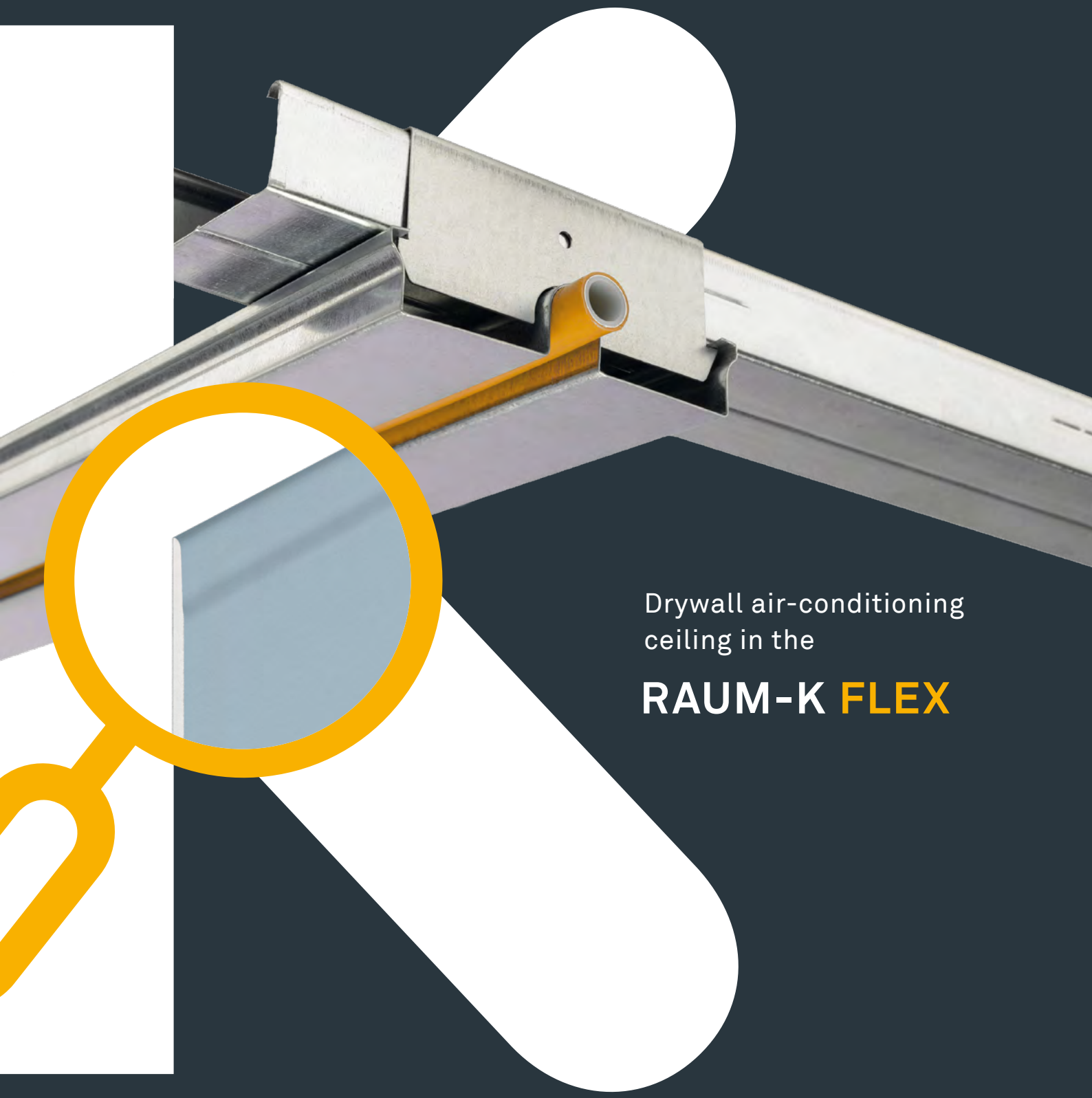
RAUM-K
New World of Energy



Drywall air-conditioning ceiling in the

RAUM-K FLEX

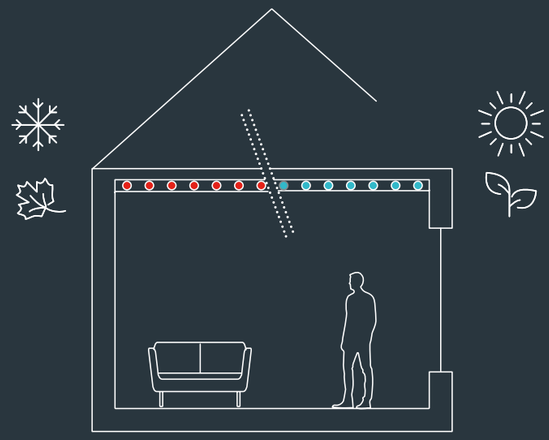
powered by

singular klima to go

Why Raum-K? **– It`s time to take action.**
The natural CO_2 content of our atmosphere can be traced back historically from the Antarctic ice. For 800,000 years, the value fluctuated between 160 and 300 ppm. Since industrialisation, it has increased to more than 400 ppm for the first time due to the emission of greenhouse gases. Today, almost one third of the total CO_2 concentration can be traced back to humans - and is increasing. This additional CO_2 in the atmosphere is causing climate change, which we must reduce at all costs for the future of the planet. If it is to be reversed urgent action is needed now. Raum-K makes the heat turnaround possible, with which we can convert almost one third of the German energy consumption from fossils to regenerative energy.
That's why you should choose Raum-K –
A New World of Energy now.

CONTENT

POTENTIAL OF A CLIMATE CEILING



Combined heating and cooling

Heat pumps are increasingly being employed: already more than 40 % of new buildings use them for the efficient operation of their surface heating. In residential buildings, the pumps mainly generate heat for underfloor heating - leaving their cooling potential unused.

