



Hertog Vloeren BV

Subfloor Heating Information for *Hertog Top 20mm (3/4")* and *Hertog Top 15mm (5/8")* Engineered Flooring

Under-floor (radiant heating) is growing in popularity for use with wooden flooring in both residential and commercial installations. Hertog engineered flooring can be installed over radiant heat provided certain conditions are met - an understanding of radiant heat and how it can impact wood flooring is vitally important. *Hertog Top* engineered flooring is created by bonding a hardwood top layer to premium grade plywood base. This forms a dimensionally stable product, which provides the appearance of a traditional solid wood floor whilst also providing excellent installation stability. These boards are suitable for installation over water-based radiant heating systems only. For information or advice regarding other systems please contact Hertog BV.

Wood as an Insulator

Unlike a stone floor, wood does not feel cold underfoot - it is an outstanding thermal insulator. Although slightly slower to heat up, wood retains the heat for longer 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 board. If it is established at an early stage that the Rc value is more than permitted, the maximum allowable Rc value could be raised. Possible adjustments to inflow and outflow temperature, the between-centres distance of pipes or the thickness of the layer on top of the pipe to the surface of the topping should then be carefully assessed.

Technical values, +/- 10%

Rc value of Hertog Top 20mm (3/4"):	0,118 m ² K/W +/-
Rc value of Hertog Top 15mm (5/8"):	0,088 m ²
K/W Rc value of oak mosaic subfloor 8mm (5/64"):	0,044 m ²
K/W Rc value of chipboard subfloor 8mm (5/64"):	0,050 m ²
K/W	

It is IMPORTANT that you read and understand the following information completely prior to commencement, since improper installation can void any warranties.

Heating up prior to Floor Installation

- Before the subfloor heating system is used for the first time, the sand/cement screed should be at least 42 days old. Set the temperature to 20 °C (68 °F) on the first day of use, and then raise it by 5 °C (41 °F) per day.
- Make sure that the supply water temperature does not exceed 45 °C (41 °F). Maintain this maximum temperature for at least 24 hours per centimetre of floor thickness.
- Lowering of the water temperature should also be in increments of 5 °C (41 °F) per day until a water temperature of 20 °C (68 °F) is achieved.
- The entire heating process takes 14 days – ensure good ventilation during this period to allow moisture to escape. The concrete/screed should be checked for residual moisture after this process. Using the CM method this must not exceed 1.8% for a concrete subfloor and 0.3% for

an anhydrite floor; if a liquid moisture barrier is used, the maximum is 3% or 75% using the RH method.

- With water-heated radiant-heat systems, a pressure test must be performed and documented by a qualified plumber or the system installer prior to beginning the installation of the wood flooring. Electric under floor systems are not suitable for use with *Hertog Top*. Check heating system manufacturers' guidelines.
- The heating system must be turned off prior to installation of the wooden flooring

NOTE: In geographic areas which experience extreme temperature and humidity conditions, it is natural, due to the inherent properties of wood, for some minor expansion and contraction to occur which could result in visual changes such as gapping or cupping. These occurrences are not covered by warranty but should self-correct with seasonal climate changes. To minimize this visual change it is important that the relative room humidity never falls below 40% or exceeds 65%.

Installation methods

Directly to Concrete/Screed

Glue the engineered boards directly to the concrete. Ensure that the concrete/screed is form retaining and level. The flatness can be checked using a 3 metre or 10-foot straight edge. The subfloor should be flat to within 5mm (3/16") in 3m (10') or 2mm (1/8") in a 2m (6') radius.

If you choose to glue the flooring directly onto the concrete (Option 1), we recommend that you take the following steps:

- Allow sufficient time for the concrete to dry (minimum 30 days) before testing for moisture content.
- Carry out a scratch test in multiple areas across the slab using a sharp implement to ensure integrity of the concrete/screed.
- Test the concrete for moisture content prior to installing the flooring using either the calcium chloride (ASTM F-1869) or relative humidity testing (ASTM F-2170) methods.
- The acceptable moisture limit is 3 pounds per 1000 square feet (approximately 1.36 kg per 93 square meters) per 24 hours, using the calcium chloride method or as otherwise stated by the adhesive manufacturer.
- The acceptable limit using the relative humidity testing method is 75%, or as otherwise stated by the adhesive manufacturer.
- If readings exceed these limits, use an appropriate damp proof membrane (DPM) provided by the same manufacturer as the adhesive to be applied.
- If no DPM is to be applied, apply a primer compatible with the adhesive to promote satisfactory adhesion.

