

RETROFITTING UNDERFLOOR HEATING SYSTEMS (UG 19)

If underfloor heating is to be retrofitted as part of the renovation of an existing building, thin-layer heating systems are often used. These are usually laid on or in the existing screed and therefore have a lower built-in height than conventional heating screeds. The long drying time of a conventionally laid screed is also generally not required, which means that functional heating and, if necessary, floor heating can be done shortly after the system has been installed. The flooring can therefore also be laid shortly after the underfloor heating system has been installed. There are various systems that differ in terms of the heat source, the load-bearing layer and the installation. With regard to the heating source, a differentiation can be made between hot water-led and electric heating systems. Hot water-based systems can be installed in combination with existing screed, as a thin-layer floating system or as a dry construction system. In some cases, the constructions can even be categorized as construction types in accordance with DIN 18560 and EN 1264. Electric heating systems, on the one hand, are generally installed in conjunction with existing screeds.

As a general rule, subfloors can only be evaluated and tested using standard construction site testing methods. It is only possible to a limited extent for parquet and floor layers to test and evaluate the load-bearing capacity of subfloor constructions, such as thin-layer systems or after milling slots into the existing screed. The installer should therefore ask the client to confirm the load-bearing capacity of the construction and its basic suitability in writing. This applies in particular to non-standard constructions for renovation work.

Particular focus should be placed on the subfloor preparation, which must be carried out before the base layer or heating elements are installed. Among other things, the subfloor must be sufficiently firm, level, clean, dry and load-bearing to accommodate the new heating system. It is also important that the subfloor is prepared and primed appropriately for the type of subfloor and other installation materials.

Electric heating systems vary in their wattage and not all variants are suitable for all types of flooring. It is therefore essential to follow the heating system manufacturer's recommendations to ensure that the correct heating system is used for the selected floor covering.

As with conventional hot water underfloor heating systems, it is important to consider the thermal resistance of the complete floor construction and ensure that it does not exceed the value of 0.15 m²K/W in accordance with EN 1264. Particularly with floating systems, the overlying prefabricated screed can lead to a comparatively high thermal resistance and thus to heat loss. Although the calculation and assessment of the thermal resistance is the responsibility of the planner, the floor layer should inform his client of any doubts.

COMMON BUILD-UPS AND THEIR ADVANTAGES

CONSTRUCTIONS IN COMBINATION WITH SCREED

Such water-led systems are installed together with the underlying screed and levelled with a levelling compound. The base layer of the heating pipes is usually a knobbed mat, which is laid on the prepared and primed subfloor and then levelled with the intended pipe cover using a levelling compound. The total layer thickness is usually around 10 to 20 mm. The low build-up height in combination with quick-drying levelling compounds enables the floor to be ready for covering quickly. Once the levelling compound has dried (approx. 2 to 5 days depending on the product and layer thickness), functional heating can be done. After functional heating, the floor covering can be laid. Such composite structures are constructions based on construction type A in accordance with DIN 18560 and EN 1264 in which heating pipes or cooling pipes are levelled in a heat distribution layer on an existing load spreading layer.

Example build-up on screed:

Priming the ready-to-lay screed with STAUF D54 - levelling the knobbed mat including heating pipes with STAUF XP 20 - full-surface bonding of e.g. LVT, PVC or textile coverings with STAUF D20 or also full-surface bonding of multi-layer or strip parquet with STAUF SPU 570

INSTALLATION AS FLOATING ON SCREED

The system described is more or less a floating screed with integrated hot water underfloor heating, which functions as a load spreading layer itself but is installed instead of a conventional heated screed. In contrast to the usual 45 mm, the pipe overlap here is generally only approx. 10 mm. However, the very low pipe cover is only recommended by the manufacturer in conjunction with ceramic tiles in combination with a decoupling mat. If resilient or textile floor coverings or parquet are to be laid, a higher pipe cover of at least 15 mm is usually required

TECHNICAL DATA SHEET

in order to increase the necessary load-bearing capacity and flexural rigidity of the load spreading layer. Compared to conventional screed, the described system has the advantages of a significantly shorter drying time until ready for covering, a lower construction height and lower flow temperatures. These floating structures are also constructions based on construction type A in accordance with DIN 18560 and EN 1264.

Example installations directly on the floating system:

Priming the ready-to-lay screed with STAUF D54 - levelling with STAUF XP 20 - full-surface bonding of e.g. LVT, PVC or textile coverings with STAUF D20.

Parquet may be fully bonded directly to the slevelled floor. 1-component reactive adhesives from the STAUF SMP and SPU product ranges are ideal for this purpose.

BUILD-UPS WITH PREFABRICATED SCREED ELEMENTS AND DECOUPLING PLATES OR DECOUPLING UNDERLAYS

A hot water-led dry construction system usually consists of polystyrene (EPS) or wood fibre elements with an aluminium lamination in which there are integrated channels to accommodate heating pipes. The load-distributing layer is usually formed by prefabricated screed panels that are used as a load distribution layer and carry the floor covering. Functional heating can take place after the prefabricated screed elements have been laid or the interlocking adhesive used (usually 1C PU reaction resin adhesive) has set. As the construction takes place on site without the active addition of water, it is water-free and is therefore well suited for the renovation of existing buildings. Such build-up on a separating layer or where heating and cooling pipes are integrated in insulation boards are constructions based on construction type B in accordance with DIN 18560 and EN 1264.

The build-up on prefabricated screeds that are applied to hot water-guided dry construction systems does not differ from those without.

Similar constructions based on construction type B in accordance with DIN 18560 and EN 1264 are thin screed constructions on a separating layer or decoupling boards, which can be glued, fixed and levelled onto the EPS elements. Such constructions have a lower build-up height and lower thermal resistance compared to constructions with prefabricated screeds.