A CLIMATE-CONTROLLED CEILING CAN DO BOTH:

HEATING AND COOLING.

Up to now, cooling has been exploited far too rarely, or compensated for with an additional air conditioning unit. A reversible heat pump offers ideal conditions, creating a comfortable indoor climate all year round and maximum energy efficiency. Climatic ceilings use this potential and equip buildings for the increased cooling demand that will await us in the course of climate change.

Cooling without the risk of catching a cold

Many rooms have drafts and cold air constantly flows through them. Rooms with such deficiencies are very common. In comparison, air conditioning systems can cool more strongly, but often cause uncomfortably cold draughts with high energy expenditure. Fortunately, air-conditioning ceilings have now become established as a means of air-conditioning. These offer practical advantages for a wide range of applications, such as absolutely silent cooling without unpleasant draughts.

Comfortable warmth without heating air

Do you know the pleasant feeling of being warmed by the sun on a clear winter day? The air is cool, but the radiant heat makes up for it.

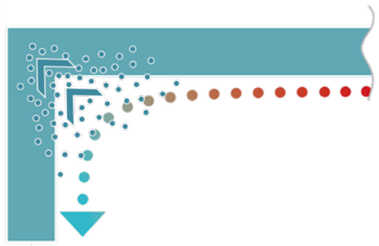
Heating with the mineral climate ceiling also works according to this principle. All surfaces in the room are heated, radiating this heat to us. The heating power can be reduced. Therefore, we are surrounded by gently heated surfaces. This means that the air does not have to be overheated and thus dried out - we feel good all round.

Healthy breathing air

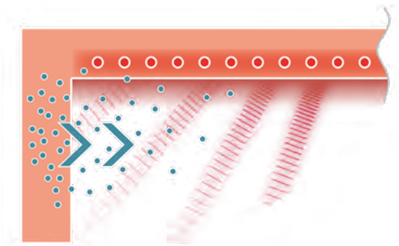
A person breathes 24,000 times every day. That is up to 12,000 litres of air* that flows into our lungs - including all the substances suspended in it. Among them is mainly house dust, which consists of mite excrement and other organic components. Allergy sufferers in particular know the value of a low-dust room climate. With a climate ceiling based on radiant heat, people can breathe cleaner air, because it circulates less dust during heating than systems based on convection.

Against mould and moisture

Mould is more than unpleasant and dangerous for people and buildings. Low ventilation increases the risk of harmful mould growth. Climatic ceilings actively prevent mould growth, because they primarily warm the room envelope - not the air. If the walls are warmer than the air, they remain dry and do not provide a breeding ground for mould.



If the air is warmer than the enveloping surfaces it cools down on them. Moisture in the air condenses on and penetrates the walls.

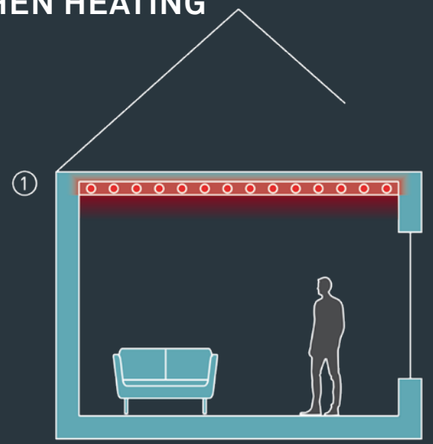


If the air is colder than the enveloping surfaces, it warms up on them. In the process, it evaporates water: the masonry dries.

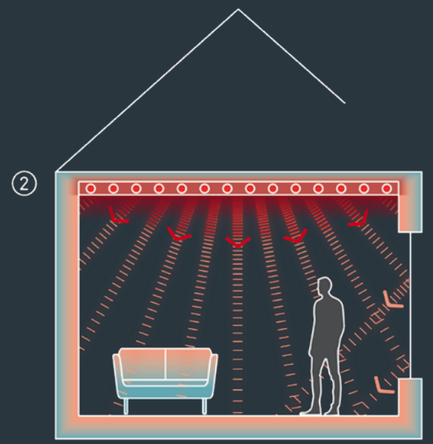
* R. F. Schmidt, G. Thews, Physiologie des Menschen, Springer, Berlin, 1995

HOW IT WORKS
AN AIR-CONDITIONED CEILING

WHEN HEATING



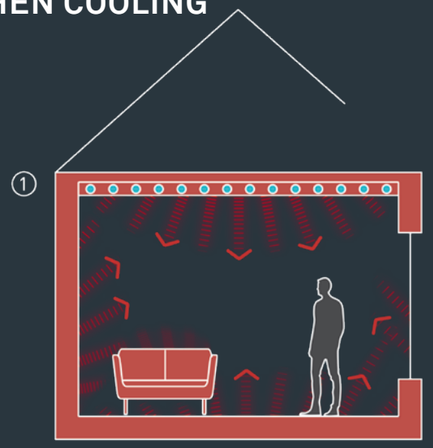
Warm water flows through pipes in the ceiling and heats its surface. On the warm surface of the ceiling, the air temperature rises.



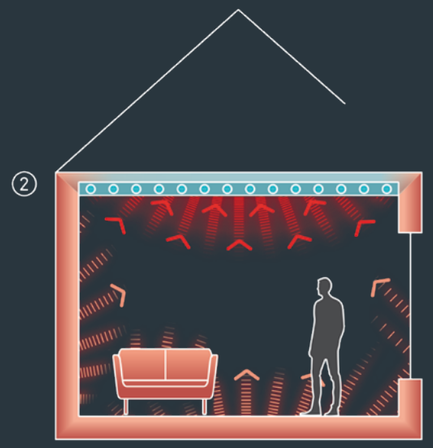
The warm air can neither rise nor cool on the ceiling: Convection is slowed down. Heat is only transferred to the floor, walls and furniture by radiation.

All surfaces are now warmer than the air in the room. Like the ceiling, they radiate their heat gently and evenly into the room.

