▲ INDUCOOL – The Steward Building, London. Photo © Knight Frank

CHILLED CEILING PANEL INDUCOOL

Kiefer Klimatechnik

INDUCOOL is a high-capacity chilled ceiling panel. Cooling is carried out using air and water simultaneously. The supply air is distributed draughtfree into the occupied zone by the integrated linear diffuser. This process considerably increases the heat transfer and cooling capacity.

INDUCOOL – **Municipial Utility Karlsruhe**. Photo © Nikolay Kazakov

CHILLED CEILING PANEL INDUCOOL

Maximum Comfort with lowest Energy Requirements

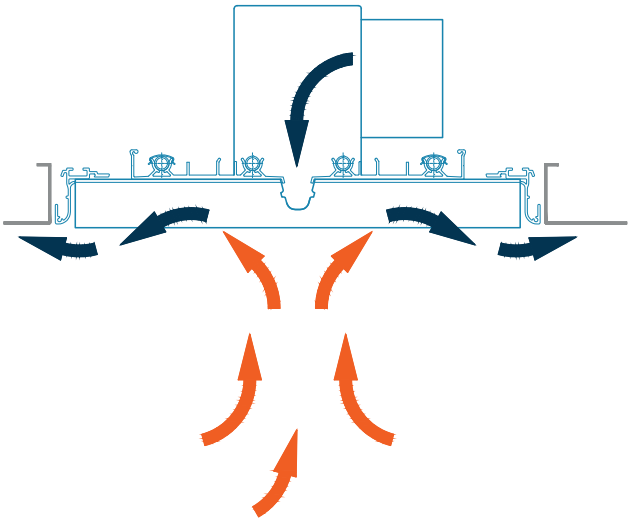
Air-conditioning systems often have to battle against the preconception that they cause draughts. If you consider the relevant standard DIN EN ISO 7730, this preconception is strengthened. Because even to achieve the best possible room class A, a 10 % dissatisfaction rate due to draughts is acceptable. But there is another way. For example, in the EURO PLAZA Office Park in Vienna a total of around 170,000 m² of office and floor space was created between 2001 and 2014 and equipped with more than 16,000m of INDUCOOL Chilled Ceiling Panels. Now every day more than 9,000 employees work here, with the result that the dissatisfaction rate lies under 1 %.

Low energy requirements owing to free cooling

Bei Owing to the use of free cooling, operating costs can be reduced to a minimum with INDUCOOL. INDUCOOL facilitates temperature differences of the supply air to the room of up to –14 K and therefore enables effective cooling through the supply air. From the transition periods and therefore 6,000...7,000 h/a the outside air offers enough cooling potential for free cooling. This leads to a considerable reduction in annual operating costs. In the EURO PLAZA, these costs in job terms amount to less than the equivalent of a single working hour per year. It is evident from this that the highest comfort doesn't have to be expensive. And this is just one of many reference projects that are equipped with INDUCOOL.

FUNCTION

Through its induction effect, the integral linear diffuser draws warm ambient air across the water-cooled, finned aluminium plates. Depending on its size, a cooling capacity of up to 500 W/m can be achieved. It is therefore sufficient to cover just 5-10 % of the ceiling area with INDUCOOL panels. The remainder of the ceiling is kept free, leaving architects and interior designers with plenty of options. Induction on the underside of the INDUCOOL panel – and therefore directly within the room – ensures the different air velocities and temperatures are rapidly balanced out. This meets the most exacting requirements for thermal comfort in the occupied zone.



ENERGIE

Low energy requirements owing to free cooling, hygienic minimum air flow rate and dissipation of residual heat using cold water.

DESIGN

Premium aluminium profiles can be used as design elements, their low spatial density giving the architect free reign for ceiling design.

TECHNOLOGY

The integrated highly inductive linear diffuser itself meets the highest requirements in terms of ambient comfort.

