

Applied Geometry.

Lindner Post Cap Ceilings and Plafotherm® Post Cap Heated/Chilled Ceilings





Building new solutions.

Lindner undertakes major projects worldwide in all areas of interior fit-out, insulation technology, industrial services and building facades. From pre-planning through to project completion Lindner is your partner of choice.

The Company's extensive manufacturing capability enables quality to be strictly maintained whilst allowing maximum flexibility to meet individual project requirements.

Environmental considerations are fundamental to all Lindner's business principles.

Through partnerships with clients Lindner turns concepts into reality.

Choosing Lindner you have:

Lindner Concepts:

Tailored solutions specifically geared to satisfy individual project requirements

Lindner Products:

Quality materials and systems to the very highest industry standards

Lindner Service:

Comprehensive project management services

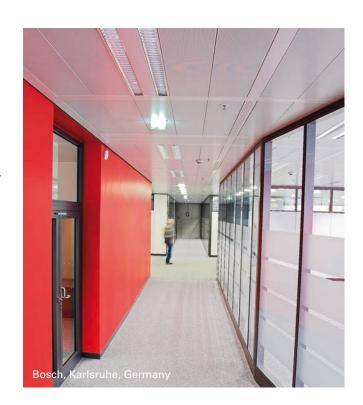
Lindner Post Cap Ceilings

Straightforward, robust and really high-profile.

These well-directed ceiling constructions with Post Cap profiles can be adapted to every building shape and offer versatile scope for design. All avenues of ceiling design are open thanks to freely selectable distances of Post Cap profiles and our range of diverse ceilings with Post Caps and Cross Noggins.

A special visual variant are radially installed Post Caps combined with trapezoidal metal ceiling panels. Post Cap ceilings allow you to install partition walls to the Post Cap profiles. Thus, you can flexibly change your room layout.

The Post Cap ceilings can perfectly be emphasised with Lindner Luminaires. In addition, we offer a pleasant climate thanks to our integrated efficient heating and cooling technologies.



Customer benefits at a glance

- Variable spacing between the post caps or ceiling panels of different sizes
- Fixing of partition walls to post cap profiles
- Wide choice of perforations
- Smoothly integrated Lindner Lighting Systems
- Integrated Heating and Cooling Systems create a pleasant temperature

Content

LMD Post Cap Ceilings	6
LMD-B 100	8
LMD-B 110	10
LMD-B 111	12
Sound absorption	14
Building material class	14
Longitudinal sound reduction	15
Plafotherm [®] Heated/Chilled Post Cap Ceilings	16
Programme	17
Heating and Cooling	18
Building material class	19
Sound absorption	20
Longitudinal sound reduction	20
Hydraulic Components	21
Lindner Lighting Systems	22
Post Cap Options	23
Joint Designs	24
Wall Connections	25
Surfaces	26
Green Building	27



LMD Post Cap Ceilings

System		Page
LMD-B 100	Linear Post Cap Ceiling Post Cap profiles visible, ceiling panels Lay-In, with Hook-On edge or with Swing-Down option	8 - 9
LMD-B 110	Post Cap Ceiling with Cross Noggins Post Cap profiles and Cross Noggins visible, ceiling panels Lay-In, with Hook-On edge or with Swing-Down option	10 - 11
LMD-B 111	Post Cap Ceiling with Cross Noggins and Crossing Boxes Post Cap profiles and Cross Noggins visible, ceiling panels Lay-In, with Hook-On edge or with Swing-Down option	12 - 13

Additional func	tions		Page
LMD-B SD		Longitudinally sound-reduced ceilings	15

Tested quality



Building material class A2-s1, d0 tested to EN 13501-1 Class A (IBC) tested to ASTM E 84 Class 0 tested to BS 476 part 6/7



Sound absorption up to sound absorption class A tested to EN ISO 354



Environmental product declarations validated to ISO 14025



Light reflectance approx. 82 % 9010 acc. to Lindner, unperforated tested to DIN 5033



Durability exposure class A tested to EN 13964, table 8 and 9



Assessment of flue gas tested to DIN 4102, part 1 – Annex C Harmless toxicity of flue gas

Additional functions



Rated normalized flanking sound level difference $D_{n,f,w}$ tested in laboratory acc. to valid standard

Certification / Regulations



Execution of the system ceilings tested to EN 13964



Quality standard according to the technical regulations of TAIM (Association of Industrial Metal Ceiling Manufacturers TAIM e.V.)