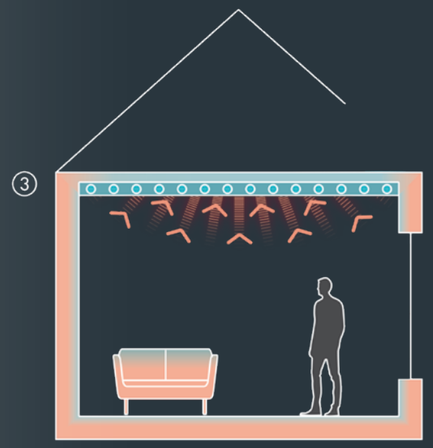
WHEN COOLING



If the surfaces are heated up in summer they radiate a lot of heat into the room. Cold water will flow through the pipes of the climate control ceiling to cool the ceiling surface.



The cooled ceiling surface absorbs heat radiation from the room. It permanently dissipates this heat with its cooling water. The radiation exchange between the cool ceiling and the warm surfaces now also cools the walls, floor and furniture.



The cooled surfaces radiate less heat into the room and allow the body a comfortable heat regulation again without sweating. This is because the body also releases its excess heat to cooler surfaces through the exchange of radiation.

Radiant heating

A climate-controlled ceiling brings heat into the room mostly by emitting thermal radiation. As a result it primarily heats the surfaces: Ceiling, wall, floor and furniture become warmer than the air. The warmer the surfaces are, the more heat they themselves radiate to their surroundings.

The pure heat radiation of the climate ceiling transforms virtually every surface of the room into a warm surface. The air on the other hand, remains pleasantly fresh and is not overheated. This ambient climate is extremely comfortable for people.

Radiant cooling

Due to direct sunlight and industrial heat, the walls and floor can heat up considerably in summer. These overheated surfaces radiate heat which disturbs the natural heat regulation of humans.

This is why cooling is achieved with the help of the ceiling: All overheated surfaces now transfer their heat via radiation exchange to the cooler climate ceiling, where it is continuously dissipated with the cooling water. In the process, the surfaces cool down and radiate correspondingly less heat into the room. In exchange we can radiate our own excess heat back to the cooler environment and feel more comfortable.

The air-conditioned ceiling is supplemented by controlled ventilation of the living space: this dehumidifies the air during hygienic air exchange and therefore enables air-conditioning to a high intensity.

RAUM-K FLEX FEATURES

Activatable area:	100 %
Installation height:	from 30 mm
Response time:	15 minutes
Fire protection:	up to F 30
Acoustic optimisation:	Perforated ceiling
Heat output[1]:	75.00 W/m² following DIN EN 14037 | Δt 15 K
Cooling capacity[1,2]:	75.00 W/m² following DIN EN 14240 | Δt 10 K

1 Higher outputs (e.g. heating above 120 W/m² and cooling above 101 W/m²) are possible and depend on design, material selection, system temperature, pipe spacing and room temperature.
2 In order to achieve the complete cooling capacity and at the same time exclude condensation, water moisture must be removed from the room air. For dehumidification, the ventilation system that is usually installed is sufficient for the minimum hygienic air exchange.

Fits in every room

Is the climate ceiling Raum-K Flex suitable for your property?

Without a doubt. The patented dry construction system adapts flexibly to any floor plan. It can even be installed on roof slopes and between wooden beams. It also doesn't matter whether the original ceiling is made of concrete or wood.

Depending on requirements, this climate-controlled ceiling can be installed directly, reducing the room height by only three centimetres. Alternatively, it can be suspended to create space for the building services.

100 % covered ceiling

The flexible dry construction system activates the entire ceiling surface in any room, no matter how angled. As a result, the climate-controlled ceiling achieves the same performance as conventional heating systems even with lower flow temperatures. Ultimately this increases energy efficiency and the system harmonises particularly well with heat pumps.

Quickly planned and available from stock

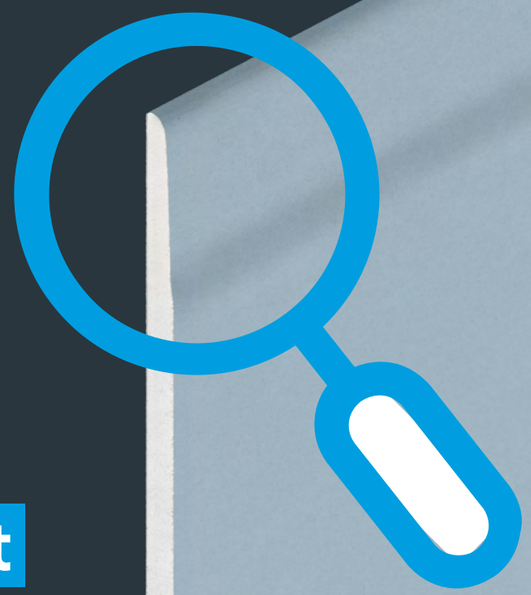
Other ceiling systems - be it prefabricated cassettes, register ceilings or semi-precast concrete elements - must be precisely prefabricated, requiring elaborate planning and long delivery times.

Raum-K Flex profiles are available at any time and are simply fitted on site.

RAUM-K TOP FEATURES

THE PLASTERBOARD FOR EVERY CEILING POSITION

The Raum-K Top is a unique special gypsum board with excellent thermal conductivity properties for use in surface heating and cooling systems. Its special core composition guarantees high thermal conductivity as well as low swelling and shrinkage under changing climatic conditions. This means that larger and more aesthetic surfaces can be created with fewer expansion and movement joints.



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Promat

OUR STRONG PARTNER: PROMAT

A plaster multi-talent

The Raum-K Top is a special dry construction board that combines everything! With outstanding technical properties and an extremely hard and resistant smooth blue surface, that can still be easily and quickly processed by means of scoring and breaking, which qualifies it for particularly high-quality dry construction systems. This means that Raum-K Top can be used as thermally effective panelling for surface cooling and surface heating systems in hospitals, care homes, training, leisure and sports facilities, as well as office buildings, hotels and in residential construction. Due to its relatively high density, Raum-K Top offers not only special thermal conductivity properties but also optimum sound insulation properties and protection against fire and moisture.

