



LEVELDEK

A NEW ERA in raised-floor underfloor heating systems

In a time when the phrase ‘high-end residential’ is becoming the norm across all areas of the construction industry it has become apparent that architects and contractors alike are looking for ever more cost-effective solutions while retaining the high-end finish that they seek.

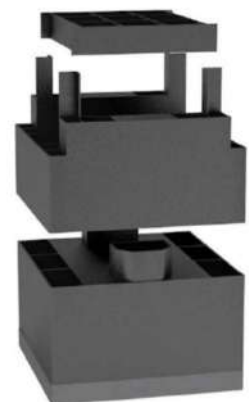
In response to this obvious demand a new, lightweight, innovative and cost-effective flooring system that includes underfloor heating has been developed.

Thanks to a collaboration between NEW ERA Flooring and Jupiter Underfloor Heating the LevelDek system has been created to fulfil the needs of the most demanding projects.

The NEW ERA floor levelling system is gradually becoming the industry standard due to its proven track record over many years. It is a simple, yet high-performing system that solves levelling problems and can be built up to 431mm in all manner of buildings. In addition the NEW ERA system has superb acoustic properties that meet Part E requirements if necessary. NEW ERA has an illustrious track record in the UK high-end residential market.

As the name suggests the NEW ERA system provides a new standard in floor levelling systems through progressive development and a complete understanding of problems inherent with uneven subfloors. NEW ERA floor levelling systems achieve a practical, cost-effective and versatile solution in overcoming inconsistencies in variable subfloor levels and conform to all the latest standards for sport floors and acoustics.

Jupiter Heating Systems Ltd is well known for producing high quality underfloor heating systems. Being specialists in the dry-install market, producing a heating system that works in conjunction with the NEW ERA system was a marriage destined to happen. The result is a lightweight, simple, fast-to-install system with many benefits.



The NEW ERA levelling system consists of incremental blocks and packers that can be stacked together to make up an infinite number of heights.

Innovation

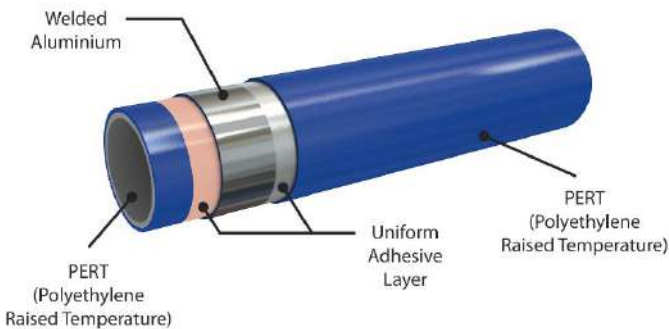


The innovation within this new system looks simple yet has been derived from many years of combined experience. It is a known fact that air insulates and before the LevelDek system was developed, underfloor heating pipework was installed between the cradles of raised-floor systems either directly on the concrete or rolled-out mineral wool insulation. This approach still left a large void of air between the pipe and the substrate above.

The LevelDek saddle resolves this issue by raising the heating element and thus ensuring contact between the warm, aluminium spreader-plates and the substrate. The added bonus of raising the heating element is that the other services (e.g. electrical) can be installed easily prior to the NEW ERA system being installed.

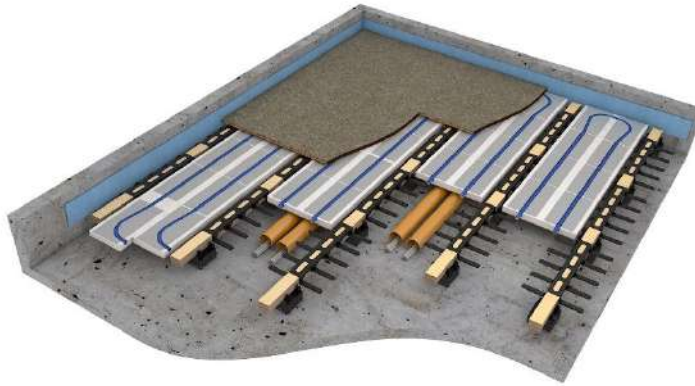
The patented saddle design is manufactured entirely from recycled polypropylene and has a guarantee of 10 years. Polypropylene retains its plasticity throughout time and is unaffected within a working temperature range of -40°C–110°C.