TECHNICAL DATA

Cooling capacity	up to 500 W/m
Panel width	295 mm (Standard) or 270 mm
Panel length	500 – 1750 mm
Installation height	145 mm
Surface covered	5 – 10 %

Further information can be found on www.kieferklima.de/en/inducool

INSTALLATION SITUATION INDUCOOL

Aesthetic ceiling design freedom

Due to the extremely high cooling capacity of INDUCOOL, only 5–10 % of the ceiling surface needs to be covered with INDUCOOL panels. The rest of the ceiling remains free for architectural designs of any kind. A wide range of ceiling attachment profiles ensure that the panels are perfectly integrated into any kind of ceiling structure.

INDUCOOL panels can therefore be developed in both false and exposed ceiling systems, either as individual panels or in continuous lengths, enabling a full range of highly aesthetic solutions to be achieved.

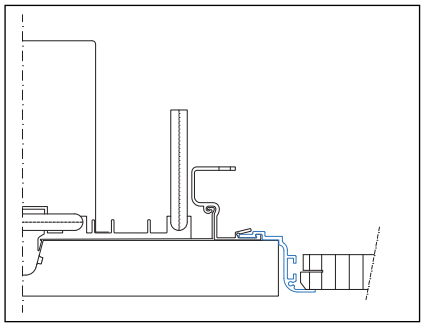
HYGIENE AND CLEANING

INDUCOOL uses the fin plates on the underside of the chilled panel for heat exchange. Unlike traditional chilled beams, the induced secondary air does not flow through the plenum or a cooling coil where dust can be deposited. This means that the air remains uncontaminated. The low temperature of the supply air dehumidifies it, which reliably prevents the formation of condensation. This prevents any hygiene issues (germ formation) commonly related to condensation. For this reason, the INDUCOOL Chilled Ceiling Panel is even suitable for use in hospitals or other areas with stringent hygiene requirements, and has been used for this application a number of times.

QUICK AND STRAIGHTFORWARD INSTALLATION

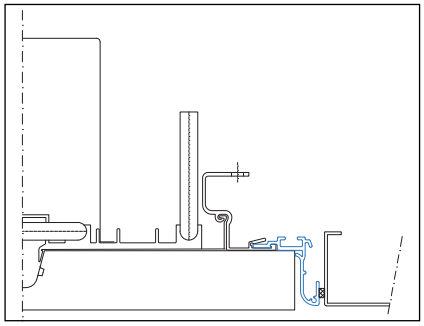
A variety of ceiling connection profiles ensures perfect integration into all ceiling types. In the case of closed ceiling systems, service access is still possible via the INDUCOOL array. Architects and interior designers therefore have a great deal of freedom in ceiling design with INDUCOOL panels, no matter whether continuous arrays or individual panels are chosen.

CEILING CONNECTION PROFILES



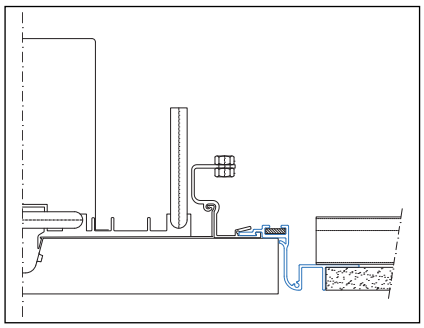
INDUCOOL – Air guide profile 1

Profile designed for use in all ceiling systems.
Particularly suitable for installation in mineral fibre ceilings and ceiling systems without a defined cutting edge.
For single and array installation.
Also possible as a circumferential installation frame.



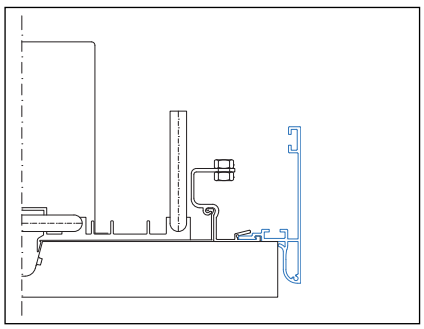
INDUCOOL – Air guide profile 3

For installation in metal ceilings or ceiling systems with a defined closing edge.
For single and array installation.
Also possible as a circumferential installation frame.