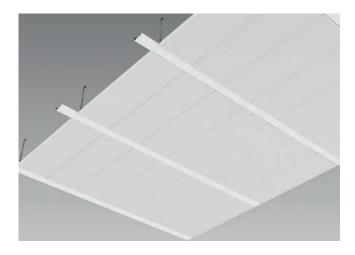
Technical data

Metal ceiling system	
Ceiling panel	Length up to 3,300 mm, width up to 1,250 mm, made of zinc-galvanised steel, powder-coated, aluminium or stainless steel available on request, depending on the system
Edges	Square
Perforation	Available in all standard perforations depending on panel dimensions resp. material, see Surface Brochure
Surface	Electrostatically applied powder-coating further surfaces see Surface Brochure
Colour	9010 acc. to Lindner, other colors in RAL and NCS availabe
Substructure	Post Cap profile manufactured from galvanised sheet steel, roll-formed or bent steel profile in standard widths of 100, 125, 150 and 200 mm including suspension, special widths of Post Cap profile available on request
Relevant norms	DIN EN 10152 / 10327 / 13964, DIN EN ISO 12944

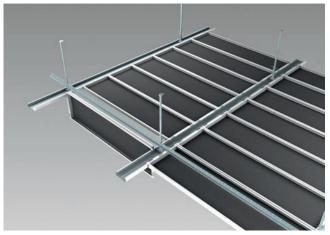
LMD-B 100

Tried and tested, but never excelled.

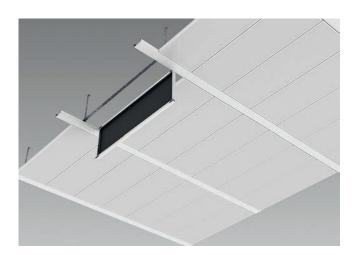
Linear Post Cap Ceiling – Post Cap profiles visible, ceiling panels Lay-In with Hook-On edge or Swing-Down option.



LMD-B 100 features post cap profiles in standard widths of 100, 125, 150 and 200 mm. If necessary, partition walls can be attached to the post cap profiles by means of additional bracings.



Post Cap ceilings are maintenance-friendly and well-priced ceiling systems. Ceiling panels Type 1 (Lay-In), Type 2 (Lay-In with Hook-On edge) and Type 3 (Lay-In with Hook-On notch) may be used separately or in combination.

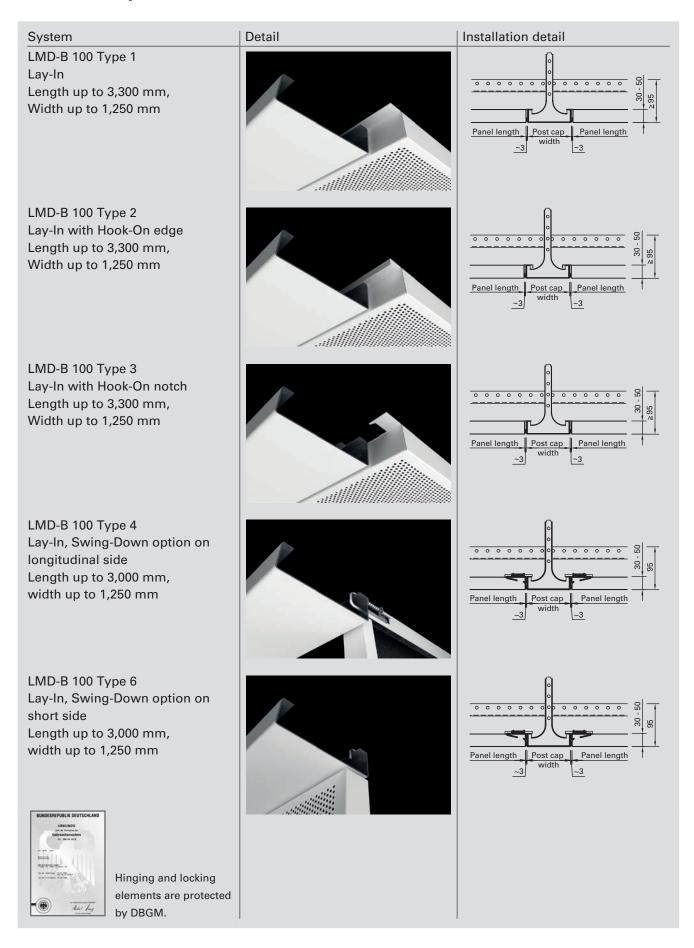


If frequent maintenance work is required, the robust Swing-Down mechanism is the perfect match. The ceiling panels' reliable swing-down mechanism makes it very easy to access the ceiling cavity. The



mechanism can be operated single-handedly with a special tool to allow the panel to swing down. An economically favourable combination of Swing-Down and Lay-In panels is possible.