The LevelDek heating system consists of only three elements. Careful consideration led to a reduction of the number of components in order to keep the cost of the system down and to stop it becoming complicated. The moulded EPS panels have a thermal resistance value of $0.86\text{m}^2\text{K/W}$ and therefore comply with Part L on upper floors. The aluminium heat-diffusion plates are made from 0.5mm thick aluminium plate and ensure an even spread of heat across the floor. Pipe centres are at 155mm.

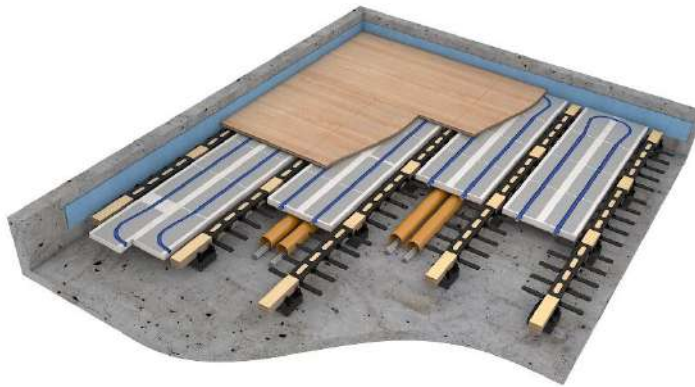


The LevelDek system is supplied with 16mm, multi-layer PE/RT pipe. The pipe is impervious to oxygen ingress and comes with a German manufacturers' 10-year standard warranty. The design life of PE/RT pipe is 200 years.

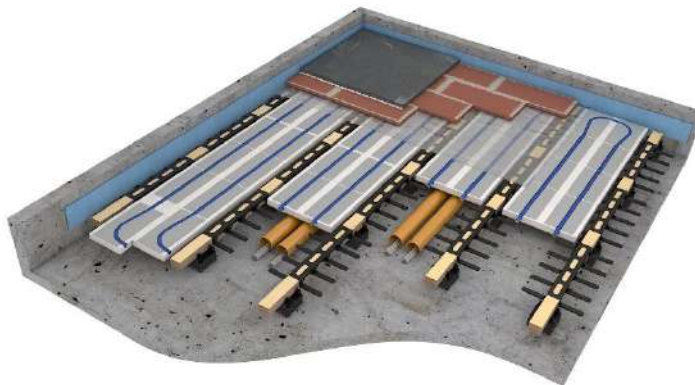
Floor constructions



Construction LD-01 – 18mm chipboard substrate – budget substrate for floor finishes such as carpet, engineered-timber floorboards, lino, marmoleum

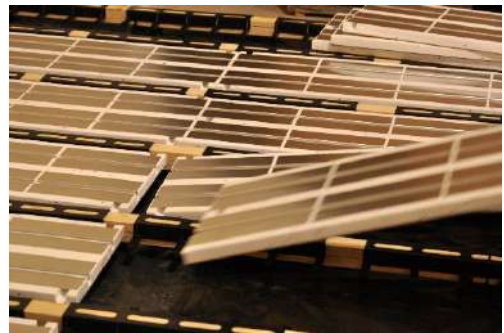
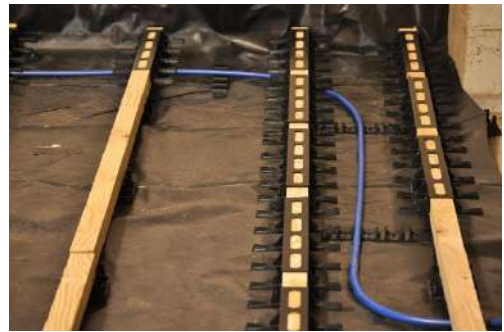


Construction LD-02 – 18mm ply wood substrate – standard substrate for floor finishes such as carpet, engineered-timber floorboards, lino, marmoleum



Construction LD-03 – 20 mm Screed Replacement Tile substrate – premium substrate for floor finishes such as large-format porcelain tiles, stone, poured terrazzo and brittle finishes.
This system comes with a 5-year floor finish warranty – even when installed by others

Installation

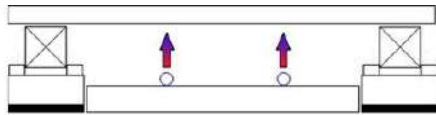


LevelDek is quick and easy-to-install as the New Era cradles and battens are swiftly positioned to the correct height. The heating panels then sit directly on the supporting saddles and are automatically aligned.

