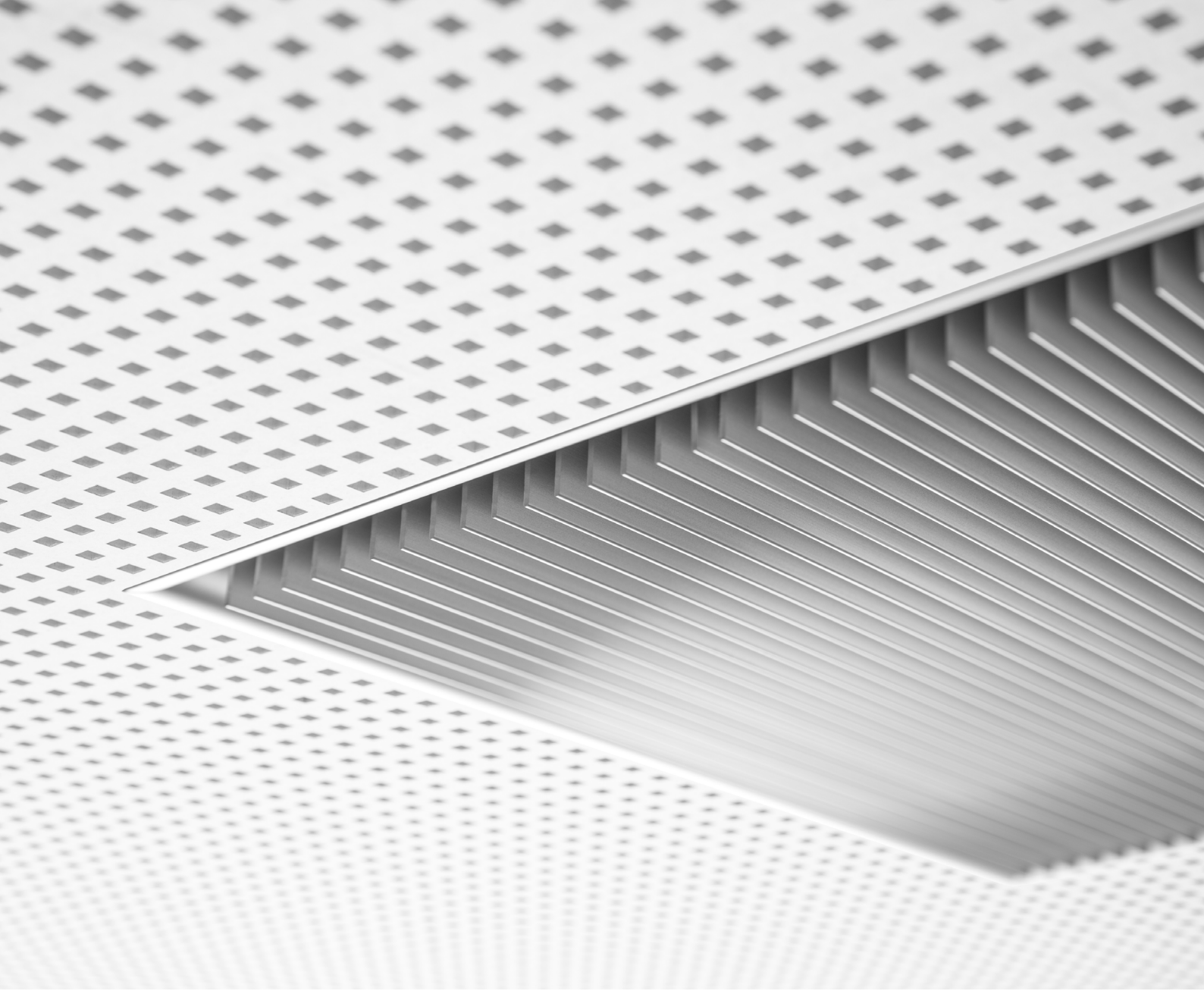


PRODUCT CATALOGUE

VENTILATION SYSTEM COMPONENTS

Kiefer
Klimatechnik

INNOVATIONS WITH AIR

CONTENT

WHY KIEFER PRODUCTS?

»Kiefer has been one of the leading companies in the field of ventilation and air conditioning technology for more than 145 years. We have been developing air diffusers, chilled ceilings, fan coil systems and concrete core cooling systems in the in-house ambient air flow laboratory for more than four decades. Comfort, quality and responsible use of resources are at the forefront of our development processes. Our trusting working relationships with building owners, architects and technical planning offices are highly valued. Our customers' satisfaction is very important to us. This means that we are on hand during every phase of the project: from the initial sketch through planning all the way to order fulfilment.«

Ingo Kiefer
Managing Director

COMPONENTS OVERVIEW

INDUL
Linear Diffuser

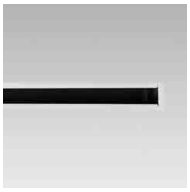
Narrow, high-induction linear diffuser for completely draught-free air distribution.
Widths: 15, 18, 24, 45 mm.
Temperature difference up to –14K..

INDUSAIL SYSTEM
Active Acoustic/Lighting Sail System

INDUSAIL SONIC with an acoustic sail for sound absorption and light reflectance. The LUMINOUS version provides active lighting. Four functions for the perfect indoor environment: acoustics, light, cooling and ventilation.

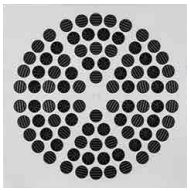
INDULFLOOR
Floor Air Diffuser

The INDULFLOOR unites sound absorber, air flow rate and discharge setting into one floor air diffuser.



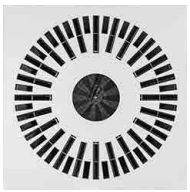
INDUSILENT
Transfer Grille

Compact transfer grilles element for installation in partition walls with integral cross-talk silencer. Air flow rates up to 140 m^3/h with pressure drop < 10 Pa.



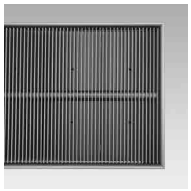
INDUDRALL
Ceiling Air Diffuser

Attractive design of high-induction ceiling air diffuser in many versions.
Sizes from 300–800 mm.
Air flow rate up to 1500 m^3/h.
Temperature difference up to –12 K.



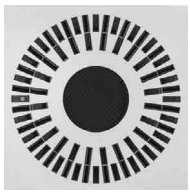
INDULTHERM
Ceiling Air Diffuser

High-induction ceiling air diffuser.
Rectangular or round front plate.
Automatically changing from cooling to heating without additional energy.



INDUCOOL
Chilled Ceiling Panel

High performance chilled ceiling panel with integrated air diffuser. Cooling with air and water. The panels require only 5–10 % ceiling area.

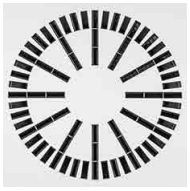


INDULVENT connect
Ceiling Fan Coil System

Up to 2550 W cooling capacity. Needs only electrical and cooling-water connections. Draught-free air distribution. Runs with Bus-System.

INDULSNAP
Wall Air Passage

With integrated cross talk silencer.
For use as inlet or outlet. Diffuser widths 24 + 45 mm. Air flow rate up to 250 m^3/h.
Input attenuation ≥ 34 dB.

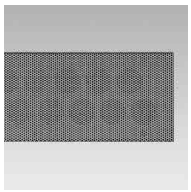


INDULCLIP
Ceiling Air Diffuser

Elegant, high-induction ceiling air diffuser in many versions.
Sizes from 300–800 mm.
Air flow rate up to 1500 m^3/h.
Temperature difference up to –12 K.

INDULCLIP Z-A
Ceiling Air Diffuser

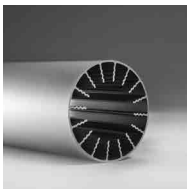
Combined inlet and outlet in compact design. High induction and comfort even at high temperature differences.



INDUQUELL
Displacement Air Outlet

Configured according to the technical requirements and designed to fit the architectural challenges. The combination of a displacement air outlet with air guide elements generates a low ambient air velocity in the occupied zone, even with large temperature differences.

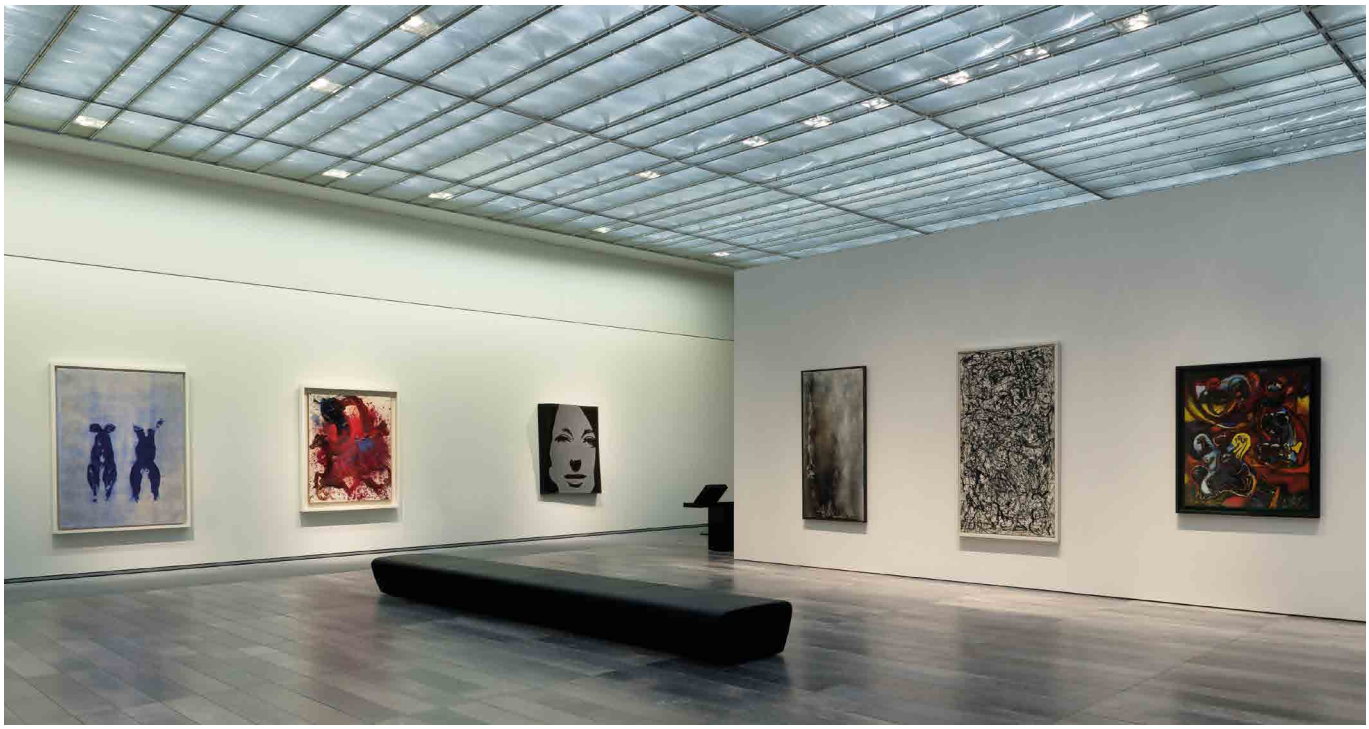
CONCRETE CORE COOLING



CONCRETCOOL
Concrete Core Cooling with supply air

Cooling pipes Ø 60 mm and Ø 80 mm made of aluminium, which is an excellent thermal conductor, are cast into the concrete ceilings in line with the grid. The inside surface of the pipes is finned to improve the transfer of heat. The supply air is not pumped directly into the working areas, but flows through the cooling pipes inside the concrete ceilings. During this process, the cold supply air heats up almost to the temperature of the ceiling. The heat required to do this is removed from the ceiling. This extraction of heat also represents the concrete core cooling at the same time. This supply air is then fed into the rooms via Kiefer air diffusers where it meets the hygienic requirements for fresh air. An outlet temperature of the supply air of approx. 21 °C is achieved entirely without the use of sequential heaters. Primary energy is therefore not required. The process is self-regulating and operates virtually without fluctuations with a high degree of temperature stability due to the significant storage capacity of the concrete ceilings. The heat recovery of the AHU system is increased to over 95 % by the addition of the CONCRETCOOL system. As a result, all the requirements of the Renewable Energies Heat Act are exceeded.

INDUL – Museum M9, Venice-Mestre. Photo © janbitter.de

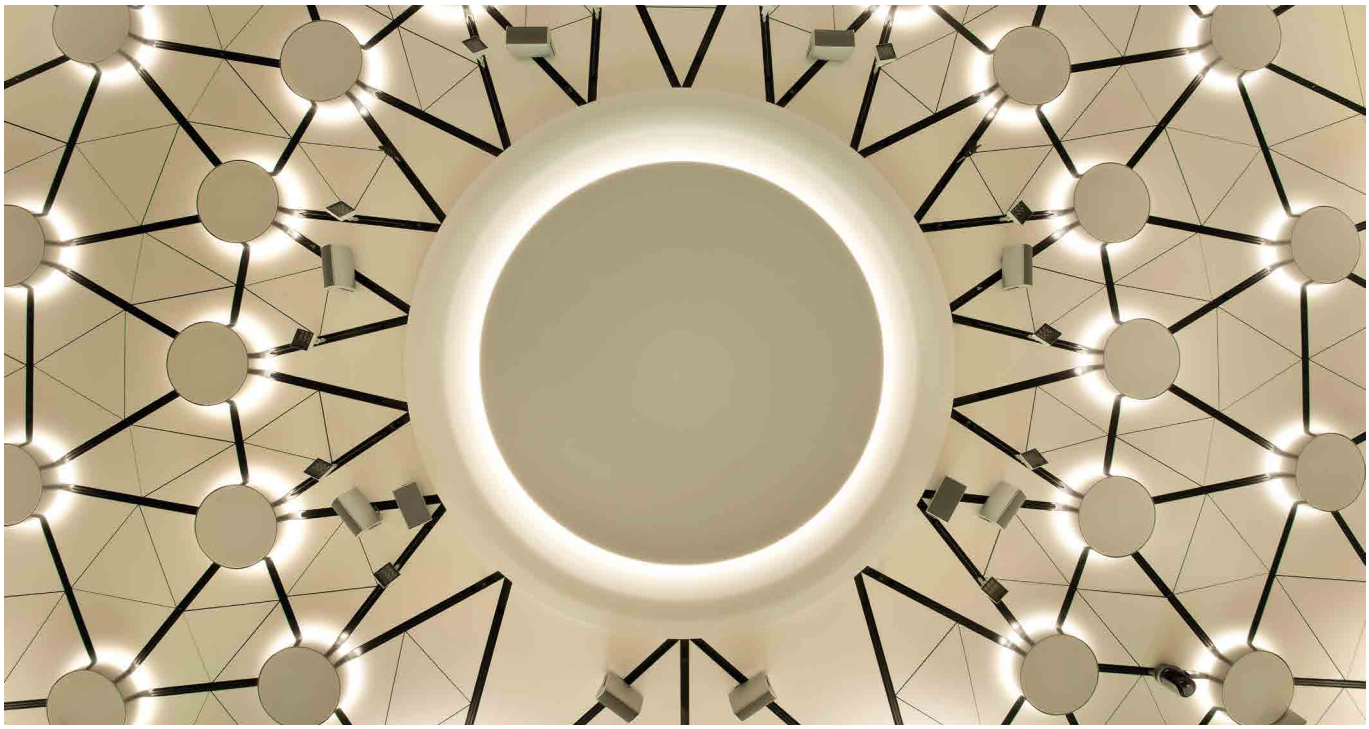


▲ INDUL – Louvre Abu Dhabi, Permanent Gallery. Photo © Marc Domage

LINEAR DIFFUSER INDUL N

Kiefer Klimatechnik

Narrow linear diffuser for ultimate comfort and unobtrusive installation in all types of ceilings. The special INDUL free-jet characteristic prevents dirt build-up along the air diffuser. This keeps ceilings dust-free for longer. The completely asymmetrical throat arrangement means it can also be installed in tricky spatial conditions.



Auditorium Allianz SE, Munich. Photo © Ken Schluchtmann

LINEAR DIFFUSER INDUL

Draught-free air distribution and aesthetic ceiling design

Draught-free ceiling design for increased wellbeing

The most important factor in creating a pleasant atmosphere in ventilated rooms is to avoid draughts. The Linear Diffuser INDUL offers the best technical prerequisites for the job. The air is divided into fine jets of only a few mm and distributes in the room in alternating directions with a spread of 45°. This results in a particularly uniform distribution of the air with a highly favourable flow of air through the room without noticeable draught.

INDUL Linear Diffusers allow for very slight fitting widths from 15 mm. They are available in various designs and can be integrated in all ceiling structures without any problems for high demands on ventilation comfort and aesthetic ceiling arrangements.

A comfort Linear Diffuser for clean Ceilings

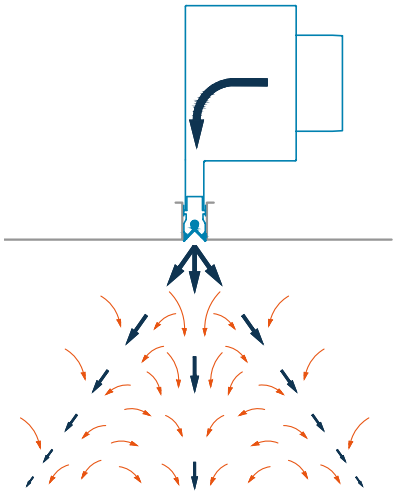
The reliable 90° free jet characteristic distributes the supply air directly into the common area, without contact with the ceiling. Precisely formed discharge profiles avoid the coanda effect. This keeps ceilings dust-free longer.

Environment Protection and Health

Back in 1993, Kiefer was the first manufacturer to use air gap instead of mineral fibres for the insulation of INDUL Linear Diffusers. The whole model series are produced with air gap insulation for an optimised insulation effect and is therefore completely recyclable.

FUNCTION

The supply air is divided into fine alternating free jets, intensifying the induction of the ambient air. The high induction permits a very high temperature difference between the ambient air and the supply air. This makes it possible to make use of free cooling, to a certain extent. The required cooling capacity is thus minimised. In spite of the low temperatures, the air gap insulation largely prevents loss of energy. And the air diffuser scores points in terms of life cycle costs as evaluated by current certification systems due to the use of recycled aluminium.



ENERGY

The extremely high induction of the INDUL Linear Diffusers enables draught-free operation even at very low supply air temperatures, resulting in significant energysaving potential through the use of free cooling.

ARCHITECTURE

The delicate outlet profiles can be inserted into any desired ceiling architecture and keep ceilings dust-free for longer. Whether unobtrusive or deliberately accented, they meet all architectural requirements.

TECHNOLOGY

Only the INDUL free jet characteristic enables a uniformly diffuse ambient air flow and permits temperature differences of up to –14K while meeting even the highest demands in terms of comfort.

TECHNICAL DATA

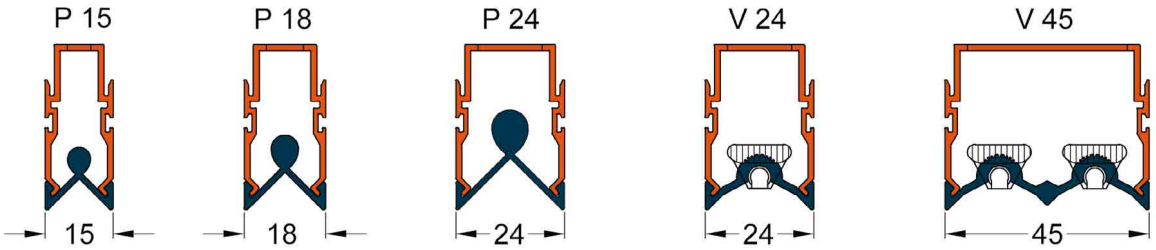
Air flow rate	20 - 250 m^3/hm
Installation width	15, 18, 24 and 45 mm
Installation length	500 - 2500 mm
Special dimensions	On request
Throat height	37 - 130 mm
Temperature difference	Down to - 14 K

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

INSTALLATION SITUATION INDUL

Freedom in aesthetic ceiling design

INDUL Linear Diffusers allow for very slight slot widths from 15 mm, which can be integrated in all ceiling joints without any problems. They offer architects freedom when designing elegant, creative and sophisticated ceilings and live up to the high ventilation requirements which are essential for that feeling of well-being.



INDUL Type P is designed for rooms with the highest comfort demands. This is achieved thanks to the diffuse, entirely non-centrifugal ambient air flow.

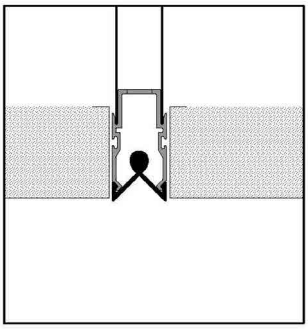
INDUL Type V is designed for rooms with high comfort demands and large supply air flow rates.

SIMPLE AND QUICK INSTALLATION

For any ceiling architecture

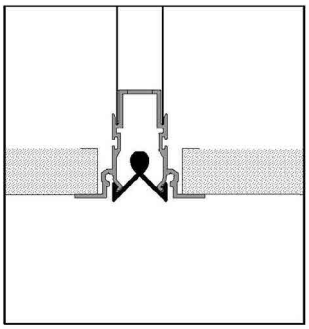
The INDUL mounting accessories allow a simple and quick installation and easy adjustment. The plug-in system for installation in series or as individual elements has been well proven in practice.

CEILING CONNECTION PROFILES



INDUL N – Installation without ceiling connection profile

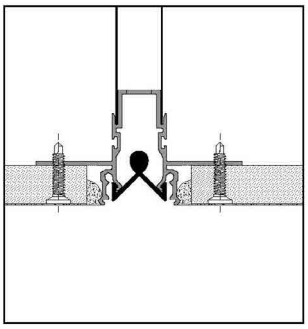
For example in wooden or metal coffered ceilings.



INDUL NA – Installation with overlay bracket

For example in mineral fibre ceilings.

Also available as a type W-NA loose version for sliding in. Ideal for double-sided ceiling supports or as a connecting element between two different ceiling systems.



INDUL NG – Installation with plaster bracket

Available in loose and moulded versions. For straightforward installation in plasterboard ceilings. It also protects the discharge profile during painting and plastering work thanks to the protective strip supplied. Clean edges are created when the strip is removed.

Photo © Ken Schluchtmann

ALLIANZ AUDITORIUM, MUNICH

PROPRIETOR	Allianz Munich
ARCHITECTS	dan pearlman Markenarchitektur GmbH, Berlin Reichwald Schultz, Hamburg, Berlin
PLANNING OFFICE	ITG GmbH, Eching / Weixerau

Photo © Diane Auckland/Fotohaus

LONDON BUSINESS SCHOOL

PROPRIETOR	Wates Ltd, Leatherhead. UK
ARCHITECTS	Sheppard Robson, London. UK
PLANNING OFFICE	Long & Partners, London. UK

Photo © DittelArchitektenGmbH

WGV VERSICHERUNG, STUTTGART

PROPRIETOR	Württembergische Gemeinde-Versicherung a.G.
ARCHITECTS	wma architekten wöhr mieslinger assoziierte, Stuttgart
PLANNING OFFICE	Rentschler und Riedesser, Filderstadt

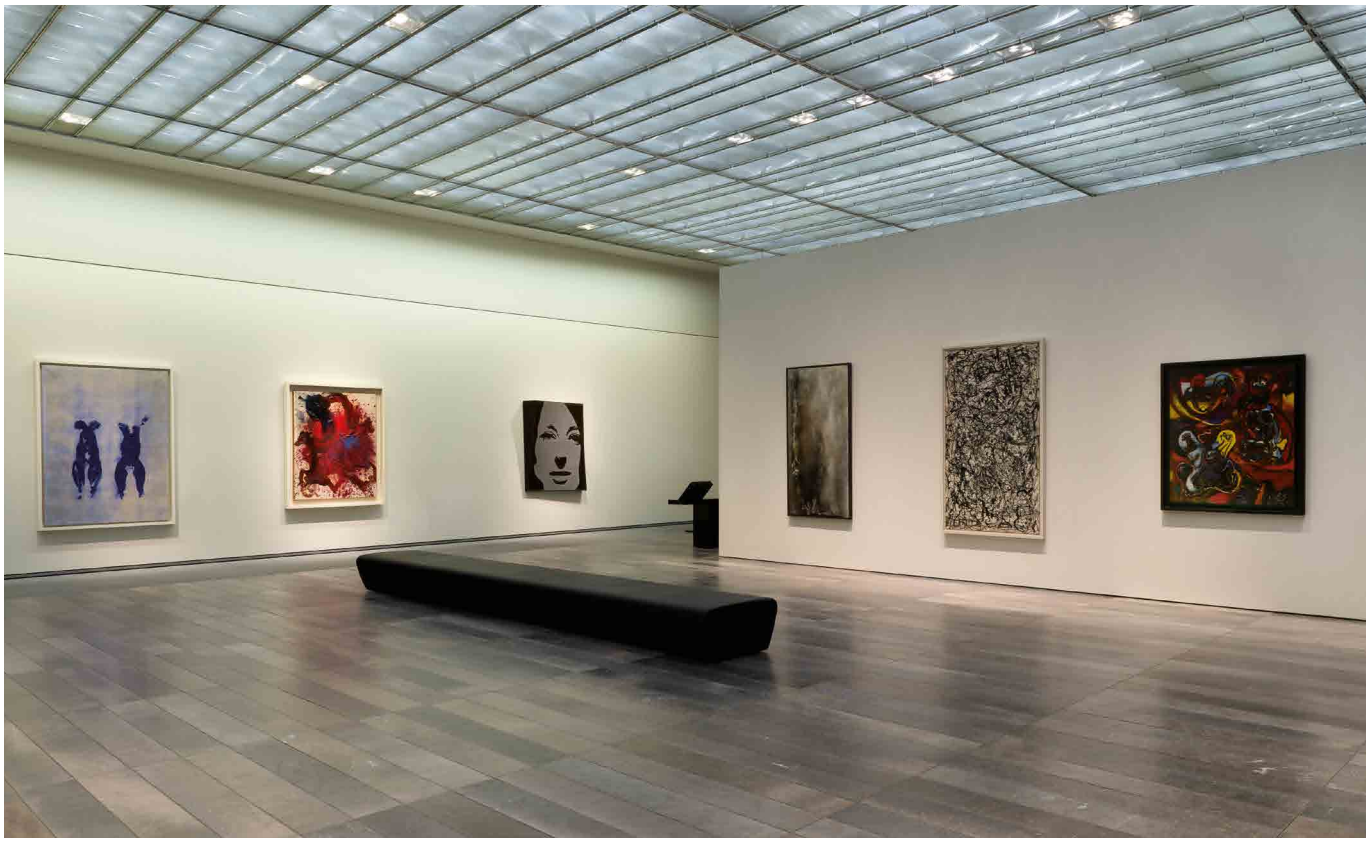


Photo © Marc Domage

MUSEUM LOUVRE, ABU DHABI

PROPRIETOR	Tourism Development & Investment Company
ARCHITECTS	Ateliers Jean Nouvel, Paris. FR
PLANNING OFFICE	Buro Happold, Bath. UK