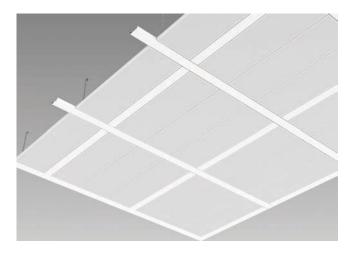
Standard requirements



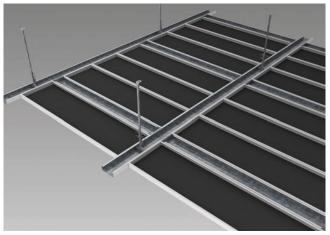
LMD-B 110

Extends your options.

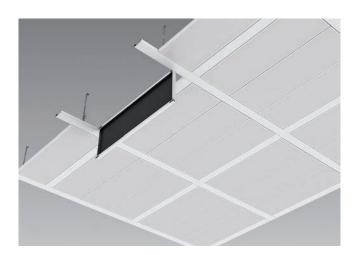
Post Cap Ceiling with Cross Noggins – Post Cap profiles and Cross Noggins visible, ceiling panels Lay-In with Hook-On edge or Swing-Down option.



This ceiling system consists of suspended linear post caps with attached cross noggins, both available in widths of 100, 125, 150 and 200 mm. Ceiling panels



are installed from above. As well as its pleasing visual LMD-B 110 scores with its option for partition connection in any direction along the post cap.

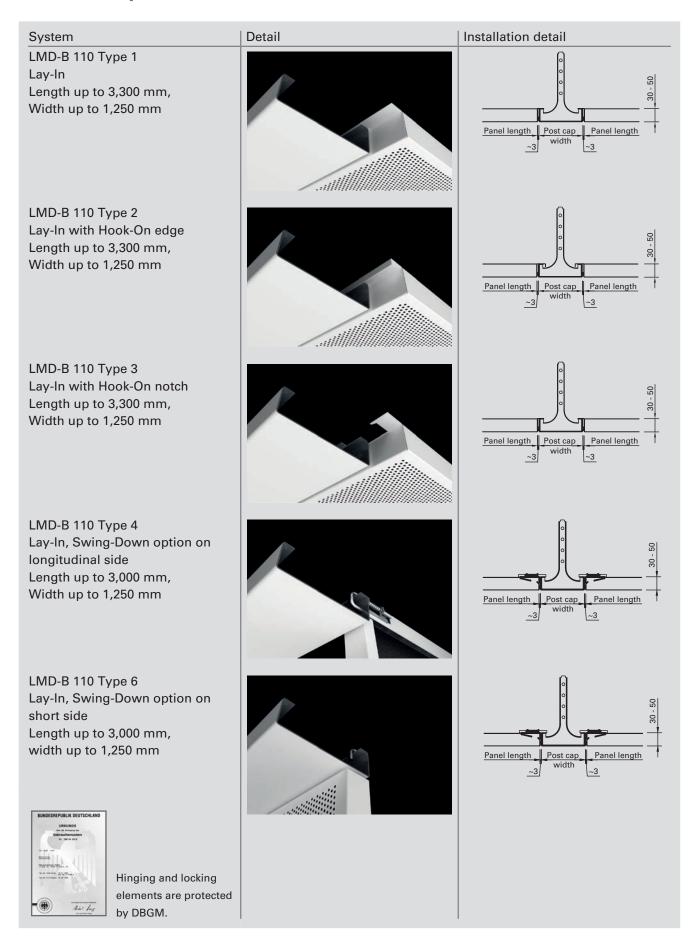


If frequent maintenance work is required, the robust Swing-Down mechanism is the perfect match. The ceiling panels' reliable swing-down mechanism makes it very easy to access the ceiling cavity. The



mechanism can be operated single-handedly with a special tool to allow the panel to swing down. An economically favourable combination of Swing-Down and Lay-In panels is possible.