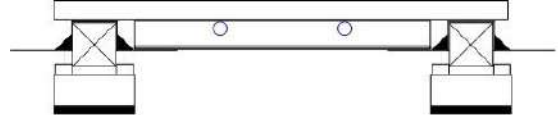
Once the heating elements are in position, the pipe is installed by clipping it into the omega-shaped channels. Tongue-and-groove chipboard or plywood can be installed and simply screwed down. The LevelDek saddle acts additionally as the perfect separator to prevent wood-on-wood squeaks.

System performance

During testing, an alternative system commonly used in conjunction with batten-and-cradle systems produced a surface temperature of only 22.5°C. With the same water temperature the LevelDek system produced a surface temperature of 26.6°C: a 20% improvement which effectively represents a 20% saving in energy costs.



Alternative system



LevelDek

| Time Interval | Flow Temp. °C | Return Temp. °C | Surface Temp. °C |
|---------------|---------------|-----------------|------------------|
| 09:00h | 35 | 20 | 19.4 |
| 10 | 45 | 40 | 19.4 |
| 20 | 44 | 44 | 20.0 |
| 30 | 44 | 44 | 20.0 |
| 40 | 45 | 44 | 20.3 |
| 50 | 44 | 43 | 20.5 |
| 60 | 43 | 43 | 20.8 |
| 70 | 45 | 42 | 21.3 |
| 80 | 44 | 44 | 21.5 |
| 90 | 44 | 42 | 21.7 |
| 100 | 44 | 41 | 21.9 |
| 110 | 44 | 42 | 22.0 |
| 120 | 44 | 42 | 22.1 |
| 180 | 44 | 41 | 22.5 |
| 240 | 44 | 40 | 22.5 |

| Time Interval | Flow Temp. °C | Return Temp. °C | Surface Temp. °C |
|---------------|---------------|-----------------|------------------|
| 09:00h | 35 | 20 | 19.4 |
| 10 | 45 | 32 | 19.6 |
| 20 | 44 | 33 | 23.3 |
| 30 | 44 | 33 | 23.6 |
| 40 | 45 | 32 | 24.3 |
| 50 | 44 | 33 | 25.0 |
| 60 | 44.5 | 33 | 25.7 |
| 70 | 45 | 32 | 25.8 |
| 80 | 44 | 33 | 25.9 |
| 90 | 44 | 33 | 26.1 |
| 100 | 44 | 33 | 26.3 |
| 110 | 44 | 33 | 26.4 |
| 120 | 44 | 33 | 26.4 |
| 180 | 44 | 33 | 26.5 |
| 240 | 44 | 33 | 26.6 |