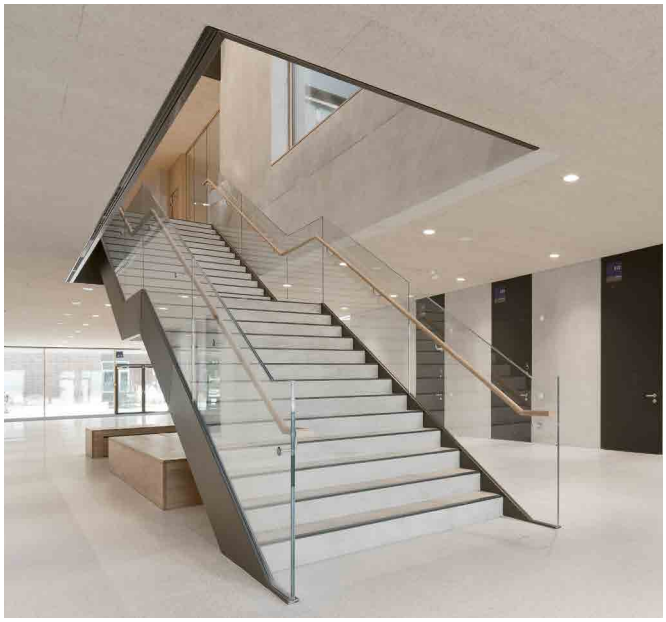


Photo © Brigida González

MAICKLER SCHOOL, FELLBACH

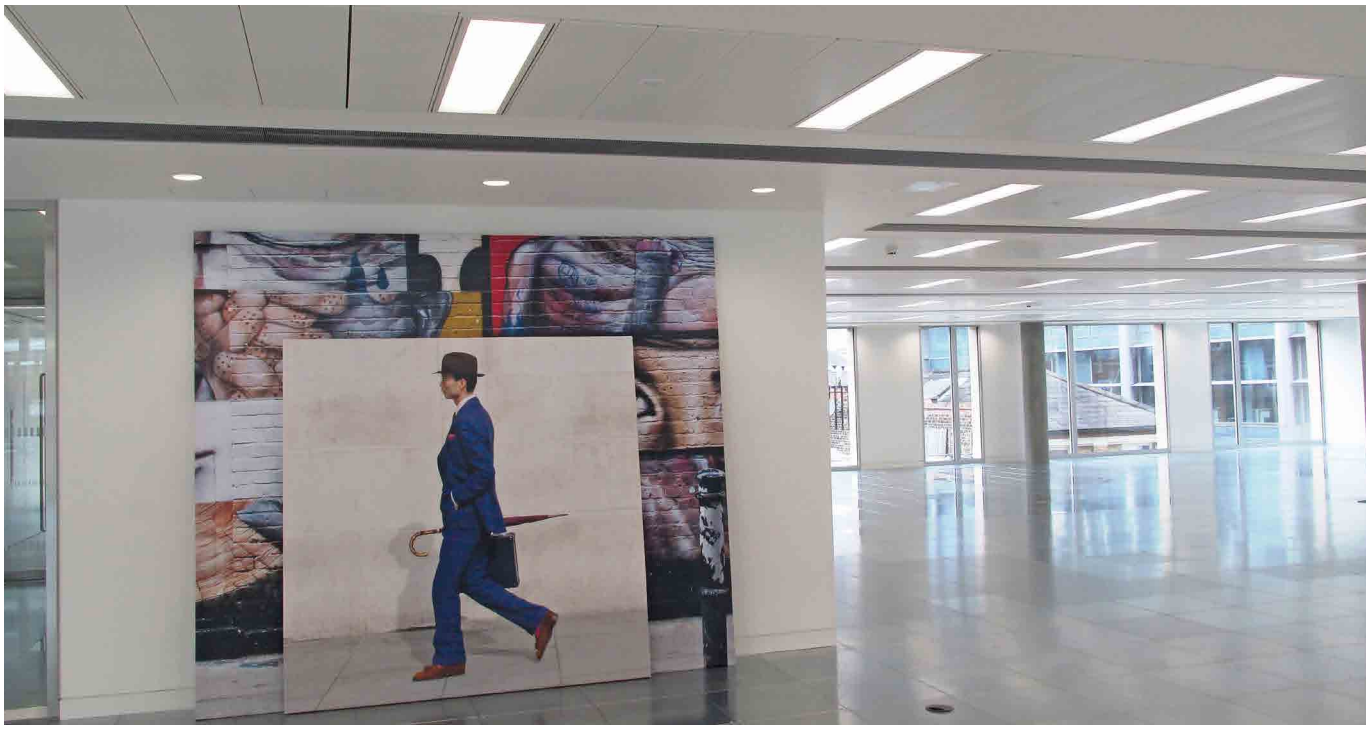
PROPRIETOR	City of Fellbach
ARCHITECTS	Löhle Neubauer Architekten
PLANNING OFFICE	ebök GmbH

Photo © Studio Simon Menges

JAMES-SIMON-GALERIE, BERLIN

PROPRIETOR	Bundesamt für Bauwesen und Raumordnung, Berlin
ARCHITECTS	David Chipperfield Architects, Berlin
PLANNING OFFICE	INROS LACKNER AG, Berlin

INDUCOOL – Municipial Utility Karlsruhe. Photo © Nikolay Kazakov

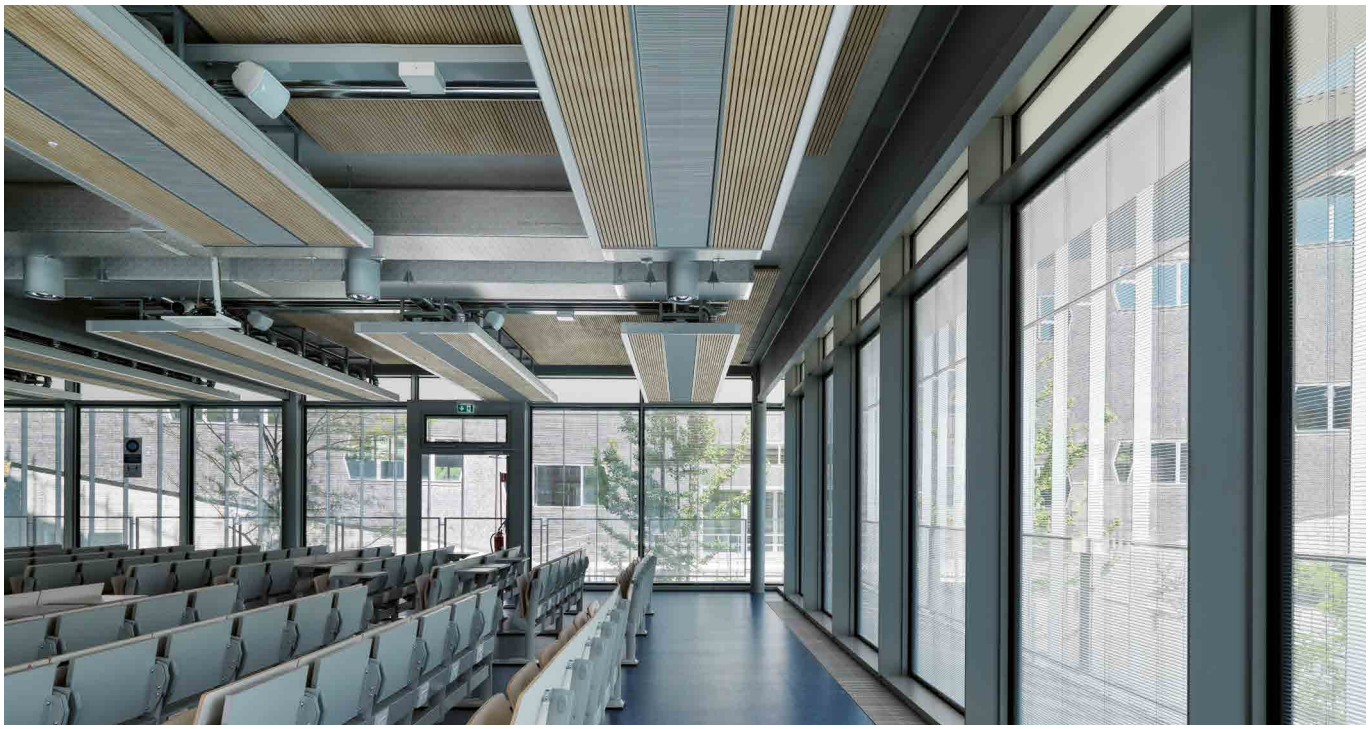


▲ INDUCOOL – The Steward Building, London. Photo © Knight Frank

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 draught-free into the occupied zone by the integrated linear diffuser. This process considerably increases the heat transfer and cooling capacity.



INDUCOOL – Politecnico di Milano, Italien. Foto © Enrico Cano

CHILLED CEILING PANEL INDUCOOL

Maximum Comfort with lowest Energy Requirements

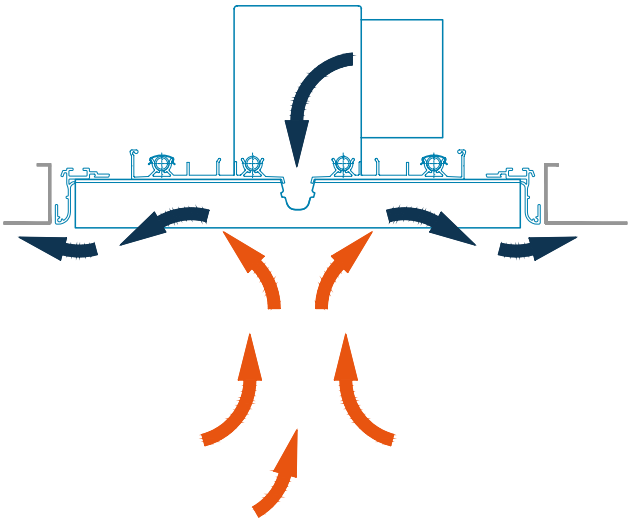
Air-conditioning systems often have to battle against the preconception that they cause draughts. If you consider the relevant standard DIN EN ISO 7730, this preconception is strengthened. Because even to achieve the best possible room class A, a 10 % dissatisfaction rate due to draughts is acceptable. 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 16,000 m 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

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.



ENERGY

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.

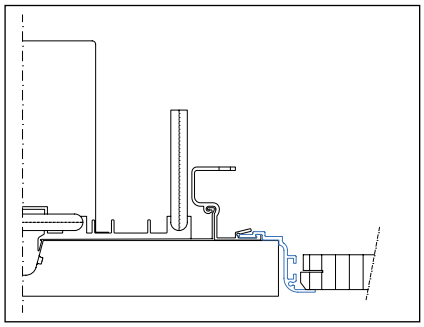
HYGIENE AND CLEANING

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

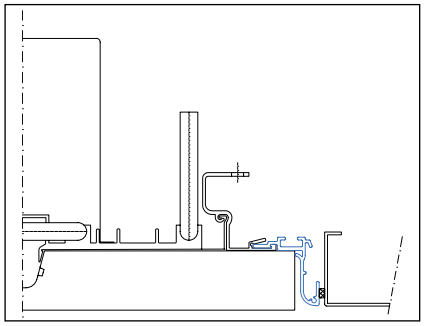
A variety of ceiling connection profiles ensures perfect integration into all ceiling types. In the case of closed ceiling systems, service access is still possible via the INDUCOOL band. Architects and interior designers therefore have a great deal of freedom in ceiling design with INDUCOOL panels,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

CEILING CONNECTION PROFILES



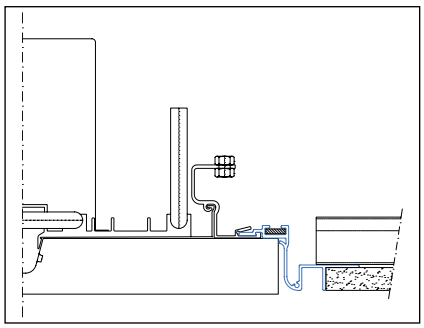
INDUCOOL – Air guide profile 1

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 band arrangement.
Also possible as a circumferential installation frame.



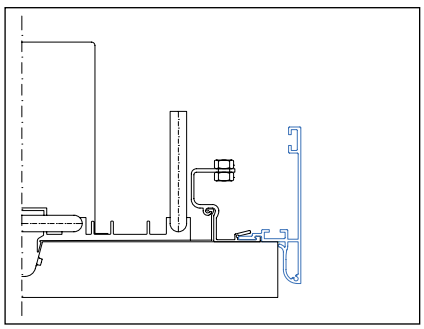
INDUCOOL – Air guide profile 3

For installation in metal ceilings or ceiling systems with a defined closing edge.
For single and band arrangement.
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 band arrangement.
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 band arrangement.

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 – Headquarter Municipial Utilities Karlsruhe. Photo © Nikolay Kazakov

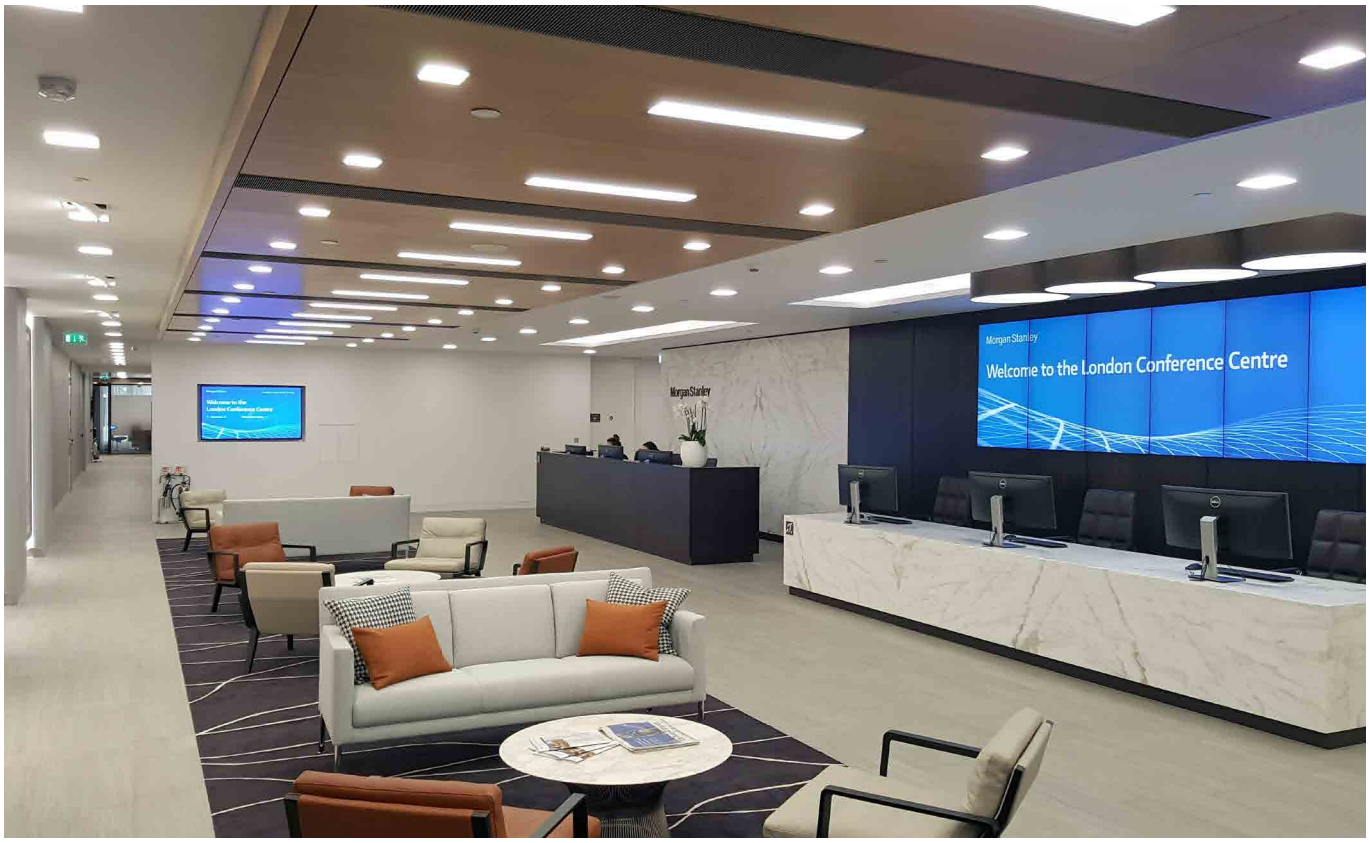


Photo © Hufton+Crow

MORGAN STANLEY, LONDON

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

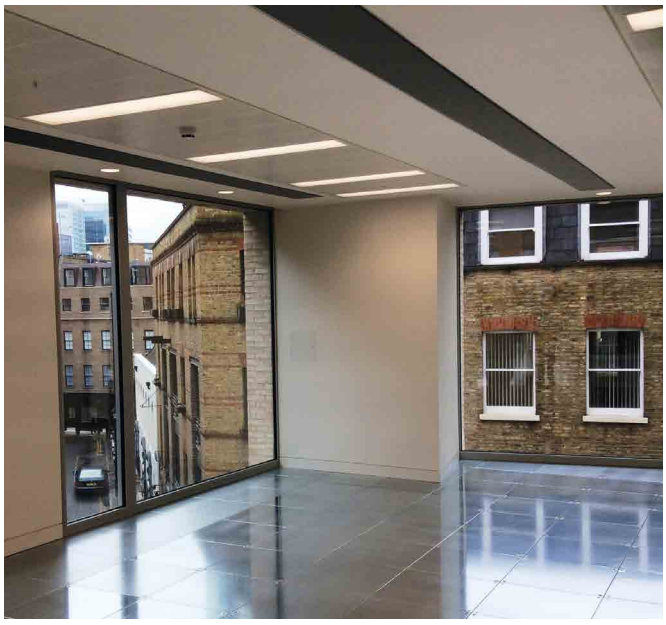


Photo © Kiefer GmbH

STEWARD BUILDING, LONDON

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

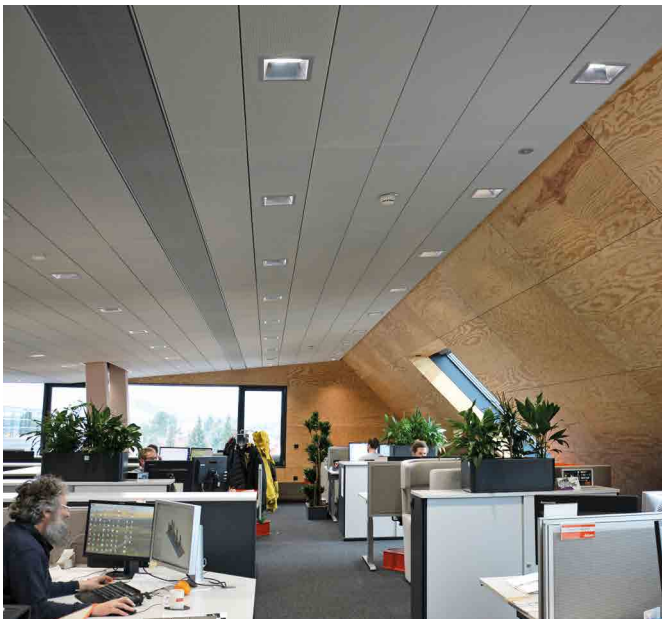


Photo © Kiefer GmbH

JULIUS BLUM GMBH, HÖCHST

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

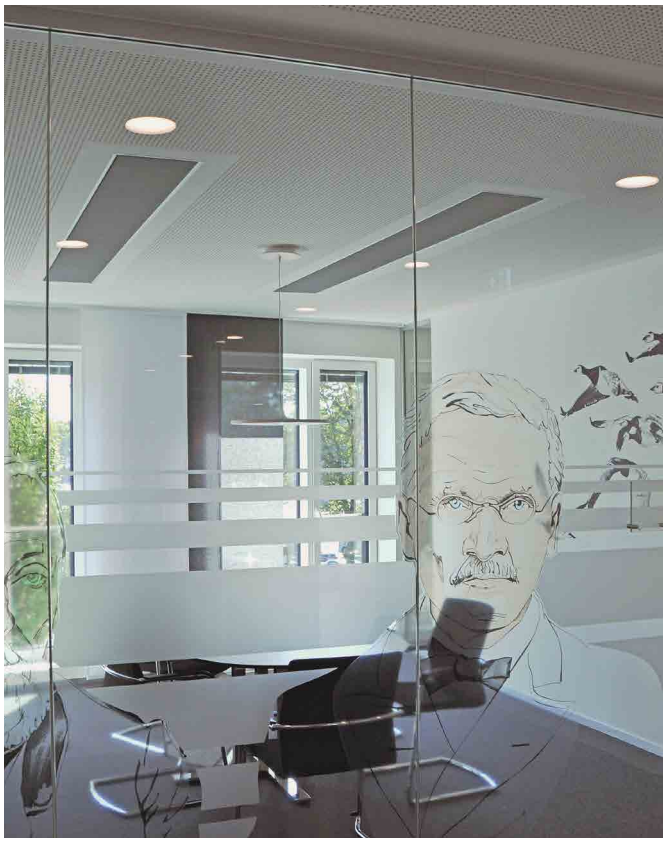


Photo © Kiefer GmbH

RAIFFEISENBANK HEIDE

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

Photo © ENGEL AUSTRIA GmbH

TECHNOLOGY CENTRE ENGEL, SCHWERTBERG

PROPRIETOR	ENGEL AUSTRIA GmbH
ARCHITECTS	Architekturbüro Kada, Graz
PLANNING OFFICE	BHM Ingenieure, Linz

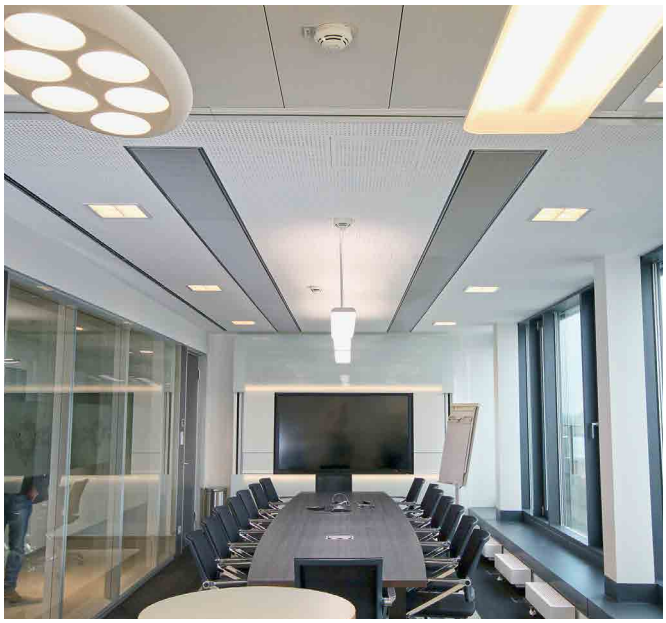


Photo © Kiefer GmbH

EURO PLAZA, WIEN

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

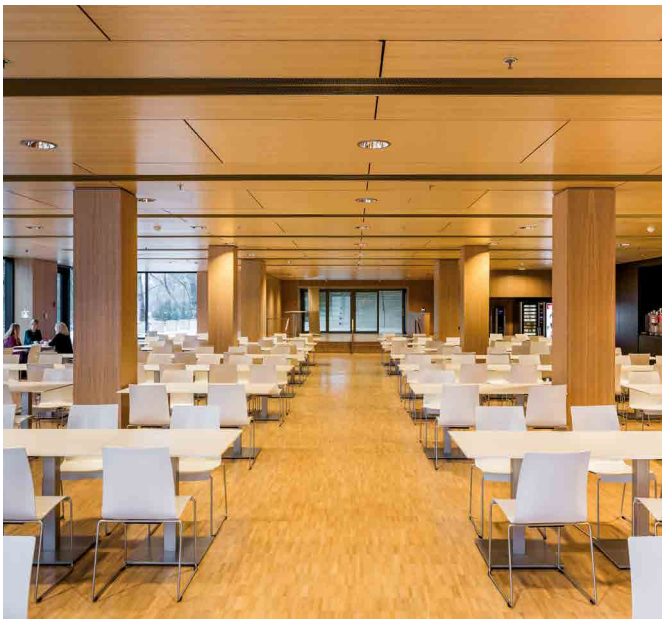
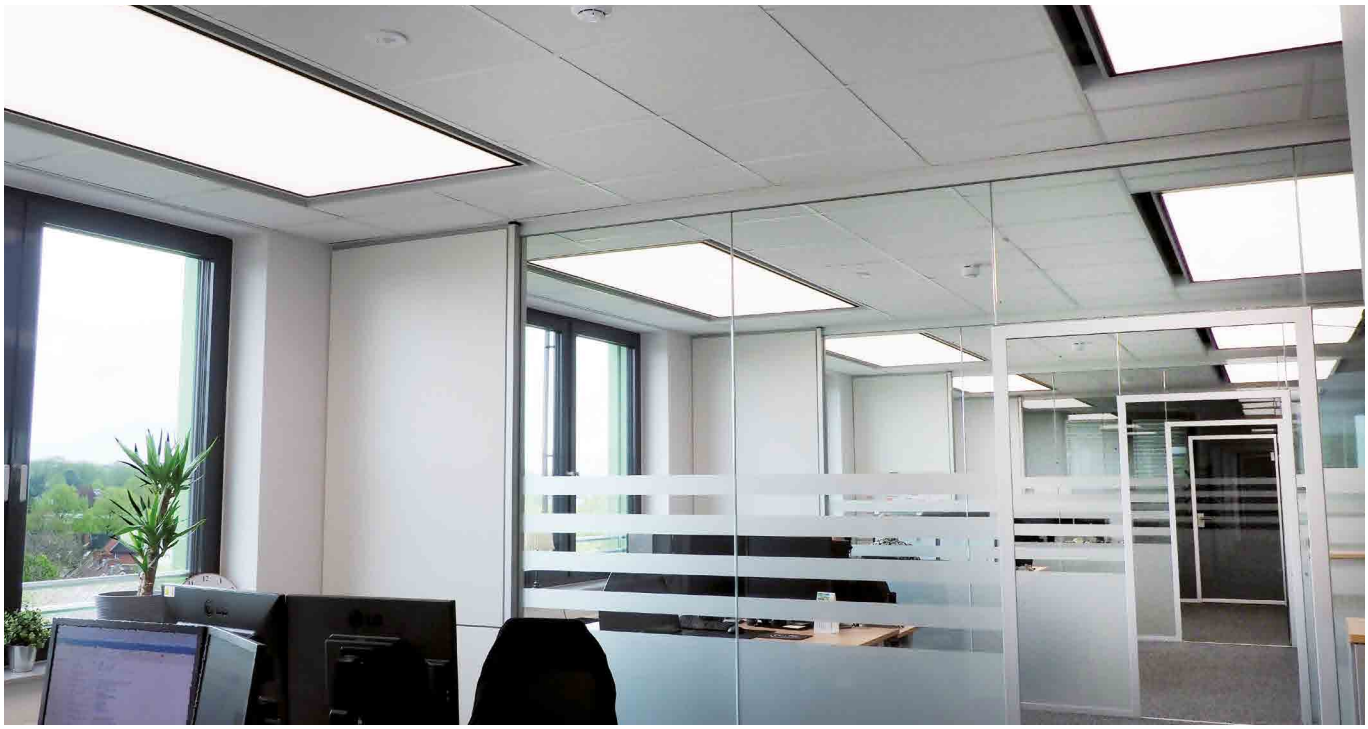


Photo © Marcus Ebener

MINISTRY, STUTTGART

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

INDUSAIL SONIC as a standalone solution within a renovation project.



