

A BIG PLUS FOR **ENERGY EFFICIENCY:**
RADIANT HEATING AND COOLING
SYSTEMS FOR **FLOOR, WALL AND**
CEILING



TAKING **COMFORT** TO THE NEXT LEVEL

Today, investors and developers of top-class private and commercial real estate have a wide range of requirements to meet in terms of heating and cooling: Sustainability, energy efficiency, the latest national regulations, modern architectural concepts and thermal comfort must be perfectly harmonized. Here, the partnership between Knauf and Uponor creates the ideal conditions for the planning of energy-optimized building technology. Uponor and Knauf support tackling this challenge with their tailored radiant heating and cooling systems for floors, walls and ceilings.



Modern living space without disturbing heaters/radiators

The best technological partnership for optimum results.

Knauf and Uponor, two well-known European brand manufacturers in the building industry, have been developing solutions using tailored systems and implementing them perfectly since 2008. Here, modern heating technology and modern building products form the ideal bond. Complete concepts for walls, floors and ceilings offer you sophisticated indoor climate solutions for the best possible comfort. The result? Something you can most definitely build on: energy efficiency based on "made in Germany" technology.

Cost-effective as well as energy-efficient.

Knauf/Uponor's concerted radiant heating and cooling systems for walls, floors and ceilings guarantee that you will be able to stay firmly in the black on your building's energy balance sheet. In addition, the high technological standard and many common advantages of the trade ensure that your new build, conversion and renovation projects can be carried out more cheaply as well as more efficiently, meaning you really get your money's worth.



The Knauf/Uponor partnership has resulted in solutions for new construction, restoration and renovation in residential and commercial buildings:

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| • Knauf FE 50 Largo & Uponor Classic for floors | p. 4 |
| • Knauf Brio & Uponor Siccus for floors | p. 5 |
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References attesting to the success of the partnership:

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NUMEROUS ADVANTAGES MAKE PLANNING AND IMPLEMENTATION EASY

- Use in solid and drywall construction as well as in new building and renovation
- Suitable for radiant heating as well as cooling
- Time saving thanks to quick and user-friendly installation
- Simplified tendering through unified tendering documents



- Common design and engineering support
- Common training measures for installers
- International sales and support

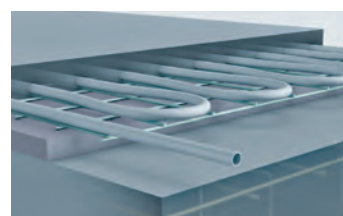
KNAUF FE 50 LARGO & UPONOR CLASSIC: THE COMMON SOLUTION FOR THE FLOOR

When creating new residential and commercial buildings, you are faced with the challenge of weighing up and perfectly balancing the highest requirements in terms of aesthetics, comfort, material and application with time and cost savings. Comfortable living or ease of use must be brought into harmony with reduced energy consumption. This involves modern, user-friendly equipment, energy-efficient indoor climate solutions, such as underfloor heating, and impact sound insulation to name but a few of the factors.

The solution

The perfectly matched system for your new build projects: Knauf FE 50 Largo self-levelling floor screed and Uponor Classic, the flexible solution for your residential and commercial building.

- Knauf FE 50 Largo self-levelling floor screed lays the foundations for energy-efficient surface heating systems. The calcium sulphate self-levelling floor screed flows easily around all pipes, conducts heat better and faster than traditional cement screed and, in the case of residential building, only needs 35 mm above the heating pipe.
- The Uponor Classic system is the ideal way to professionally equip your houses and big developments – all with the easiest possible handling, as there are only three perfectly matched components making up the heating level: the steel mesh, the pipe and the self-levelling floor screed.



A BIG PLUS FOR HIGH DEMANDS

UPONOR CLASSIC

- Exact pipe laying: The steel mesh and pipe holders ensure standardized pipe distances – along both horizontal and vertical
- Sturdy clamping: The pipe clips secure the pipe firmly on the carrier element
- No damage to insulation covering
- Free hand when choosing your insulating material
- Cost-efficient one-man installation: Flexible, fast and easy to install, saving you time and money



KNAUF FE 50 LARGO

- Increased living comfort and lower energy consumption
- High thermal conductivity
- Optimum heating pipe contact and minimal tube covering
- Quick installation
- Ready for covering after approx. 21 days
- Even, firm surface
- Wide joint distribution
- Maximum design freedom for all types of flooring

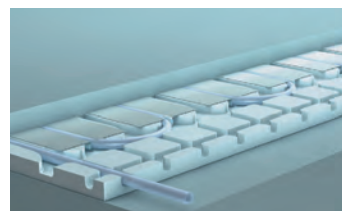
KNAUF BRIO & UPONOR SICCUS: THE COMMON SOLUTION FOR THE FLOOR

When renovating residential buildings, you often have to meet elaborate fire protection and sound insulation requirements. At the same time, the conditions for integration of contemporary housing technology into flooring construction must be met through more evenness, for example for the installation of a radiant heating system. The shorter the processing time, the more pleasant it is for your customer and the more cost-efficient it is for you.

