE90 adhesive with the help of a toothed T69 steel adhesive comb and blind nail the boards to the subfloor.

4. HOW EFFECTIVE IS WOOD AS AN ISULATOR?

Wood is an outstanding thermal insulator: unlike a stone floor, it does not feel cold. Although wood is slightly slower to heat up, it retains the heat for a long period thanks to its excellent insulating properties. However, to ensure good heat emission, the conductivity resistance (Rc value) of the wooden floor should not be too high. This is determined by the thickness and composition of the engineered floor.

Technical values

Rc value of our 24 mm engineered flooring:	0.14 m² K/W
Rc value of our 21 mm engineered flooring:	0.12 m² K/W
Rc value of our 16 mm engineered flooring:	0.10 m² K/W
Rc value of oak mosaic intermediate floor 8 mm:	0.044 m² K/W
Rc value of chipboard intermediate floor 8 mm:	0.050 m² K/W
Thermal conductivity of our 24 mm engineered flooring:	λ = 0.185 W/mK
Thermal conductivity of our 21 mm engineered flooring:	λ = 0.17 W/mK
Thermal conductivity of our 16 mm engineered flooring:	λ = 0.15 W/mK
Thermal conductivity of oak mosaic 8 mm:	λ = 0.18 W/mK
Thermal conductivity of chipboard 8mm:	λ = 0.16 W/mK

5. UNDERFLOOR HEATING - PRECONDITIONS

Heat up the underfloor heating system before laying the wooden floor.

- → Before you use the subfloor heating unit for the first time, the sand/cement screed should be at least 42 days old. Set the water temperature to 20 °C on the first day of use, and then raise it by 5 °C every day.
- → Make sure that the supply water temperature does not exceed 45 °C. Maintain this maximum temperature for at least 24 hours per centimeter of floor thickness.
- → The lowering of the water temperature should also be in increments of 5 °C every 24 hours until you reach a water temperature of 20 °C.
- → The entire heating process takes 14 days – ensure good ventilation during this period to allow moisture to escape. Check the cement screed for residual moisture after this process. This must not exceed 2,0% for a sand/cement screed and 0,3% for an anhydrite floor; if a liquid moisture barrier is used, the maximum is 3%.

Use a Fidbox®

Fidbox heat sensors should be installed underneath the wooden floor in each space. The Fidbox is a monitor for temperature (°C) and relative humidity (%) as well as a data log for long-term data recording all in one, which is concealed in the hardwood flooring itself. The Fidbox can either be purchased direct from the manufacturer, or through (your) WOODlife (dealer). For more information we refer to the supplier's website: https://floorprotector.at/fidbox/en/

Heating up after laying the wooden floor

- → When laying the floor, the screed should be between 15 and 20 °C. Maintain this temperature for at least 5 days after laying, then you can slowly raise the temperature (1 to 2 °C every day) until you reach the temperature you desire or the maximum permissible temperature.
- → The residual moisture in the floor must be no more than 2.0% for a cement screed and no more than 0.3% for an anhydrite floor.
- → The maximum contact temperature of the cement screed is 28 °C. The contact temperature is the temperature of the surface of the cement screed / anhydrite floor, measured 3 heating days after setting the temperature (depending on the depth of the pipes).

Heating during the season

- → Raise the temperature very gradually at the start of the heating season and lower it again very gradually at the end (1 to 2 °C every day).
- → To keep the floor as stable as possible, do not create any difference in day and night temperatures.

Key points

- → The relative humidity in the room must be kept between 30% and 70%. Measure the relative humidity using a well-calibrated measuring device in a non-draughty room 10 cm above the floor. NOTE: if the RH is too low, cracks may form.
- → The cover on water pipes must be at least 30 mm thick to ensure a good distribution of heat.
- → The maximum contact temperature of the cement screed is 28 °C.
- → Heat the room at a steady temperature.
- → Follow the heating protocol before, during and after installation.
- → When you begin to turn up the subfloor heating again in winter, do so gradually (raise the temperature approximately 1 to 2 °C every day).
- → If the cement screed is uneven and/or weak, use an oak mosaic intermediate floor.
- → Sand an anhydrite floor beforehand with K24, remove all dust and always apply a primer.
- → If there is a chance of rising moisture, or residual moisture exceeding 2.0% (for an anhydrite floor no more than 0.3%) with a maximum of 3%, then apply a moisture barrier.
- → If there is no wooden intermediate floor, the cement screed needs to be of excellent quality. It is essential that 20 kg of pressure per m² be applied to each board immediately after gluing into place.
- → Use WOODlife PE90 adhesive or something similar – ask your supplier for advice.
- → Apply the adhesive using a toothed T69 steel adhesive comb.
- → Do not place any thick rugs on top, or cupboards with no space underneath.
- → Cracks and shrinkage joints are often caused by insufficient relative humidity and/or an excessively high water temperature.

6. ELECTRIC UNDERFLOOR HEATING

There are two types of electric floor heating: underfloor heating mats and cables.
With the placement of electrical floor heating, the wooden floor must never be installed directly onto the electric underfloor heating. An intermediate layer of high compression leveling compound (min. 2000 N / cm2 (310 N/ inch) needs to be applied over the electric underfloor heating system. This is to ensure an even temperature over the entire surface of the floor area, to prevent high temperatures in certain spots.