▲ INDUSAIL LUMINOUS - Itzehoer Versicherungen. Photo © Michael Göttsche

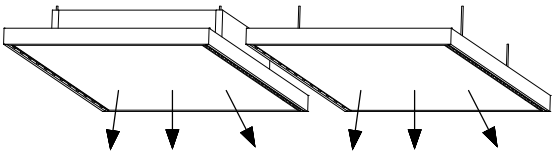
ACOUSTIC SAIL – LIGHTING SAIL

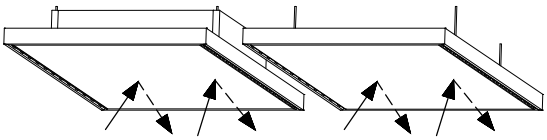
INDUSAIL SONIC
INDUSAIL LUMINOUS

The INDUSAIL SYSTEM combines acoustics, light, cooling and ventilation. Developed for modern office spaces, the active acoustic sail system offers maximum flexibility when it comes to designing the office landscape. In addition to the features of the INDUSAIL SONIC, the INDUSAIL LUMINOUS sail provides active, integral LED area lighting.

INDUSAIL SYSTEM

ONE SYSTEM – MANY POSSIBILITIES





INDUSAIL LUMINOUS

LIGHT
intelligent room lighting

AIR
draught-free supply of fresh air

COOLING
comfortable air conditioning

ACOUSTICS
high sound absorption

INDUSAIL SONIC

LIGHT REFLECTANCE
Supports the lighting

AIR
draught-free supply of fresh air

COOLING
comfortable air conditioning

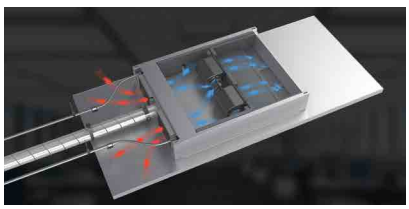
ACOUSTICS
very high sound absorption

The right option for every room – two INDUSAIL ranges in three designs

The perfect indoor environment thanks to four functions: superb lighting, draught-free fresh air supply, comfortable cooling and a high level of sound absorption for a feel-good climate to everyone's liking. Both versions of the INDUSAIL offer flexible expansion and combination options. They can be used in isolation or throughout a space. As such, the system offers maximum flexibility when it comes to designing the office landscape.

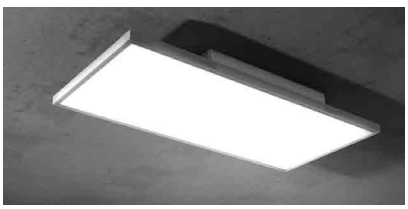
	INDUSAIL LUMINOUS			INDUSAIL SONIC		
	plus	air	silent	plus	air	silent
Lighting	●●●	●●●	●●●	●*	●*	●*
Ventilation	●	●●●	-	●	●●●	-
Cooling	●●●	●	-	●●●	●	-
Acoustics	●	●	●●	●●	●●	●●●

**No lighting; very good light reflectance



Recirculation air cooling

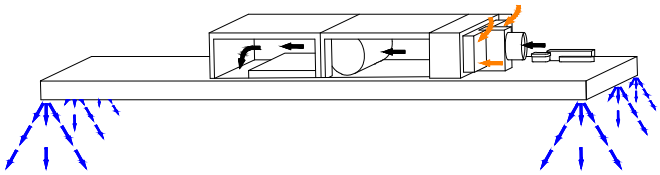
Draught-free ambient air flow



Intelligent room lighting with the INDUSAIL LUMINOUS

FUNCTION

The INDUSAIL SYSTEM is a flexible acoustic sail with integral fan coil for ambient air conditioning, factoring in lighting technology. The recirculation air or mixed air is induced via highly inductive linear diffusers, with an optional fresh air intake to improve the ambient air quality. By combining active and inactive components, the requirements of different office concepts can be fulfilled, even in the event of future changes. If planned appropriately, modifications to the partition wall situation will have no effect on the arrangement of the ceiling elements.



The integral, highly inductive linear diffusers, with their specially developed discharge geometry, create fine individual air jets. Ambient air can be effectively induced at the edges of the individual jets.

ENERGY

Low energy demand due to decentralised recirculation air cooling adapted to changing cooling loads and the option of using free cooling. Energy saving EC fans increase energy efficiency.

DESIGN

Multifunctional system combining the areas of acoustics, light, cooling and ventilation, to offer maximum flexibility when designing the office landscape.

TECHNOLOGY

Acoustic elements with optional, integral LED area lighting and a decentralised fan coil system, with scope to induce supply air.

TECHNICAL DATA

			INDUSAIL SONIC plus	INDUSAIL SONIC air	INDUSAIL SONIC silent
Cooling capacity		watts	up to 1600	up to 1600	–
Dimensions	Sail	mm	50 x 1100 x 2500		
	Fan coil unit	mm	205 x 914 x 1352	–	–
	Supply air box	mm	200 x 900 x 125	–	–
Cold water temperature			from 16 °C (non-condensing)	–	–
Total weight in operation		kg	60	36	16
Installed height		mm	255	250	50
			INDUSAIL LUMINOUS plus	**INDUSAIL LUMINOUS air**	**INDUSAIL LUMINOUS silent**
Cooling capacity		watts	up to 1600	up to 1600	–
Dimensions	Sail	mm	85 x 1100 x 2500		
	Fan coil unit	mm	205 x 914 x 1352	–	–
	Supply air box	mm	200 x 900 x 125	–	–
Cold water temperature			from 16 °C (non-condensing)	–	–
Total weight in operation		kg	74	50	30
Total installed height		mm	290	285	85

For further technical information, visit https://www.kieferklima.de/en/products/lighting-sail-indusail-luminous/

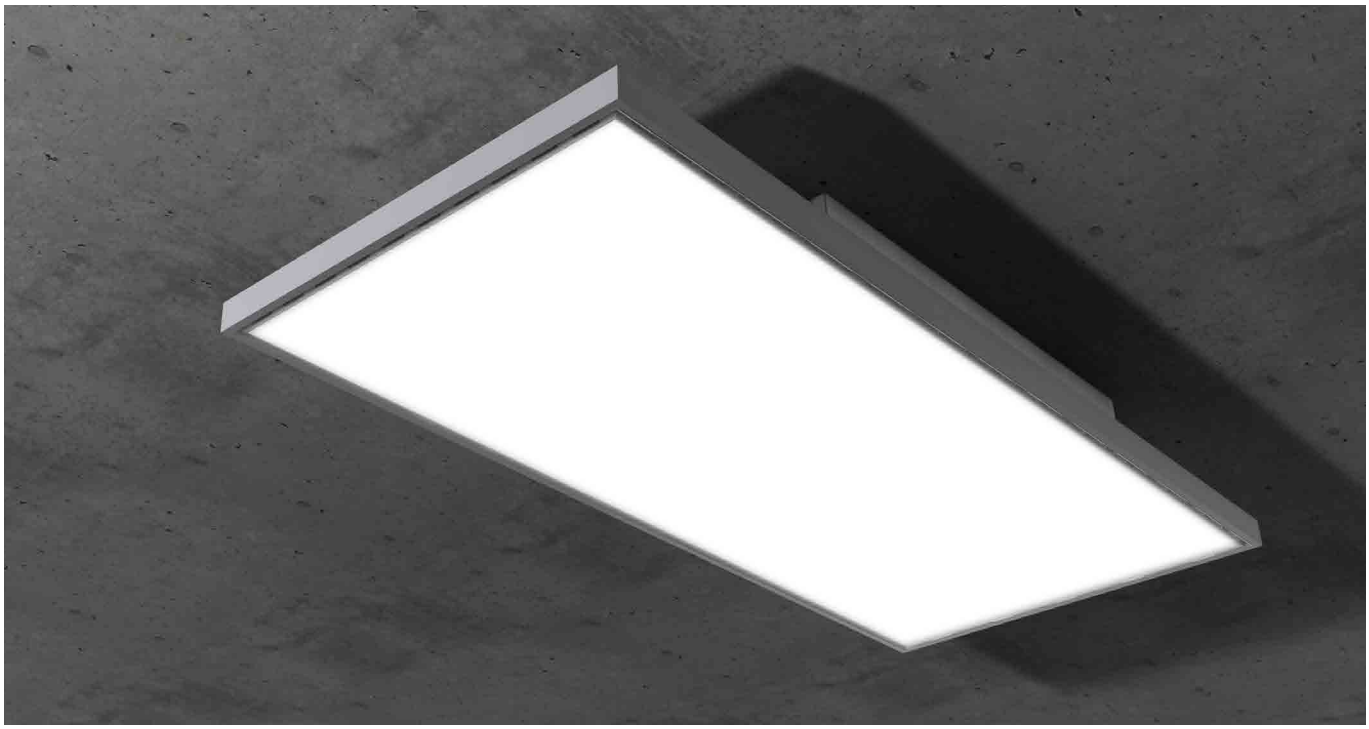


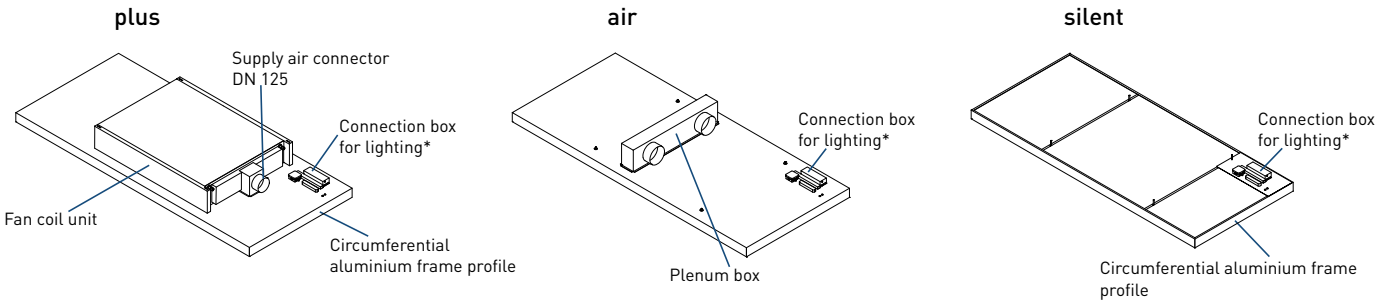
Photo © Kiefer GmbH

CONSTRUCTION AND DESIGN OF THE INDUSAIL SYSTEM

INDUSAIL SYSTEM ceiling sails in the SONIC design consist of an acoustic sail for sound absorption and light reflectance. The LUMINOUS version also provides lighting. Here the sail is a lighting sail, complete with integral area lighting. Depending on the design, the sails are then supplemented by a fan coil unit and plenum box.

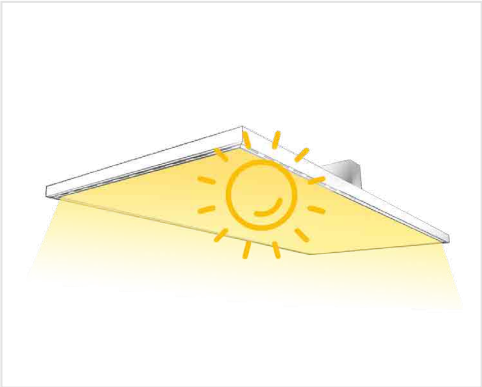
In the case of designs with active components, the integral, highly inductive type INDUL P18 discharge profiles introduce recirculation air to the room around the edge of the sail. SONIC ceiling sails have a fleece-coated and open-pored substrate. The LUMINOUS lighting sails are covered with a translucent diffuser material. Both serve to improve the interior acoustics and absorb sound.

SYSTEM CONSTRUCTION OF INDUSAIL VERSIONS



* SONIC versions without connection box for lighting

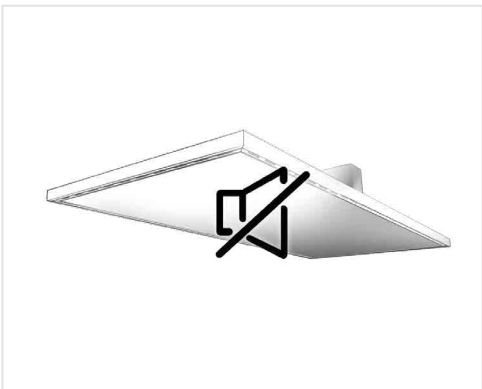
ONE PRODUCT – FOUR FUNCTIONS FOR A PERFECT INDOOR ENVIRONMENT



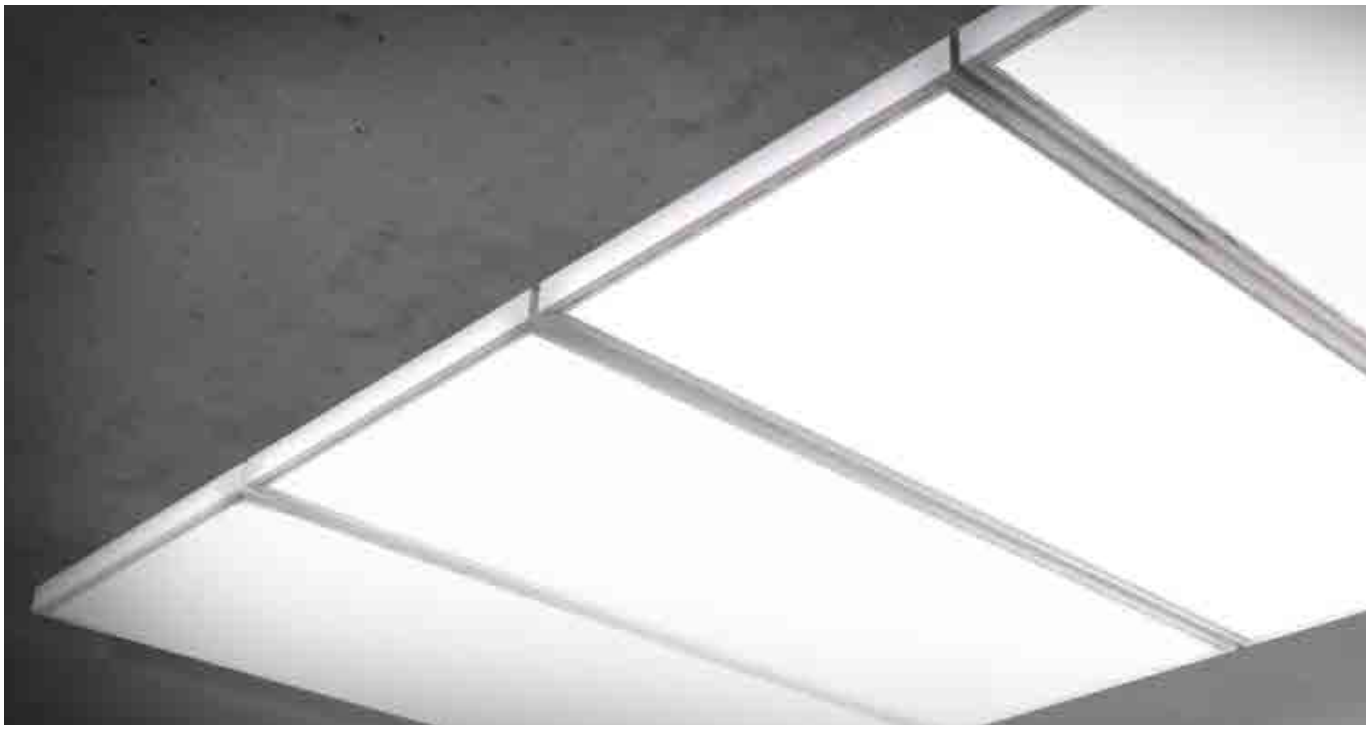
Intelligent room lighting
All versions of the INDUSAIL LUMINOUS feature integral LED area lighting. This provides near-daylight quality, glare-free illumination based on circadian light cycles, thereby reducing fatigue.
The INDUSAIL SONIC does not have active lighting but supports the most common types of lighting with a high light reflectance value of > 90 %.

Healthy ambient air
All versions of the INDUSAIL air have an integrated supply air connection on the ceiling sail to introduce preconditioned fresh air only, with no discernible draught. Continual exchanges of air boost comfort and the ability to concentrate.

Optimum ambient climate
Cooling the ambient air via a fan coil unit creates pleasant temperatures for an ideal work environment. Optimum air conditioning prolongs performance and promotes concentration.



Improved ambient sound
The acoustic sails guarantee good audibility with high sound absorption for successful interior acoustics.



INDUSAIL LUMINOUS AS AREA LIGHTING SOLUTION

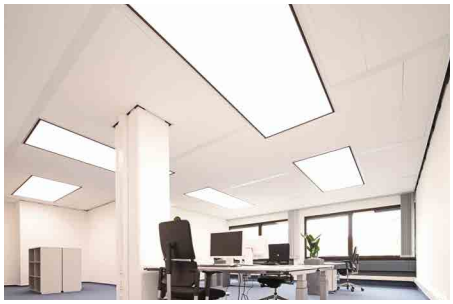
Good light for perfect ambient quality

The INDUSAIL LUMINOUS is a multifunctional lighting sail system. Pleasant acoustics are combined with comfortable cooling and ventilation, as well as integral LED area lighting. This provides near-daylight quality, glare-free illumination based on circadian light cycles, thereby reducing fatigue.

Light controls our biological rhythms and has a significant impact on our biological and emotional wellbeing. Good light boosts performance and concentration, reduces errors and prevents fatigue.

The INDUSAIL LUMINOUS creates an optimal lighting situation for good visual function and perfect visual comfort. With the optional "tunable white" version, it is possible to freely adjust the light appearance between cool white (6500 K) and warm white (2700 K), and to dim the light. This enables circadian lighting control, closely aligned with natural lighting conditions by day and night. This is particularly suitable for the perfect illumination of indoor workspaces where an optimum environment is required for focused working without causing fatigue.

INDUSAIL LUMINOUS – HCL HUMAN CENTRIC LIGHTING



INDUSAIL LUMINOUS - Circadianes Arbeitsplatzlicht

Frame	Aluminium
Colour	Natural anodised
Light appearance	Warm white (2700 K) Cool white (6500 K) Freely adjustable
Light source	LED (max. 160 watt) Dimmable, tunable white
CRI	> 80
Height	85 mm (excl. electronics)
Length x width	2500 x 1100 mm
Luminous flux (net)	Approx. 10,300 lm
Supply voltage	220 to 240 V (50/60 Hz)
IP rating	IP 20
Light source included	Yes

◀ The lighting technology can be operated via DALI bus or by using optional controllers available from Kiefer.

Design example for compliance with DIN EN 12464-1 and ASR A3.4 (technical rules for German workplaces)

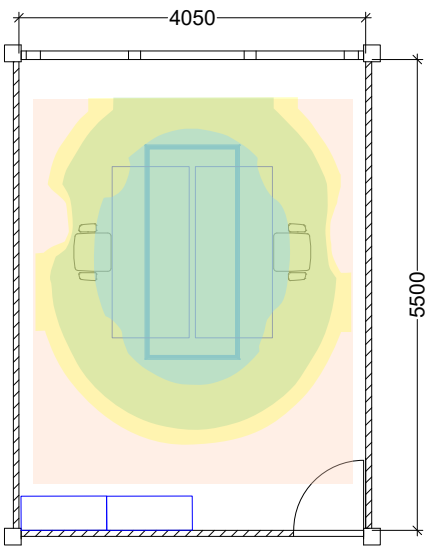
Arrangement with 1 INDUSAIL LUMINOUS plus

With one INDUSAIL LUMINOUS plus, up to 2 workstations can be provided with comfortable, compliant and circadian lighting.

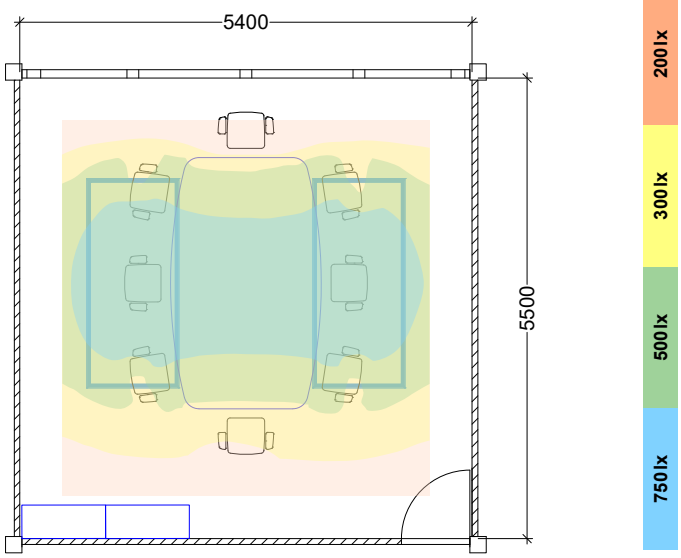
Arrangement with 2 INDUSAIL LUMINOUS plus

With two INDUSAIL LUMINOUS plus, up to 8 workstations (the example shows a meeting room) can be provided with comfortable, compliant and circadian lighting.

3-axis space



4-axis space



OPTIMISING THE INTERIOR ACOUSTICS

Acoustic sails can reduce nuisances such as noise in interiors. This improves working conditions and performance. In open-plan offices in particular, it can often be hard to concentrate when others are talking loudly. Audibility, increased intelligibility and low reverberation times are key criteria of interior acoustics that increase the acoustic quality in a space and, with it, boost the performance of the people working there. The ceiling is the largest continuous surface in a room and can control sound propagation with the sound-absorbing ceiling sails. This increases the wellbeing, satisfaction and performance of the people in the room.

INDUSAIL SYSTEM AS AN ACOUSTIC SOLUTION

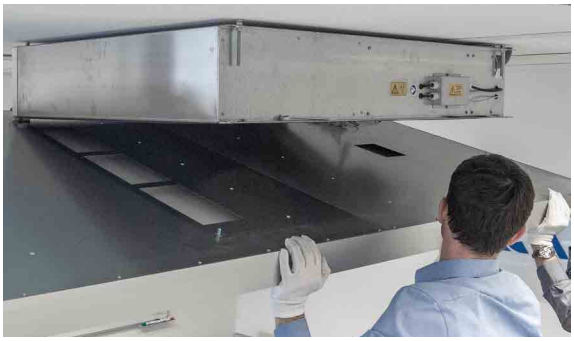
The open-pored absorber material on the ceiling sails delivers optimum sound absorption levels, with a glass fleece coating on the visible side of the INDUSAIL SONIC and translucent diffuser material on the INDUSAIL LUMINOUS version.

For further technical information, visit
www.kieferklima.de/en/products/lighting-sail-indusail-luminous

CLEAN INSTALLATION – EASY CLEANING AND MAINTENANCE

Dustproof installation is important to prevent soiling. In versions with a fan coil unit, the base frame is installed first. The acoustic sail should only be mounted once the construction site is dust-free and ready for occupancy. The INDUSAIL SONIC plus acoustic sail and the INDUSAIL LUMINOUS plus lighting sail have folding hinges that make them easy to service. This allows convenient access to all internal components for cleaning and maintenance.

In line with VDI 6022, the unit sections through which air flows are easy to clean.