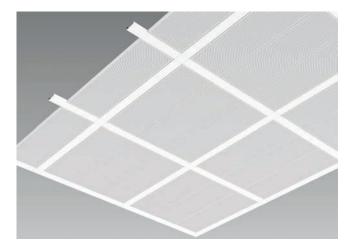
Standard requirements



LMD-B 111

Tightly crossed.

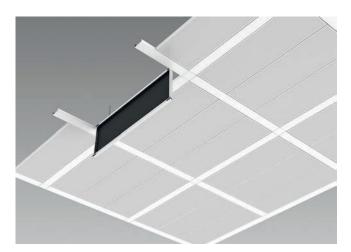
Post Cap Ceiling with Cross Noggins and Crossing Boxes – longitudinal post cap and post cap cross noggin visible, suspension in crossing box, ceiling panels Lay-In with Hook-On edge or Swing-Down option.



The distinct visual of this ceiling system is created with suspended crossing boxes and Hook-On cross noggins. Ceiling panels Type 1 (Lay-In), Type 2 (Lay-



In with Hook-On edge) and Type 3 (Lay-In with Hook-On notch) may be used separately or in combination.

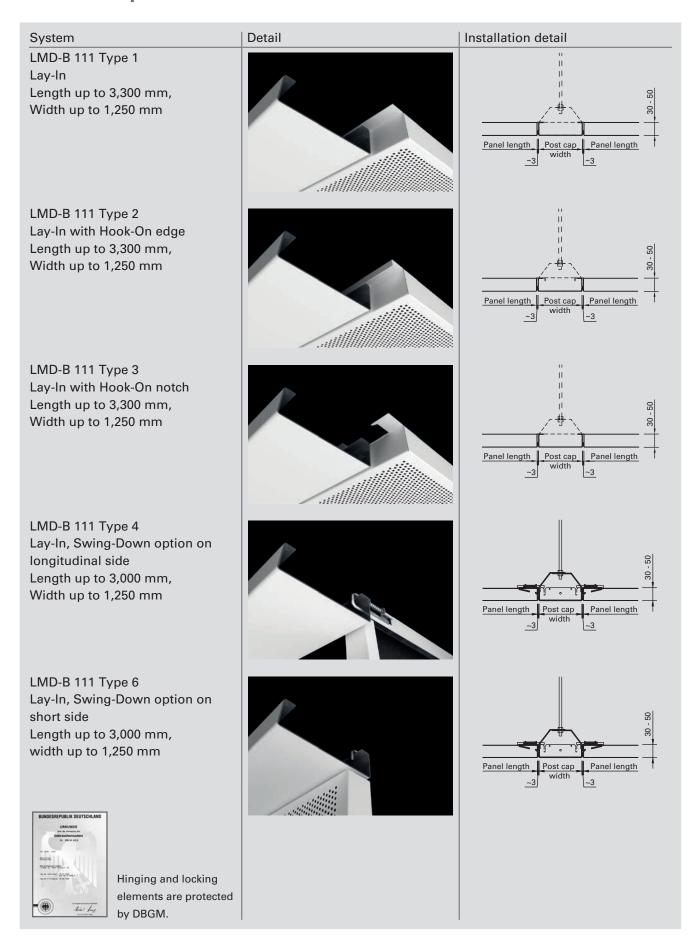


If frequent maintenance work is required, the robust Swing-Down mechanism is the perfect match. The ceiling panels' reliable swing-down mechanism makes it very easy to access the ceiling cavity. The



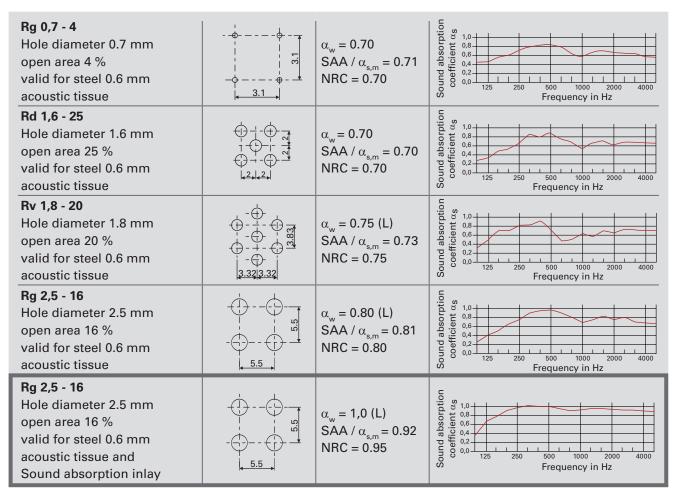
mechanism can be operated single-handedly with a special tool to allow the panel to swing down. An economically favourable combination of Swing-Down and Lay-In panels is possible.