Raum-K Flex + Raum-K Top

We are proud present a particularly strong duo as a universal room climate system. Through our cooperation partner Promat Industry, you can rely on complete safety. The special plasterboard Raum-K Top from Promat Industry is perfectly matched to all the requirements of a modern room climate system. Rely on the number 1 in fire protection if you are planning a powerful, efficient and sustainable heating and cooling system in your building project. In our synergetic cooperation, decades of experience and expertise in the Promat business area Industrial Customers combine to create a perfectly coordinated system.

The advantages at a glance

- → Special core formulation for a high thermal conductivity of 0.318 W/(m·K)
- → Simple and fast processing
- → Low swelling and shrinkage performance for large-area aesthetic ceilings and surfaces with a particularly long edge length of up to 15 m
- → High shock resistance
- → Especially insensitive to moisture

The hard facts

Thickness / Width / Length:	10 / 1,250 / 2,000 mm
Edge shape:	HRAK
Palletizing:	24 pieces
Content per pallet:	60 m^2
Weight per m^2:	(approx.) 10,4 kg
Weight per pallet:	(approx.) 624 kg
Distance expansion joint:	up to 15 m
Distance from support profile to wall:	up to 12,5 cm
Thermal conductivity:	λ 0.318 W/(m·K)

MOUNTING VARIANTS

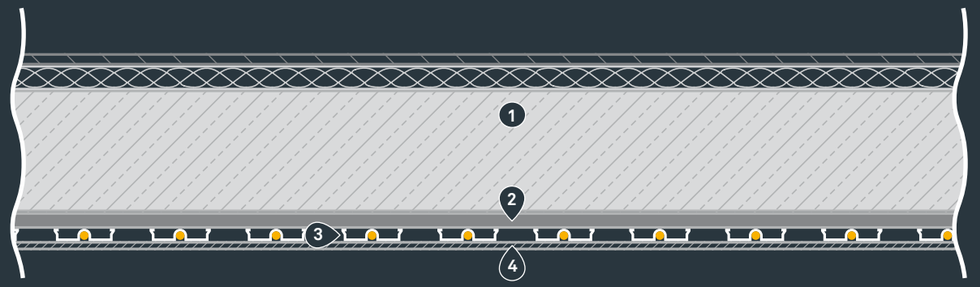
STRUCTURE

1 Slab (wood, concrete, ...)

2 Bearing profile or counter-battening

3 Heat conduction profile with integrated heating / cooling line

4 Lower ceiling: Raum-K Top panels



DIRECT MOUNTING

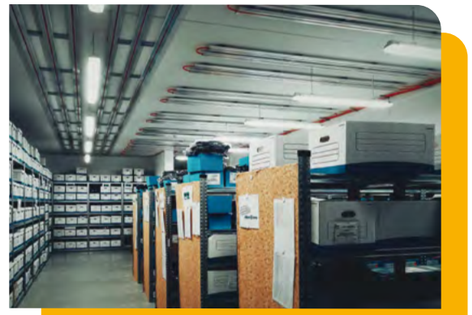
Mounted directly on the structural slab

The thermal conduction profiles are normally mounted on a counter-battening or support profiles which would need fewer drill holes. The heat conducting profiles can also be mounted directly to the ceiling. In this case, the installation height is only 30 mm including planking or 20 mm without planking. The pipes are simply pressed into the seam of the heat conducting profiles. A separating tape (felt) must be inserted between the ceiling (dowel) and the profile.

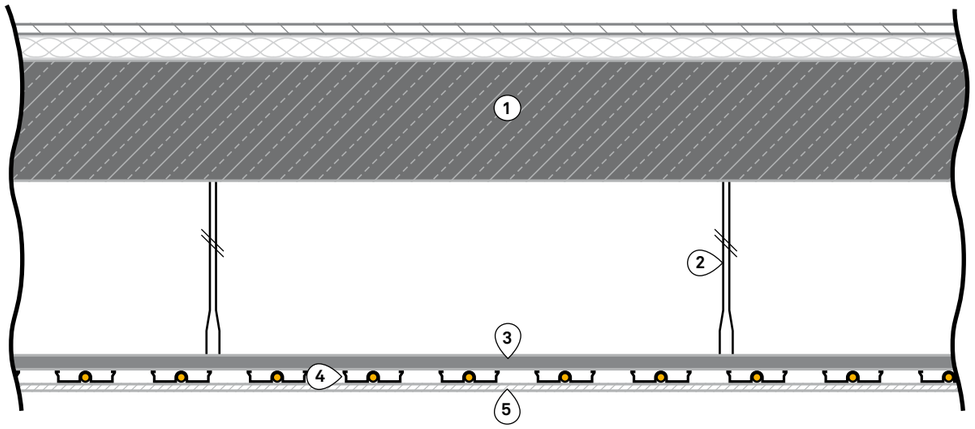
The heat-conducting profiles are mounted here on a counter-battening. Pipes are simply pressed into the bead of the profiles.

Assembly without planking

In warehouses or production halls, the profiles can also be mounted openly on the ceiling - without the usual planking with Raum-K Top panels. This reduces costs and increases performance.



Installation without planking reduces costs and increases performance, where aesthetics play a secondary role.