Opening the acoustic/lighting sail

Photo © OBERMEYER

OBERMEYER CORPORATE HEADQUARTERS, MUNICH

PROPRIETOR	OBERMEYER Objekt Hansastraße 40 GbR
ARCHITECTS	OBERMEYER internal planning
PLANNING OFFICE	OBERMEYER & Kiefer Klimatechnik GmbH

Photo © Kiefer GmbH

HYPO INFORMATIK, BREGENZ

PROPRIETOR	Hypo Vorarlberg Bank AG, Bregenz, AT
ARCHITECTS	Architekturbüro Helmut Kuess, Bregenz, AT
PLANNING OFFICE	Klimaplan Technisches Büro GmbH, Hohenems, AT

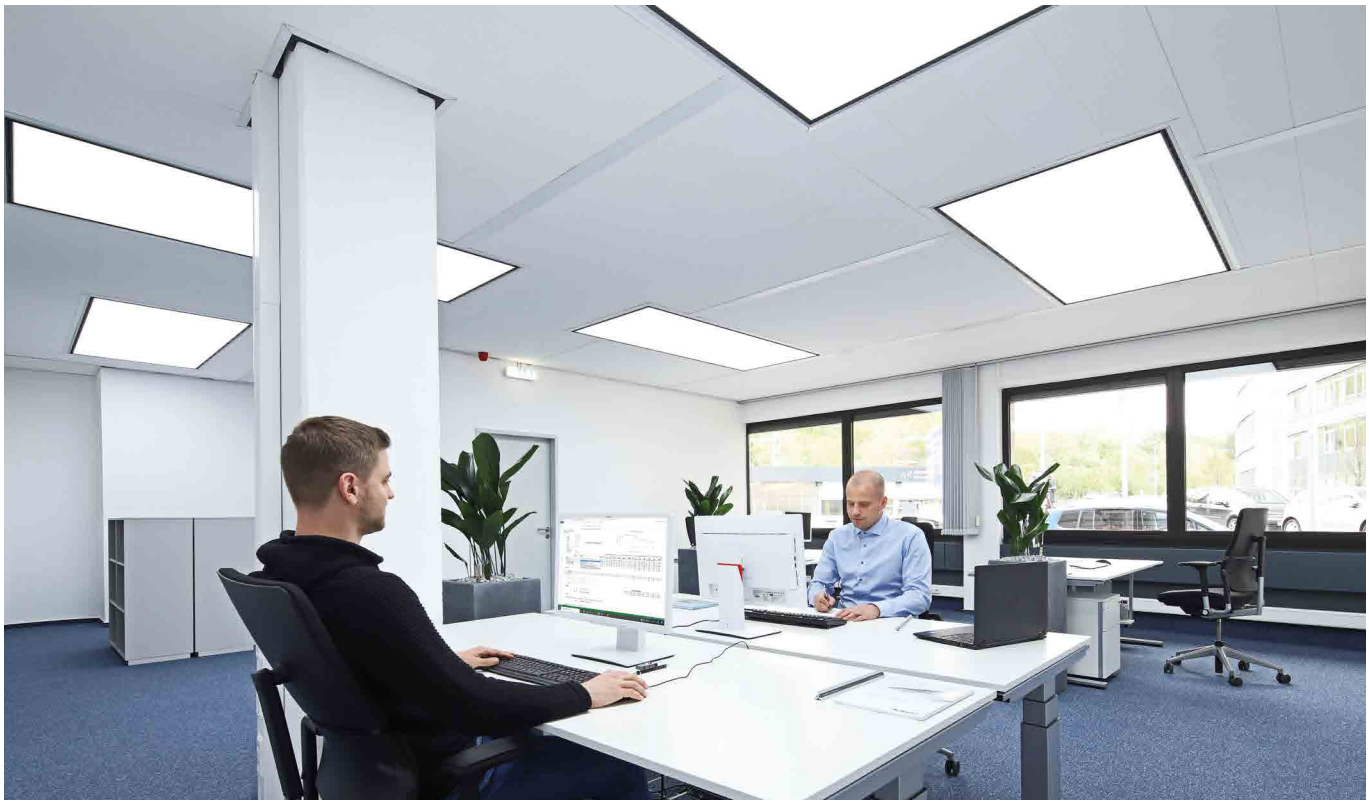


Photo © Kiefer GmbH

OPEN-PLAN OFFICE IN THE KIEFER KLIMATECHNIK GMBH BUILDING, STUTTGART

Photo © Andrea Flak

LIGHTHOUSE HOTEL & SPA, BÜSUM

PROPRIETOR	Jens Sroka/Heimathafen Management GmbH & Co. KG
ARCHITECTS	Planungsgemeinschaft Ladehoff + Hannemann & Krützfeldt
PLANNING OFFICE	Pahl & Jacobsen Ingenieurbüro für TGA, Heide

INDULVENT – Sparkasse Bayreuth. Photo © Gerhard Hagen

▲ INDULVENT – Lighthouse Hotel & Spa, Büsum. Photo © Rainer Taepper

FAN COIL SYSTEM INDULVENT connect

Kiefer Klimatechnik

Decentralised fan coil system which sets new benchmarks in terms of dimensions, cooling capacity, acoustics and comfort. INDULVENT connect was developed as a clear alternative to current ceiling fan coil systems and the associated disadvantages. INDULVENT connect offers 3D ambient air conditioning: maximum cooling capacity + good acoustics + highly comfortable inflow behaviour = above average user satisfaction.

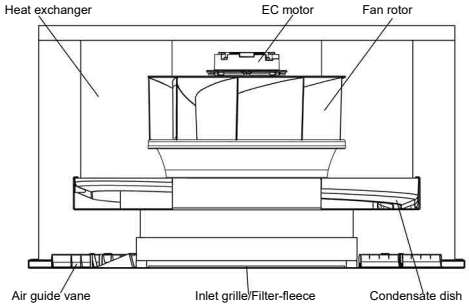
INDULVENT – Mercedes-Benz-Museum, Stuttgart. Photo © Kiefer GmbH

FAN COIL SYSTEM INDULVENT connect

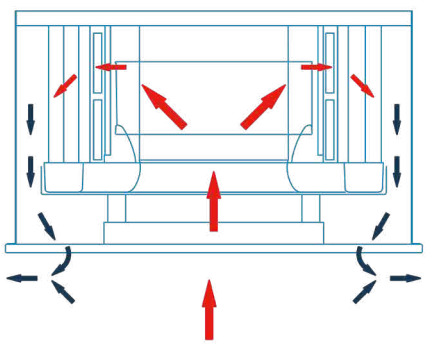
High cooling capacity and comfortable ambient air flow

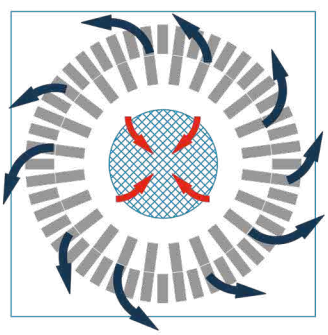
A decentralised fan coil system offers high flexibility, as the room where it is installed can be used for different purposes. INDULVENT connect combines the high cooling capacity of a fan coil system with the comfortable ambient air flow of a highly inductive ceiling air diffuser. INDULVENT connect is suitable for almost all applications where high cooling loads need to be transferred and a comfortable indoor environment is a priority. The reference projects shown range from typical offices and conference rooms, to halls, hospitals, workshops and laboratories, and on to control centres and control rooms. INDULVENT connect is equally suitable for both new and renovated buildings.

Construction



Air flow path





FUNCTION

The energy-saving, acoustically optimised EC fan draws the ambient air into the interior of the housing and cools it by means of the integrated ring cooler. The cooled ambient air is then fed back into the room via the front plate with highly inductive air guide vanes. The major advantage which results from combining a fan coil system with inductive introduction of air is reflected in the significantly greater comfort. In contrast to current systems, which blow the supply air into the room without extensive mixing with ambient air, here Kiefer's own comfortable, draught-free ambient air flow is formed. As an option, the INDULVENT connect can be supplied with a four-pipe heat exchanger to achieve combined cooling/heating.

The optional, preprogrammed controller continually adjusts the recirculation air flow rate and the water mass flow rate for optimum transfer of the cooling and heating loads (only with four-pipe design) at all times and thus meets user requirements. INDULVENT connect units always have a condensate pan and a condensate pump with float switch to ensure operational reliability. This means any condensate can be easily discharged.

The optional controller enables the units to be controlled individually or to be grouped into a control zone comprising multiple master/slave units without further outlay on control technology.

ENERGY

Decentralised fan coil system which reacts only to the actual cooling requirement within the room, thus avoiding energy losses.
EC technology that saves energy each time it is used and variable volume flow rates matched to the cooling load ensure high energy efficiency with low operating costs.

DESIGN

Dimensions no larger than those of standard air diffusers allow the INDULVENT connect to be integrated into all commonly used ceiling systems. Various different designs and numerous special solutions give architects much greater creative freedom than is usually the case with fan coil systems.

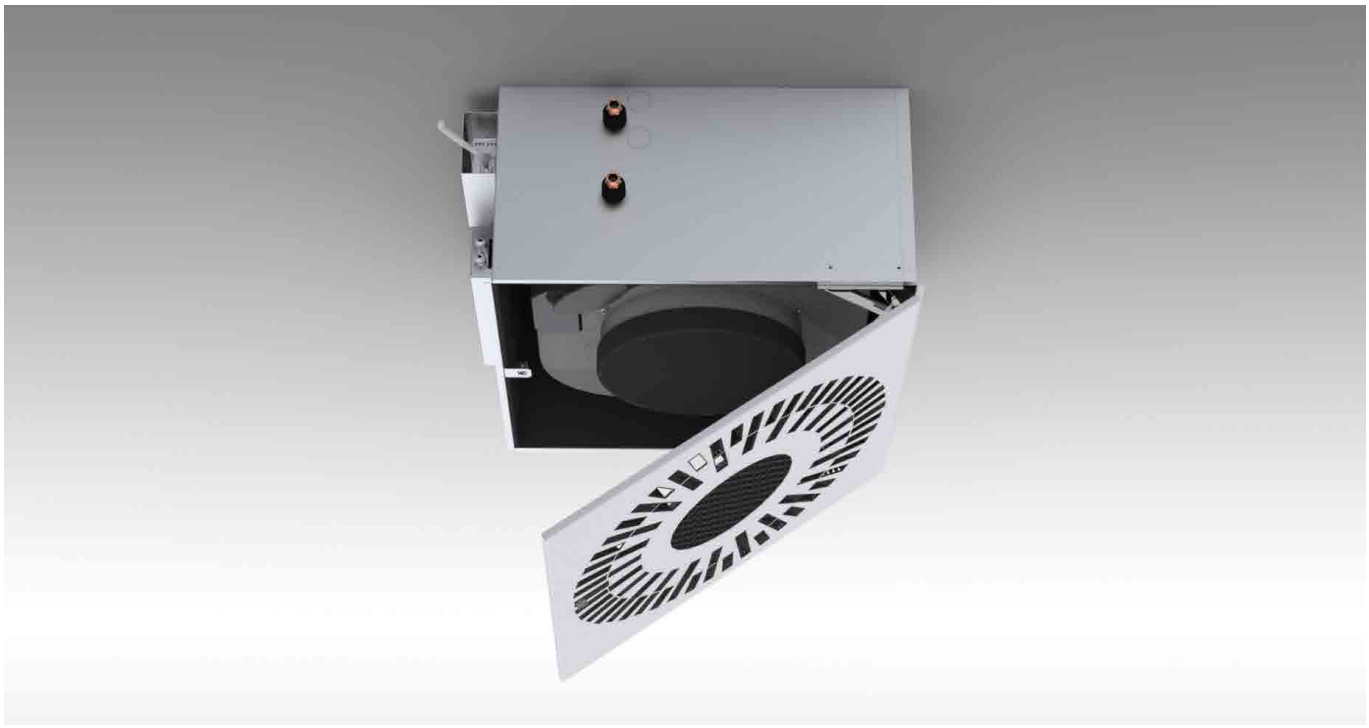
TECHNOLOGY

Decentralised fan coil system developed for the highest demands on comfort, with a cooling capacity of up to 2550 W. The hinged front plate allows maintenance and cleaning tasks to be carried out quickly and easily from within the room. The optional bus-compatible controller enables independent operation as well as integration in a BMS.

TECHNICAL DATA

Cooling capacity	up to 2.550 W
Size	600 x 600 mm / 625 x 625 mm
Installation length	335 mm
Cold water temperatures	6 – 14 °C
Accessories	Straight-through valves with ½" thermal actuator for cold water shut-off during downtimes

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



INSTALLATION SITUATION INDULVENT connect

The INDULVENT connect housing is no larger than that of a standard air diffuser and can be easily integrated into all common ceiling systems. Various different designs and numerous special solutions give architects much greater creative freedom than is usually the case with fan coil systems. With the RQF version, suspended installations without false ceilings are possible, without any impairment to comfort levels.

COMBINATION INDULVENT connect / INDULCLIP Z/A

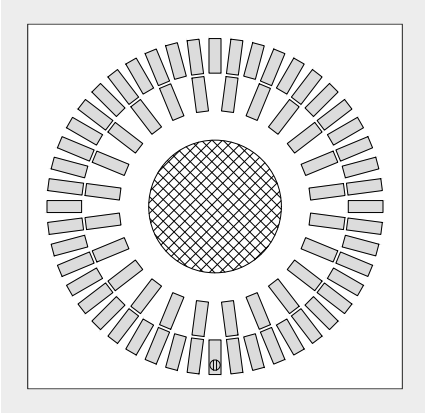
The INDULVENT connect has been designed as a stand-alone system. The optional control unit makes it possible to realise individual solutions or control groups by way of master/slave solutions. This keeps the cooling capacity adjusted to current requirements at all times. It enables straightforward installation of INDULVENT units in the case of retrofits and renovations in particular, without the need for complex building management services (BMS). In larger construction projects which usually have a BMS installed anyway, the INDULVENT controllers can simply be integrated via the KNX bus. Alternatively, the controllers can be dispensed with in such cases and the INDULVENT connect controlled via an analogue 0-10 V signal from the BMS.

In rooms where the cooling load is transferred wholly or partially via the preconditioned supply air, the use of INDULCLIP Z/A is ideal. The air diffuser is visually almost identical with the INDULVENT connect front plate. The components can be combined in a project as follows:

- INDULVENT connect for rooms without supply air provision.
- INDULVENT connect and INDULCLIP Z/A for rooms with average and high cooling loads, which also have supply air provision for hygiene reasons.
- INDULCLIP Z/A for rooms with a high supply air demand, where the cooling loads can only be transferred via the supply air.

EASY TO CLEAN (VDI 6022)

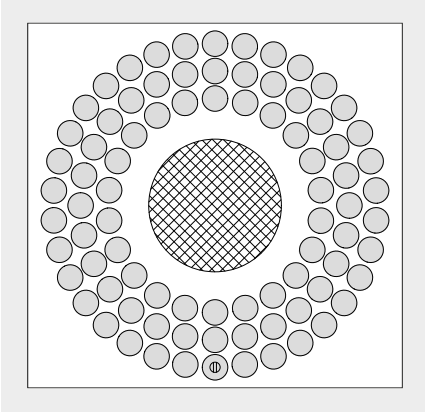
The INDULVENT connect has a special feature in the form of a folding hinge, which comes as standard. The front plate can be opened without the need for tools, and pivoted downwards. This makes the housing, filter, fan, heat exchanger, condensate dish, etc. easily accessible for cleaning.



View of front plate of INDULVENT connect RQD
Suitable for ceiling installation

Square front plate 600 x 600 mm or 625 x 625 mm with INDULCLIP air flow path elements

Matt black or light grey (similar to RAL 7035)



View of front plate of INDULVENT connect RQF
Suitable for ceiling installation and mounting without a suspended ceiling

Square front plate 625 x 625 mm with INDUDRALL air flow path elements

Matt black or light grey (similar RAL 7035)

Cooling capacity (2-pipe)[1]

Control voltage [V(DC)]	Sound power level [dB(A)]	Total cooling capacity [W]					Electrical power [W]
		Cold water supply temperature					
		6 °C	8 °C	10 °C	12 °C	14 °C	
2	< 25	1220	1080	930	775	605	9
3	27	1580	1395	1200	990	770	10
4	33	1830	1610	1380	1135	880	11
5	37	2010	1760	1505	1240	960	13
6	40	2145	1880	1605	1315	1015	15
7	43	2260	1980	1685	1380	1060	18
8	46	2365	2060	1755	1435	1105	21
9	49	2455	2145	1820	1485	1140	25
10	52	2550	2220	1880	1535	1175	30

[1] Ambient air conditions: 26 °C / 60 % rel. humidity, dew point: 17,6 °C, $\dot{m}$ = 250 kg/h

Photo © Kiefer GmbH

MARKENRAUM MERCEDES-BENZ MUSEUM, STUTTGART

PROPRIETOR	Mercedes-Benz-Museum GmbH, Stuttgart
ARCHITECTS	dan pearlman Markenarchitektur GmbH, Berlin
PLANNING OFFICE	Drees & Sommer Advanced Building Technologies, Stuttgart

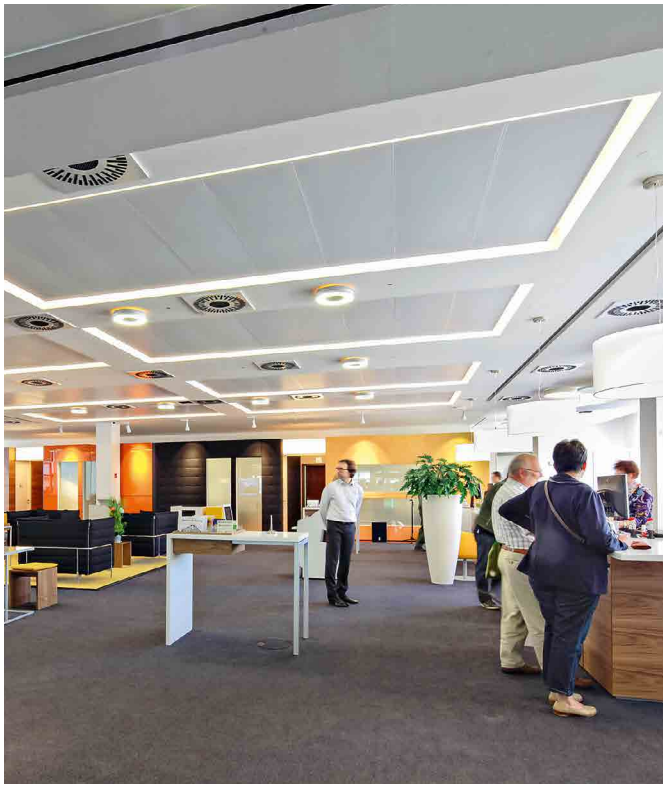


Photo © Volksbank Lahr eG

VOLKSBANK LAHR

PROPRIETOR	Volksbank Lahr eG, Lahr
ARCHITECTS	Schaible Freie Architekten, Lahr
PLANNING OFFICE	Planungsbüro Eichhorn & Engler, Friesenheim

Photo © Hörburger GmbH & Co KG

WIFI VORARLBERG, DORNBIRN

PROPRIETOR	WIFI Vorarlberg, Dornbirn. AT
ARCHITECTS	Atelier Ender, Nüziders. AT
PLANNING OFFICE	Klimaplan GmbH, Hohenems. AT

Photo © Kiefer GmbH

SPARKASSE BAYREUTH

PROPRIETOR	Sparkasse Bayreuth
ARCHITECTS	BAURCONSULT Architects, Haßfurt
PLANNING OFFICE	Rabenstein, Bischofsgrün

Photo © Kiefer GmbH

LANDESKRANKENHAUS FELDKIRCH

PROPRIETOR	Vorarlberger Krankenhaus-Betriebsgesell-schaft. m.b.H., Feldkirch. AU
ARCHITECTS	Erich Gutmorgeth, Innsbruck. AT
PLANNING OFFICE	Klimaplan GmbH, Hohenems. AT

Photo © Thomann GmbH

MUSIKHAUS THOMANN, TREPPENDORF

PROPRIETOR	Musikhaus Thomann e.K., Treppendorf
ARCHITECTS	Blum Diez GmbH, Kitzingen
PLANNING OFFICE	Ingenieurbüro HPM, Stegaurach

Photo © Kistler GmbH

KISTLER, SINDELFINGEN

PROPRIETOR	Kistler Instrumente GmbH, Sindelfingen
PLANNING OFFICE	Schatz Projectplan GmbH, Schorndorf

The INDULFLOOR offers high thermal comfort and space saving integration into raised floors and cavity floors.

▲ INDULFLOOR can be used in a range of application areas in modern architecture, especially in office spaces.

FLOOR AIR DIFFUSER INDULFLOOR

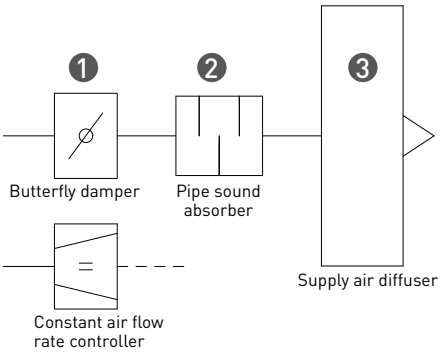
Kiefer Klimatechnik

Three functions combined into a single floor air diffuser

INDULFLOOR is a floor air diffuser with an integrated sound absorber and innovative mechanics for demand-based air volume flow control and discharge setting.
The INDULFLOOR is perfect for integration into raised floors and can be installed along façades to save space.

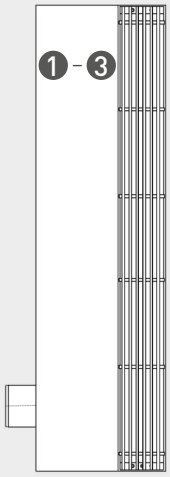
INDULFLOOR

Three functions combined into a single floor air diffuser



Ventilation diagram of commercially available floor air diffuser

1. Butterfly damper, air flow rate limiter or controller
2. Pipe sound absorber
3. Plenum box with outlet



INDULFLOOR ventilation concept

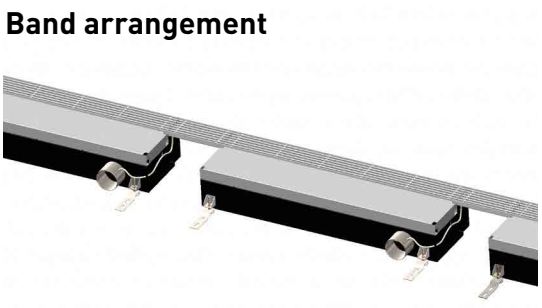
1. Damper element with mechanics for air flow rate adjustment or control, optionally electric.
2. Sound absorber
3. Plenum box with integrated mechanism for discharge setting

INSTALLATION SITUATION

The INDULFLOOR is installed directly onto the unfinished floor. Installation tolerances are easy to compensate for with the height-adjustable feet so that the diffuser can easily be aligned then secured to the floor with the impact-noise decoupled fixing tabs.
The INDULFLOOR has a stable console to which the floor covering can be applied directly. The floor panels of the raised floor can be recessed in the area around the INDULFLOOR, thereby reducing the overall installation height.
The INDULFLOOR can be installed as a single diffuser or as band arrangement. With the band arrangement, a connecting plate is installed between the active diffusers to which the linear grille spacer can then be fitted. This allows multiple INDULFLOOR units to join together as a visually continuous band.

Single element

Band arrangement



FUNCTION

INDULFLOOR comprises a plenum box with integrated sound absorber and a mechanism for room-side air volume flow and discharge setting. Optionally, the electric setting by using an actuator or controller is also possible. The air diffuser has an asymmetrically positioned air connection socket and an accessible linear grille with support frame. The floor air diffuser has four height-adjustable feet for adjustment to installation tolerances. In order to create a defined and simple interface to the raised floor, the floor air diffuser is equipped with a console to which the floor covering can be applied directly. The height of the console is set according to the floor covering. A room-side pressure measurement nipple allows for pressure and air flow rate recording on site. The desired supply air flow rate can be read off from the performance curve with the measured pressure signal and the scale on the air diffuser and set on the diffuser. A pressure-independent variable air volume flow control with Modbus communication is also possible.

ENERGY

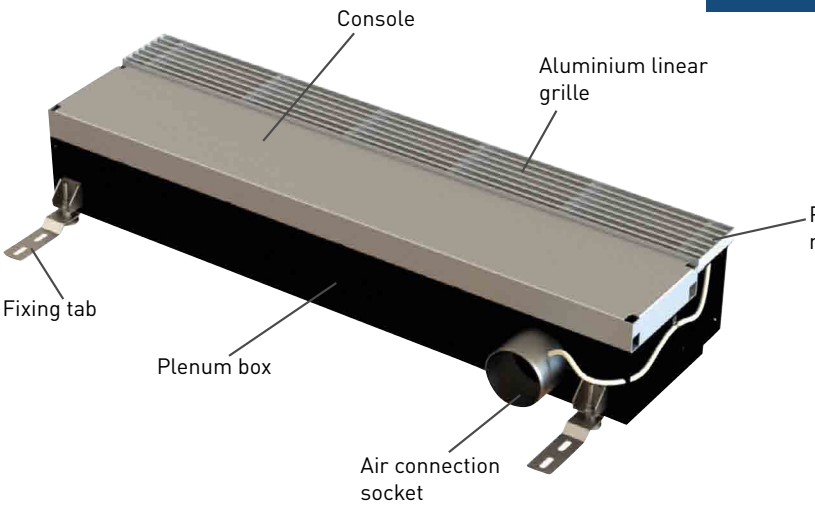
Demand-based and energy-efficient ventilation with minimal pressure loss offers significant energy and cost savings.

DESIGN

Elegant linear grille made from fine, anodised aluminium. Single or array arrangement also possible directly on the façade.

TECHNOLOGY

Compact read-to-use solution with integrated sound absorber and innovative mechanism for simultaneous air flow rate and discharge setting. Maximum indoor comfort thanks to optimal mixed/source air flow.



Modbus

FuE BSFZ - 2024 -

TECHNICAL DATA

Visible width of the linear grille	113 mm
Installed length	1100 mm
Total height incl. adjustable feet	193 - 243 mm
Custom dimensions	On request
Recommended line pressure range*	Between 30 and 60 Pa
Temperature differential	Up to -6 K
Air flow rate	30 -160 m³/h
Air flow setting:	manual, electrical: 2-stage / continuous / variable control
Sound power level at 133 m³/h and 30 Pa	LWA < 32 dB(A)

* Minimum pressure loss for the version with an electric air flow controller: 2 to 30 Pa, depending on the air volume flow.

