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Energy-efficient, cosy, attractive

Upper Austrian innovation in the e-heating sector



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In cooperation with the [Johannes Kepler University Linz](#)^{***} and the [Kaiserslautern University of Technology](#)^{****}, the HELIOLITH eU start-up in Peuerbach, Upper Austria, which was founded in 2018 by Gerhard Forst, has developed an electrical heating system that uses both radiated, infrared warmth and the heat storage capacity of polymer concrete. The feeling of wellbeing thus created is entirely comparable with that from a traditional tiled stove and in a study, the [Austrian Institute for Healthy and Ecological Building](#)^{*****} confirmed that the system offers a high degree of comfort.

One of the first such hybrid heating systems was installed in the tack room of a stables and this fact illustrates more than clearly its range of possible applications. Apart from its heat output, the system possesses additional advantages, as it is visually attractive, can be manufactured in virtually any design, has a small footprint and is also interesting from an overall cost standpoint. Gerhard Forst, "For example, if someone has a log cabin, they can install a heating panel with a root wood look." In fact, the fledgling HELIOLITH eU company offers solutions for virtually every situation and for example, hotels, spas and leisure centres can all employ its highly robust system for the provision of pleasant temperatures in both in- and outdoor areas.

Energy-efficient e-heating

Businessman Gerhard Forst has been using the funding consulting service offered by Business Upper Austria, the region's location agency since 2016, initially as a one-person company and then for his start-up. The grant expert, Roland Nöbauer, both put the young entrepreneur in touch with the correct research bodies and accompanied the product development process. This professional support was also successful with regard to grant applications and all-in-all helped Gerhard Forst optimise his heating system and set a new standard for e-heating energy efficiency. In a scientific study, the Austrian Institute for Healthy and Ecological Building confirmed that the system offers a high degree of comfort.

Retrofitting possible

Electrical heating systems are in particular demand for retrofitting in existing objects (old properties, renovations, cellars and attics) where a relaying of water piping is problematic, complicated or impossible. Such systems are also popular for weekend houses, which should be warmed quickly and can then cool down. Owing to their strong drying effect, as a rule IR heating systems creating a high percentage of infrared and heat radiation cause damage to log cabins and wood structures. However, the new system can also be employed in this area, as it allows natural materials to remain animate. This is the proven result of a scientific expertise from the Kaiserslautern University of Technology.

Cosy and comfortable

Conventional IR radiators offer the advantage of rapid heat generation and dissemination. However, they fail to provide a sense of comfort, owing to the fact that once switched off, the lack of a storage and convection effect creates an immediate, subjective feeling of coldness. Consequently, permanent heating is required and hence a constant electrical input. Therefore, as Gerhard Forst stresses, “We were looking for a system that could provide both attributes and establish a new energy efficiency benchmark.” Hybrid heating achieves these prerequisites, as within this context, the designation hybrid stands for a special type of heat distribution (convective and infrared radiation). The heating element is entirely encapsulated in polymer concrete as a heat storage mass and is thus protected against moisture penetration.

Research-intensive development

Heating systems using a combination of various effects and ambient conditions are by definition complex and therefore the integration of expert scientific knowledge represents an important precondition for their success. Consequently, in order to optimise every technically relevant heating aspect of the system and thus attain the highest degree of energy efficiency, Gerhard Forst, the HELIOLITH founder, has been cooperating with international research institutes for many years. For example, diverse parameters such as net radiation output and efficiency, as well as the heating up and cooling down periods were defined and perfected in teamwork with the Kaiserslautern University of Technology.

Optimised material

The Johannes Kepler University Linz examined and optimised important physical characteristics of the heating panel material (polymer concrete) such as its specific heating capacity and conduction capacity. In addition, simulation models were created for an ideal, theoretical layout of the heating wires, which would subsequently provide uniform temperature distribution.

Top attests

Together with the Austrian Institute for Healthy and Ecological Building (IBO), a series of as yet scientifically unproven comfort characteristics and functions were studied. Gerhard Forst, “We received top ratings in every area.” The experts confirmed that HELIOLITH heating has a physiological impact upon comfort, allows optimised regulation for lightweight and massive structures, and differs from other radiation heating systems such as standard infrared. HELIOLITH took advantage of the Upper Austrian “Innovation Check with Deductible” funding instrument for the IBO examinations.

* <https://expoenergy.eu/ne13/index.asp?pn=3>

** <http://www.iena.de/en/home.html>

*** <https://www.iku.at/en/>

**** <https://www.uni-kl.de/en/>

***** <https://www.ibo.at/en/>