Structure

1 Slab (wood, concrete, ...)
2 Suspension according to requirement
3 Bearing profile or counter-battening
4 Heat conducting profile with integrated heating / cooling line
5 Suspended ceiling: Raum-K Top panels

SUSPENDED MOUNTING

ROOM FOR THE BUILDING SERVICES

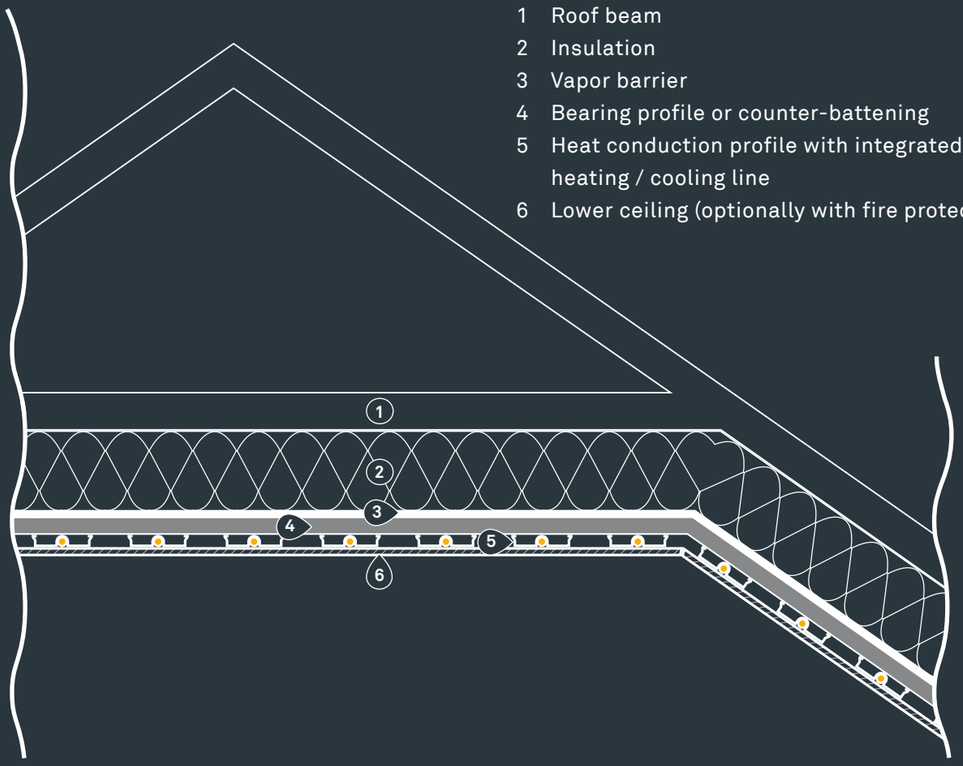
The climate control ceiling can be suspended to any depth to create a cavity for the building services. Even a slight suspen-sion can sometimes be useful, for example to compensate for unevenness in the raw ceiling.

At the front, you can see the suspended support profiles for the **ROMA KG** air-conditioned ceiling that is being built. Behind the scenes, heat-conducting profiles are already mounted on them and pipes are fixed in their bead.

The suspended air-conditioning ceiling for the **WU-VIENNA** was precisely cut to the complex geometry of the ceiling on site, thereby allowing room for occupants, that would not have been possible with prefabricated panels.

Structure

1 Roof beam
2 Insulation
3 Vapor barrier
4 Bearing profile or counter-battening
5 Heat conduction profile with integrated heating / cooling line
6 Lower ceiling (optionally with fire protection)



MOUNTING ON ROOF SLOPES OR BETWEEN WOODEN BEAMS

Mounting on beam ceilings

If the thermal conduction profiles are installed between the beams of a ceiling, the wooden beams still protrude visibly after planking. This preserves the room height and the original ceiling soffit, which also helps to protect historical structures. Alternatively, the profiles can also be mounted under the beams to conceal them.

Assembly in the attic

For gable roofs, the flexible thermal conduction profiles can also provide roof slopes and walls for heating and cooling operation. This allows a high occupancy density to increase performance and efficiency. Avoid injuries to the vapour barrier!

REDEVELOPMENT

Maintains the room height

The profiles are mounted directly on the raw ceiling. In this case, the entire structure reduces the ceiling height by only three centimetres. In the case of a beamed ceiling, the ceiling height even remains completely unchanged, because the profiles can be fitted between the wooden beams. This also preserves the soffit of the original ceiling and thus accommodates the protection of historical structures. Incidentally, fire protection (F 30) is also possible when installing between wooden beams.

High occupancy density in each room

When it comes to renovation, the climate-controlled ceiling scores with its flexibility: the profiles can be fitted into any plan, no matter how angled, and enable a high occupancy density everywhere. Even sloping roofs and walls can be made and built for heating and cooling operation if required. Ultimately, this optimises the efficiency and performance of the system.

Castle Wertingen

Measures for energy refurbishment:

- → Air-conditioned ceilings in offices
- → New windows and/or seals
- → Attic insulated
- → 2 heat pumps and 2 gas boilers in the attic

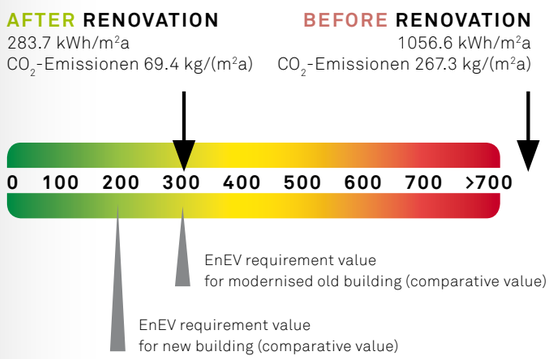
Energetic refurbishment without ETICS

Anyone with a beautiful façade does not like to hide it behind thermal insulation. On historic buildings, this is often even prohibited by the preservation order. But that does not rule out energy-efficient renovation by any means: After all, cladding insulation is only one of many measures and not necessarily the most efficient.

A new indoor climate system reduces the energy demand at least as effectively, if not more so. Depending on the existing insulation standard and heating system, the energy-saving potential of an ETICS can be exceeded by a new climate control ceiling alone. The reasons for this are described in detail in the chapter on economic efficiency: The convectionless operation, the relief of the heat generator and the improved insulation effect of dry walls reduce the heating requirement considerably.