INDUCOOL – Air guide profile 3-GK

For installation in plasterboard ceilings.
The special profile enables the clean levelling out of the plasterboard with the INDUCOOL panel.
For single and array installation.
Also possible as a circumferential installation frame.



INDUCOOL – Air guide profile 2/90/24

For freely suspended INDUCOOL installation without a suspended ceiling.
The air guide profile discreetly hides the connections and mounting points.
For single and array installation.

INDUCOOL – Morgan Stanley, London. Photo © Hufton+Crow

TECHNICAL AND ECONOMICAL SYSTEM ADVANTAGES

Low Energy Consumption

INDUCOOL is the optimal solution for minimising energy costs, utilising a combination of air & water to satisfy the room cooling loads. For the majority of locations, there will be many hours in which the outdoor air required to "drive" the panel, will be below dew point, therefore providing maximum free cooling and negating the use of mechanical refrigeration. Similarly, the secondary water can be cooled effectively for many hours utilising evaporative cooling, again minimising the use of mechanical refrigeration. INDUCOOL is the first choice for low energy systems.

Increased Comfort

Occupant comfort is the key objective for any air conditioning system, and is delivered by the terminal device. INDUCOOL delivers the highest possible levels of comfort for a terminal device. Conditioned outdoor ventilation air is delivered through a series of high induction micro jets where it mixes fully with the room air ensuring maximum dispersion of the fresh air to the occupants. The mixed air is delivered to the occupied zone at very low velocities ensuring no occupant discomfort from draughts. The cooled surface of the panel will typically operate at 4–5 °C below room design temperature as with a chilled ceiling, providing added comfort through a radiant exchange to the occupants. Typically, occupant satisfaction levels of 95 % are achieved when measured against the comfort standard EN 7730. INDUCOOL provides maximum occupant comfort and hence productivity.

Large Performance Range

INDUCOOL Chilled Ceiling Panels provide measurable advantages due to their large performance ranges for cooling load and specific air flow rate. Depending on the density of the setup and the performance level, a cooling load in excess of 100 W/m2 and a specific air flow rate of 5...40 m^3/hm^2 can be achieved. The system can therefore be customised to meet any requirements. When the set-up is used for a different purpose, simple adjustments can lead to higher cooling loads and air flow rates than originally planned. INDUCOOL Chilled Ceiling Panels from Kiefer are therefore more flexible than traditional systems and can be used for a variety of applications.

INDUCOOL – Technology Centre Engel, Schwertberg. Photo © ENGEL AUSTRIA GmbH

Photo © Hufton+Crow

MORGAN STANLEY, LONDON

PROPRIETOR	Morgan Stanley & Co. International PLC, London. UK
ARCHITECTS	tp bennett LLP, London. UK
PLANNING OFFICE	Meit Consultants LLP, London. UK

Photo © Kiefer GmbH

STEWARD BUILDING, LONDON

PROPRIETOR	Henderson Global Investors, London. UK
ARCHITECTS	Allford Hall Monaghan Morris (AHMM), London. UK
PLANNING OFFICE	Long & Partners, London. UK

Photo © Kiefer GmbH

JULIUS BLUM GMBH, HÖCHST

PROPRIETOR	Julius Blum GmbH, Höchst. AT
ARCHITECTS	Arno Bereiter, Lustenau. AT
PLANNING OFFICE	Klimaplan, Hohenems. AT

