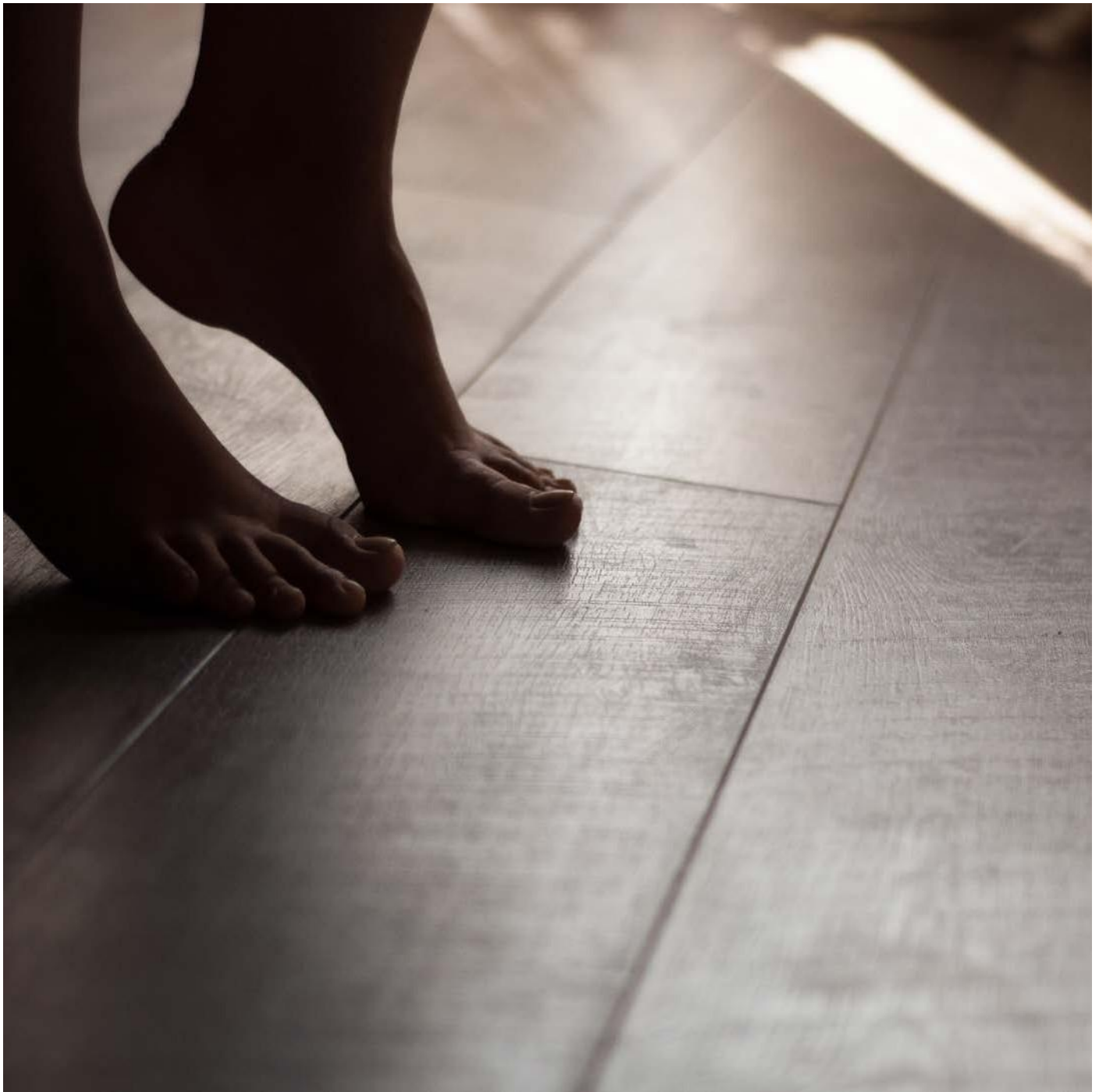




Warm to the touch

Barlinek flooring for underfloor heating
and cooling systems



1. General information:



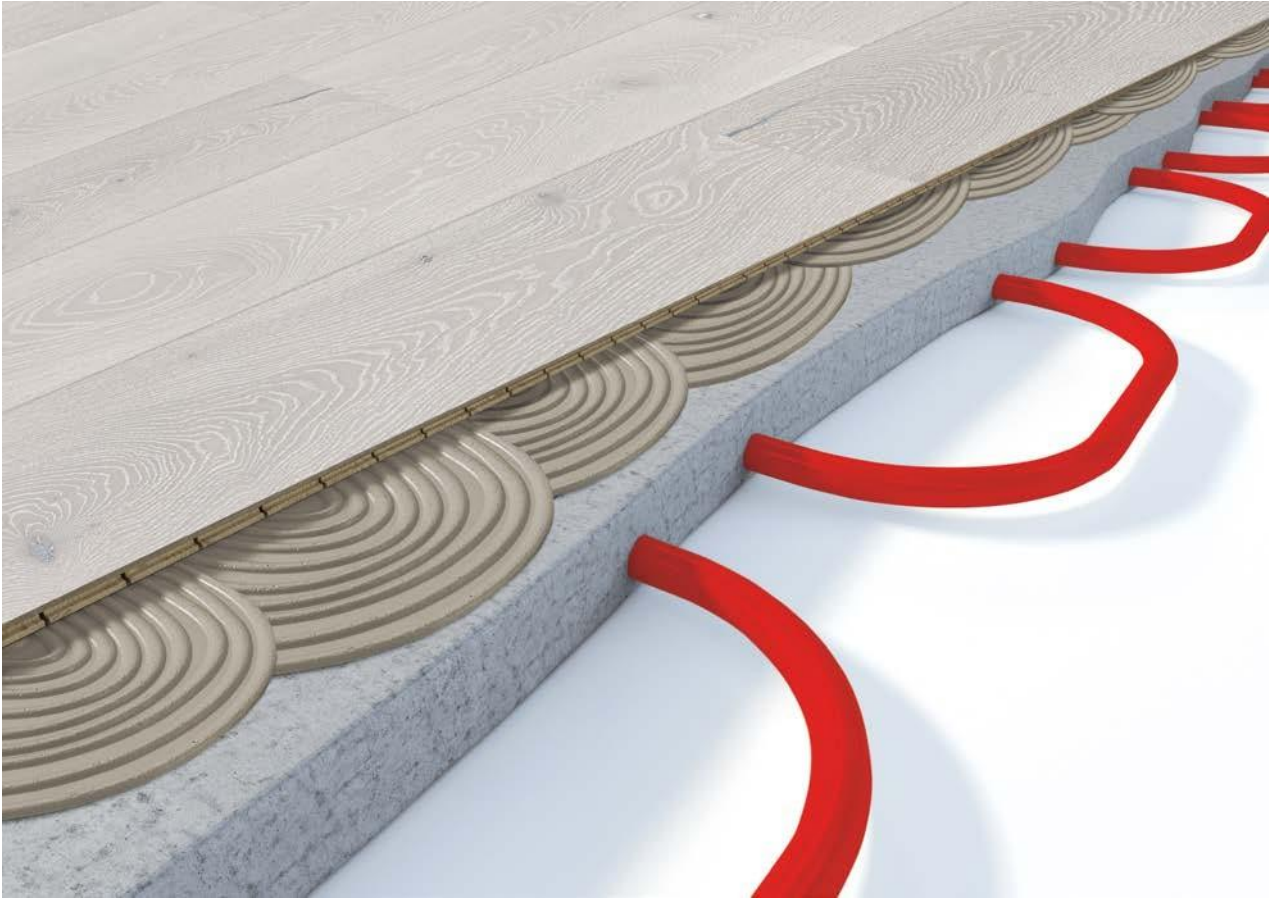
- All flooring from Barlinek's range can be installed over underfloor heating systems.
- In the case of three-layer planks and vinyl panels, both floating and glued installations are possible.
- Hybrid flooring – floating and glued installation.
- Suitable for installation over both water-based and electric underfloor heating systems, whether embedded in screed or dry – see details below.
- **Installation must be carried out in accordance with the instructions, and the conditions of use must be observed.**
- The maximum permissible surface temperatures must not be exceeded. For three-layer boards: 84.2°F (29°C); for hybrid flooring and vinyl panels: 80.6°F (27°C).
- Particular attention must be paid to air humidity, which should be maintained within the recommended range of 45–60 per cent (for three-layer boards and hybrid floors); in our microclimatic conditions, this necessitates the use of humidifiers during the winter season.
- Sudden (sharp) rises in temperature should be avoided. Floors should be heated gradually – the temperature should be increased by no more than 41°F (5°C) per 24 hours.
- Do not cover floors with underfloor heating with carpets or mats. This will prevent the maximum permissible temperature from being exceeded.
- Furniture should have legs at least 4" (10 cm) high.
- Underfloor heating systems should be fitted with thermostats, controllers and floor sensors to enable temperature control.
- When installing on both unheated and heated subfloors, the floor areas must be separated by an expansion joint.
THIS DOES NOT APPLY TO ADHESIVE INSTALLATION.
- Before installation, the product must be acclimatised for at least 48 hours under conditions in accordance with the installation instructions.