Standard requirements





Example of the range of standard perforations available for ceilings without Heating and Cooling Technology





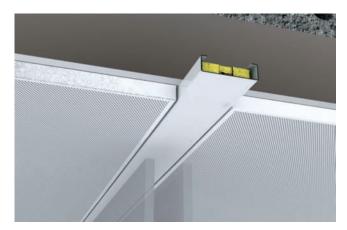
Building material class

Product	Building material class	
LMD Metal ceiling panel Metal ceiling panel manufactured from galvanized sheet steel, including powder-coated surface in colour 9010 acc. to Lindner and bonded acoustic tissue on the reverse side	A2-s1, d0 tested to EN 13501-1	
Insula Mineral wool inlay Mineral wool shrink-wrapped in acoustic transparent foil Insula A2 Insula I Insula Basic	A2-s1, d0 tested to EN 13501-1 B1 tested to DIN 4102-1 B2 tested to DIN 4102-1	

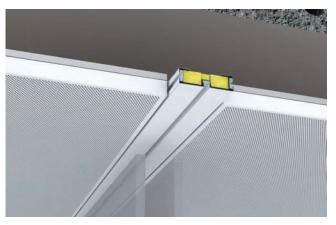


Longitudinal sound reduction

Today, modern buildings are expected to satisfy high demands. Design, performance, security and flexibility as well as long-term profitability must be granted. Furthermore, rooms have to make the people therein feel comfortable. All this can be accomplished by using longitudinally sound-reduced Lindner ceilings available with a range of different inlays. It goes without saying that we always provide for our ceiling panels to be easy to remove in case of maintenance works.



LMD-B 100 SD



LMD-B 100 SD with barrier



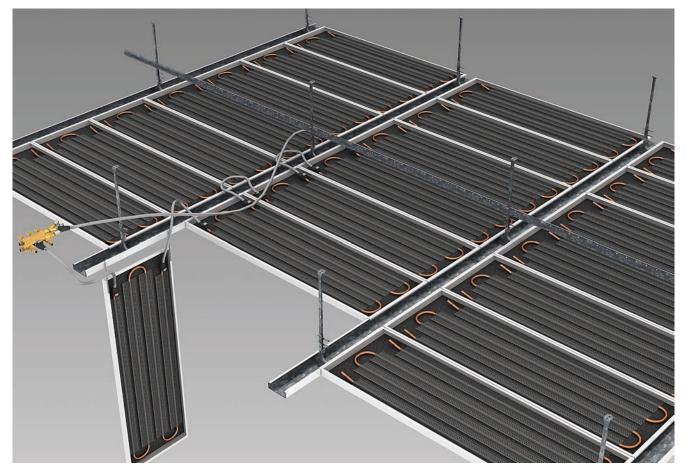
LMD-B 129 SD

LMD-B 137 SD

LMD-B 100 SD	Lay-In sandwich elements	D _{n,f,w} = 45 dB	without barrier
LMD-B 100 SD	Lay-In sandwich elements, mineral wool	$D_{n,f,w} = 49 dB$	without barrier
LMD-B 100 SD	Lay-In sandwich elements, mineral wool, barrier on one side	D _{n,f,w} = 64 dB	with barrier
LMD-B 100 SD	Lay-In sandwich elements, mineral wool, barrier on both sides	D _{n,f,w} = 67 dB	with barrier
LMD-B 129 SD ¹⁾	Lay-In/Swing-Down sandwich elements, mineral wool, fastening of partition walls in Post Cap grooves	D _{n,f,w} = 48 dB	without barrier
LMD-B 137 SD ¹⁾	Lay-In sandwich elements, mineral wool, fastening of partition walls in joints	D _{n,f,w} = 48 dB	without barrier

¹⁾ Minimum purchase quantity for post cap profiles on request

Plafotherm® Heated/Chilled Post Cap Ceilings



The integrated Heating and Cooling Technologies of Plafotherm® B create a pleasant temperature for any living and working environment. The tried and tested post cap system ensures safe handling. We will be glad to give your metal ceiling a distinctive look by applying one of our many eye-catching Lindner surfaces.