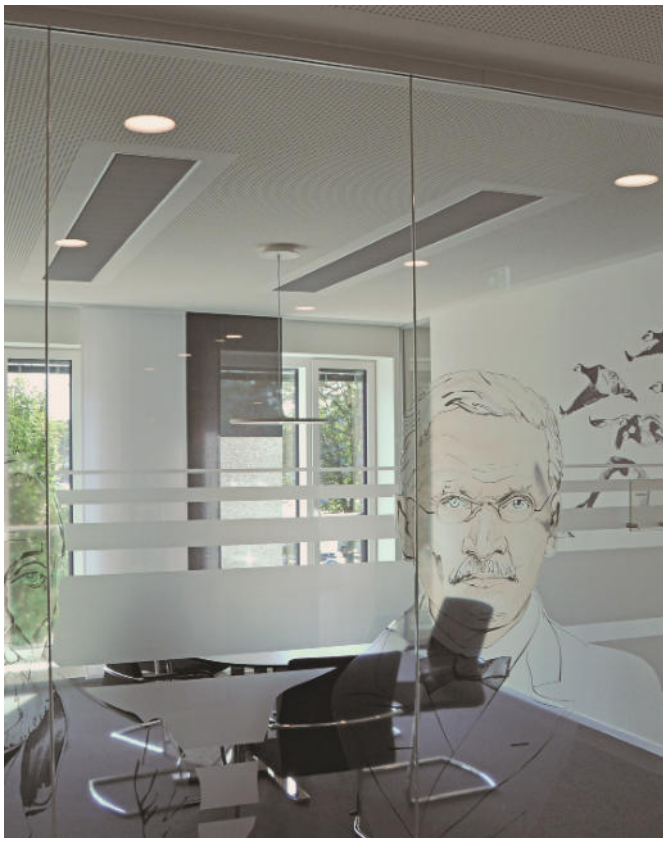


Photo © Kiefer GmbH

RAIFFEISENBANK HEIDE

PROPRIETOR	Raiffeisenbank eG Heide
ARCHITECTS	DL Architects + Partner, Bredsted
PLANNING OFFICE	Ingenieurbüro Pahl und Jacobsen, Heide

Photo © Nikolay Kazakov

MUNICIPIAL UTILITIES KARLSRUHE

PROPRIETOR	Municipial Utilities Karlsruhe
ARCHITECTS	SCOPE Architects, Stuttgart
PLANNING OFFICE	FC-Planung GmbH, Neustadt a.d.W.

Photo © Kiefer GmbH

EURO PLAZA, WIEN

PROPRIETOR	KAPSCH Immobilien GmbH, Vienna. AT
ARCHITECTS	Neumann + Partner, Vienna. AT
PLANNING OFFICE	Scholze Ingenieurgesellschaft mbH, Stuttgart / Dresden / Vienna. AT

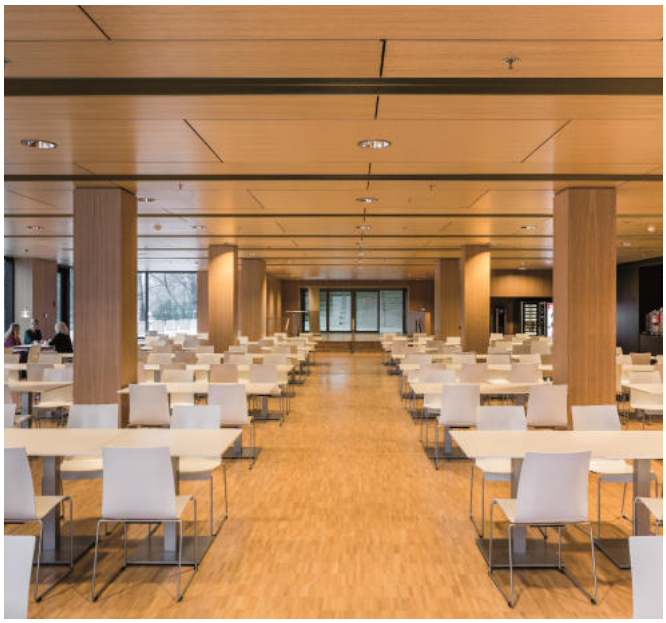


Photo © Marcus Ebener

MINISTRY, STUTTGART

PROPRIETOR	Vermögen und Bau Baden-Württemberg
ARCHITECTS	Staab Architects, Berlin
PLANNING OFFICE	Duschl Ingenieure Project GmbH & Co.KG, Rosenheim

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