2. Preparation and assessment of the subfloor

MAXIMUM PERMISSIBLE MOISTURE CONTENT OF SCREED ON UNDERFLOOR HEATING

	WET/EMBEDDED SYSTEMS	DRY SYSTEMS
CEMENT SCREED	1.8% CM or 65% RH ADHESIVE BONDING – in the event of higher moisture content, a moisture-barrier primer (polyurethane or epoxy) may be used, provided the manufacturer permits its use on screeds with underfloor heating. FLOATING INSTALLATION – in the event of higher moisture levels, a vapour barrier film with an SD value of $\geq 75^*$. We recommend FixMat Sound as the underlay. *a parameter specifying the diffusion resistance factor – the higher the value, the better the protection against water vapour	2.0% CM or 75% RH ADHESIVE BONDING AND FLOATING INSTALLATION – higher humidity – use a vapour barrier film with an SD value of $\geq 75^*$ as the first layer. *a parameter specifying the diffusion resistance factor – the higher the value, the better the protection against water vapour
ANHYDRITE SCREED	0.3% CM or 40% RH Moisture must not be trapped (blocked) in this type of screed – this may lead to their degradation. The screed must be dried out.	0.5% CM or 50% RH Moisture must not be sealed off (blocked) in this type of screed – this may lead to their degradation. The screed must be dried out.

- **WET-EMBEDDED SYSTEMS** – curing must be carried out prior to installation – this applies to new screeds.
- The purpose of curing is:
 - removing excess moisture – bringing its moisture content into balance with the average ambient humidity,
 - reducing shrinkage and thermal stresses as well as surface deformations; the screed surface undergoes changes – deflection – as it dries.
- Nowadays, the most common practice is to use pre-programmed functions in boilers, which, once activated, carry out the curing process automatically. The fitter does not cure the substrate! They have neither the obligation nor the authority to do so. The fitter obtains a declaration from the customer, the installer, the site manager or the client's representative confirming that the curing process has been carried out.
- The fitter is obliged to familiarise themselves with the curing protocol and retain a copy for their own records.
- In the case of heat pumps and other low-temperature systems currently in widespread use, it is not possible to achieve the high temperatures specified in the Barlinek Substrate Preheating Protocol (up to 122°F (50°C)) – temperatures typically range from 104°F - 113°F (40°C–45°C). Given the recommended extended 30-day curing period, this does not pose a problem and ensures that the required parameters are met.
- The drying time of the screed depends on several factors:
 - the supply temperature and the layout of the heating pipes – a higher temperature and a denser layout result in a more even heat distribution and speed up drying,
 - drying time. The type and thickness of the screed must be taken into account. A sufficiently long curing time allows moisture to migrate gradually, thereby reducing the likelihood of excessive stresses and, consequently, cracks,
 - the type of screed – its thickness and the underfloor heating system.
- It is the installer's responsibility to assess the substrate and draw up a measurement report. The following must be checked:
 - substrate moisture content – see the table on page 3,
 - levelness – permissible deviations from the horizontal for three-layer boards and hybrid floors – 1/8" (3 mm) over a length of 2 metres. For vinyl panels laid as a floating floor, 5/64" (5 mm) over a length of 2 metres. (In the case of gluing, the type of adhesive used, the surface area and static loads must be taken into account, and the subfloor must be prepared accordingly),
 - the presence of cracks and contaminants.
- Moisture content can be measured using various methods: by weighing, using the carbide method, and with electronic instruments – each with a specific calibration depth and measurement accuracy.
- When carrying out invasive measurements – e.g. CM – care must be taken to avoid damaging the heating pipes. We make cut-outs in the spaces between them (marked by the screed contractors) or use, for example, thermal film or thermal imaging cameras to locate their route.
- Note that there may be significant variations in moisture readings following the curing process; these may indicate differences in the thickness or density of the screed, as well as leaks or air pockets within the system.
- **FOR DRY SYSTEMS:** three-layer boards and hybrid floors – 1/8" (3 mm) over a length of 2 metres. For vinyl panels laid as a floating floor – 5/64" (5 mm) over a length of 2 metres.
- For floating installation, a vapour barrier film with a minimum SD value of ≥ 75 may be used as an additional moisture barrier.