Longitudinally sound-reduced Plafotherm® B ... SD Heated/Chilled ceilings provide for utmost flexibility when it comes to changing the floor plan in the simplest way. For this reason, these ceilings are in many cases installed in combination with movable partition walls. The heating and cooling system is particularly suitable to ensure room-to-room sound absorption as it may provide for excellent longitudinal sound reduction values between 43 dB and 62 dB, depending on the construction.



Programme

System	
Plafotherm® B 100	Linear Heated and Chilled Post Cap Ceiling Post Cap profiles visible, ceiling panels Lay-In, with Hook-On edge or with Swing- Down option
Plafotherm® B 110	Heated and Chilled Post Cap Ceiling with Cross Noggins Post Cap profiles and Cross Noggins visible, ceiling panels Lay-In, with Hook-On edge or with Swing-Down option
Plafotherm® B 111	Heated and Chilled Post Cap Ceiling with Cross Noggins and Crossing Boxes Post Cap profiles and Cross Noggins visible, suspension in crossing box, ceiling panels Lay-In, with Hook-On edge or with Swing-Down option
Plafotherm® B 100 SD	Linear Heated and Chilled Post Cap Ceiling, longitudinally sound-reduced Lay-In sandwich elements
Plafotherm® B 137 SD	Linear Heated and Chilled Post Cap Ceiling, longitudinally sound-reduced Lay-In sandwich elements, fastening of partition walls in joints

Tested quality



Building material class A2-s2, d0 tested to EN 13501-1



Light reflectance approx. 82 % 9010 acc. to Lindner, unperforated tested to DIN 5033



Sound absorption up to sound absorption class B tested to EN ISO 354



Durability exposure class A tested to EN 13964, table 8 and 9



Environmental product declarations validated to ISO 14025



Nominal cooling capacity 120 W/m² tested to DIN EN 14240 (10 K) Nominal heating capacity 133 W/m² tested to DIN EN 14037 (15 K)

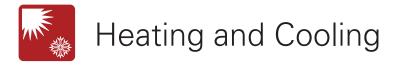
Certification / Regulations



Execution of the system ceilings tested to EN 13964



Quality standard according to the technical regulations of TAIM (Association of Industrial Metal Ceiling Manufacturers TAIM e.V.)



Heating/Cooling technology	consisting of aluminium heat conducting profile with copper pipe fret, integrated into ceiling panel for thermal conductivity		200	Cooling
Heat conducting profile	aluminium profile plain or perforated, standard widths of 80 and 120 mm	[W/m ²]	180 160 140	- Heating
Pipe fret	copper coil, 12 x 0.5 mm	scity	120	
Water volume	approx. 1 l/m²	capa	100 80	
Centre distance	from 90 mm on	Specific	60	
Nominal cooling capacity acc. to DIN EN 14240 (10K)	112 W/m ²	Sp	40 20	6,0 8,0 10,0 12,0 14,0
Nominal heating capacity acc. to DIN EN 14037 (15K)	126 W/m²			Excess or insufficient temperature [K]

Heating/Cooling technology	consisting of aluminium heat conducting profile with stainless pipe fret, integrated into ceiling panel for thermal conductivity		200	Cooling
Heat conducting profile	aluminium profile plain or perforated, standard widths of 80 and 120 mm	capacity [W/m²]	180 160 140	- Heating
Pipe fret	stainless, 12 x 0.5 mm	acity	120	
Water volume	approx. 1 l/m²		100 80	-
Centre distance	from 90 mm on	Specific	60	
Nominal cooling capacity acc. to DIN EN 14240 (10K)	109 W/m²		40 20	6.0 8.0 10.0 12.0 14.0
Nominal heating capacity acc. to DIN EN 14037 (15K)	123 W/m ²			Excess or insufficient temperature [K]