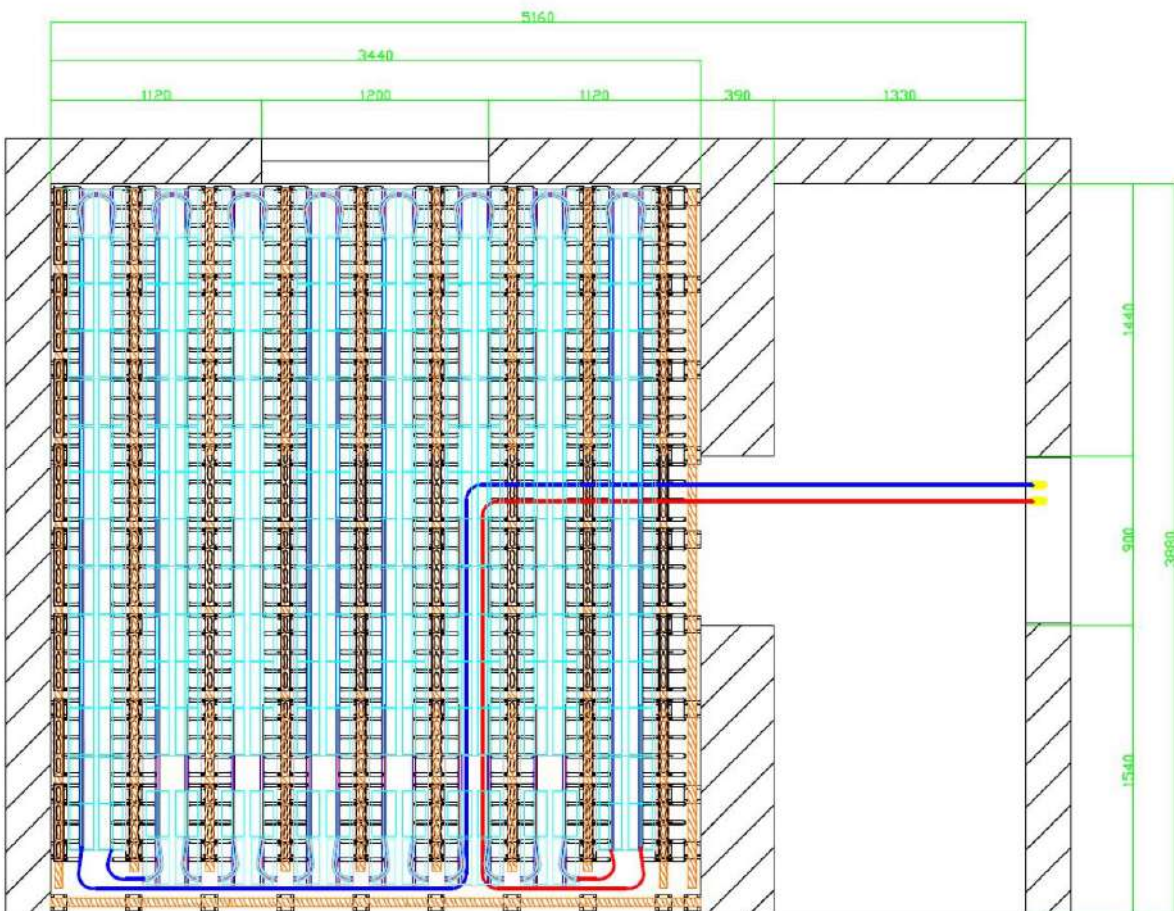
| Mean water temp. | Room temp. | Pipe centres 15.5 cm | | Pipe centres 15.5 cm | | Pipe centres 15.5 cm | | Pipe centres 15.5 cm | |
|------------------|----------------|------------------------|----------------|------------------------|----------------|------------------------|----------------|------------------------|----------------|
| | | Chipboard R=0,00 m²K/W | Surface temp. | Chipboard R=0,05 m²K/W | Surface temp. | Chipboard R=0,10 m²K/W | Surface temp. | Chipboard R=0,15 m²K/W | Surface temp. |
| q _m | q _i | 18 mm | q _F | 18 mm | q _F | 18 mm | q _F | 18 mm | q _F |
| °C | °C | W/m2 | °C | W/m2 | °C | W/m2 | °C | W/m2 | °C |
| 45 | 15 | 102.3 | 24.2 | 83.9 | 22.7 | 71.2 | 21.6 | 61.8 | 20.8 |
| 45 | 18 | 91.1 | 26.3 | 74.7 | 24.9 | 63.4 | 23.9 | 55.0 | 23.2 |
| 45 | 20 | 83.6 | 27.6 | 68.6 | 26.4 | 58.1 | 25.5 | 50.5 | 24.8 |
| 45 | 22 | 76.1 | 29.0 | 62.4 | 27.9 | 52.9 | 27.0 | 45.9 | 26.4 |
| 45 | 24 | 68.6 | 30.4 | 56.3 | 29.3 | 47.7 | 28.6 | 41.4 | 28.0 |
| 50 | 15 | 121.0 | 25.7 | 99.3 | 23.9 | 84.2 | 22.7 | 73.1 | 21.8 |
| 50 | 18 | 109.8 | 27.8 | 90.1 | 26.2 | 76.4 | 25.0 | 66.3 | 24.2 |
| 50 | 20 | 102.3 | 29.2 | 83.9 | 27.7 | 71.2 | 26.6 | 61.8 | 25.8 |
| 50 | 22 | 94.8 | 30.6 | 77.8 | 29.2 | 66.0 | 28.2 | 57.2 | 27.4 |
| 50 | 24 | 87.3 | 32.0 | 71.7 | 30.6 | 60.8 | 29.7 | 52.7 | 29.0 |
| 55 | 15 | 139.7 | 27.2 | 114.6 | 25.2 | 97.2 | 23.8 | 84.3 | 22.7 |
| 55 | 18 | 128.5 | 29.3 | 105.4 | 27.4 | 89.4 | 26.1 | 77.6 | 25.1 |
| 55 | 20 | 121.0 | 30.7 | 99.3 | 28.9 | 84.2 | 27.7 | 73.1 | 26.8 |
| 55 | 22 | 113.5 | 32.1 | 93.2 | 30.4 | 79.0 | 29.3 | 68.5 | 28.4 |
| 55 | 24 | 106.1 | 33.5 | 87.0 | 31.9 | 73.8 | 30.8 | 64.0 | 30.0 |