3. Gluing to underfloor heating

- Three-layer planks – suitable for use with one- and two-component polyurethane adhesives, silane-based adhesives and STP adhesives. Barlinek's range includes the 1K 950 adhesive.
- Hybrid **flooring on underfloor heating must only be installed** using adhesives recommended by Barlinek.
- Vinyl panels – installation using adhesives recommended by Barlinek.
- The hardness of the screed must be checked using an Ri scribe (with the spring tension set to the lowest position).
- Screeds must be sanded down without fail. Anhydrite screeds should be sanded until the grain becomes visible.
- When bonding to anhydrite screeds, do not use adhesive systems without a primer.
- Self-levelling compounds – use CT-type (cement-based) compounds with minimum strength parameters of C25, F6.

4. floating installation on underfloor heating

IT IS RECOMMENDED TO USE FLOOR COVERINGS WITH A MAXIMUM THERMAL RESISTANCE OF 0.15 M²K/W – FLOOR INCLUDING UNDERLAY

THERMAL RESISTANCE OF BARLINEK FLOORING:

- **THREE-LAYER PLANK** – thermal resistance 0.1 m²K/W – recommended underlay for underfloor heating – FIX MAT SOUND and EXTREME 1.5 mm.
- **HYBRID** – thermal resistance 0.018 m²K/W – requires EXTREME 1.5 mm underlay or another product with a CS value of at least 400 kPa
- **SPC** – thermal resistance 0.05 m²K/W – ; requires an EXTREME 1.5 mm underlay or another underlay with a CS value of at least 400 kPa

THERMAL RESISTANCE OF BARLINEK UNDERLAYS – EXTREME AND FIXMAT



EXTREME 1.5 mm



FIXMAT SOUND 2.15 mm

- **EXTREME 4/64"** (1.5 mm) – thermal resistance 0.009 m²K/W;
- **FIXMAT SOUND** – thermal resistance 0.009 m²K/W;
- **ECO 13/64"** (5.5 mm) **board** – thermal resistance 0.079 m²K/W;
- **CORK 5/64"** (2 mm) – thermal resistance 0.045 m²K/W;

water-based – embedded



- According to Polish building regulations, the minimum thickness of the screed over the heating cables should be 1,77" (4.5 cm) concrete or 1,38" (3.5 cm) anhydrite.
- Temperature controllers and underfloor temperature sensors must be used.
- We recommend the use of thermal seals.

THREE-LAYER PLANK	HYBRID	VINYL
YES	YES	YES
FLOATING AND GLUED INSTALLATION	FLOATING AND GLUED INSTALLATION	FLOATING AND GLUED INSTALLATION
*floating – FIXMAT SOUND and EXTREME 1.5 mm underlay recommended	*dedicated adhesives – recommended by third-party suppliers Dedicated underlay – EXTREME 1.5 mm	*specialised adhesives – recommended by external suppliers dedicated underlay – EXTREME 1.5 mm

water-based – solvent-based



- Temperature controllers must be used.
- Temperature controllers and underfloor temperature sensors must be used.
- We recommend the use of thermal seals.
- If the substrate is XPS or EPS polystyrene, pay attention to the CS parameter, which should be at least 29 psi (200 kPa).
- Pay attention to the stability and evenness of the subfloor, particularly in older buildings.
- When refurbishing old buildings that are poorly insulated, set the water temperature and flow rates high to ensure an adequate supply of heat (this may cause wooden floors to dry out).