Heating and Cooling

Heating/Cooling technology	consisting of graphite panel with copper pipe fret, integrated into ceiling panel for thermal conductivity		200	
Heat conducting profile	heat conducting graphite panel plain	[W/m ²]	180 160	Cooling————————————————————————————————————
Pipe fret	copper coil, 12 x 0.5 mm	/\(\)	140	
Water volume	approx. 1 l/m ²	capacity	120 100	
Centre distance	100 mm		80	
Nominal cooling capacity acc. to DIN EN 14240 (10K)	120 W/m²	Specific	60 40 20	
Nominal heating capacity acc. to DIN EN 14037 (15K)	133 W/m²			6.0 8.0 10.0 12.0 14.0 Excess or insufficient temperature [K]

Determination of excess and insufficient temperature Recomended operation data

$$\begin{split} \Delta \mathsf{T}_{\mathsf{K}} &= \vartheta_{\mathsf{R}} - \frac{\vartheta \mathsf{VL} + \vartheta \mathsf{RL}}{2} \\ \Delta \mathsf{T}_{\mathsf{H}} &= \frac{\vartheta \mathsf{VL} + \vartheta \mathsf{RL}}{2} - \vartheta_{\mathsf{R}} \end{split}$$

$$\begin{split} & \Delta T_{_{K}} = insufficient \ temperature \ (cooling) \ [K] \\ & \Delta T_{_{H}} = excess \ temperature \ (heating) \ [K] \\ & \vartheta_{_{R}} = room \ temperature \ [C^{\circ}] \\ & \vartheta_{_{VL}} = flow \ temperature \ [C^{\circ}] \\ & \vartheta_{_{RL}} = return\text{-}flow \ temperature \ [C^{\circ}] \end{split}$$

Flow temperature (cooling)	15 - 17 °C
Temperature spread	2 - 4 K
Flow temperature (heating)	30 - 35 °C
Temperature spread	4 - 6 K
Recomended pressure drops	25 - 30 kPa



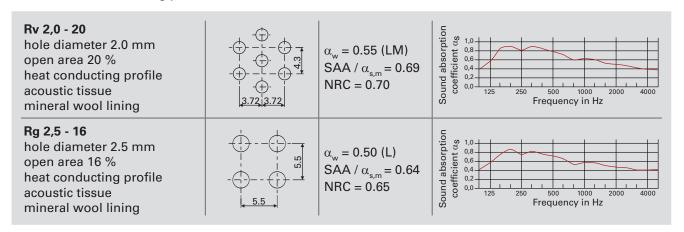
Building material class

Product	Building material class	
Plafotherm® metal ceiling panel Metal ceiling panel manufactured from galvanized sheet steel, including powder-coated surface in colour 9010 acc. to Lindner, bonded acoustic tissue on the reverse side and heat conducting profile	A2-s2, d0 tested to EN 13501-1	
Insula Mineral wool inlay Mineral wool shrink-wrapped in acoustic transparent foil Insula A2 Insula I Insula Basic	A2-s1, d0 tested to EN 13501-1 B1 tested to DIN 4102-1 B2 tested to DIN 4102-1	



Example of possible standard perforations for Heated and Chilled Ceilings with heat conducting profiles.

Standard heat conducting profile



Acoustically effective heat conducting profile

Rv 1,8 - 20 hole diameter 1.8 mm open area 20 % acoustically effective heat conducting profile acoustic tissue mineral wool lining	 $\alpha_{\rm w} = 0.80$ SAA / $\alpha_{\rm s,m} = 0.79$ NRC = 0.80	O
Rv 1,8 - 20 hole diameter 1.8 mm open area 20 % acoustically effective heat conducting profile acoustic tissue	 $\alpha_{\rm w} = 0.70 \; {\rm (L)}$ SAA / $\alpha_{\rm s,m} = 0.74$ NRC = 0.75	0,0 125 250 500 1000 2000 4000 Frequency in Hz



Longitudinal sound reduction

Plafotherm® B 100 SD		D _{n,f,w} = 48 dB	Lay-in sandwich elements, without barrier
Plafotherm® B 100 SD	0 0	D _{n,f,w} = 62 dB	Lay-in sandwich elements, with barrier
Plafotherm® B 137 SD		D _{n,f,w} = 48 dB	Lay-in sandwich elements, without barrier

Hydraulic Components

For perfect connections.

For perfect heating and cooling connections, Lindner provides a great number of hydraulic components and accessory parts.