A good example is the energy-efficient refurbishment of Wertingen Castle: Insulation of the façade was already ruled out by a preservation order. Instead, only the ceiling to the attic was insulated and the windows were newly glazed and sealed. The greatest energy savings resulted from the new heating system: The offices are now tempered by air-conditioned ceilings fed by heat pumps and gas heaters. These measures reduced the primary energy requirement by around 73 %. The more comfortable indoor climate in the office is an undoubtedly welcomed bonus.

So if you are thinking about an energy refurbishment, have an expert calculate the various measures and weigh up the benefits carefully. It's worth it.



Air-conditioned ceilings in Monument protection

Climatic ceilings are ideally suited for the renovation of listed buildings, as they preserve the building fabric: As Wertingen Castle demonstrates, they improve the energy balance without having to cover the historic façade with an insulation layer. There is also no need to tear up the floor for installation. In wooden beam ceilings - for example in half-timbered houses - the heat-conducting profiles can be laid between the beams in such a way that the original ceiling soffit is retained after planking. The thermal radiation of the climate-controlled ceiling helps to protect the masonry by drying the walls.

NEW BUILDING

Single-family house with air-conditioned ceiling to the open stairwell.

Synergy optimizes price-performance

Since all options are open in new construction, the flexibility of the climate control ceiling recedes into the background, leaving the spotlight to numerous synergy effects:

For example, the good insulation of new buildings enables a lower occupancy density, which reduces investment costs. Those planning ceiling heating from the onset can reduce the floor build-up or dispense with the screed altogether to save further costs.

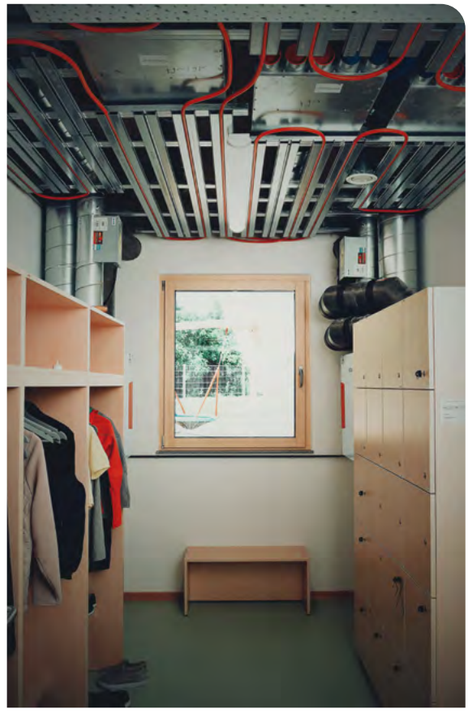
While the suspended ceiling acting alone can achieve fire protection up to F 30, higher fire protection is also possible in combination with the overall construction.

Suspended construction

The suspended construction is ideal for large commercial areas and in the hallway. It creates space for the building services and facilitates future changes to the room layout.

If the ceiling is suspended resiliently, it has a sound-absorbing effect and, depending on the planking, can replace the impact sound insulation of the floor.

Above the suspended air-conditioning ceiling of the **RBZ BIBERACH** there is enough space for ventilation ducts and other elements of the building services.



SAVINGS POTENTIAL IN TIMBER CONSTRUCTION

Saves material costs and working time

The air-conditioned ceiling is usually installed in dry construction under the ceiling or suspended from it. Where it covers the ceiling, this does not have to be of visible quality, of course. This means that the storey ceilings can be built with less expensive timber.

In prefabricated timber construction, the prefabricated ceiling elements can also be fitted with heat conducting profiles and pipes in the factory if required. This cuts installation time and effort on the construction site and simplifies the process on site. As a rule this reduces the cost.

No wet screed necessary

Underfloor heating - if it is to be inexpensive - requires a wet screed, which carries a lot of moisture into the building. As long as the screed is drying, it should not be loaded, which delays the progress of construction. Most importantly, a lot of water evaporates as it dries out, and that poses a risk to the wood structure. Wood and moisture being highly incompatible.

By using a climate-controlled ceiling, the wet screed is not necessary. This avoids the risks to the wood and opens up additional options for floor construction. Many of them are also less costly than the wet screed and can be walked on immediately, which can accelerate the construction progress by up to 6 weeks.

Installation level and Impact sound insulation

If the climate control ceiling is designed as a suspended drywall ceiling, this creates a cavity that can be used for any installations (ventilation system, electrics ...). In addition, this also reduces the costs for the actual installations.

The ceiling can also be suspended resiliently, which gives it good sound-absorbing properties. This effect can be used to improve the existing impact sound insulation of the floor and thus cure one of the disadvantages of timber construction. The floor structure can remain slim and you hear much less noise on the ground floor from upstairs.

Better thermal insulation due to dry walls

The thermal radiation of the climate ceiling has a direct influence on the compensation moisture of a wooden exterior wall: The wall becomes warmer than the room air and evaporates the moisture contained in the wood. This dries the wooden wall, which protects the building and demonstrably improves the insulating properties of the wall.

ROOM ACOUSTICS

Good acoustics for productive work

The ambience suffers in rooms that are not acoustically suitable for their use. For example, if voices in a conference room reverberate for too long they are difficult to understand. Listening then already requires a large part of the concentration and the head is no longer properly free to process the information.

Unsuitable acoustics can become a permanent burden at in the workplace. The Fraunhofer Institute for Building Physics has identified acoustic overstimulation as a major stress factor at work: it leads to more errors, dissatisfaction and increased sick leave. In other words: acoustically optimised rooms increase productivity and people's comfort and well being.

Optimize the reverberation

Depending on the use of the room, a different listening quality is desirable: speech intelligibility, for example, requires shorter reverberation times than the performance of music, which wants to offer the listener a spatial sound image. How a room sounds is initially determined by its architecture and interior design. If its acoustics do not correspond to its use, they can be changed - for example by perforated plasterboard.