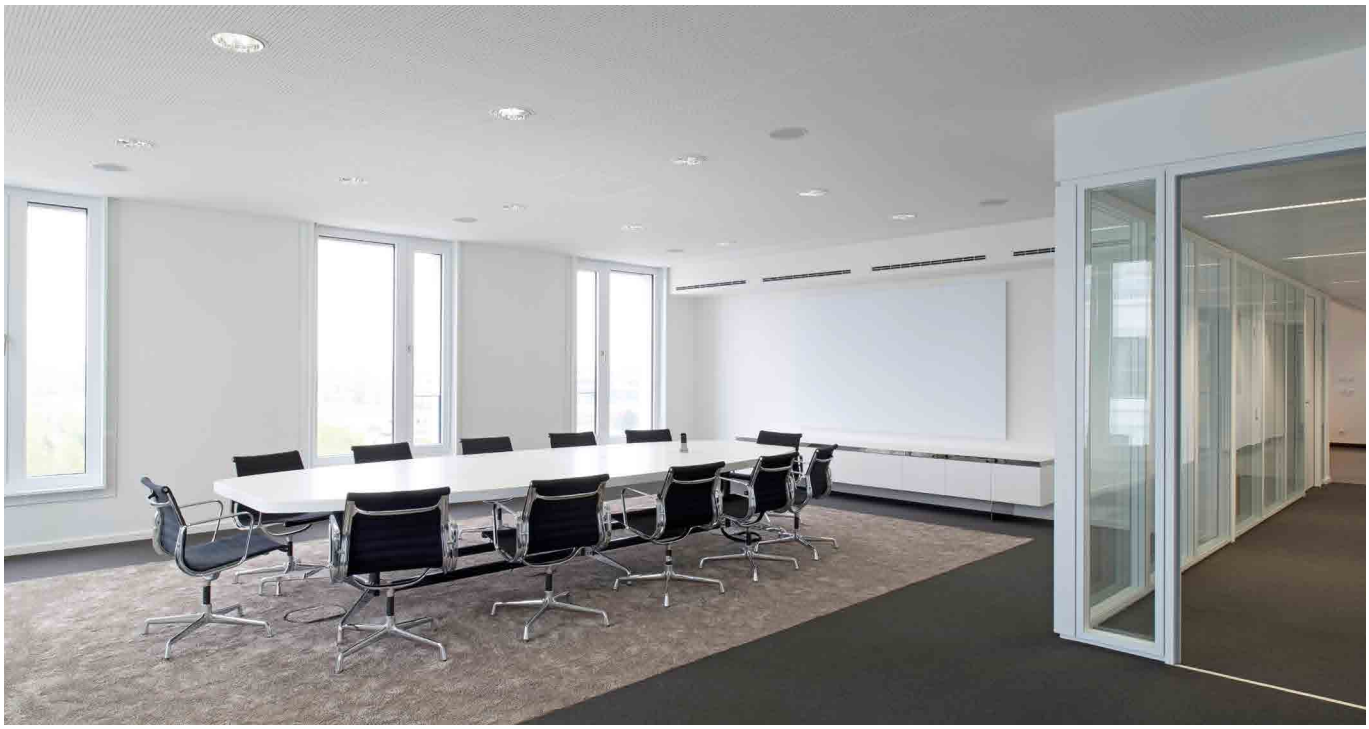
INDULSNAP – EgeTrans, Marbach. Photo © EgeTrans Internationale Spedition GmbH

▲ INDULSNAP – EgeTrans, Marbach. Photo © EgeTrans Internationale Spedition GmbH

WALL AIR PASSAGE INDULSNAP

Kiefer Klimatechnik

INDULSNAP is the first wall air passage with an integrated cross-talk silencer which is completely concealed in the drywall. Excellent absorption values fulfil the highest demands. The proven INDUL exhaust profile combines great performance with a high level of comfort.



Forum am Hirschgarten, München. Photo © Christian Hacker

WALL AIR PASSAGE INDULSNAP

A versatile ventilation system for supply and extract air with integrated cross-talk silencer

Above all, modern office buildings must be versatile. During the planning and construction phase it is usually not clear whether the office space will later be used as an individual, group or open plan office, or as a conference room. Because of this, the area has to be flexibly partitioned according to the axes of the building. The inlet of supply air and exhaustion of extract air must be correspondingly versatile.

To utilise the height of the building as efficiently as possible, suspended ceilings are often not present, in order to reduce the height between floors to a minimum. In this instance the supply and extract ducts are usually installed in the hollow ceiling cavities of the corridors, in this case the inlet of supply air and the exhaustion of extract air is logically located in the partition wall to the corridor.

However, the confined space in the corridor cavity makes the use of conventional cross-talk silencers impossible, so that the air passage also has to ensure that cross-talk from one office to the next is absorbed.

The INDULSNAP Wall Air Passage has been designed to meet all of these requirements.

FUNCTION

The INDULSNAP wall air passage consists of a plenum box with an integrated cross-talk silencer and a highly inductive air guide diffuser. The plenum box with an installation depth of only 40 mm was designed so that it is completely concealed in a stud wall construction which is double-panelled on both sides. Due to the offset arrangement of the connection and the air guide rail in combination with an acoustically highly effective interior lining, this results in damping values, which in most cases eliminates the use of sound absorbers to reduce cross-talk noise from office to office. The installation length of 550 mm enables installation in a 625 mm dry-wall grid. INDULSNAP is used as an individual air inlet or exhaust diffuser. If a corridor cavity is constructed in an architectural grid, larger individual INDULSNAP lengths of 860 mm, 1000 mm or 1200 mm can be selected. In this case, INDULSNAP is usually configured as a combined air inlet and exhaust. The diffuser profile, which has been adopted from the INDUL Type V linear diffuser, ensures excellent airflow within the room and achieves air displacement in the entire office up to a room depth of 7 m. In spite of this, a draught-free airflow can be achieved due to the high inductive effect of the exhaust profile. With a possible temperature difference of up to – 8 K between the supply air and the room temperature, this enables free cooling and therefore provides great potential for energy saving.

ENERGY

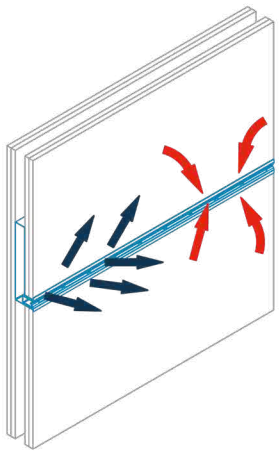
Owing to the high temperature difference, there is excellent energy-saving potential through the use of free cooling.

DESIGN

Integration of cross-talk sound attenuators means there is no requirement for corridor space, provision for flexible axes thanks to a combined diffuser for supply and extract air, low floor height as there is no need for suspended ceilings.

TECHNOLOGY

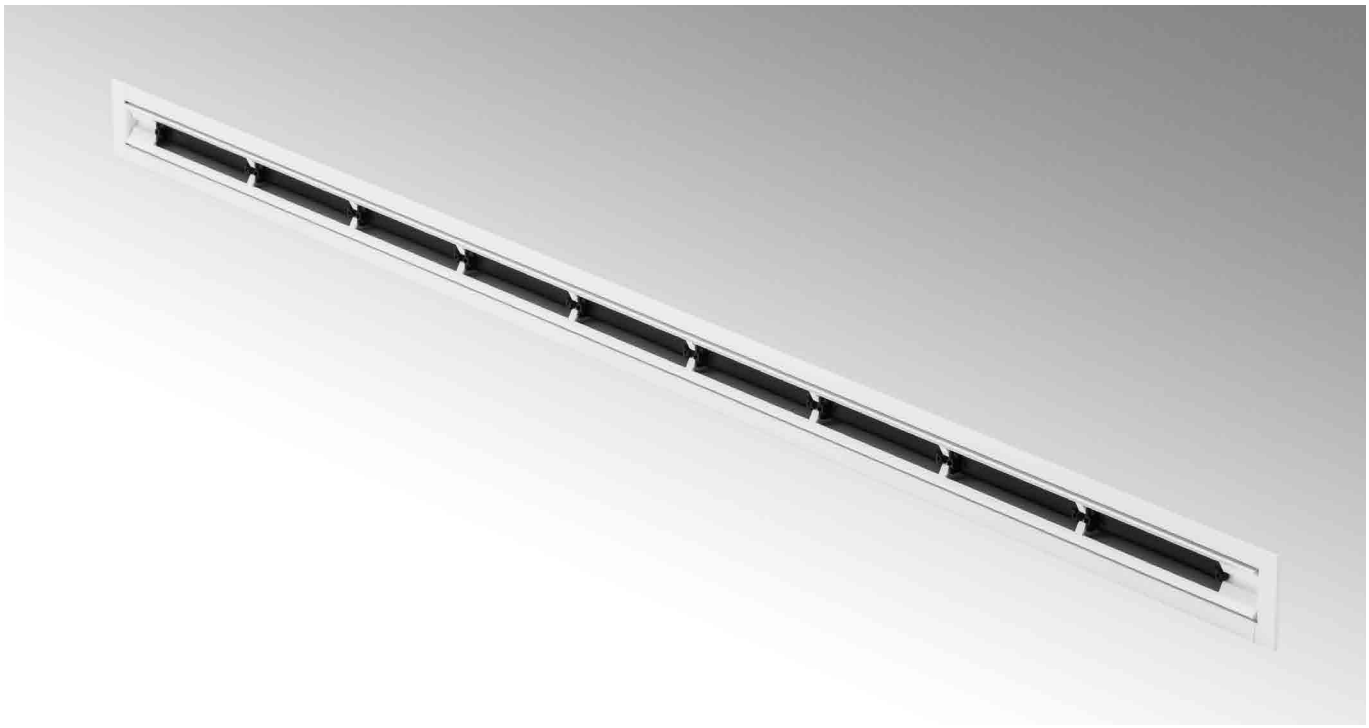
Draught-free air distribution and room flushing to a room depth of 7 m, input attenuation ≥ 34 dB between 125 and 8000 Hz, making cross-talk sound attenuators superfluous.



TECHNICAL DATA

Sizes	24 / 45 mm slot width
Installation lengths	550, 860, 1000, 1200 mm – standard lenght on stock special lengths on request
Temperature difference	up to - 8 K
Input attenuation	≥ 34 dB
Air flow rate	70 - 250 m^3/hm

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



INSTALLATION SITUATION INDULSNAP

As standard, INDULSNAP is intended for installation in drywalls with a wall thickness of more than 100 mm. However, greater wall thicknesses can be easily accommodated by using a support extension. Installation is carried out in two steps. First of all, the plenum box, which is equipped with dust protection, is integrated into the wall structure during the drywall construction. Once the drywall construction and painting are complete, in the second step the air guide rail is simply inserted into the plenum box by means of a snap-in fastening. This eliminates entry of dirt into the INDULSNAP during the construction phase.

Type INDULSNAP V24
Single-slot version for flow rates
of 70 to 150 m^3/hm

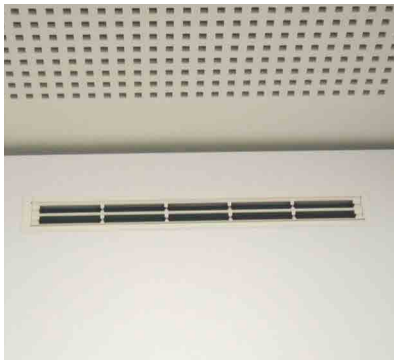
Type INDULSNAP V45
Two-slot version for flow rates
of 140 to 250 m^3/hm

Available as individual or combined wall air diffusers for supply and extract air in drywalls or as air guide profiles without absorption boxes for direct installation in plasterboard panels.

INSTALLATION SITUATION

The decorative, high quality air guide profiles of the INDULSNAP can be fitted from within the room by means of a snap connector, and removed again just as easily. This facilitates faster progress in the construction work and provides easy access for cleaning purposes to VDI 6022.

INDULSNAP plenum box with dust protection in the completed drywall. The extended neck protrudes beyond the wall structure, because it must still be equipped with acoustic elements.



INDULSNAP with air guide rail in the completed state, including the attached acoustic element.

Installation in a furniture trim above a 60 cm deep built-in cupboard.

Installation in a furniture trim covering a built-in cupboard.

Photo © Dr. Frank Rothe / Metawell GmbH

ILB – INVESTITIONSBANK DES LANDES BRANDENBURG, POTSDAM

PROPRIETOR	Investitionsbank des Landes Brandenburg
ARCHITECTS	KSP Jürgen Engel Architects, Berlin
PLANNING OFFICE	Deerns Deutschland GmbH, Berlin

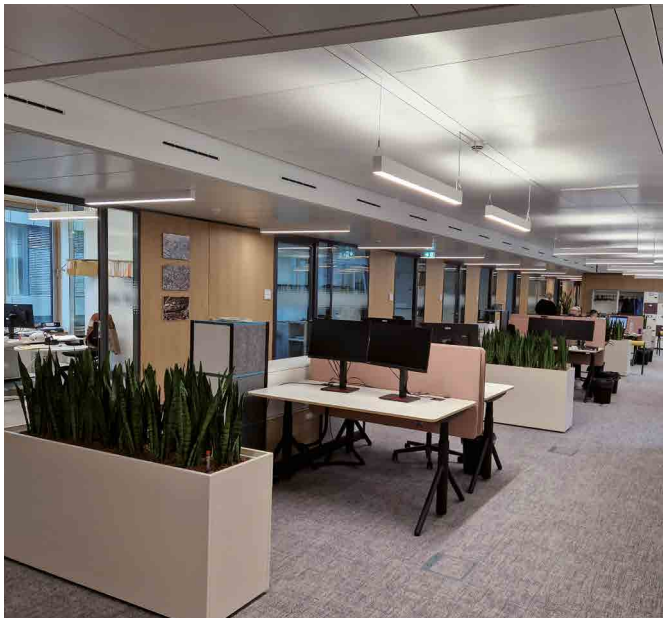


Photo © Kiefer Klimatechnik

WGV VERSICHERUNGEN, STUTTGART

PROPRIETOR	Württembergische Gemeinde-Versicherung a.G.
ARCHITECTS	wma architekten wöhr mieslinger assoziierte, Stuttgart
PLANNING OFFICE	Rentschler und Riedesser, Filderstadt

Photo © SAP AG / Stefan Schilling

SAP, WALLDORF

PROPRIETOR	SAP AG
ARCHITECTS	Vorfelder Freie Architects, Walldorf
PLANNING OFFICE	Zimmermann + Partner GmbH, Walldorf

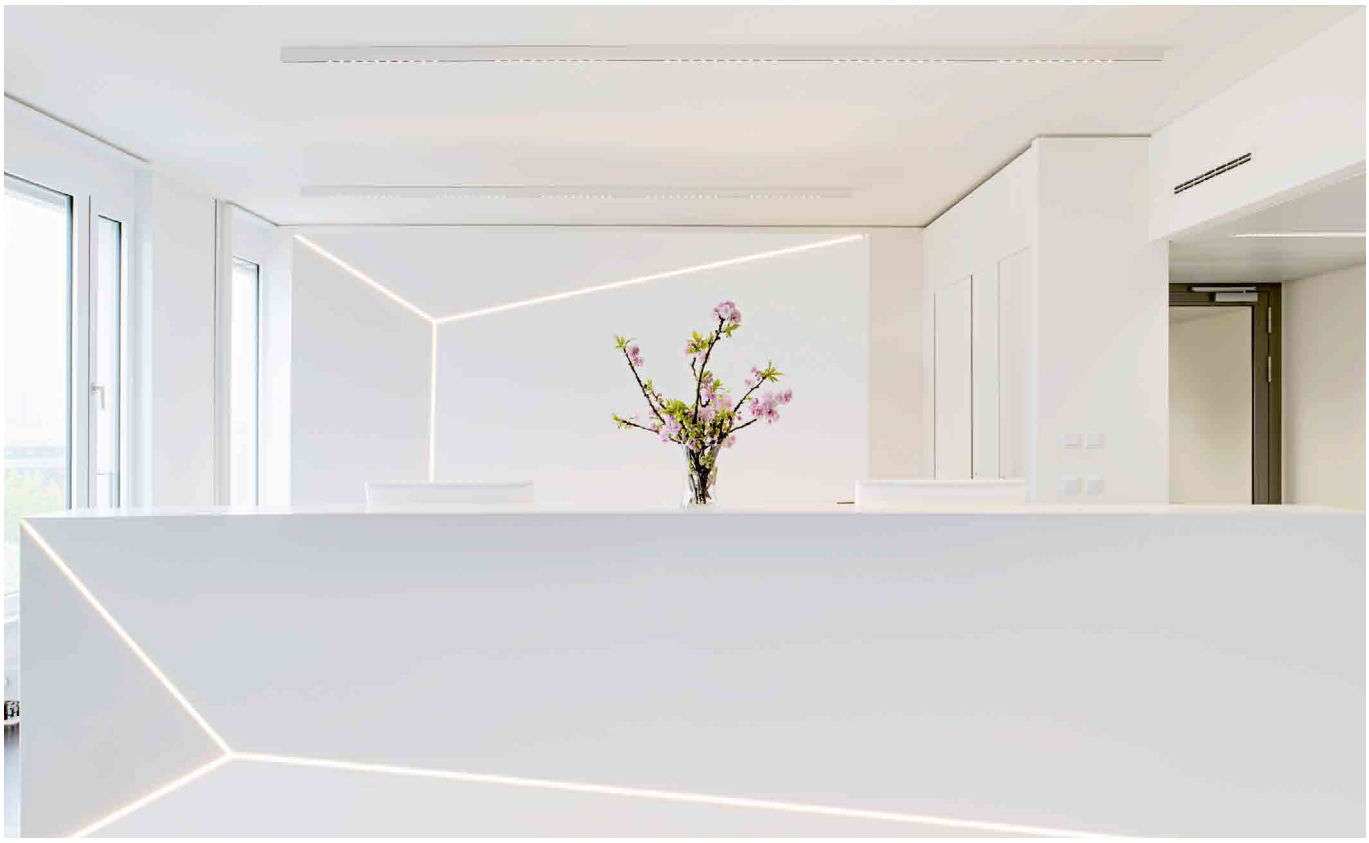


Photo © Christian Hacker

FORUM AM HIRSCHGARTEN, MUNICH

PROPRIETOR	Office Center Hirschgarten GmbH, Munich
ARCHITECTS	Allamann, Sattler und Wappner, Munich
PLANNING OFFICE	Climaplan, Munich

Photo © EgeTrans Internationale Spedition GmbH

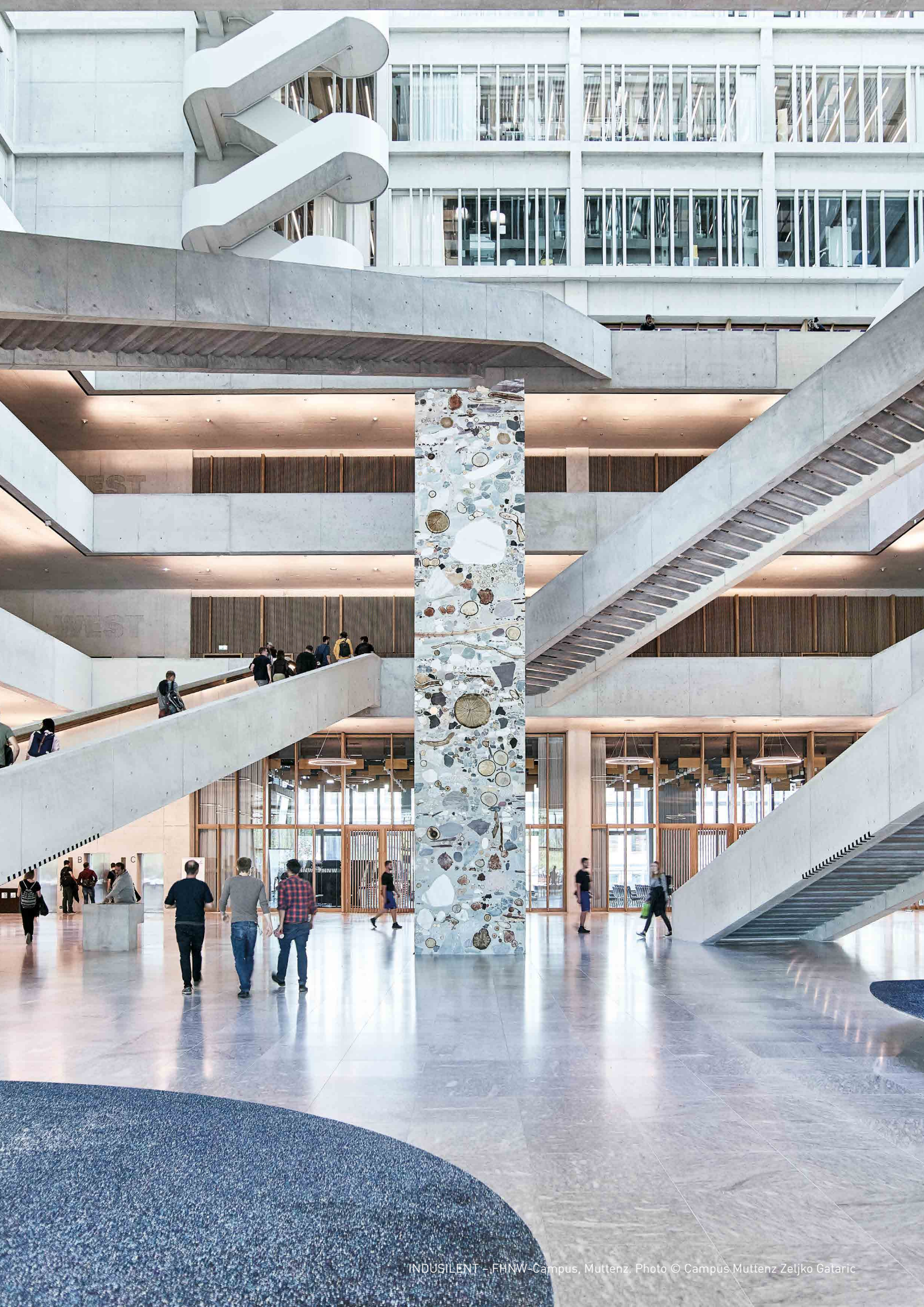
EGETRANS GMBH, MARBACH

PROPRIETOR	Steinmüller Immobilien GmbH, Marbach
ARCHITECTS	d. eger beratungs- und planungsgesell-schaft b.r., Kernen
PLANNING OFFICE	IFZ – Ingenieurbüro Förderer und Zimmermann, Backnang

Photo © EMA House.ch

EMA HOUSE SUITES, ZURICH

PROPRIETOR	EMR Properties AG, Zurich. CH
ARCHITECTS	Ushi Tamborriello, Baden. CH
PLANNING OFFICE	Fanzum AG, Zurich. CH



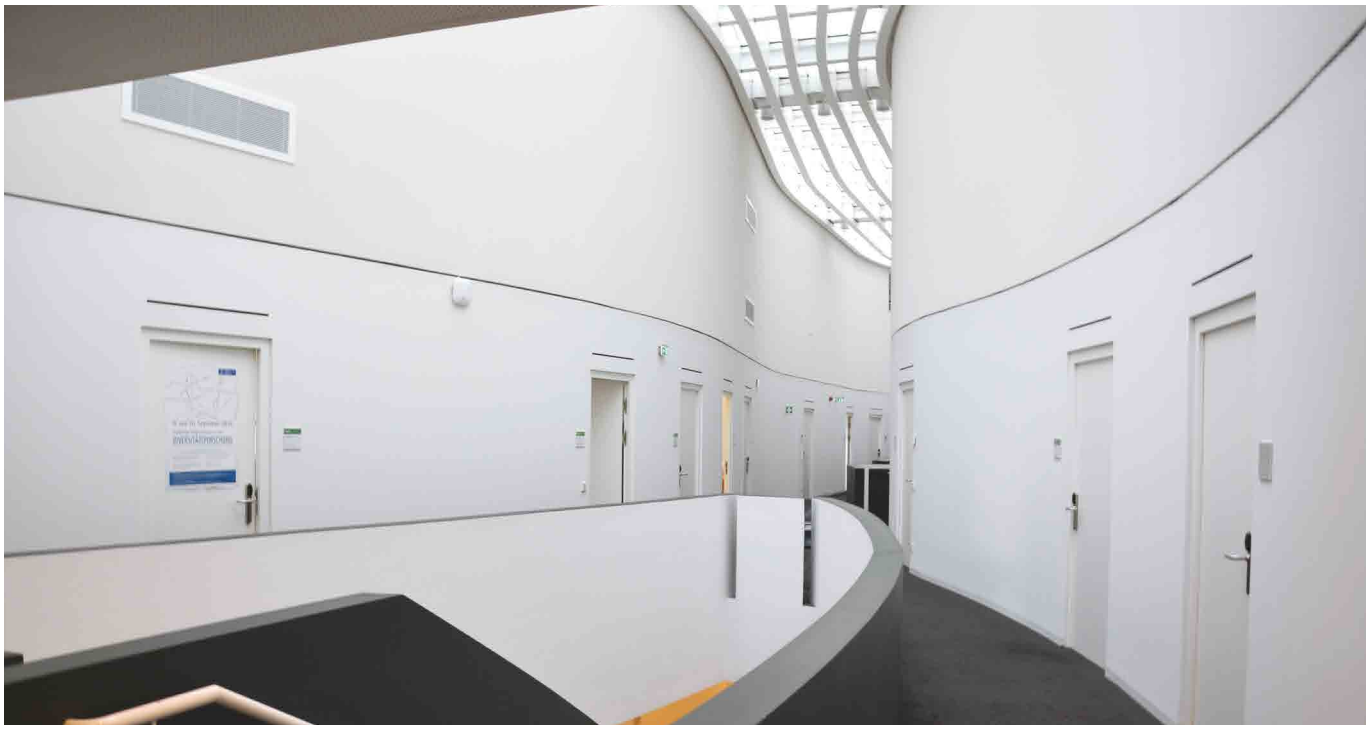
INDUSILENT - FHNW-Campus, Muttenz. Photo © Campus Muttenz Zeljko Gataric

▲ INDUSILENT – FHNW-Campus, Muttenz. Photo © Campus Muttenz Zeljko Gataric

TRANSFER GRILLES INDUSILENT

Kiefer Klimatechnik

The compact and acoustically highly effective transfer grille for partition wall installation that allows architects and interior designers greater creative freedom. It is available as a slender 20 mm joint or with an attractive decorative cover. The installation can be designed to be almost invisible through the targeted use of architectural elements.



INDUSILENT – Wirtschafts-Universität Wien. Photo © Kiefer GmbH

TRANSFER GRILLES INDUSILENT

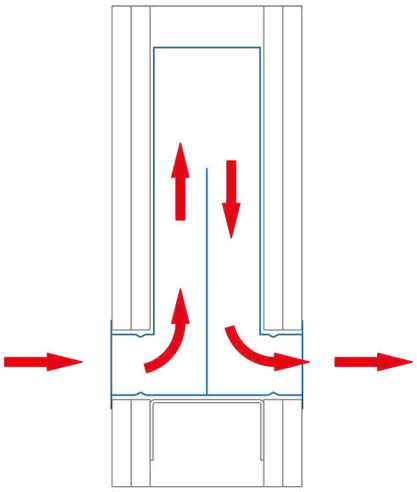
Nowadays, in modern buildings with tight building envelopes, sound-absorbing transfer grilles are an intelligent solution for extract air routing.
INDUSILENT transfer grilles are absolutely the best choice when:

1. high sound absorption is needed,
2. a low installation height is required and
3. the air outlet slots should have a specific look in keeping with the project.

As a result, they are particularly common in buildings that meet high architectural standards, such as the Swatch headquarters in Biel, Switzerland, and the Vienna University of Economics and Business in Austria.

FUNCTION

The INDUSILENT enables the free transfer of air from room to room. The acoustic weakening of the partition wall as a result of installing the transfer grille is mitigated by the integration of a highly effective inner lining. Taking into account a maximum pressure differential of 10 Pa, specific air flow rates of up to 140 m³/hm are possible.