The solution

The tailored system for quick and cost-efficient dry construction renovation: Knauf Brio, the pre-fab screed made of gypsum fibre, on top of Uponor Siccus, the lightweight dry lining for floors.

- With Knauf Brio, the floor can be walked on straight away, can bear weight and be covered after 24 hours, is non-combustible and is particularly thin at just 18 mm. In combination with a Knauf suspended ceiling, Knauf Brio offers the best possible comfort in sound insulation.
- Uponor's lightweight panel Siccus is the ideal base for your renovation project as few components are needed: a heat emission plate and a heating pipe. In combination with Knauf Brio Pre-fab Floor Screed, its low structural height and particularly low weight offer a priceless structural advantage in renovation. At the same time, the low-mass flooring construction creates favourable conditions for quick temperature regulation.



A BIG PLUS FOR RESIDENTIAL BUILDING RENOVATION

UPONOR SICCUS

- Minimum floor construction height from 50 mm
- Short installation time, immediately accessible if installed with pre-fab floor screed
- Low dead weight from 23 kg/m² in combination with pre-fab floor screed
- Specially devised installation panel for universal use



KNAUF BRIO

- No need to wait for drying
- Can bear weight and can be covered after a day
- Low structural height: from 18 mm
- Easy handling thanks to optimum dimensions and low weight
- Chair roll resistant without any further protection measures
- Increased sound insulation on timber beams, perfect in combination with Knauf suspended ceiling
- Improved fire protection F90: from 28 mm composite unit element

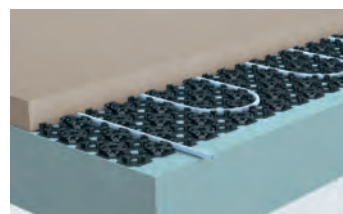
KNAUF ALPHADUR 430 & UPONOR MINITEC: THE COMMON SOLUTION FOR THE FLOOR

Implementing new energy concepts, such as radiant heating systems and pipe installation, in existing building complexes and with the available existing components is an incredibly challenging task. Thanks to thin-layer systems, the advantages of underfloor heating can be exploited to the full: pleasant cosy warmth, suitability for allergy sufferers as well as increased energy efficiency of up to 12 % as compared with radiator based heating.

The solution

The outstanding matched system for renovations: Knauf Alphadur 430 on top of Uponor Minitec. In comparison with a normal underfloor heating screed system, this thin-layer underfloor heating will save you up to 50 mm of structural height.

- Thanks to its low element height of only about one centimetre, Uponor's Minitec system is best suited to renovation. The foil element can simply be laid on top of the screed, wood or tile flooring in order to secure the Uponor PE-Xa pipe 9.9 x 1.1 mm.
- Thanks to Knauf Alphadur 430, the underfloor heating can be applied either in combination with the old substrate, such as old screed, or to a bare floor with a layer thickness of 16 mm and up.



A BIG PLUS FOR RENOVATION

UPONOR MINITEC

- Ideal for retrofitting in existing buildings during renovations
- Suitable for direct installation on screed or tiled floors
- Elements height only 12 millimetre
- Low-cost installation of foil elements and pipe
- Foil elements can be walked on immediately after installation
- Short heat-up times
- Low heating water temperatures
- Can be connected directly to existing radiant heating systems



KNAUF ALPHADUR 430

- Particularly thin
- From 16 mm thick as bonded screed on sturdy substrate
- Can be walked on after just 3h
- Can be covered after around 7 days
- Suitable for all types of top covering

KNAUF MP 75 & UPONOR MINITEC CLAMP TRACK SYSTEM: THE COMMON SOLUTION FOR WALLS AND CEILING

Today in the construction of offices, buildings and luxury housing, there is a growing trend towards the use of room-encompassing surfaces such as walls and ceilings to regulate room temperature. Radiant heating and cooling systems on walls and ceilings are the method of choice, as this is the only way to fulfil the requirement of achieving maximum cosiness at minimal investment and operating costs – both for heating and for cooling.

The solution

The multifaceted solution for large surfaces: Knauf MP 75 interior plaster and Uponor's universal system for ceilings and walls.