Using an Oak Mosaic Subfloor

If the subfloor does not satisfy the above requirements, i.e. the screed is uneven and/or weak, use an oak mosaic subfloor (take care not to exceed the maximum Rc value an (oak) mosaic subfloor should be installed. Glue Hertog Top engineered boards to this subfloor.

CAUTION: With this method of installation the risk of the thermal resistance being too high is significantly increased. The resultant thermal resistance may be such that the under floor heating is unsuitable as a primary source of heating.

When installing using a mosaic subfloor, take the following steps:

- Glue a mosaic subfloor onto the concrete using Wakol MS260 or equivalent adhesive.
- Once the adhesive has set, sand the subfloor until it is even.
- Then glue the boards on top using a Wakol MS260 or competitive adhesive and also blind nail the boards to the subfloor.

Heating up after laying Hertog Top Engineered Boards

When fitting the floor, the concrete/screed should be between 15 and 18 °C (59 and 64,4 °F) Maintain this temperature for at least 5 days after laying, then slowly raise the temperature (1 to 2 °C per day) until the desired temperature is reached.

- The maximum contact temperature of the concrete subfloor is 28 °C.(82.4 °F). The contact temperature is the temperature of the surface of the concrete / anhydrite floor, measured 3 heating days after setting the temperature (depending on the depth of the pipes).

Heating during the season

A subfloor heating system is a “slow” system; it takes longer for a room to reach the desired temperature and also for the heat to dissipate. To minimize the effect that rapid changes in temperature will have on the moisture content of the wood floor, it is recommended that an outside thermostat be installed. Unlike conventional heating systems, which switch on as needed, radiant systems work most effectively and with less stress to the wood floor if the heating process is gradual, based on small incremental increases in relation to the outside temperature.

- 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 per day).
- To keep the floor as stable as possible, do not create significant variations in day and night temperatures.
- Seasonal gapping can be expected.

For the boards to remain in good condition, the indoor temperature must remain stable. Sudden fluctuations in temperature and relative humidity will cause the flooring to shrink, expand, contract, crack, cup and bow excessively.

Key points

- It is highly recommended that the radiant heat system be designed specifically to accept a wooden floor.
- Install heat sensors for temperature measurement and data collection. We recommend Fidbox®. Visit www.floorprotector.at for further information.
- The Relative Humidity (RH) in the room must be between 40% and 65%. Measure the RH using a well-calibrated measuring hygrometer in a non-draughty room 15 cm above the floor. If the RH is too low, cracks may form.
- Use of an in-floor temperature sensor as well as a separate thermostat for the individual room is required.
- Radiant heat is dry heat. A humidification system may be necessary to maintain wood flooring in its comfort zone.
- The cover on water pipes must be at least 30mm thick to ensure a good distribution of heat.
- The maximum contact temperature of the cement screed and underside of the wooden floor is 28 °C (82.4 °F).
- 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 1a 2 °C (33.8to 35.6 °F) per day.
- Use a two-component flexible adhesive such as Wakol MS260 or equivalent– ask your supplier/installer for advice.
- Placing rugs on top of a wooden floor may cause discolouration.
- Do not install fixed cabinetry or kitchen islands over installed wooden flooring.
- Do not place cupboards directly onto the floor with no space underneath.

- Cracks and shrinkage joints are often caused by insufficient RH and/or an excessively high flooring temperature.

Guarantee

We guarantee *Hertog Top* to be a stable product and provide a guarantee against delamination, excessive deformation and cracking. To form part of the guarantee, heat sensors must be installed to monitor and record temperatures. Hertog BV may reject claims where sensors have not been installed, or based upon reports of sensor temperature recordings. Hertog BV will not be responsible for any claims arising resulting from incorrect installation/adherence to Hertog BV Installation Instructions. Any costs resulting from a rejected warranty claim will be for the account of the claiming party. **In the event of claims, arbitration or conflict, these will be held in The Courts of Law, Maastricht, The Netherlands and be subject to Dutch law.**