ENERGY

Low pressure drops

DESIGN

The INDUSILENT is a ventilation element that allows architects and interior designers greater creative freedom. It is available as a slender 20 mm joint or with an attractive decorative cover. The installation can be designed to be almost invisible through the use of specific architectural elements.

TECHNOLOGY

Standard sound level differential Dn,e,w > 50 dB. Building material class A2 according to DIN 4102 (incombustible).

TECHNICAL DATA

Installation length	500, 800, 1000, 1200 mm – standard lenght on stock special lengths on request
Box height	230 mm or 340 mm (Type T) / 300 mm (Type S)
Air flow rate	Up to 140 m³/hm at 10 Pa pressure drop
Sound absorption	High Standard sound level differential, tested by Fraunhofer Institute
Wall thickness	From 58 mm (Type TS)
Building material class according to DIN 4102	A2 (incombustible), fibre-free in the air stream

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

INSTALLATION SITUATION INDUSILENT

The transfer grille is mounted during the construction of the dry wall between the wall partition pieces. After completing dry construction wall and paintwork the dust protection must be removed from the air slots. Type TG / SG is fitted with a deco-frame on both sides. Optionally, the connection to the plasterboard wall can be concealed behind a cover frame. Type TS is intended for installation in system partition walls. In this case, a corresponding joint has to be provided in the planking. For adaptation to other wall thicknesses, an attachable neck extension is optionally available for the types TR, TG, SR, SG.

INDUSILENT TYPES

INDUSILENT Type TR

For double skin partition wall

starting from 125 mm wall thickness

Type TR with deco-frame in RAL standard colours

Installation height 230 and 340 mm

INDUSILENT Type TG

For double skin partition wall

starting from 125 mm wall thickness

Opening remains as a shadow gap, with cover frame option

Installation height 230 and 340 mm

INDUSILENT Type SR

For double skin partition wall

starting from 100 mm wall thickness

Type SR with deco-frame in RAL standard colours

Installation height 300 mm

INDUSILENT Type SG

For double skin partition wall

starting from 100 mm wall thickness

Opening remains as a shadow gap, with cover frame option

Installation height 300 mm

INDUSILENT Type TS

Slimline design for installation in system partition walls

There has to be an appropriate joint in the panelling.

Installation height 230 and 340 mm

Photo © Kiefer GmbH

VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS

PROPRIETOR	VIENNA UNIVERSITY OF ECONOMICS AND BUSINESS, Vienna. AT
ARCHITECTS	Atelier Hitoshi Abe, JP
PLANNING OFFICE	KWI Engineers GmbH, Vienna. AT

Photo © Werner Huthmacher

PIK – POTSDAM-INSTITUTE FOR CLIMATE IMPACT RESEARCH

PROPRIETOR	Potsdam-Institut für Klimafolgenforschung e.V.
ARCHITECTS	BHBVT, Berlin
PLANNING OFFICE	Ingenieurgesellschaft W33, Berlin

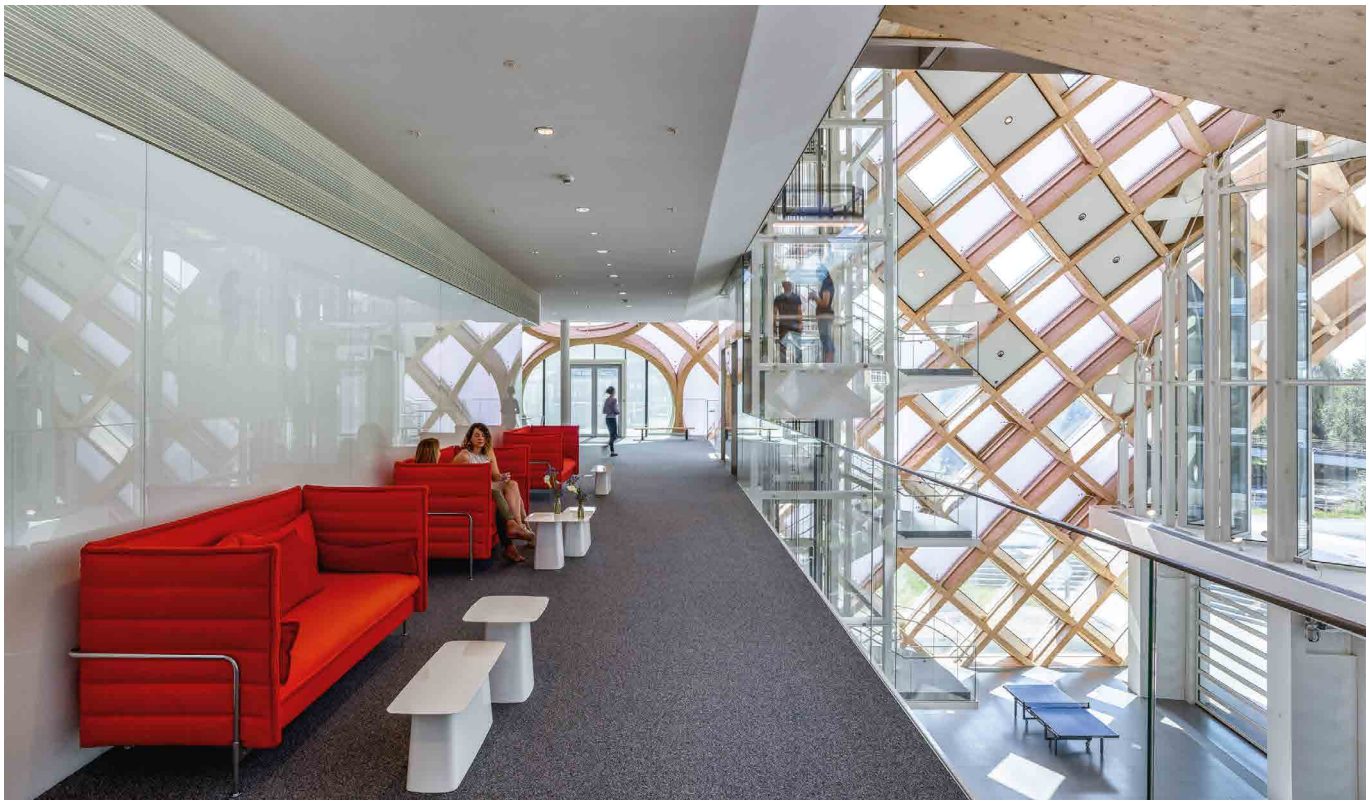


Photo © Swatch

SWATCH-HEADQUARTERS, BIEL

PROPRIETOR	Swatch Group AG, Biel. CH
ARCHITECTS	Shigeru Ban, Tokyo. JP

Photo © Zeljko Gataric

UNIVERSITY OF APPLIED SCIENCES AND ARTS NORTHWESTERN MUTTENZ

PROPRIETOR	Hochbauamt Basel-Landschaft, Fachhochschule Nordwestschweiz. CH
ARCHITECTS	pool Architects, Zurich. CH
PLANNING OFFICE	Kalt + Halbeisen Ingenieurbüro AG, Kleindöttingen. CH

INDULCLIP – Breuninger GmbH & Co., Stuttgart. Photo © David Matthiessen

▲ INDUDRALL – Land Securities Head Office, London. Photo © Timothy Soar

CEILING AIR DIFFUSER INDUDRALL, INDULCLIP, KOMBICLIP INDUDRALL Z-A, INDULCLIP Z-A

INDULCLIP, INDUDRALL and KOMBICLIP are striking air diffusers. Available in a range of designs and colours, they are often incorporated into the ceiling architecture as an attractive design element in their own right. The excellent air distribution performance offered by these ceiling air diffusers makes them the right choice when a comfortable indoor environment is a priority.

INDULTHERM, INDULTHERM-e

Enables comfortable cooling and powerful heating. The ceiling air diffuser operates in cooling mode as a highly inductive ceiling air diffuser and supplies in heating mode the supply air with a large penetration depth into the room.

INDUDRALL – Hotel Waldmühle, Zella-Mehlis. Photo © Kiefer GmbH

INDUDRALL, INDULCLIP UND KOMBICLIP

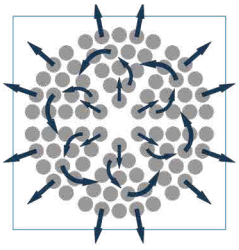
Air diffusers designed to blend harmoniously into the ceiling architecture

The highly inductive INDULCLIP and INDUDRALL air diffusers come in a variety of designs, shapes and colours, and can be flexibly integrated into any ceiling construction. The KOMBICLIP combines clip and swirl elements. It is particularly suitable for more discreet installations requiring lower air flow rates. Architects naturally regard choice of colour to be an important part of an interior design scheme.

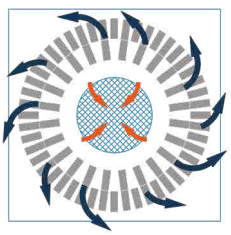
While our front plates are often requested in white (RAL 9010), they can be supplied in any RAL colour. The clip and swirl elements are available as standard in matt black and light grey but can also be manufactured in any other RAL colour as a matter of course.

INDULCLIP

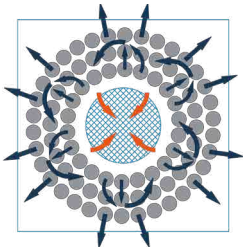
INDUDRALL



INDULCLIP Z-A



INDUDRALL Z-A



FUNCTION

The clip and swirl elements developed by Kiefer enable very high induction, so that large differences in temperature of down to –12 K between supply and ambient air can be quickly reduced to achieve draught-free air distribution. The result is energy efficiency combined with high cooling capacity for the operation of the ventilation unit, as there is no need to heat the outdoor air following heat recovery in the central unit.

In the INDUDRALL air diffuser, the flow from the front plate is fan-shaped. The single elements are combined into blocks in such a way that they form air jets for optimal ambient air induction. This makes INDUDRALL particularly suitable for high air flow rates and critical applications.

For INDULCLIP Z-A and INDUDRALL Z-A, the plenum box has a dual chamber design that allows the extract air to be drawn through a large opening in the middle of the front plate. As there is no need for additional extract air outlets, an enormous amount of space and expense is spared.

ENERGY

Low pressure losses and high temperature differences are the prerequisite for energy-efficient operation throughout the air conditioning plant.

DESIGN

A range of different design options, shapes and colours allows the architect to add creative accents with this type of diffuser too. Special designs allow plenty of scope for the architect's personal vision and design ideas.

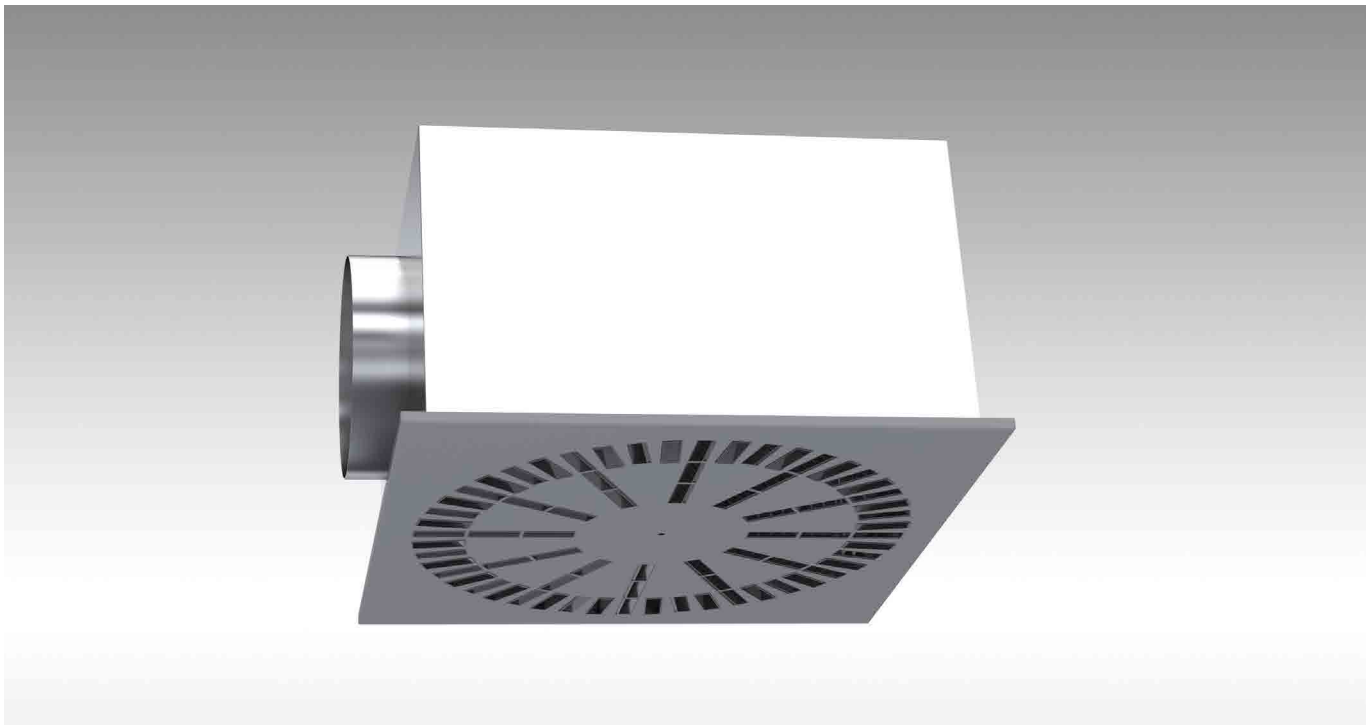
TECHNOLOGY

Kiefer air guide elements are optimised in terms of flow technology, enabling draught-free introduction of air even in demanding conditions.

TECHNICAL DATA

Sizes and types	INDULCLIP, INDUDRALL 300 mm - 800 mm, round and square KOMBICLIP 210 mm, round INDULCLIP Z-A, INDUDRALL Z-A 600 mm / 625 mm, square
Supply air temperature difference	up to -12 K
Air flow rate	20 - 1500 m^3/h
Room heights	2.3 m to approx. 8 m
Colour front plate	RAL of choice
Colour single elements	black or light grey (RAL 7035), other colours possible on request
Butterfly damper	adjustable from the room

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



INSTALLATION SITUATION

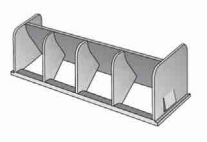
Kiefer ceiling air diffusers can be installed in any ceiling system or freely suspended, even without an intermediate ceiling. The plenum boxes are usually fitted before or during ceiling assembly, while the front plate is only attached after the ceiling has been finished. This means the outlets can be accessed at any time. Depending on the ceiling system used, the dimensions of the front plate can also be adjusted for flush mounting.
Given the high induction facilitated by the clip and swirl elements, Kiefer ceiling air diffusers do not need a Coanda effect for draught-free ambient air flow. Visible suspended installations are therefore also possible without suspended ceilings and without compromising comfort.

SPECIAL FEATURES

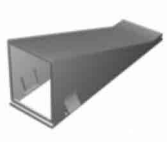
Due to the high induction facilitated by the INDULCLIP and INDUDRALL air guide elements, completely draught-free ambient air flow can be achieved, even with large differences in temperature of down to –12 K between the supply and ambient air. Unlike most competitor products, INDULCLIP and INDUDRALL, therefore, also work extremely well together with recirculation air coolers and fan coil units. INDULCLIP and INDUDRALL are also a great choice in combination with central air conditioning units. As inlet temperatures can be low, there is no need for a reheater in most situations and the cooling potential of the outdoor air is directly usable.

INDULCLIP-Air guide elements

Type C20



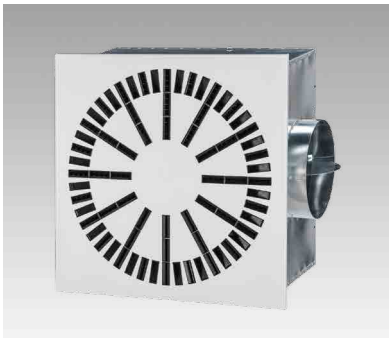
Type P20W

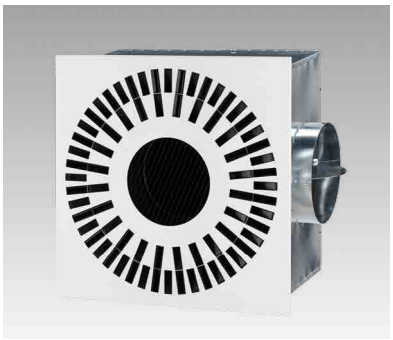


INDUDRALL-Air guide elements

Type I

Type II



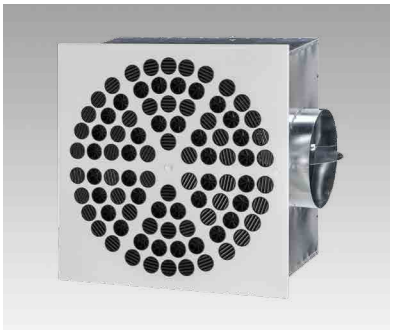


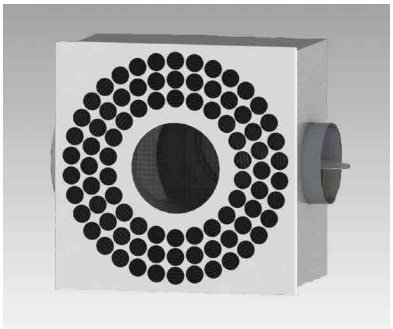
INDULCLIP / INDULCLIP Z-A

Excellent level of comfort, a striking design and proven technology – INDULCLIP has every angle covered. The powerful induction of ambient air means large cooling loads can be managed for draught-free interiors. The air diffuser is designed for use anywhere. It acts to create a uniquely feel-good climate in offices, showrooms and hospitals.

Colour front plate	RAL of choice
INDULCLIP	Black or light grey (RAL 7035), other colours possible on request
Air guide elements	

	INDULCLIP	INDULCLIP Z-A
Sizes	210 up to 800 mm	600 or 625 mm
Designs	Round or square	Square
Supply air temperature difference	-12 K	-10 K





INDUDRALL / INDUDRALL Z-A

Highly inductive ceiling air diffuser in a variety of designs, shapes and colours. The air guide elements, developed specifically for this ceiling air diffuser, make it possible to meet the individual requirements of each room. No other ceiling air diffuser of its type can match the flexibility of INDUDRALL.

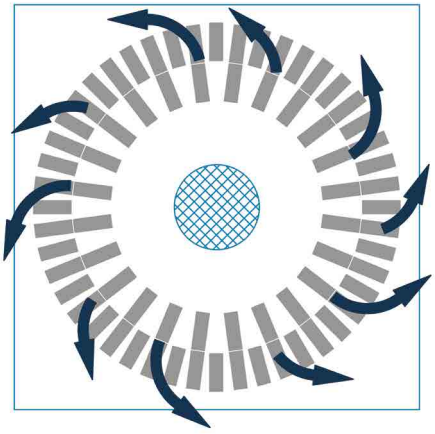
Colour front plate	RAL of choice
INDUDRALL	Black or light grey (RAL 7035), other colours possible on request
Air guide elements	

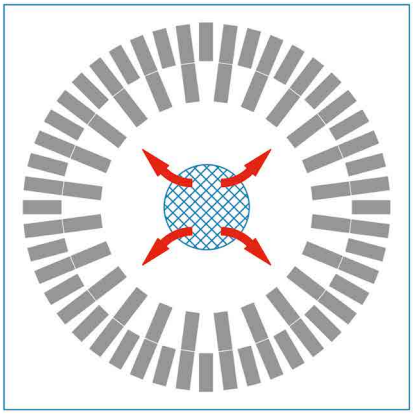
	INDUDRALL	INDUDRALL Z-A
Sizes	300 up to 800 mm	600 or 625 mm
Designs	Round or square	Square
Supply air temperature difference	-12 K	-10 K

CEILING AIR DIFFUSER INDULTHERM/INDULTHERM-e

Comfortable cooling and powerful heating

The need to use air-conditioning plant for more than comfortable room cooling arises repeatedly. Where ambient air conditioning calls for a heating mode, economic considerations demand that this function be incorporated into an existing air-conditioning plant. The alternative, static heating surfaces, would often be inconvenient. INDULTHERM is an outstanding way to fulfil the requirements for an air-only system to provide heating and cooling from a single installation. In cooling mode, supply air is distributed, draught-free, through the entire room. And, in heating mode, the diffuser distributes warm supply air in the room so that it reaches practically to the floor. Many of the familiar solutions require electrical assistance and costly control equipment and switchgear. INDULTHERM is a cost-effective alternative.





FUNCTION

The air diffuser operates in cooling mode as a highly inductive swirl diffuser and offers a draught-free ambient air flow. When the supply air temperature rises (heating mode), it switches – automatically and with no external power supply – from horizontal to vertical air discharge with a large penetration depth.
Due to the excellent induction effect in cooling mode, the INDULTHERM air diffuser is also ideal for use with split or multi-split air conditioning units. The INDULTHERM-e has been specially developed to accommodate the rapid changes in supply air temperature that these units require. The INDULTHERM-e includes a servomotor that enables fast changeover via an external control signal (0-10 V).

ENERGY

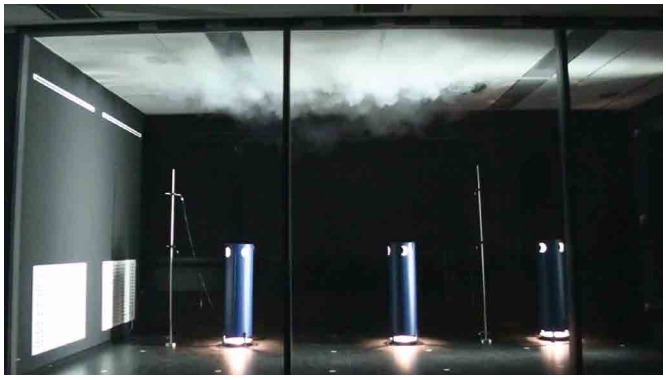
Thermomechanical changeover from cooling to heating with no external power supply. Low pressure drop enables energy efficient operation.

DESIGN

Attractive design, available in a square or round version.

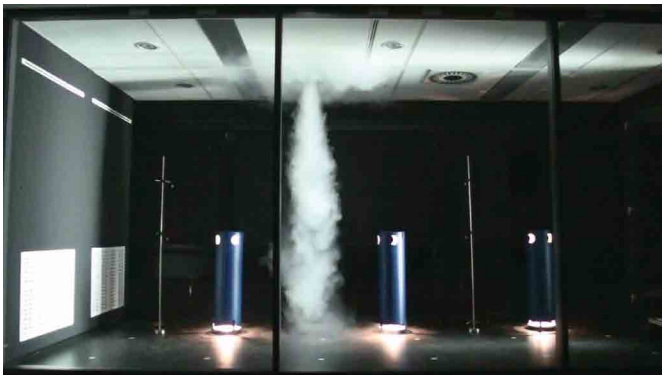
TECHNOLOGY

Air is distributed throughout the interior without creating a draught, with a temperature differential of down to -12 K. Large penetration depth in heating mode.



INDULTHERM in cooling mode:

- The INDULTHERM operates as a highly inductive ceiling air diffuser.
- Air with a temperature difference down to -14 K is distributed, draughtfree, in the room.



INDULTHERM in heating mode:

- In spite of the difference in density, warm air is distributed through the entire room practically to floor level.
- With warm supply air INDULTHERM switches automatically to a vertical air outlet with great penetration depth; no external power supply is needed.
- The INDULTHERM-e employs an electric actuator for switching.

TECHNICAL DATA

Sizes	600 mm and 625 mm
Designs	Round and square
Supply air temperature difference	Down to - 12 K (cooling mode) / up to +15 K (heating mode)
Flow rate	180 - 1.000 m^3/h
Room heights	3 m – ca. 7 m
Colour of front panel	RAL colour of choice
Single elements	Black or light grey (RAL 7035), other colours possible on request
Butterfly damper	Adjustable from the room

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

Photo © Timothy Soar

LAND SECURITIES HEADQUARTER, LONDON

PROPRIETOR	Land Securities Group PLC, London. UK
ARCHITECTS	KKS Space, London. UK
PLANNING OFFICE	Long & Partners, London. UK

Photo © Salzburger Landeskliniken Betriebsges.m.b.H.