THREE-LAYER BOARD	HYBRID	VINYL
YES	YES	YES
FLOATING AND GLUED INSTALLATION	FLOATING AND ADHESIVE INSTALLATION ONLY after using an additional board , e.g. a gypsum fibre board such as Fermacell, Jumpax, Thermo-Top or Wakol RP	FLOATING AND ADHESIVE INSTALLATION ONLY when an additional board is used , e.g. Fermacell, Jumpax, Thermo-Top or Wakol RP fibre-reinforced gypsum board
*floating – it is best to use an intermediate underlay, e.g. Fixmat Sound *glued – after installing an additional gypsum fibreboard such as Fermacell, Jumpax or Thermo-Top or Wakol RP	*glued – recommended adhesives. *floating – Extreme 1.5 mm underlay	*glued – recommended adhesives. *floating – Extreme 1.5 mm underlay

water-based – dry milled screed



- No specific guidelines. Prepared in collaboration with Barlinek.
- Care should be taken to ensure that the milling is not too shallow and that the pipes do not protrude above the surface of the underlay.
- Ensure that the heating pipes are properly embedded and filled. The pipes must be carefully filled or, preferably, encased in a liquid compound. A liquid compound will 'envelop' them more effectively. Cracked filler or the use of tile adhesive (particularly when bonding the floor) is unacceptable.
- With newly screeded subfloors, it is not possible to 'cure' them. You must wait for them to dry naturally or apply a damp-proof barrier using a damp-proof primer.
- When refurbishing old, poorly insulated buildings, set the water temperature and flow rates high to ensure an adequate supply of heat (note that this may cause wooden floors to dry out excessively).
- Temperature controllers and underfloor temperature sensors should be used.
- We recommend the use of thermal seals.

THREE-LAYER BOARD	HYBRID	VINYL
YES	YES	YES
FLOATING AND GLUED INSTALLATION	FLOATING AND GLUED INSTALLATION	FLOATING AND GLUED INSTALLATION
*floating – it is best to use FixMat Sound or Extreme 1.5 mm underlay	*glued – recommended adhesives *floating – Extreme 1.5 mm underlay	*glued – recommended adhesives. *floating – Extreme 1.5 mm underlay

Electrical – recessed



- The most important factor is selecting the correct power output, taking into account the type and requirements of the floor, the thickness of the screed and the installation recommendations.
- Care must be taken to ensure the heating cables are correctly bonded. They must be at the same level; it is therefore recommended to first fill them with a suitable compound and then pour a levelling compound over them.
- Check the quality of the materials used. Ensure that compounds specifically designed for underfloor heating systems have been used, and that the minimum thickness specified by the manufacturer has been achieved.
- It is unacceptable to embed the cables in tile adhesive, particularly in the case of bonded floors.
- It is recommended to lay lower-power heating cables more densely (5W/mb recommended), which results in a more even distribution of heat.
- Due to the thinner screed, the floor will heat up more quickly.
- It is essential to use temperature controllers.
- It is essential to use floor temperature sensors.
- The use of thermal seals is recommended.

THREE-LAYER BOARD	HYBRID	VINYL
YES	YES,	YES,
FLOATING AND GLUED INSTALLATION	FLOATING INSTALLATION AND GLUED – recommended	FLOATING INSTALLATION AND ADHESIVE INSTALLATION – recommended
*floating – it is best to use FixMat Sound or Extreme 1.5 mm underlay	*dedicated adhesives – recommendations from third-party suppliers *check the thickness of the screed; according to Barlinek's guidelines, it must be at least 0.59" (15 mm) above the underfloor heating cables	*adhesive installation – recommended adhesives. *floating installation – Extreme underlay, 1.5 mm *Check the underlay thickness; according to Barlinek's guidelines, it must be at least 0.79" (20 mm) above the heating cables