- Uponor's Minitec Clamp Track system can be used in ceilings and walls for both cooling and heating. This allows you to adjust the temperature of your room optimally and cost-effectively. When you need to cool the room down, the ceiling acts as a heat-transferring surface; when you need to heat it up, the walls fulfil this function.
- Modern types of interior plaster such as Knauf MP 75 are ideal system components for radiant heating and cooling systems in walls and ceilings. MP 75 is a pliable and particularly high-yield type of single-layer gypsum plaster. Thanks to its excellent thermal conductivity, heat is transferred to the whole layer of plaster without any loss, therefore achieving all-round radiation into the room.



A BIG PLUS FOR HEATING AND COOLING

UPONOR MINITEC CLAMP TRACK

- Minimum installation height
- A universal system for ceilings and walls
- Very few, optimally interacting system components
- Choice of preference for decades
Uponor PE-Xa pipe 9.9 x 1.1 mm
- Quick & Easy fitting system for fast, economical installation
- Quick reaction time thanks to slim plaster coverage
- Saves energy thanks to optimum operating temperatures



KNAUF MP 75

- Moisture-regulating, one-layer gypsum plaster
- Excellent thermal conductivity
- Can be applied by hand or using a machine
- Also suitable for areas of the house that require moisture resistance
- Water vapour permeable, harmless to skin – ideal for a healthy indoor climate
- Abrasion and nail-proof
- Surfaces can be smoothed and structured
- Can be wallpapered, tiled or painted

THE 1.6-LITRE HOUSE: ENERGY EFFICIENT SYSTEMS FOR COMPLETE SELF-SUFFICIENCY

This holistic energy concept is transforming the residential and commercial building in Munich (Germany) into a very special property. Following completion of renovation and building work, the building's energy requirement is now only 1.6 l/m² a year. In addition, the energetically optimized and independently heated property has reduced its CO₂ emissions to 22 t a year.



Outside view of the 1.6-litre house in Munich, Germany

Precisely planned and professionally implemented: energy efficiency in combination with first-class energy values and top quality.



- Site:** Landwehrstrasse 16, Munich
- The task:** The existing building, comprising 1,600 m² of residential and commercial space was renovated and expanded by 800 m² of residential space. The requirement was to upgrade the property in a particularly energy-efficient way.
- The solution:**
- Knauf FE 50 Largo
 - Uponor Classic



Uponor's Classic system is laid on Knauf's heat insulation and later covered by the self-levelling floor screed FE 50 Largo.

Knauf & Uponor's perfectly matched radiant heating & cooling systems have essentially contributed to making an annual energy consumption with the peak value of just 1.6 l/m² possible.



The laying of the sturdy Uponor PE-Xa pipes for radiant temperature control is quick and economical.

LUXURY RESTORATION – RENOVATION OF A RESIDENTIAL BUILDING

Renovating an existing building is one of the most exciting tasks in residential construction. Even more so when the building is listed and has to be redesigned in a contemporary way within the framework of the renovation of an inner-city district with a total of 166 residential units. Today, living comfortably means using gentle radiated heat. The upgrading of heating systems to provide low-temperature radiated heat also ensures better energy efficiency.



Maximum comfort through perfectly harmonized systems

The impressive result of the Uponor/Knauf partnership



- Site:** Kirchenstrasse in Munich Haidhausen
- The task:** Renovation of a residential building with dry construction work
- The solution:**
- Knauf Brio
 - Uponor Siccus
 - Wood fibre insulation panel
 - Knauf EPO Leicht (light levelling mortar)



Quick laying of Knauf's Brio Pre-fab Screed on top of Uponor's Siccus panels

Underfloor heating was planned in the bathrooms. The gypsum fibre elements are also approved for residential bathrooms. The Uponor Siccus system was chosen as underfloor heating, as it is perfect for pre-fab screed and is quick to install. Together with the Brio Pre-fab Screed, this results in very light heating floor screed weighing just 23 kg/m² (approx.). This is a definite plus point in old timber beam ceilings that cannot be additionally loaded. As a comparison, a standard new build construction with liquid screed would weigh approx. 110 kg/m² whilst cement screed would weigh as much as 130 kg/m².



The perfectly matched systems allow the project to move forward quickly.

KNAUF AND UPONOR – SYSTEM-BASED QUALITY

Knauf and Uponor have set themselves the highest quality standards. In order to meet these securely, all products and harmonized systems are developed, produced and tested according to strict conditions. Our obligations mean safety for you.

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The Knauf logo is rendered in a bold, blue, sans-serif typeface. The letters are closely spaced, and the 'K' and 'A' are particularly prominent.The Uponor logo is rendered in a bold, blue, sans-serif typeface. The letters are closely spaced, and the 'U' and 'P' are particularly prominent.

Detailed information on the individual components of the matched Knauf/Uponor systems for energy-efficient radiant heating and cooling can be found in separate catalogues, which can be ordered at: zentrale@knauf.de and/or international@uponor.com