The Comfort
MULTIBETON
Surface Heating
and Cooling

Quality ist the best guarantee.

Energy output

Comfort

Heat balance

Indoor climate

Floor temperature

Humidity

Naturally MULTIBETON!

Control

MULTIBETON

The comfort

Humans spend a vast amount of their life indoors. From a thermal perspective it's of interest to get to know more about the "third skin" of humans.

Energy output

Physically speaking, humans are a heat power machine performing chemical and mechanical work. To perform this work, the body is provided energy through nutrition. A little example: A sleeping adult has a total heat output of approx. 80 W compared to an adult performing strenuous physical labour, at approx. 450 W. This shows that structures and building services must meet different requirements.

Comfort

Thermal comfort is not an exact measure. If a person feels comfortable in said thermal factors, their performance is typically best. Temperature regulation is balanced and the body will be at a temperature of about 37 °C. In addition, multiple investigations on the sense of comfort have shown the range from satisfied to completely dissatisfied is quite wide.

Heat balance

It's the contact organ between "inside" and "outside". The skin regulates our heat balance. If the core temperature (37 °C) drops by 1.5 K, the metabolism increases by about 20 %. Three-fourths of a human's heat is output through thermal radiation and conduction. Warm skin strives to give off energy to colder areas. This particularly applies to our head and feet.

Indoor climate

Building biollogists consider buildings the human's third skin. Everybody perceives a different optimal indoor climate. Various indoor climate components have been deterrmined which impact comfort. The factors are e.g.: air movement, humidity, temperature of enclosing areas, air temperature, amount of time spent, density, clothing, activity level and physical condition.

Floor temperature

When the planner or builder plans a MULTIBETON underfloor heating, they will also ask about a healthy and comfortable surface temperature. This is on average 24 °C. In addition, there are studies showing that humans prefer higher temperatures (approx. 26 °C) at the cold-sensitive feet on upper floor coverings with good thermal conductivity (e.g. tiles). On carpet (low thermal conductivity), people already feel very comfortable at temperatures around approx. 23 °C. The European standard therefore prescribes a maximum surface temperature for stay areas of 29 °C, 33 °C in baths and 35 °C in edge zones.

Humidity

With respect to indoor humidity there are two noteable extremes. For example: At a room temperature of 22 °C the relative humidity can range from 20 % to 75 % to be considered comfortable. On the one hand the nasal mucosa will dry out and on the other hand you will need to fight mould and mildew. For hygiene and health reasons the target should not be above or below 40 % to 60 % relative humidity.

Naturally MULTIBETON!

So what does thermal comfort have to do with the MULTIBETON product? Artus Feist, the founder of MULTIBETON and pioneer in surface heating, started researching alternative heating system in the mid 1960s. Since he personally always complained of cold feet, underfloor heating wasn't a far reach. In the mid 1970s, Mr Feist and Dr Kollmar collaborated intensely on a scientific level. The result was the renowned MULTIBETON modulation process and other patents. MULTIBETON surface heating gained widespread recognition in the industry from this and is now still considered a pioneer in energy-efficient heating. In the decades after, many experts discovered surface heating is beneficial to the health and considered comfortable. MULTIBETON comes quite close to human requirements for a natural heating system.

Control

MULTIBETON recommends using a thermometer to objectively adjust the desired room temperature with regard to impacts of thermal comfort. Do not be misled by your current temperature sensation. After reading the room temperature, you will feel satisfied with a temperature display between 19 and 23 °C. First set the boil control unit for the room needing the most heat. Then lower the thermostats in the other rooms. Take a few days for this to rule out misinterpretations relatd to day/night or the weather. Remember, every degree of room temperature costs about 6 % more energy. MULTIBETON surface heating is designed to make you feel comfortable as quickly as possible. If you live or work in a new building, check the current values over the next year. The heating curve is typically only lowered a bit by the boiler control unit.

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