The maximum permissible heat radiation capacity must not exceed 55W / m2.
The surface temperature at any point of the subfloor must not exceed 28 °C. At the beginning of each heating season, the temperature must be gradually increased by max 2 degrees per day.

Fidbox® heat sensors should be installed underneath the wooden floor in each space. The Fidbox is a monitor for temperature (°C) and relative humidity (%) as well as a data log for long-term data recording all in one, which is concealed in the hardwood flooring itself.

The relative humidity in the room must be kept between 30% and 70%. Measure the relative humidity using a well-calibrated measuring device in a non-draughty room 10 cm above the floor. NOTE: if the RH is too low, cracks may form.

7. UNDERFLOOR COOLING - PRECONDITIONS

There are two types of underfloor cooling (UFC): systems that cool to 18°C and systems from manufacturers that recommend cooling to 15°C. The latter variant is not suitable in combination with wooden floors, because condensation may form.
With UFC, it is not possible to work with an indefinitely low water temperature due to the risk of condensation. The water temperature can only be a few degrees lower than the actual room temperature.

To allow UFC to do its job optimally, it is generally recommended that the floor pipes are laid tightly. This usually creates an overcapacity for UFH. This overcapacity can be compensated by lowering the hot water temperature. Choosing the right control unit is of great importance.

With both UFH and UFC, it is important to pay attention to how the parquet behaves when it is heated and cooled down. In particular, the release and absorption of moisture, by respectively increasing and decreasing the parquet temperature, must remain within set limits.

Failure to pay attention to this can lead to damage to the parquet floor. That is why the temperature of the floor may not be raised or lowered indefinitely. Maximum and minimum values are recommended for parquet floors on UFH and UFC. These values depend on how the pipes are laid. In general, the heat of the supplied tap water for UFH may be a maximum of 40°C. A minimum temperature of 18°C applies for UFC.

PAY ATTENTION! If floor cooling is present, protection against condensation is required.

The dew point is the same as the condensation point and stands for the moment at which the moisture from the air will condensate at a certain temperature. This dew point highly depends on the relative humidity in the room. Moist air will condense faster than dry air. A temperature below the dew point can lead to local condensation.

Think of it, for example, as when a cold drink that has just been poured from the refrigerator into a glass in a warm room. The glass will fog up with a layer of moisture (condensation).

The same can happen when the water temperature of the underfloor cooling is too low. The floor surface becomes too cold in relation to the room temperature and condensation will occur. The higher the relative humidity increases in a room; the quicker condensation can be expected to occur.

Condensation can be monitored in various ways.
The easiest way is to place a sensor on the coldest part of the installation. When detecting condensation, this will switch off the cooling or shut off the primary supply of chilled water in the installation.

A more complicated controller calculates the dew point (= 100% humidity) and switches off the installation before the dew point is reached (eg at 95% humidity).

8. WARRANTY

Commitment to the Customer

We feel that no other hardwood flooring in the industry is manufactured to higher quality standards than a WOODlife engineered wood floor. The warranties described below are given to the original purchaser and are SUBJECT TO THE PROCEDURES, LIMITATIONS, DISCLAIMERS AND EXCLUSIONS SET FORTH HEREIN. The warranties cover only approved product applications as recommended by WOODlife Flooring BV within this document and are effective on WOODlife's engineered flooring purchased after May 1st, 2008.

A 10-year warranty

WOODlife Flooring BV warrants, to the original purchaser, that its products, in their original manufactured condition, remain free from delamination, excessive deformation and –cracking during a period of at least 10 years. Cracking that does not exceed more than 10% is not covered by the guarantee.

Fidbox® heat sensors should be installed underneath the wooden floor in each space. We may reject claims where these sensors have not been used.

In cases of UFC, protection against condensation is mandatory.

The climate should satisfy the above requirements (relative humidity between 30% and 70% measured 10 cm above the floor using a calibrated hygrometer; the contact temperature of the cement screed must be no higher than 28 °C).

Wood is a natural product and therefore sometimes shows unexpected behavior. The warranty does not cover the normal expansion and contraction that wood floors may experience between boards at different times during the year. If minor separations do occur, they are not covered by this warranty. Cupping or crowning due to excessive moisture or humidity is not covered by this warranty.

Claims

In the unlikely event that any portion of your WOODlife floor should fail with respect to the provisions of the warranty, WOODlife Flooring, at its discretion, to the original purchaser, will provide the appropriate amount of affected square footage of the same product, if available or one of equal value. At the customer's request, a refund for the amount of the defective product in lieu of an exchange is an option. Labor expenses are not covered by this warranty. To file a claim, contact us by registered letter:

WOODlife Flooring BV
Zandkant 1
NL-5845 EV St. Anthonis
the Netherlands

Claims must be filed within the warranty coverage period with information verifying date of purchase, such as the sales receipt for the flooring. WOODlife Flooring reserves the right to inspect the floor and remove samples for technical analysis.