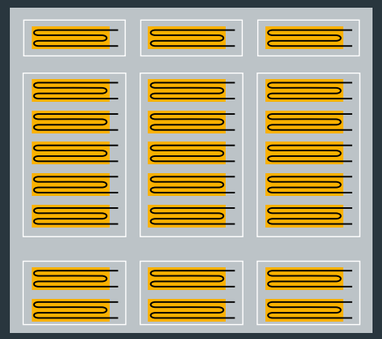
SYSTEM PERFORMANCE

Determination of the effective system performance

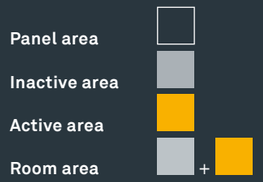
The nominal capacity of a cooling ceiling always refers only to its active area. In order to determine the effective performance of the cooling ceiling, the active area must be related to the panel area in accordance with VDI Guideline 6034: If the area makes up only 61 % of the panel area, the panel area also has only 61 % of the nominal capacity. The resulting performance value can be used to determine how much tile area is required to cover the cooling demand of the room.

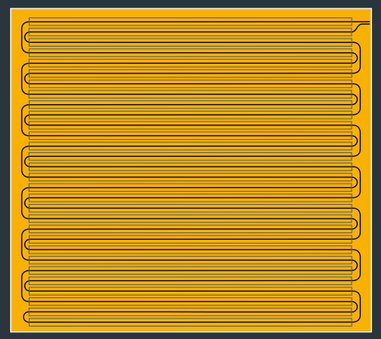
However, this value does not take into account the system-related inactive spaces and edge areas. These can considerably reduce the maximum possible total output on the room floor. This is because if the panel area of the ceiling system only covers 71 % of the room area, only 71 % of the power determined for the panel area remains for the room area.

The nominal output of a grid ceiling is therefore put into perspective several times over. Whereas, a fully installed and activated climate-controlled ceiling such as Raum-K Flex applies almost its full rated output to the entire room surface. This means that even with a lower nominal output, it can achieve a higher output on the room floor.



Ceiling system A
Active area: 6,24 m²
Panel area: 10,22 m²
Room area: 14,44 m²





Ceiling system B
Active area: 14,44 m²
Panel area: 14,44 m²
Room area: 14,44 m²

Calculation of the effective cooling capacity using the ceiling systems shown as an example

83 W/m²	**Nominal cooling capacity of the active surface** with temperature difference $\Delta\theta$ 8 K	**48 W/m²**
50,7 W/m² $= 83\ W/m^2 \times \frac{6,24\ m^2}{10,22\ m^2}$	**Cooling capacity of the plate surface** (according to VDI 6034) = nominal cooling capacity × $\frac{\text{Active area}}{\text{Panel area}}$	**48 W/m²** $= 48\ W/m^2 \times \frac{14,44\ m^2}{14,44\ m^2}$
35,9 W/m² $= 50,7\ W/m^2 \times \frac{10,22\ m^2}{14,44\ m^2}$	**Cooling capacity per room area** = power plate area × $\frac{\text{Panel area}}{\text{Room area}}$	**48 W/m²** $= 48\ W/m^2 \times \frac{14,44\ m^2}{14,44\ m^2}$

DETERMINE THE REAL POWER ON THE BASIS OF THE TEST VALUES

Performance values in practice

Assuming you are planning a room with a cooling requirement of 40 W/m². You want to cool this room with an air-conditioned ceiling and you wonder whether the system of your choice can meet the cooling demand on its own. The manufacturer promises a nominal output of 70 W/m², but this is precisely the point where caution is advised. Although this specification is correct, it only refers to the active part of the ceiling (according to DIN EN).

In relation to the entire room floor, the performance can be significantly lower: This is because, depending on the system, certain parts of the area cannot be installed or activated at all. In practice, this inactive part of the ceiling area must be taken into account with 0 W/m². So if only 60 % of the ceiling area is active, you also only get 60 % of the rated power in relation to the room floor - it's as simple as that.

The advantage of a completely active area

Many climate ceilings can only activate 40 - 80 % of the ceiling area due to the system. For example, bandraster and edge areas are usually inactive. Accordingly, only 40 - 80 % of the nominal output remains on the room floor.

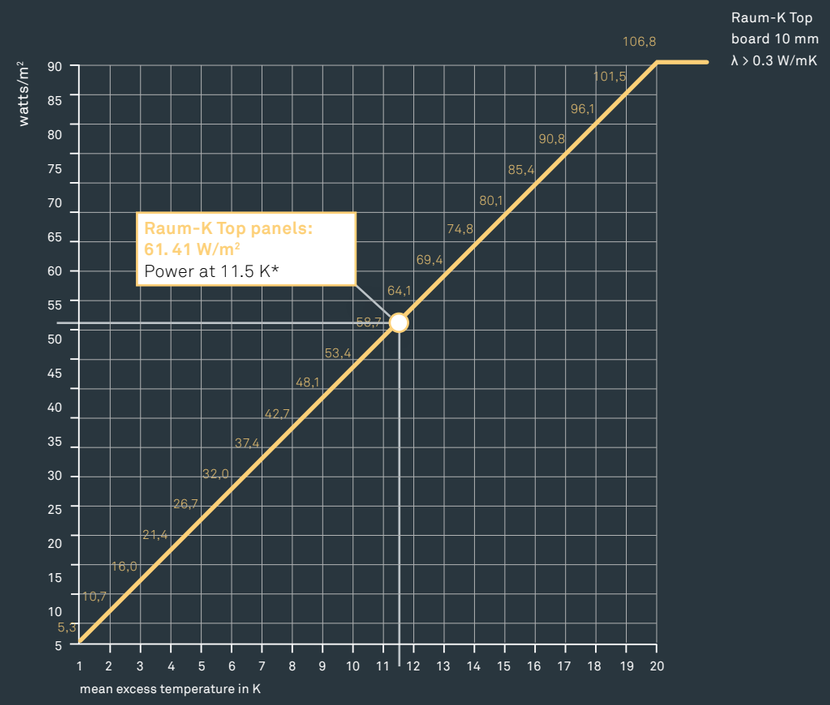
When you consider these performance losses, you also understand the advantage of a fully activated climate ceiling such as the Raum-K Flex: Its active area corresponds to 100 % of the installed area. This means that it uses almost the full rated output over the entire floor area of the room. Some other ceiling systems have a somewhat higher nominal output however, they fall behind in terms of effective output, however, they fall behind in terms of effective output due to their inactive surfaces.

