

OPERATING SURFACE HEATING WITH COOLING FUNCTION IN SUMMER

Bauwerk Parquet is suitable for installation over underfloor heating, as per the standard EN 1264 (series) 'Surface-embedded heating and cooling systems with water flow'. The maximum acceptable surface temperature is 29°C, and must not be exceeded. Heat accumulation due to carpets, shelving units, futon beds or similar objects must be avoided as it can lead to more expansion in the joints and bulging in the boards.

Wood is much more efficient in passing more heat to your feet compared to tiles, for example. This results in improved walking and living comfort.

For wood types that have a greater tendency to swell or shrink (e.g. beech and maple), larger joints and cupping may occur in the winter. Humidifying the air and maintaining a healthy indoor climate (20 to 22°C, with relative humidity of 35 to 40% during the heating period) can counteract this effect. Measuring the indoor climate conditions is particularly important for operating a heated screed floor. Using an air humidifier is recommended during the heating season.

Choosing wooden flooring

Multi-layer parquet swells and shrinks much less than solid parquet, and is thus better suited for this purpose. In general, all bonded or floating parquet floors by Bauwerk are suitable for installation on top of underfloor heating. Flooring with a heat transfer resistance of $R \leq 0.15 \text{ m}^2 \text{ K/W}$ is considered to be suitable without any special adjustment. Because of its low heat transfer resistance, full-area bonding is the best installation method. With floating installation, the necessary inclusion of an underlay mat and the often-unavoidable layer of air (e.g. due to unevenness in the floor or heavy furniture) tend to increase heat transfer resistance. With sharp fluctuations in room climate, this can lead to the production of noises (creaking/crackling).

Special considerations for installation on top of underfloor heating

- › General installation rules for Bauwerk parquet apply.
- › A meeting must be held at the planning stage involving the architect, designer, electrical and building engineers, screen and floor installers as well as the building contractor or its representative to coordinate the overall planning and construction.
- › To coordinate the planning and construction of heated/cooled surfaces in a new building, the latest specialist information, data sheets and documents available for download at www.flaechenheizung.de can be used.
- › When underfloor heating is on, the surface temperature must not rise above 29 °C in any location. High temperatures and/or an excessively dry indoor climate conditions have a negative effect on wooden flooring and can lead to joint expansion, deformation or even crack formation.
- › With controlled living space ventilation that does not recover moisture, the air circulation rates must be adjusted during the heating period to avoid an indoor climate that is too dry.

Guide for installing on new heated screed (does not apply to dry structures)

Functional testing for the new underfloor heating: Functional heating is performed and recorded by the installing company. The functional heating procedure only involves recording that the heating is operating without malfunctions. It by no means is intended to dry the screed down to the humidity content that makes it ready for parquet installation.

The installation readiness heating must take place immediately after the functional heating procedure. In doing so, instructions issued by the heating system's manufacturer, as well as the applicable country-specific SIA, DIN and ÖNORM standards, must be complied with. In the case of screeds with chemical additives, such as accelerants, the corresponding manufacturer's instructions must be followed.

The heating planner must indicate the locations of the CM measurement points in the plan. These depend on the thickness of the screed, the least favourable ventilation conditions in the room, and the lowest surface output of the heating. The location of the measurement points must be inspected by the insulating layer installer, marked by the HVAC system technician and accepted by the screed installer. At least one measurement point must be marked per room. There must be no heating pipes within a distance of 10 cm (diameter of 20 cm) from the measurement point.

Before performing the control measurement of the screed humidity using a CM measuring device or the KRL method, it is recommended that the humidity be measured using film or electronic measuring

devices, in order to avoid unnecessary CM/KRL measurements.

For screed heating, the building designer must prepare a joint plan in conjunction with the heating installer, screed installer and floor installer. The type of screed, the arrangement of the heating circuit and the type of parquet must be taken into account. Any expansion joints present must generally be kept in the surface layer.

After installation readiness heating, the underfloor heating must be kept working on the lowest setting until the end of the installation of the parquet surface, without switching it off for the night.

Operation with surface temperature adjustment (cooling)

A surface cooling system can increase comfort on hot days during the summer months. The cooling function of the floor surface temperature system cannot, however, replace a conventional air conditioning system. A floor cooling system does not remove humidity from warm air, and thus can only play a supporting role in cooling the ambient air. In general, all multi-layer parquet floors must be glued-down over their entire surface. Beech and maple are types of wood that only have limited suitability for this purpose. All the other wood types offered by Bauwerk Parkett are well-suited. The maximum heat transfer resistance should not exceed $<0.15 \text{ m}^2 \text{ K/W}$.

During the planning phase, the manufacturer of the surface cooling system must describe the requirements for the parquet floor, especially in terms of maintaining the indoor climate conditions. A room-by-room control system must ensure that no moisture or mould damage can occur in the parquet floor or its base structure. The surface temperature and simultaneous measurement of relative air humidity at floor level must ensure that the threshold value for this is never exceeded. Relative air humidity at floor level plays a decisive role in this.

With the stipulated air humidity values, the parquet elements show natural properties typical of the wood appropriate to the dimensions of the elements, with formation of small gaps and only modest horizontal deformations. Prolonged deviation from these values can lead to larger gaps and deformations. Temperature-regulated surfaces should not be covered by carpets or similar objects. There must be a clearance between the floor and furniture in the room, in order to improve the effectiveness of the heating and cooling, and to prevent the risk of damage. The minimum surface temperature during the cooling phase must be $22 \text{ }^\circ\text{C}$, but in any case, never more than $3 \text{ }^\circ\text{C}$ lower than the room's ambient temperature.

During the cooling phase, temperature and relative air humidity near the floor must be continuously measured or estimated. Whenever these values are exceeded, the controller must switch the system off in due time, before there is a risk of moisture damage or mould. The weekly average relative air humidity at floor level value must not exceed 65%, and the daily average must not exceed 75%.

› Relative air humidity at floor level can be estimated by measuring room temperature, relative air humidity of the ambient air in the room and floor temperature.

We recommend using the cooling system for the first time in summer, after completing a full heating period. We recommend recording relative air humidity and temperature using an electronic data logger or the system controller, or managing the system using an app on a mobile device.