– heating films

e.g. DREAM HEAT, RED SNAKE, CALEO, HEAT DECOR



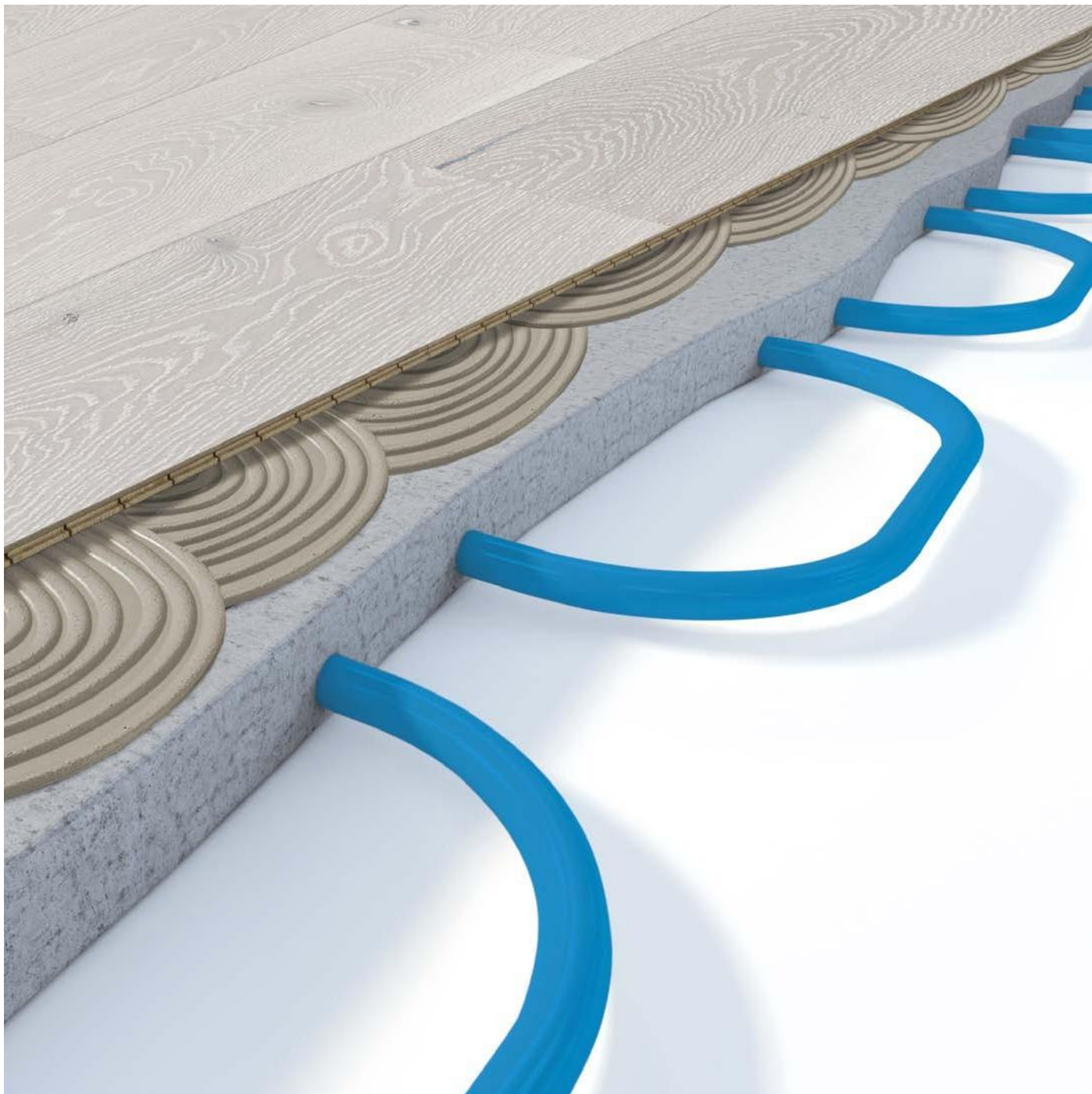
- The most important factor is selecting the correct power rating. This should take into account the type and requirements of the floor, as well as the installation recommendations.
- There are significant differences in the quality of the films, most of which are imported from China. The most common type is the 'ladder-style' film with resistance strips. Problems with uneven temperature distribution can arise, even within a single film, which is why it is recommended to check the installation with a pyrometer.
- Heating films either operate at full power or not at all, so it is recommended to increase the temperature gradually.
- Below is an example of a typical under-screed heating system:



1. underlay – minimum 5/32" (4 mm) thick, well-insulating – usually XPS; the underlay must be thick enough to accommodate connectors and cables; 2. heating film; 3. vapour barrier film; 4. Barlinek laminated board;

- It is essential to use temperature controllers.
- It is essential to use floor temperature sensors.
- The use of thermal seals is recommended.