High performance optimizes the System temperature

The output on the room floor must be selected so that the load peaks in heating and cooling operation are manageable. Furthermore, the highest possible total output is worthwhile, as it corresponds to the system temperature: With a high effective output, the system temperature is closer to the room temperature and requires less energy input. For example, a high ceiling output increases the efficiency of the heat pump.

Profile with Raum-K Top

At 11.5 Kelvin overtemperature, profiles with plasterboard achieve 57.81 watts of heat output per square metre. The use of Raum-K Top panels raises the output at the same system temperatures to 61.41 watts of heat output per square metre due to the better thermal conductivity.



* Measured at 35/28° according to EnEV

PERFORMANCE DIAGRAMS HEATING

The material influences the performance

The following diagrams illustrate the output as a function of the average overtemperature or undertemperature. From this you can see what temperatures are required to achieve a certain heating or cooling capacity.

The Flex system can be designed in two material combinations that differ in their heating-cooling performance: Aluminium profiles generally achieve higher performance values than steel profiles, while Raum-K Top panels achieve higher performance than plasterboard. This difference results from the thermal conductivity of the materials.

Performance comparison heating mode

Example temperatures (typical design according to EnEV):

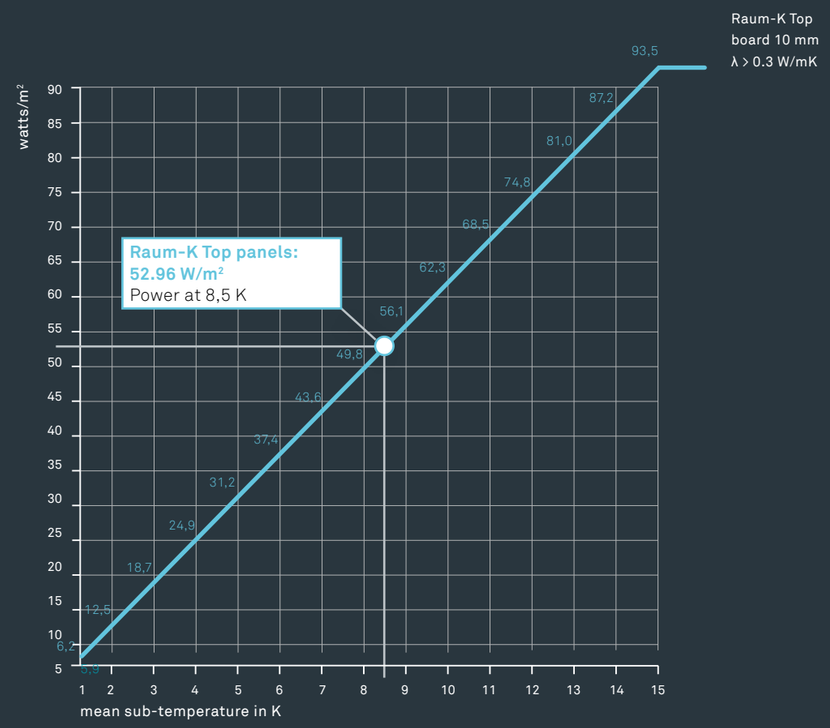
Flow:	35 °C
Return:	28 °C
Average system temperature:	31.5 °C
Room temperature:	20 °C
Mean excess temperature:	11.5 K

Heating	**Raum-K Flex Profile**
Raum-K Top board 10 mm 10 mm **λ** > 0.31 W/mK	61.41 W/m²

Higher outputs (e.g. heating above 120 W/m² and cooling above 101 W/m²) are possible and depend on design, material selection, system temperature, pipe spacing and room temperature.

Profile with Raum-K Top

At 8.5 Kelvin below temperature, profiles with plasterboard achieve 49.9 watts of cooling capacity per square metre. Raum-K Top panels achieve 52.96 watts of cooling capacity per square metre at the same system temperatures due to their better thermal conductivity.



COOLING POWER DIAGRAMS

The optimal material combination

An ideal situation is when performance targets are achieved within price limits. If you already meet the performance requirements with steel profiles and plasterboard, this is the most economical option. Where more heating or cooling capacity is required, aluminium profiles and Raum-K Top panels are recommended.

Since the more efficient design can manage with lower system temperatures, it can also pay off in the long term through higher energy efficiency and enable additional subsidies.

Performance comparison cooling mode

Example temperatures (typical design according to EnEV):

Flow:	16 °C
Return:	19 °C
Average system temperature:	17,5 °C
Room temperature:	26 °C
Average undertemperature:	8.5 K

Cooling	**Raum-K Flex Profile**
Raum-K Top plate 10 mm	**52.96 W/m²**

Higher powers (e.g. heating above 120 W/m² and cooling above 101 W/m²) are possible and depend on design, material selection, system temperature, pipe spacing and Δt to room temperature and are useful e.g. at 101.24W with a Δt 10K.

RAUM K
New World of Energy

Comfort, ecology and economy under one roof

The ultimate goal of heating and cooling has always been a comfortable indoor climate. Nowadays, systems should also have an ecological energy balance and of course be as economical as possible in terms of investment and operation. The solution for all these requirements is the same:

An efficient mineral climate ceiling that heats and cools comfortably.

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