Resilient and textile floor coverings are then fully bonded to the levelled surfaces, e.g. with STAUF D20.

Multilayer parquet should preferably be fully bonded in com-

ination with additional decoupling underlays such as STAUF Polyester Fleece. 1-component reactive adhesives from the STAUF SMP and SPU product ranges are ideal for this purpose.

PREFABRICATED SCREEDS WITH INTEGRATED HOT WATER UNDERFLOOR HEATING

The heating pipes are integrated into a prefabricated screed element (usually gypsum fibre prefabricated screeds), which is also the load spreading layer. The pipes are filled with levelling compound and the floor covering is laid on top. This method offers the advantage of quick and easy installation as well as minimal overlap of the heating element. Prefabricated screeds with integrated hot water underfloor heating are structures based on construction type A in accordance with DIN 18560 or EN 1264.

Example build-u on prefabricated screed:

Priming the gypsum fibre prefabricated screed with STAUF D54 - filling with STAUF GS - full-surface bonding of e.g. LVT, PVC or textile coverings with STAUF D20.

In combination with multilayer parquet, also prime the gypsum fibre prefabricated screed with STAUF D54 - level with STAUF GS - full-surface bonding of parquet with 1-component reactive adhesives from the STAUF SMP and SPU product ranges.

BUILD-UPS IN COMBINATION WITH ELECTRIC UNDERFLOOR HEATING SYSTEMS IN COMBINATION WITH SCREED

Electrical heating systems are usually wire-guided systems that are fixed to a backing or are thin heating mats that do not require a backing. These systems are fixed to the existing load spreading layer before they are levelled in the specified layer thicknesses. For heating systems without a self-adhesive backing, it is usually necessary to first fix them by trowel-filling with a stable levelling compound, followed by levelling with a self-levelling compound. Electric heating systems are characterized by a very short reaction time and an extremely flat design. They can be used as supplementary heating to existing heating systems or as the only main heating system. Such composite constructions are based on construction type A in accordance with DIN 18560 and EN 1264.

There are many different installation options in combination with STAUF installation materials. Examples of installations with resilient and textile coverings or parquet are.

Priming the screed ready for covering with STAUF D54 - Filling or mounting the electronic heating system with STAUF RM -

TECHNICAL DATA SHEET

Priming the STAUF RM with STAUF D54 - Filling with STAUF XP 20 - Full-surface bonding of e.g. LVT, PVC or textile coverings with STAUF D20.

In combination with multilayer parquet, the work steps are the same, and the multi-layer parquet can be fully bonded to the electric underfloor heating system levelled with STAUF XP 20 using 1-component reactive adhesives from the STAUF SMP and SPU product ranges.

FLOATING BUILD-UPS IN COMBINATION WITH ELECTRIC UNDERFLOOR HEATING SYSTEMS:

For floating build-ups on subfloors, insulation underlays (moisture and/or impact sound insulation) are first laid on the existing load spreading layer, onto which the heating system is installed. A self-bearing layer, which is laid floating on MDF wood fibre boards, for example, forms the rest of the build-up. The floor coverings are usually laid floating, either directly or in combination with a previous levelling layer and full-surface bonding.

SCREEDS THAT ARE MILLED IN FOR PIPES:

In the course of renovation and modernisation work in existing buildings, slots for hot water heating pipes are milled into the screed and refilled before the floor covering is laid. Before starting the floor covering work, the professionals carrying out the work check the old screed for load-bearing capacity, thickness and suitability and complete the milling work and installation of the new pipes. It is particularly important that the screed from the existing floor is load-bearing and thick enough to be suitable for milling. The milled slots are then usually filled with a stable, plastic-modified levelling compound. To balance the load and heat output, the surface is then levelled with reinforced, self-levelling compound in a layer thickness of approx. 5 to 10 mm. In combination with parquet flooring, thin-layer decoupling underlays can also be bonded to the screed to reduce the shear stress caused by the parquet on the subfloor. Before starting the milling work, the screed must be adequately tested and prepared. The floor layer should obtain written authorisation from the client confirming the load-bearing capacity and suitability of the construction.

In combination with STAUF installation materials, there are numerous possibilities for different floor constructions. Some

examples of such build-ups with resilient and textile coverings as well as parquet are.

Priming the ready-to-lay screed and milling channels with STAUF D54 - Filling the pipes with STAUF RM - Priming the STAUF RM with STAUF D54 - Levelling with reinforced STAUF XP 20 - Full-surface bonding of e.g. LVT, PVC or textile coverings with STAUF D20.

In combination with multilayer parquet, the levelling work steps are the same, or the multilayer parquet can be full-surface bonded with additional decoupling underlays such as STAUF Polyester Fleece. 1-component reactive adhesives from the STAUF SMP and SPU product ranges are ideal for this job.

The build-ups as described are „off-standard constructions“, some of which have been tried and tested for years and are even recognized as state-of-the-art technology. However, the construction for laying the floor coverings must be contractually agreed separately with the client and approved in writing. Due to the variety of different system variants, it is necessary to follow the instructions and specifications of the manufacturer of such systems. This includes information on the required subfloor condition, subfloor preparation and type of installation. It is also essential to follow the instructions and specifications for pipe covering, suitable surface coverings, functional heating, flow temperatures, etc.). As is so often the case in building work, the following applies here: „The better the communication between planner, client and installer during the planning phase, the better the floor“.

The above information corresponds to the current state of development. They are to be regarded as non-binding, as we have no influence on the installation and the installation conditions vary locally. Claims arising from this information are therefore excluded. The same applies to the commercial and technical advice provided free of charge and without obligation. We therefore recommend that you carry out sufficient tests yourself to determine whether the product is suitable for the intended purpose. 022024