THREE-LAYER BOARD	HYBRID	VINYL
YES	YES	YES
FLOATING INSTALLATION ONLY	FLOATING INSTALLATION ONLY	FLOATING INSTALLATION ONLY
	*In such cases, it is possible to use an underlay other than the one we recommend – a dedicated cork mat or an XPS underlay with a CS value of at least 58 psi (400 kPa). *Installation must be carried out by an authorised fitter and in accordance with the film manufacturer's instructions. Hybrid installation is only possible without an integrated underlay	*In this case, it is possible to use an underlay other than the one we recommend – a dedicated cork mat or an XPS underlay with a CS value of at least 58 psi (400 kPa). *Installation must be carried out by an authorised installer and in accordance with the film manufacturer's instructions. Hybrid installation is possible only without an integrated underlay



Barlinek flooring on underfloor
cooling systems

The use of underfloor cooling systems is becoming an increasingly common solution. An underfloor cooling system is a solution in which the floor structure absorbs heat from the room, thereby lowering its temperature. The heat-absorbing medium is cold water fed into pipes embedded in the screed. This solution makes it possible to achieve a comfortable room temperature on hot summer days. The entire floor surface then acts as a 'cooling' element, as its temperature is lower than the air temperature in the room. This is in accordance with the thermodynamic principle of heat flow from a warmer medium to a colder one. Among other things, heat pumps, which are currently popular on the market, enable this solution.

Barlinek permits the use of its own products in underfloor cooling systems only if the system is supplemented by an air-conditioning system. This applies primarily to three-layer flooring.

The information below sets out the key parameters and guidelines relating to the use of underfloor cooling systems on which flooring from Barlinek's range has been installed:

1. The integration of underfloor heating and cooling systems should be determined at the building design stage.
2. The regulation of the water temperature in the circuit should be linked to the air temperature and humidity.
3. The floor temperature should not be more than 39.2°F (4°C) lower than the air temperature.
4. A lower floor temperature in an active underfloor cooling system causes an increase in air humidity in the area close to the floor; therefore, the underfloor cooling system should be integrated to an air-conditioning system and an efficient ventilation system (preferably mechanical). Active air conditioning significantly enhances the cooling effect of the floor, mainly by reducing air humidity.
5. In addition, air conditioning and ventilation increase air movement in the room, which improves thermal comfort; with increased air movement and lower humidity, the perceived temperature is lower than the actual temperature.
6. In sunny areas (south- and east-facing sides), use blinds or other shades to prevent the floor from heating up, thereby avoiding the formation of condensation.
7. Do not cover the floor with items such as carpets, and avoid using furniture with low legs
8. Installation of floors with low thermal resistance. From Barlinek's range, Hybrid and LVT floors are the best choice. If you opt for wooden floors, you should choose varnished ones (the varnish limits the transfer of moisture from the air into the boards).
9. The recommended installation method is gluing, using moisture-resistant adhesives.
10. Install an automated system to control temperature and humidity in the rooms – relative humidity must not exceed 50 per cent. In every room with an underfloor cooling system, a sensor should be installed that calculates the relationship between relative air humidity and the temperature on the surface of the floorboards, and cuts off the cold water supply before the so-called dew point is reached – that is, before water vapour condenses on the surface of the floorboards. The absence of such a safeguard may result in condensed water from the air seeping onto the floor, causing uncontrolled moisture absorption by the timber and leading to damage to the wooden floor, such as warping, discolouration or gaps forming between the floorboards.



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For every pack sold, we plant
one tree



We are saving
the peregrine falcon



The 'Bartek' oak
under our care

14 March 2023