LANDESKLINIK, TAMSWEG

PROPRIETOR	Salzburger Landeskliniken Betriebsgesellschaft mbH, AT
PLANNING OFFICE	Dick + Harner GmbH, Salzburg. AT

Photo © Kiefer GmbH

BIO-SEEHOTEL, ZEULENRODA

PROPRIETOR	Bio-Seehotel Zeulenroda GmbH, Zeulenroda-Triebes
PLANNING OFFICE	Bauconzept Planungsgesellschaft mbH, Lichtenstein / Sachsen

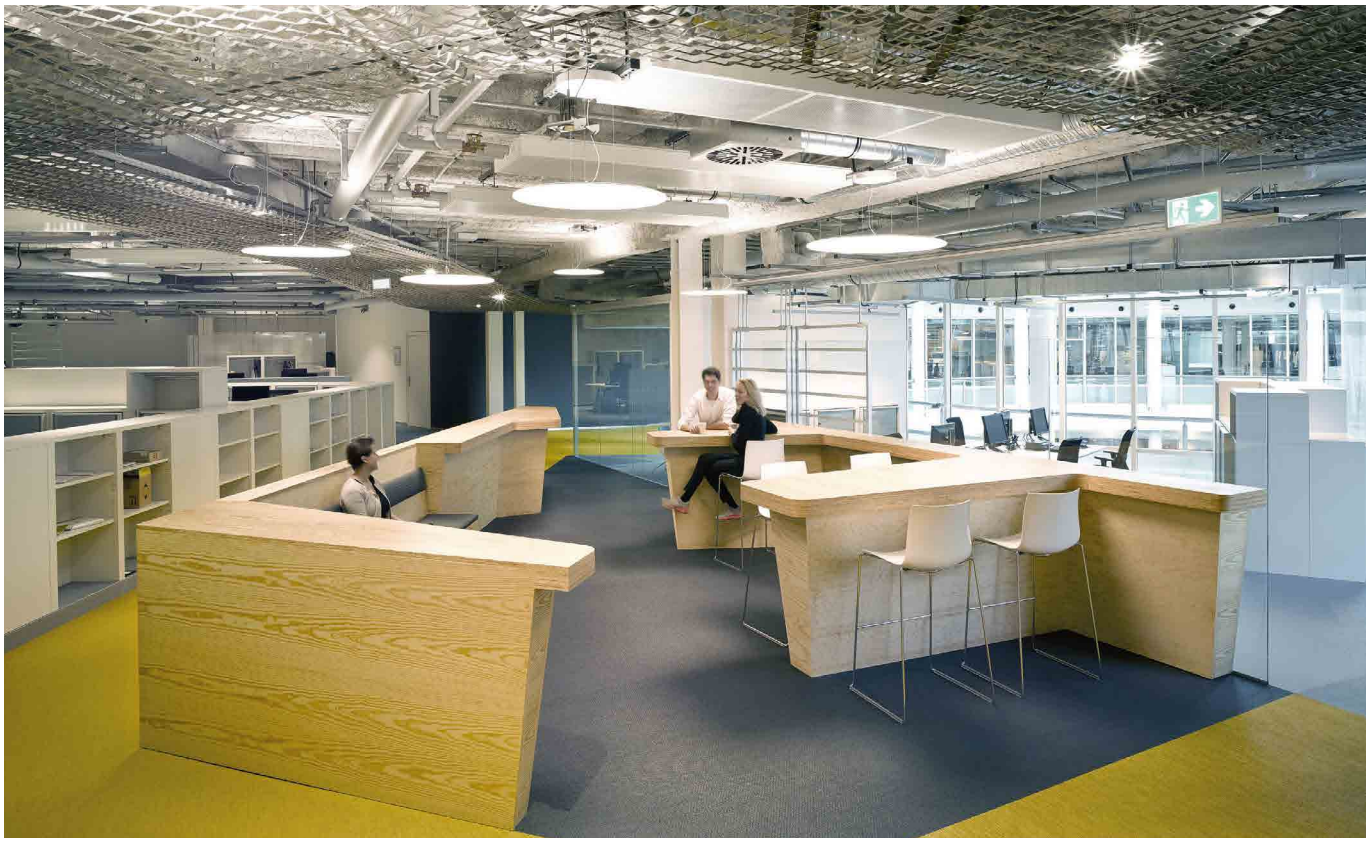


Photo © David Matthiessen

BREUNINGER, STUTTGART

PROPRIETOR	E. Breuninger GmbH & Co., Stuttgart
ARCHITECTS	Behnisch Architects, Stuttgart
PLANNING OFFICE	Prof. Dr.-Ing. Dirk Bohne GmbH, Düsseldorf

Photo © Volkswagen Group

VOLKSWAGEN AUTOMOBILE, STUTTGART

PROPRIETOR	Volkswagen Group, Wolfsburg
ARCHITECTS	Delta Bauplanung GmbH, Braunschweig
PLANNING OFFICE	Planung Engineering Nick GmbH, Leonberg

Photo © Rainer Taepper

LIGHTHOUSE HOTEL & SPA, BÜSUM

PROPRIETOR	Jens Sroka, Heimathafen Management GmbH & Co. KG
ARCHITECTS	Planungsgemeinschaft Ladehoff + Hannemann & Krützfeldt
FACHPLANER	Pahl & Jacobsen Ingenieurbüro für TGA, Heide

INDUQUELL – Scharoun theatre, Wolfsburg. Photo © Lars Landmann

▲ INDUQUELL – Hotel The Fontenay, Hamburg. Photo © „The Fontenay", Hamburg

DISPLACEMENT AIR OUTLET INDUQUELL

Displacement outlets offer maximum thermal comfort due to low air velocities and gentle air distribution.
For a wide variety of application areas with the highest acoustic requirements.

INDUQUELL – Scharoun theatre, Wolfsburg. Photo © Lars Landmann

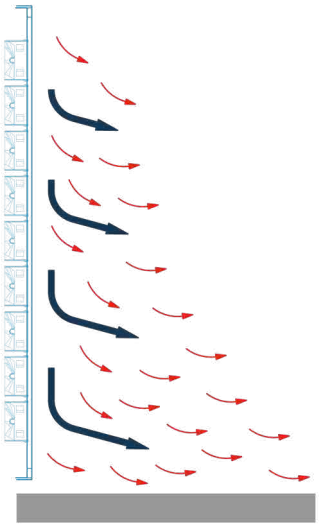
DISPLACEMENT AIR OUTLET INDUQUELL

With displacement air systems, the supply air is fed into the room at a slow rate and with low turbulence. Displacement air ventilation systems feature low air velocities in the area of operation, and virtually noise-free function of the linear diffusers. Displacement air flows create, by nature, a rising temperature profile across the height of the room. With displacement air ventilation systems, the supplied fresh air is fed directly to the people in the room, and a high air quality thus arises in the occupied zone. Displacement air solutions are predominantly designed individually for the building and the operation requirements. In the Sharoun theatre hall, for example, supply air is fed in via doubled chairbacks with supply air outlets at the top.

A full-surface floor plenum underneath feeds the supply air into the chair floor brackets. Special swirl elements are also integrated into the chairbacks to improve comfort and ensure a draught-free air flow path. The optimum arrangement of the swirl elements was determined during an air flow test at our own flow laboratory using the original theatre chairs, and compliance with the required values for draught-free air and interior acoustics was confirmed. By exactly reproducing the existing perforated plate at the top of the theatre chair, we were able to fully satisfy all of the requirements in the building's preservation order for an invisible ventilation solution.

FUNCTION

Conventional displacement ventilation systems are typically characterised by low air velocities and small temperature differentials between the supply air and ambient air in the occupied zone. By contrast, the INDUQUELL enables high temperature differentials of down to -8 K, with greater thermal comfort when used in combination with the inductive air guide elements developed by Kiefer.



ENERGY

Powerful due to high temperature differential of down to -8 K for energy efficient operation.

DESIGN

Creative displacement air solutions that meet technical requirements. Customised to meet user requirements and room geometry.

TECHNOLOGY

The combination of a displacement outlet with inductive air guide elements creates a low ambient air velocity in the occupied zone, even with large temperature differentials.

TECHNICAL DATA

Temperature difference	Down to -8 K
Type	Individual design as surface-, pillar- or base displacement outlet
Colours	RAL colour of choice
Air guide elements	Black or light grey (RAL 7035); other colours available on request
Optional	Decorative perforated sheet

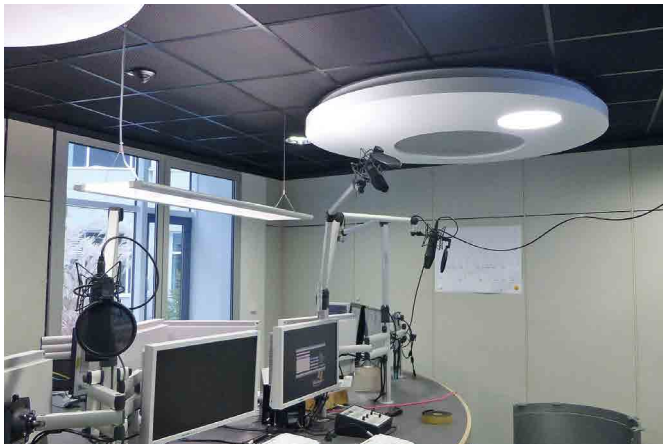
Further information can be found on www.kieferklima.de/en/induquell

INDUQUELL – Evangelisches Allianzhaus, Bad Blankenburg. Photo © Kiefer GmbH

INSTALLATION SITUATION INDUQUELL

Flat or round displacement outlets for ceiling, wall, balustrade or plinth installation can be designed to meet a wide variety of comfort requirements. For industrial applications, displacement diffusers are available for heating and cooling modes with flat or radial discharge.

Displacement outlets offer maximum thermal comfort due to low air velocities and gentle air distribution. They are powerful due to a high temperature differential of down to -8 K and offer plenty of creative options thanks to the different designs.



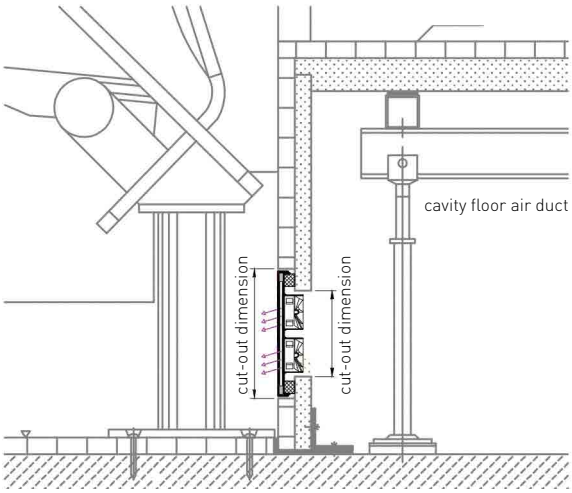
INDUQUELL DIV

with round INDUDRALL air guide elements for ceiling, rail and base installation, with or without decor panel for the air-guiding front plate, for unobtrusive integration of displacement air outlets in rooms.

INDUQUELL TAILORED INTEGRATED SOLUTIONS

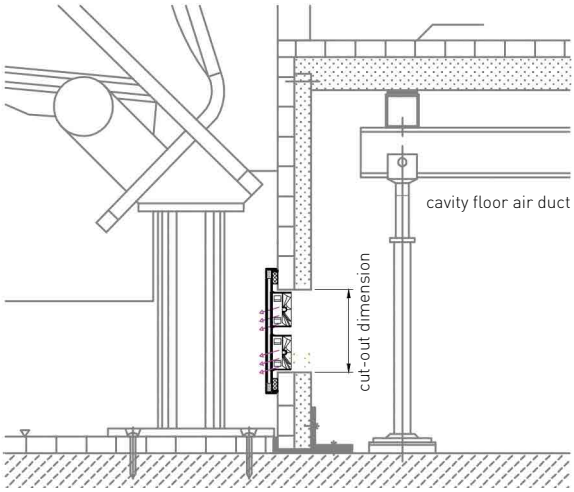
INDUQUELL DIV,

Chair-air diffuser installation variant for pressure chamber flush installation



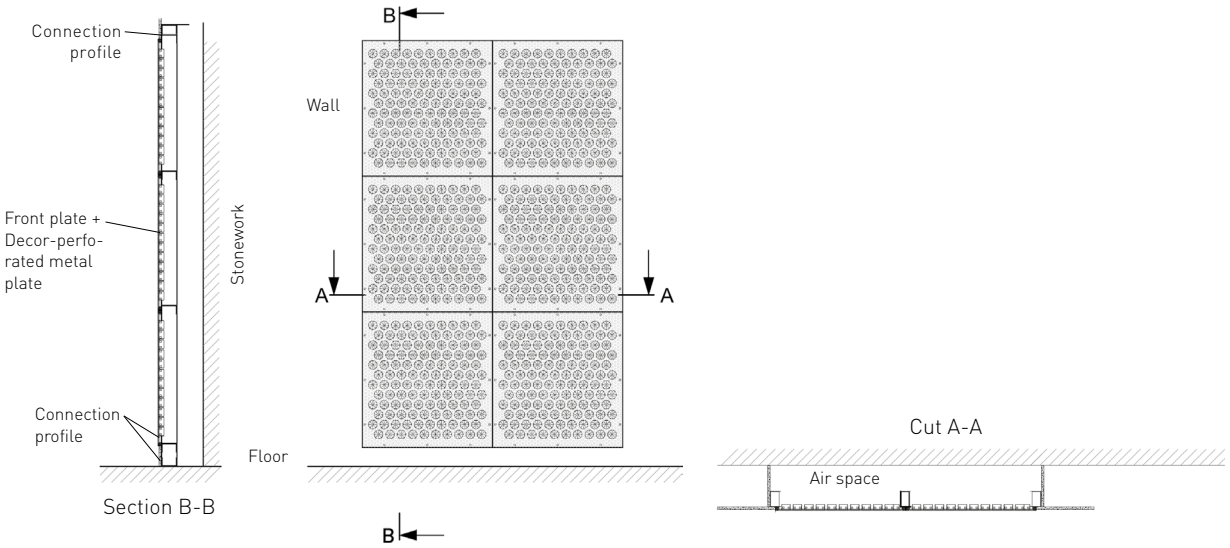
INDUQUELL DIV,

Chair-air diffuser installation variant for pressure chamber surface-mounted installation



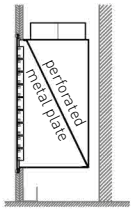
INDUQUELL DIV as an Surface displacement outlet

As a non-recessed wall mounting – 1251 x 1952 mm (arrangement 6 pce, 625 x 650 mm) for walls with single layer panelling

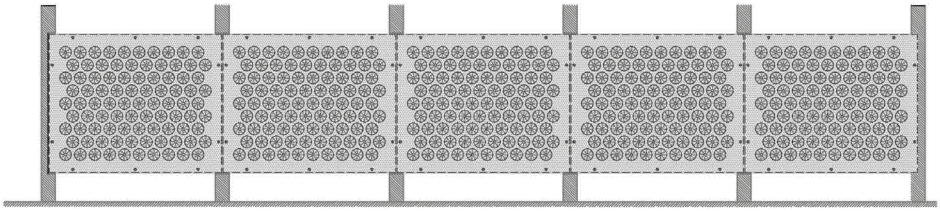


INDUQUELL as an Air diffuser array

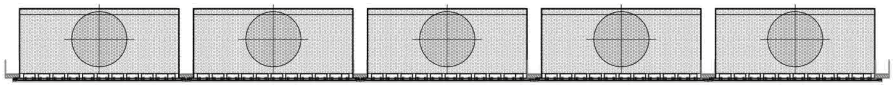
Section

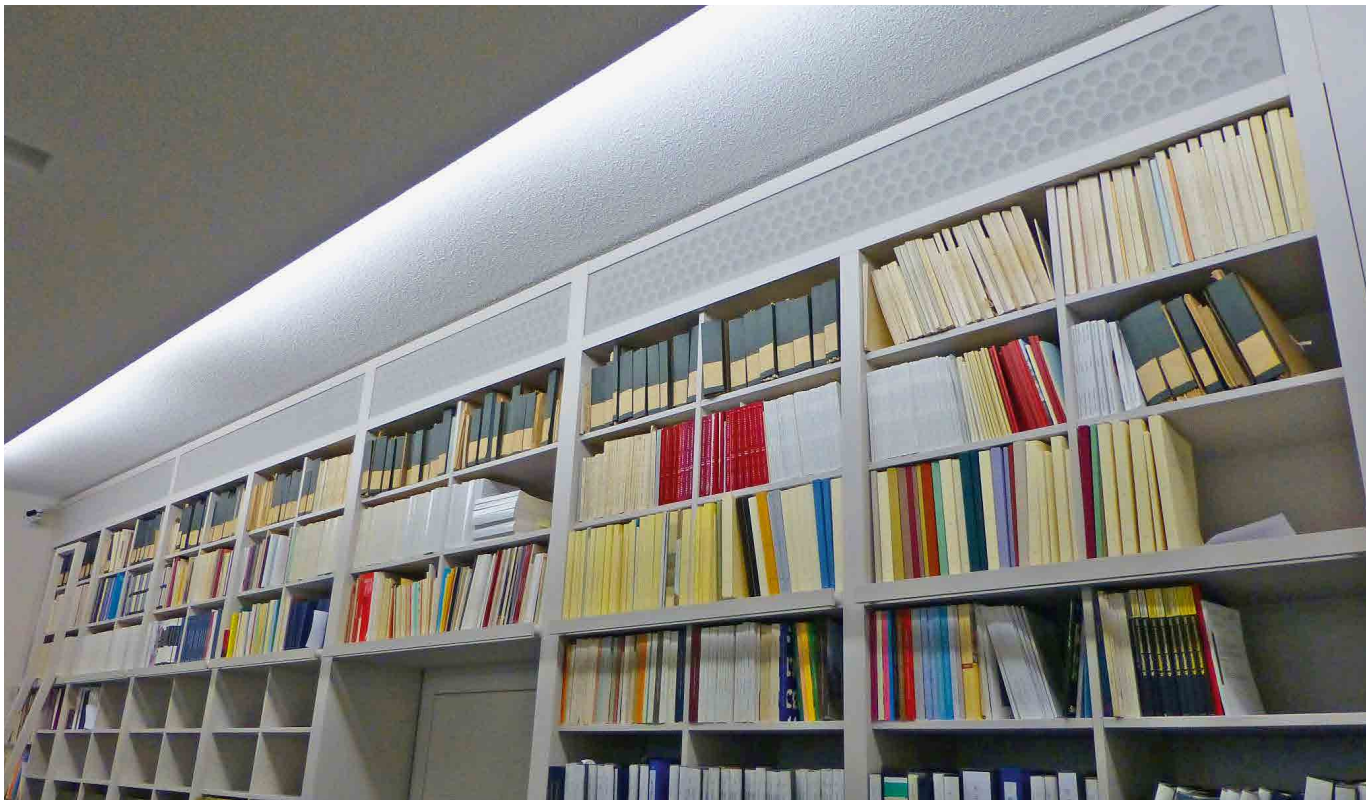


View showing a diffuser array



Top view of a diffuser array





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THE LIBRARY - KLASSIK STIFTUNG WEIMAR

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ARCHITECTS	gildehaus.partner, Weimar
PLANNING OFFICE	Ing.-Büro Hirsch, Erfurt

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UNIVERSITY OF APPLIED SCIENCES, WÜRZBURG-SCHWEINFURT

PROPRIETOR	Staatliches Bauamt Schweinfurt
ARCHITECTS	Stanek u. Höring Architects, Würzburg
PLANNING OFFICE	abi – beratende Ingenieure, Würzburg

Photo © „The Fontenay", Hamburg

HOTEL „THE FONTENAY", HAMBURG

PROPRIETOR	Kühne Immobilia GmbH, Hamburg
ARCHITECTS	Störmer Murphy and Partners, Hamburg und Aukett + Heese, Berlin
PLANNING OFFICE	HBI, Dipl.-Ing. Heinz Brozi, Berlin

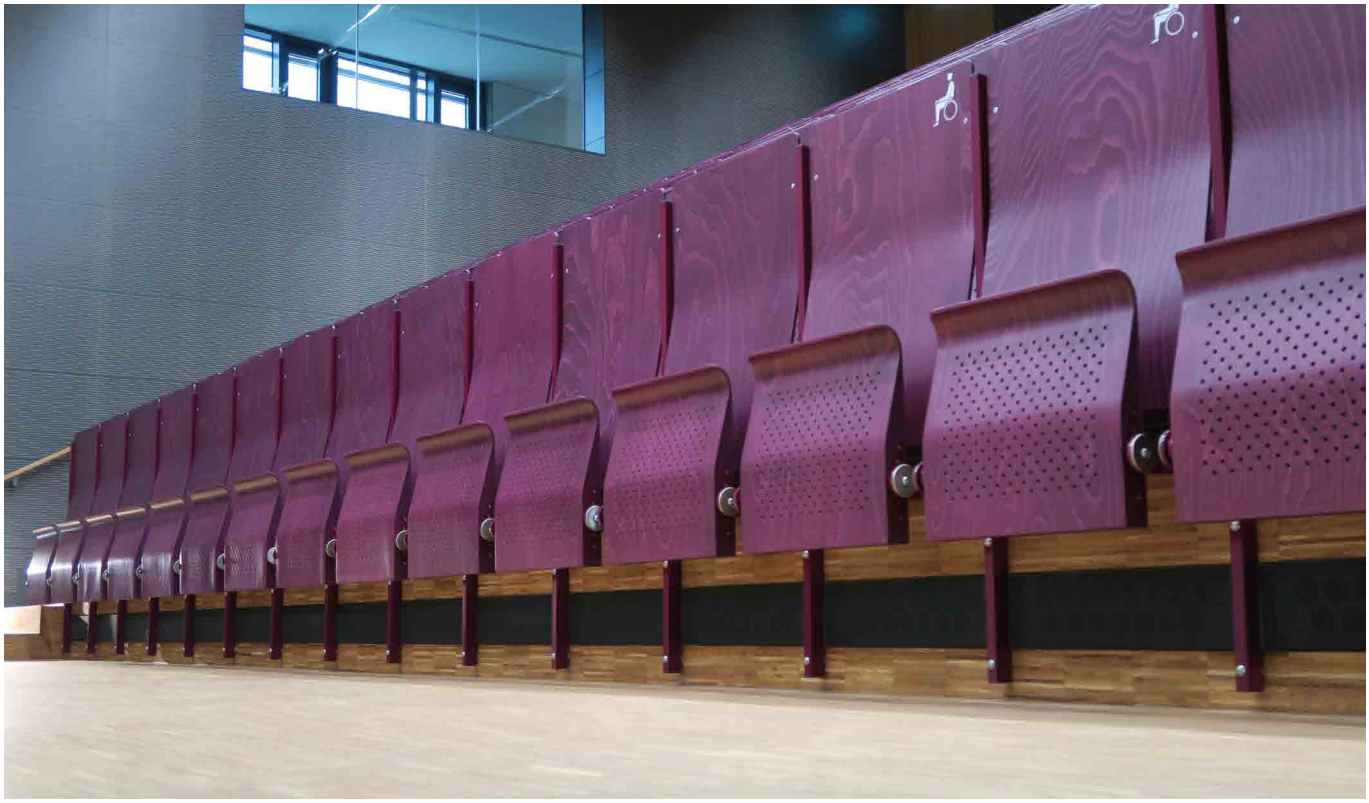


Photo © Kiefer GmbH

KOMMUNIKATIONS- UND INFORMATIONSZENTRUM DER UNIVERSITÄT ERFURT

PROPRIETOR	TLBV - Thüringer Landesamt für Bau und Verkehr
ARCHITECTS	Nickl & Partner Architects, Berlin
PLANNING OFFICE	HKL Ingenieurgesellschaft mbH, Erfurt

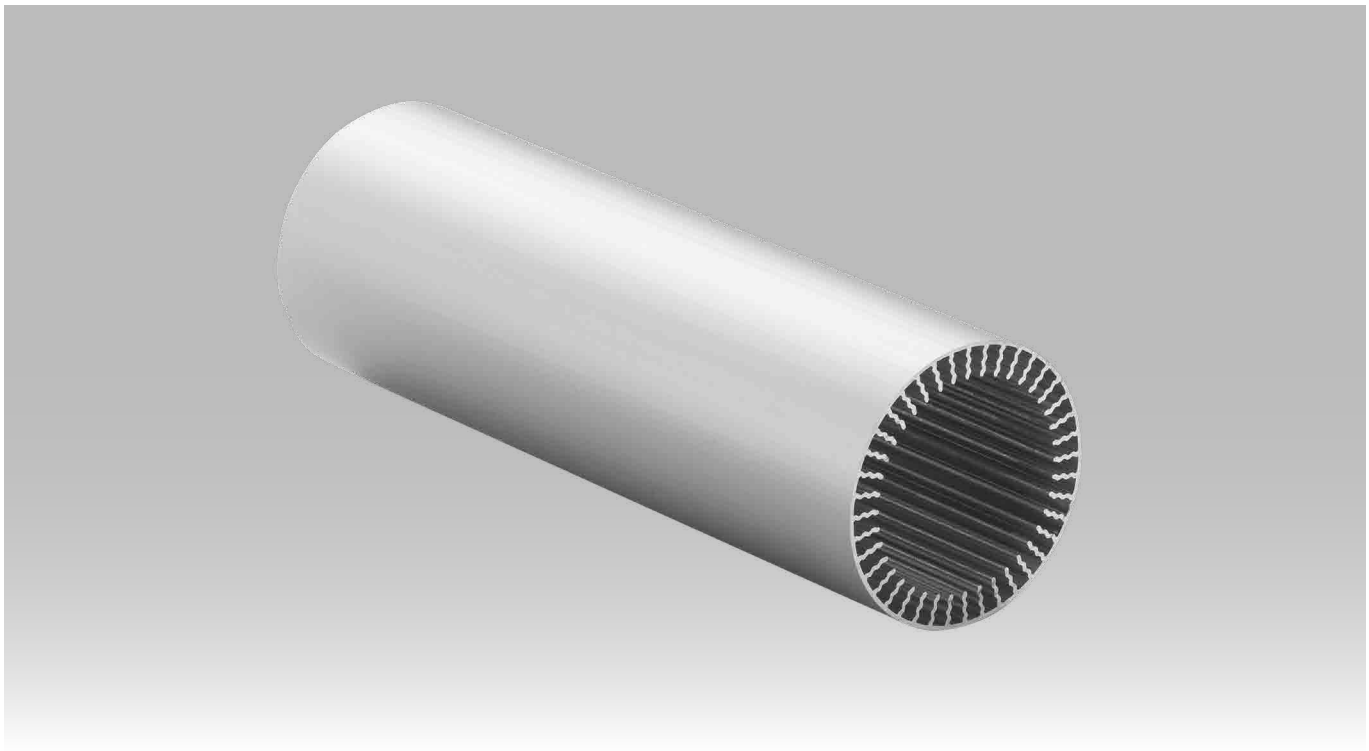
CONCRETCOOL – Sebastian-Lotzer-Middle School, Memmingen. Photo © Klaus Mauz

▲ CONCRETCOOL – Sebastian-Lotzer-Middle School, Memmingen. Photo © Klaus Mauz

CONCRETE CORE COOLING CONCRETCOOL

Kiefer Klimatechnik

An innovative symbiosis between component temperature control and supply air creates comfort with high energy efficiency through maximum utilisation of free cooling. Supply air induction is practically invisible, resulting in above-average user satisfaction.



CONCRETCOOL – INNOVATIVE ACTIVATION OF BUILDING STRUCTURES

Building component activation operates in the same way as a chilled ceiling, but one that also has a large volume of stored energy. This makes it possible to discharge stored heat at times when it makes more sense to do so from an energy perspective (during the night or in the early hours of the morning). The thermal capacity of the building component creates only a slight temperature rise in the room during the day. Two systems have become established on the market, one of which works with water as the energy source; the other simply with outdoor air, making efficient use of free cooling and linking building component activation to the ventilation function at the same time. A building component activation system is generally fairly slow to respond to changes. A rapid change to the medium temperature, therefore, only produces a very slow change in the surface temperature of the ceiling. However, this is not a drawback to the system. An increase in the room load, and therefore the ambient temperature, produces an instant energy output from the ceiling, i.e. an immediate response without any complex control measures.
In building component activation with air, air instead of water is used as the energy source to charge the building structure. Cool outdoor air, at temperatures below 12°C, is there for the taking for up to 6000 hours per year (approx. 70 %). So air beats water – and at the same time, it supplies rooms with fresh air and can reduce room air humidity in summer.