Design calculations and drawings

The thermal resistance of our various substrates as well as the thermal resistances of floor finishes are taken at design stage to produce heat output calculations. From this information it is possible to calculate whether or not the underfloor heating system is sufficient to heat the space it is serving.

| | | | |
|--|--|--|--|
| Room-Nr.: 02.05 Building unit: | | Room description: TV Room/Den | |
| Room area: $A_R = 42,30 \text{ m}^2$ | Design share = 80 % | Nominal inside temperature: $\theta_{int} = 20 \text{ }^\circ\text{C}$ | |
| Heating surface: $A_{heat} = 25,02 \text{ m}^2$ | Floor heating output: $\Phi_{F,th} = 1810 \text{ W}$ | Output of supply line: = 0 W | |
| Non-heated surface: $A_{unh.} = 17,28 \text{ m}^2$ | spec. Floor heating output: $\Phi_{F,th} = 72,4 \frac{\text{W}}{\text{m}^2}$ | Surface of supply line: = 0,00 m^2 | |
| Floor construction | $R_{Floor \text{ covering}} = 0,100 \frac{\text{m}^2\text{K}}{\text{W}}$ | $R_{insulation} = 0,750 \frac{\text{m}^2\text{K}}{\text{W}}$ | |
| $\theta_{below} = 15,0 \text{ }^\circ\text{C}$ | $s_{covering} = 12,0 \text{ mm}$ | $R_{Floor \text{ line}} = 0,076 \frac{\text{m}^2\text{K}}{\text{W}}$ | |
| | $\lambda_{R,Covering} = 0,316 \frac{\text{W}}{(\text{m}\cdot\text{K})}$ | $R_{below} = 0,170 \frac{\text{m}^2\text{K}}{\text{W}}$ | |
| Surface circuit Nr. = 02.05/1 | manifold Nr. = 9 | Pipe type = JUPITER 16x2,00 mm | |
| Number of circuits = 1 | $\theta_{flow} = 42,6 \text{ }^\circ\text{C}$ | $\dot{V} = 153,3 \frac{\text{l}}{\text{min}}$ | |
| Pipe length = 73,76 m | $\sigma = 5,0 \text{ K}$ | $\Delta p = 149,1 \text{ hPa}$ | |
| of this the supply line length = 2 · 0,00 m | $\theta_{return} = 37,6 \text{ }^\circ\text{C}$ | Flow meter = 2,56 $\frac{\text{l}}{\text{min}}$ | |
| Floor heating output = 667 W | Total heating output = 883 W | | |
| separate Central / comfort zone | | | |
| $\Phi = 667 \text{ W}$ | Heating surface = 9,22 m^2 | $\Phi = 72,4 \frac{\text{W}}{\text{m}^2}$ | |
| System type = meander | Division = RZ | $\theta_{F,m} = 26,7 \text{ }^\circ\text{C}$ | |
| Surface circuit Nr. = 02.05/2 | manifold Nr. = 9 | Pipe type = JUPITER 16x2,00 mm | |
| Number of circuits = 1 | $\theta_{flow} = 42,6 \text{ }^\circ\text{C}$ | $\dot{V} = 141,9 \frac{\text{l}}{\text{min}}$ | |

In addition to these calculations, layout drawings are produced for both installation and recording purposes.



JUPITER



LEVELDEK
A NEW ERA IN HEATING