Locations	Annual mean outside air	Share of annual hours ≤12 °C	Share of annual hours ≤14 °C	Share of annual hours ≤16 °C
	(°C)	(%)	(%)	(%)
Hamburg	8.7	65	75	84
Berlin	8.8	63	72	80
Cologne	9.4	62	47	83
Dresden	8.8	63	72	80
Frankfurt	10.4	58	67	76
Stuttgart	10.4	58	67	76
Munich	8.2	64	74	80
CH-Basel	10.0	59	68	75
CH-Zurich	9.1	62	70	77
CH-Geneva	9.8	59	67	75
A-Vienna	9.9	57	65	73
L-Luxembourg	10.1	64	73	80
NL-Amsterdam	9.5	63	74	83
GB-London	10.8	59	71	80
I-Milan	11.7	51	58	66
F-Paris	11.2	56	65	74

The CONCRETCOOL Concrete Core Cooling system using incoming air allows the cooling potential of outside air (mean annual level 8–11 °C) as detailed above to be harnessed for direct cooling of concrete ceilings. It follows that the cooling is free for most of the periods of use.

FUNCTION

Cooling tubes, made of aluminium with high thermal conductivity and with diameters of 60 or 80 mm, are cast into concrete ceilings in a grid. The internal surface is ribbed to improve heat transfer. The supply air is not fed directly to the rooms: it firstly flows through the cooling tubes within the concrete ceilings. This warms the cold supply air to approximately ceiling temperature, the required heat being taken from the ceiling. This withdrawal of heat provides the cooling for the ceiling. This supply air is then fed to the room through Kiefer air diffusers, meeting the hygiene requirement for fresh air. An outlet temperature of approximately 21 °C is achieved for the supply air without using a supplementary heater. No primary energy is required, the process is self-regulating and virtually free of variation. The temperature is extremely stable owing to the high storage capacity of the concrete ceilings. Heat recovery by the ventilation system is increased to over 95% by the addition of the CONCRETCOOL system. As a result, the requirements set out in the German Renewable Energies Act are exceeded. Combined with the potential of free cooling, this results in unparalleled operating costs and high energy savings.

ENERGY

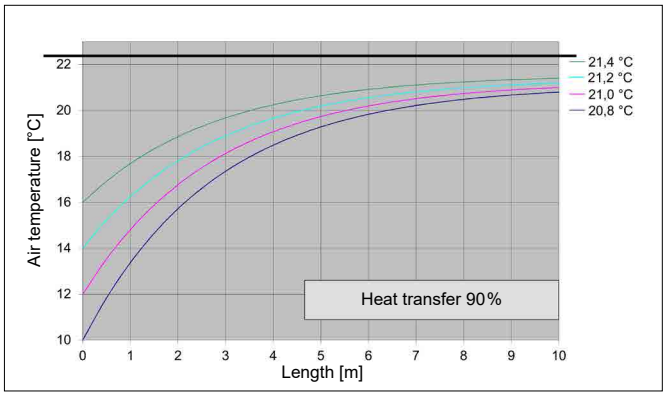
High energy savings through maximum use of free cooling and an overall heat recovery rate of > 95 %.

DESIGN

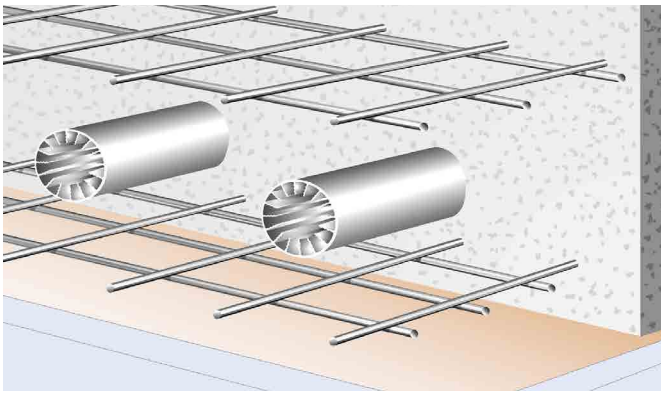
The air ducts are not visible from within the room – air diffusers are unobtrusively integrated into the concrete ceiling or corridor partition wall.

TECHNOLOGY

The cooling medium is air, so there is no risk of it freezing on building sites in winter, and drilling into the tubes will not result in water damage.



CONCRETCOOL heat-transfer efficiency based on measurements by HLK/University of Stuttgart



TECHNICAL DATA

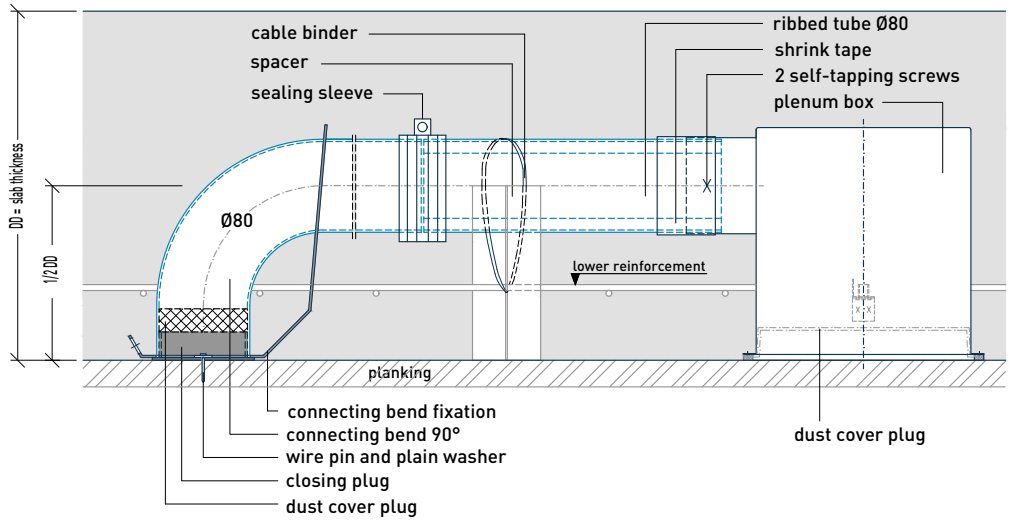
Cooling capacity (unsteady)	30 - 70 W/m²
Tube diameter	60 and 80 mm
Material	Aluminium
Heat transfer	up to 90 %
Ceiling strength	22 - 30 cm
Specific air flow rate	6 - 7,5 m³/hm²

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

INSTALLATION SITUATION CONCRETCOOL

To achieve a high storage capacity for the thermal energy, prefabricated cooling tubes are installed in the structurally neutral part of the concrete ceiling, between the upper and lower reinforcements. They are fixed in place with spacers and secured to stop them floating. The cooling tubes are embedded in concrete when the ceilings are cast. The joist-free flat ceilings are 22 to 30 cm thick. The system is straightforward to integrate without modifying the structural dimensions. The cooling tubes can be installed with cast in-situ concrete, filigree ceilings and factory-cast ceilings. The finished ceiling has a storage capacity of 165 to 200 Wh/m²K, depending on thickness and concrete quality.

detail - CONCRETCOOL- cooling tube coil in concrete ceiling

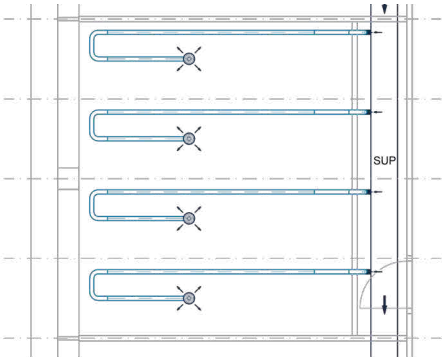


INNOVATIVE VENTILATION CONCEPT

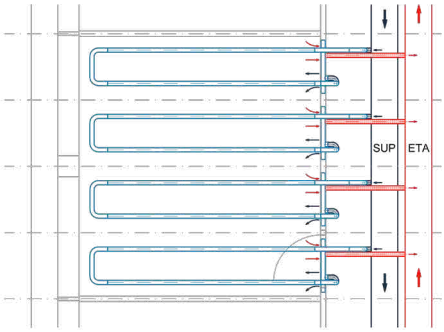
The CONCRETCOOL Concrete Core Cooling ventilation system is particularly suitable for schools and educational facilities, where plenty of fresh air is needed for a high density of occupants in a relatively small space. Continuous replacement of the ambient air prevents the CO_2 level in the room from rising. This is essential for maintaining concentration, leading to more successful learning outcomes. A comfortable ambient temperature is also ensured through the combination of supply air and an activated ceiling for cooling. The CONCRETCOOL system maintains a high level of efficiency, whilst satisfying all of the main requirements for creating an atmosphere that is conducive to learning.

INSTALLATION SITUATION COOLING TUBE COIL

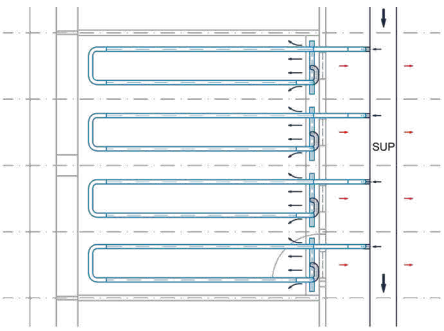
Cooling tubes made of heat conducting aluminium are cast into concrete ceilings, in line with the building grid. The cooling tubes can be installed in in-situ concrete, filigree ceilings and factory cast slabs.



Cooling tube in combination with GLS 230 ceiling air diffuser; connector behind the ceiling panelling



Cooling tube with the INDULSNAP wall air passage; supply and extract air version



Cooling tube in combination with the INDUL linear air diffuser behind the ceiling panelling

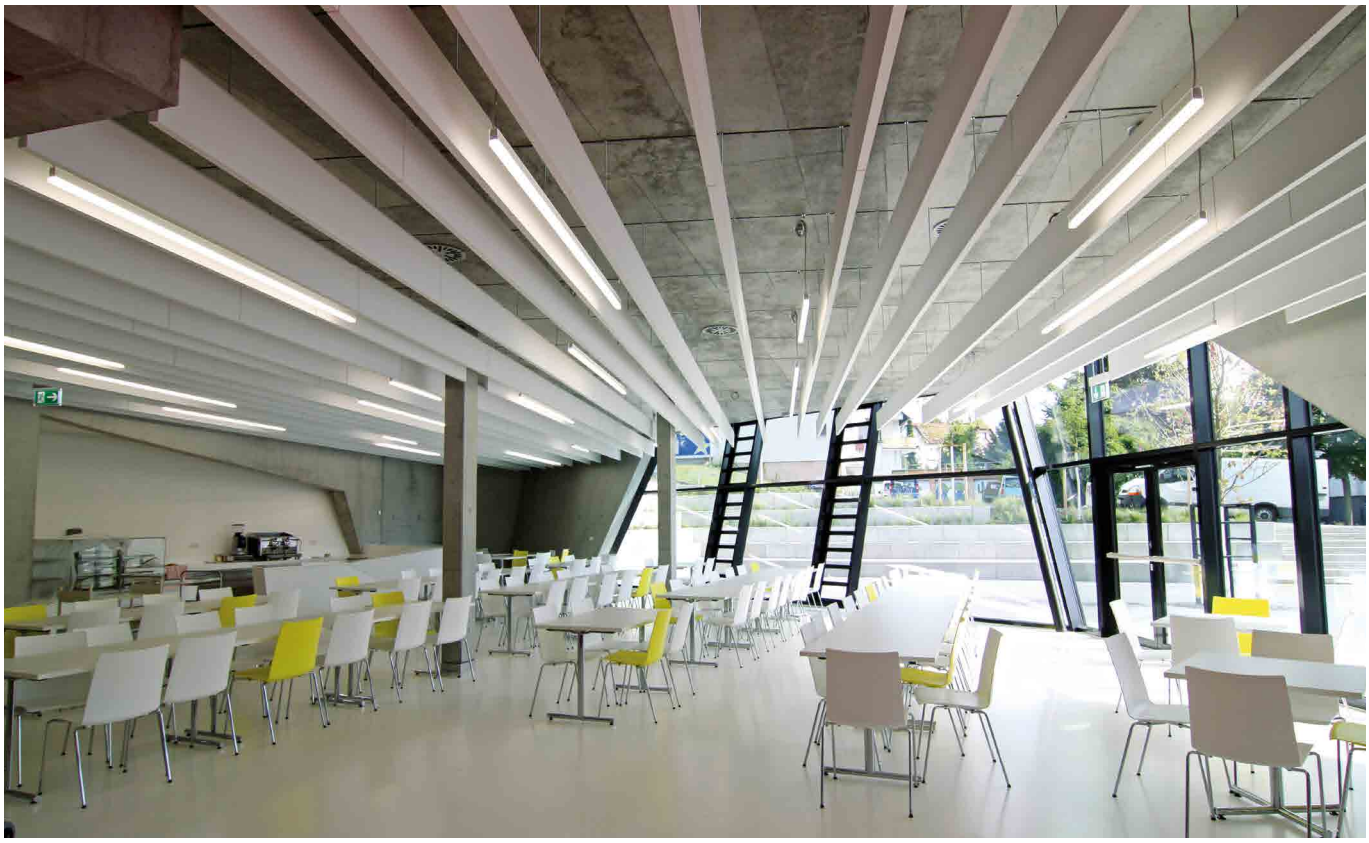


Photo © Kiefer GmbH

GRIMMELSHAUSEN GYMNASIUM, GELNHAUSEN

PROPRIETOR	Schulträger Main-Kinzig-Kreis
ARCHITECTS	hkr.Architects, Gelnhausen
PLANNING OFFICE	Ingenieurbüro TGE, Gelnhausen

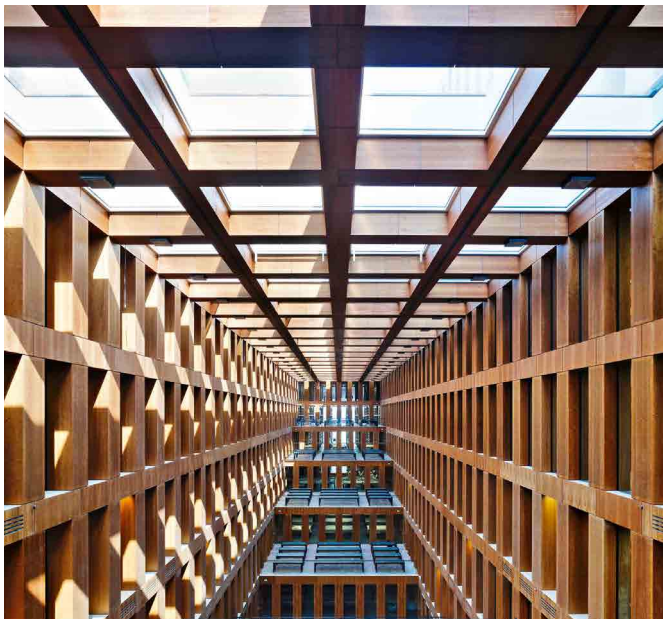


Photo © Stefan Müller

JACOB-WILHELM-GRIMM-ZENTRUM, BERLIN

PROPRIETOR	Humboldt-Universität, Berlin
ARCHITECTS	Max Dudler, Berlin, Zurich. CH, Frankfurt
PLANNING OFFICE	Zibell, Willner + Partner, Berlin

Photo © Bernhard J. Lattner

M.PIRE TOWER, MÜNCHEN

PROPRIETOR	Bayrische Bau- und Immobilien Gruppe, München
ARCHITEKT	Helmut Jahn, Chicago. US
PLANNING OFFICE	Ingenieurbüro P. Berchtold, Sarnen. CH

TÜRLI SCHOOL SACHSELN, SWITZERLAND

PROPRIETOR	Einwohnergemeinde Sachseln
ARCHITECTS	Durrer Architekten, Luzern, Switzerland
PLANNING OFFICE	Ingenieurbüro P. Berchtold, Sarnen, Switzerland

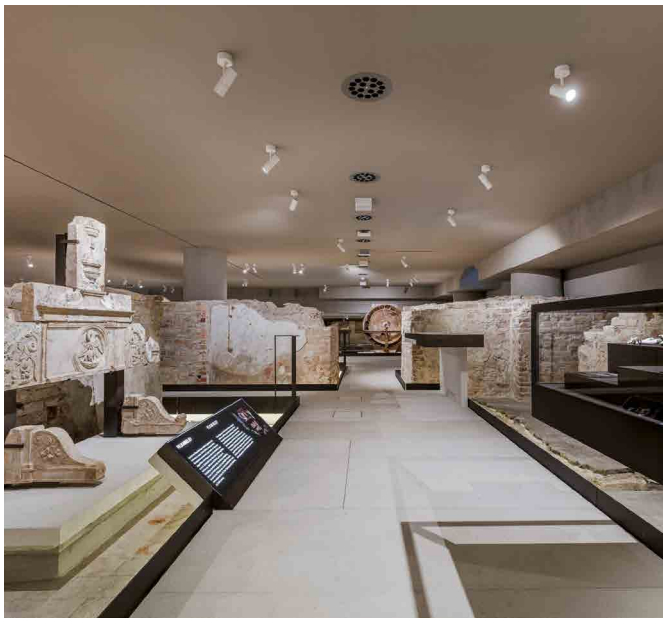


Photo © Martin Wittwer / freitreppe.com

HUMBOLDT FORUM IN THE BERLIN PALACE

PROPRIETOR	Stiftung Humboldt Forum im Berliner Schloss
ARCHITECTS	Franco Stella Berliner Schloss – Humboldt Forum PG, Berlin
PLANNING OFFICE	Winter Beratende Ingenieure, Inros Lackner SE, HTES GmbH

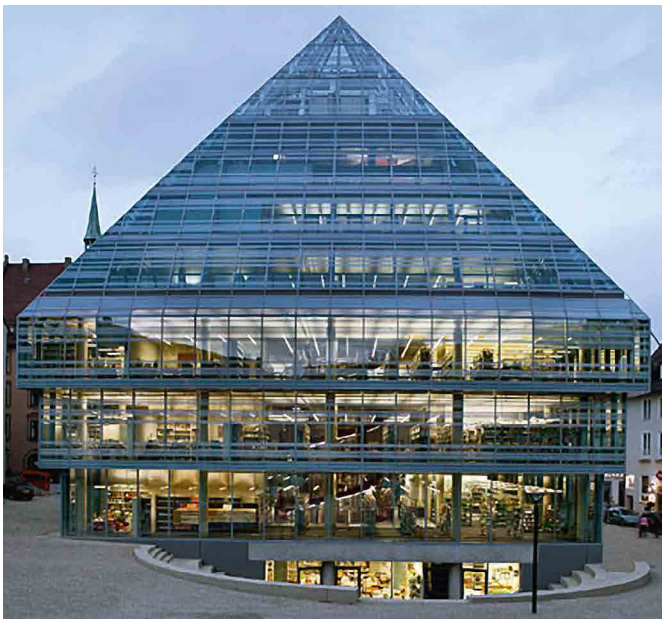


Photo © Martin Duckek

STADTBIBLIOTHEK, ULM

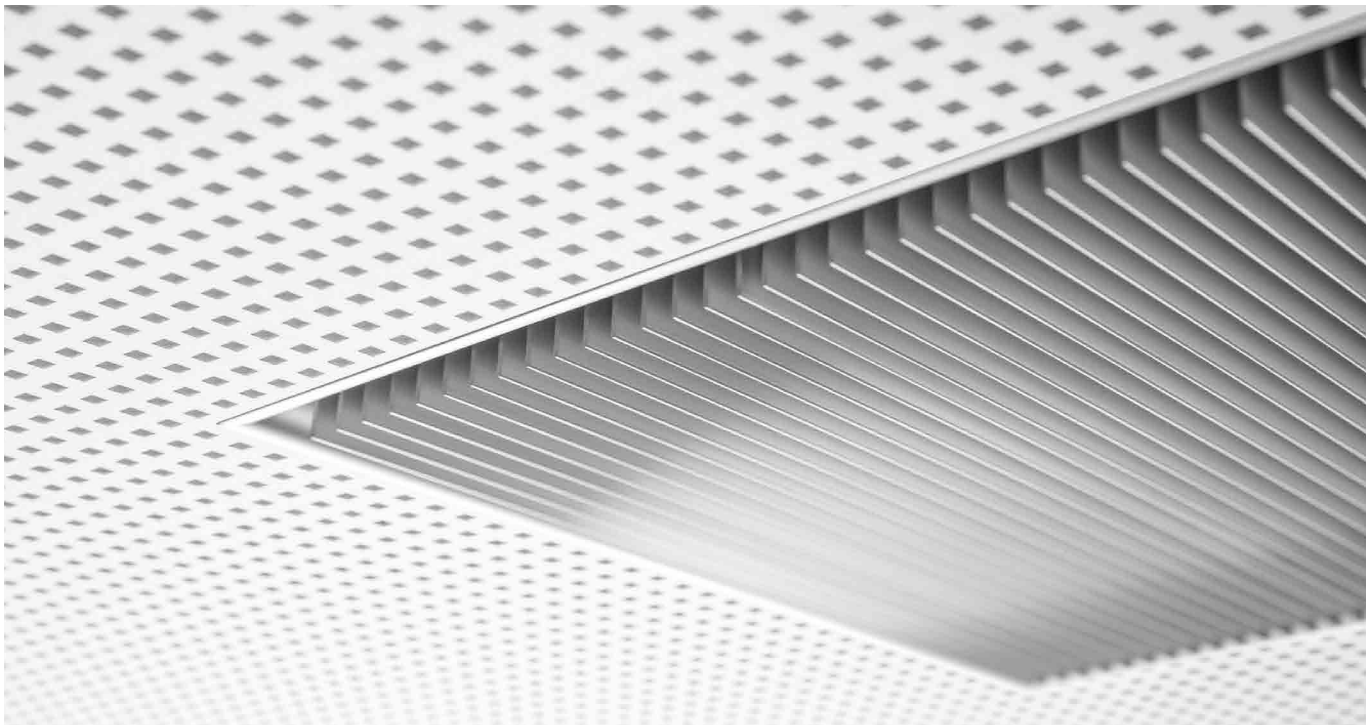
PROPRIETOR	Stadt Ulm
ARCHITECTS	Gottfried Böhm, Köln
PLANNING OFFICE	S. H. Keppler, Ulm


Kiefer
Kiefer
Kiefer

ENVIRONMENTALLY FRIENDLY AIR-CONDITIONING TECHNOLOGY FOR PEOPLE

Kiefer Klimatechnik

High levels of ambient air quality are conducive to the well-being and performance capabilities of every employee. For this reason, we strive for draught-free ambient air flow and optimised System parameters. In close collaboration with the building owners, engineering firms and architects, as well as with experienced specialists, we develop customised ventilation and air conditioning systems.



VENTILATION SYSTEM COMPONENTS

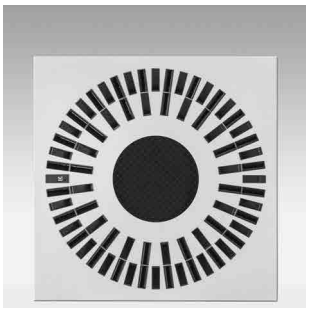
Linear diffusers, Chilled ceilings, Concrete core cooling

High-quality components

For more than four decades, we have been selling high-quality linear diffuser systems around the world, such as linear and ceiling air diffusers, wall air passages and displacement air outlets, chilled ceiling panels and concrete core cooling with supply air. All throughout, comfort, quality and the careful handling of resources have remained in the foreground of our developments.

Solutions from experience

Practical experience from numerous and many varied projects has, again and again, led to new solutions, which ultimately simplify component installation, reduce spatial demands and improve performance. Important criteria for determining quality is the optimal and draught-free ambient air flow, as well as the low noise transfer of the air supply components.



Conserve resources

In the interest of the environment, it has always been our goal to find optimised ways for energy recovery of room air conditioning. The innovative system of Concrete core cooling with supply air, for example, reduces energy consumption up to 50% compared to conventional systems.

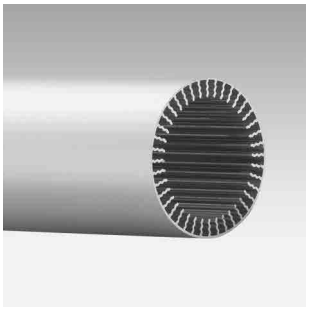


Photo © Daniel Stauch

PLANT ENGINEERING

Efficient and reliable plant technology design and implementation

Kiefer designs, installs and maintains ventilation and air conditioning systems for thermal comfort and industrial air conditioning that are harmonised to the requirements of production equipment and the needs of employees. In particular, in those areas, where special demands are posed on ventilation systems, we are present with our product and service portfolio: In mechanical engineering, high-tech, textile, synthetics, chemical, automobile, beverage and foodstuffs industries, as well as in museums, libraries and hospitals. As complex as the demands are on the modern ventilation technology, so much more diverse are their possible solutions. Our knowledge of process control workflows and the particular characteristics of the respective branches, as well as our many years of experience are the prerequisite for the optimal counselling of our customers. Customised and efficient air conditioning solutions are thereby created.

Maintenance and service

In order to maintain the value of your System, we desire to remain a competent partner by providing a comprehensive customer service. Our technicians perform regular service and maintenance, which is indispensable for continuous fault-free, energy optimised and flawless hygienic operation.

SERVICES

Research and development

Optimised processes and reliable systems

In the Kiefer Development Centre, which covers around 400 m², our air conditioning engineers work tirelessly on innovative and future-oriented solutions. They develop new, environmentally compatible components, carry out aerodynamic and acoustic tests, and optimise ventilation, lighting and control systems.

System verification for new projects

In our ambient air flow laboratory, we also conduct ambient air flow analyses on your behalf. In close consultation with you, we set up 1:1 model interiors, where we analyse thermal comfort levels under summer and winter conditions. The resulting test data is used to verify the targets set.

Analysis of thermal comfort in existing buildings

We can also carry out ambient air flow analyses in your existing buildings. This involves performing thermal comfort tests according to the relevant standards (DIN EN 16798-3 and DIN EN ISO 7730). To complete our service to you, we provide a detailed report containing all the relevant data and results.

CONSULTATION AND PLANNING

We support your construction projects

Services for all aspects of air conditioning technology

In close collaboration with architects and engineers, our company creates new ways towards a practice-oriented ventilation and air conditioning. From the fundamental outline to the drafts and implementation planning, through to the optimized solutions in the area of energy efficiency, we offer the complete package from one source: Consultation, planning, construction and execution.

We see ourselves as your climate expert at all times, actively supporting you and your construction projects with our wealth of experience.

Contact us – www.kieferklima.de/en/contact

www.kieferklima.de/en

Kiefer Klimatechnik GmbH
Heilbronner Straße 380 - 388
70469 Stuttgart

phone: +49 711 81 09-0
email: info@kieferklima.de

Kiefer
Klimatechnik

Qualitäts-management-system
ISO 9001
Gemäß DIN EN

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