Advantages:

- Tested system

- Ideal for heating/cooling systems
- One-stop solutions
- Maintained independently from other building trades

Connection hoses and fittings

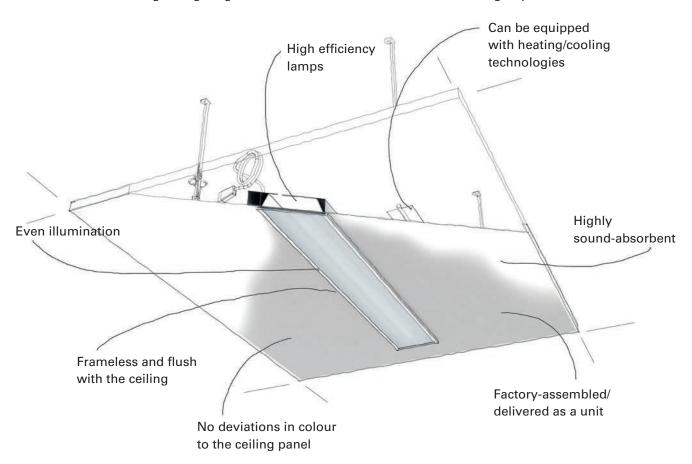
High-grade steel hoses are oxygen impermeable, tested to DIN 4726, and are used as connection hoses. These hoses are perfectly suited to accept a large number of fittings. The quick plug connector MultiQuickConnect does without retaining claws which unnecessarily damage the meanders. Thus, a quick and user-friendly installation and removal is ensured. A locking button that clearly sticks out checks the correct installation and guarantees a positive connection and a secure hold. A system distributor with three outgoing lines completes the system.



Lindner Lighting Systems

Integration is our passion.

Lindner has a wide range of lighting fixtures that fulfill even the most demanding requirements.





Light Channels

The length and the execution of the light channels can flexibly be adapted to the room geometry. Moreover, they impress from the technology to the easy installation.

Integrated Luminaires

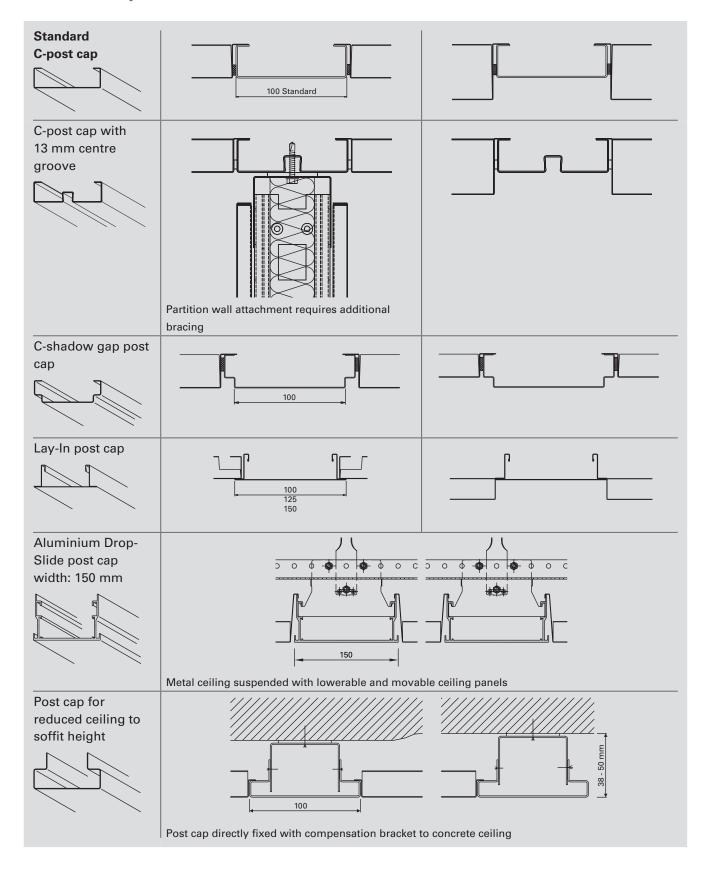
A wide range of integrated luminaires is available. These luminaires are shapely integrated into ceiling panels. Moreover, they are adapted to the room concept and the lighting quality.

System Luminaires

A multitude of system luminaires which are perfectly adapted to the ceiling systems regarding dimensions, installation and colour deviation are available.

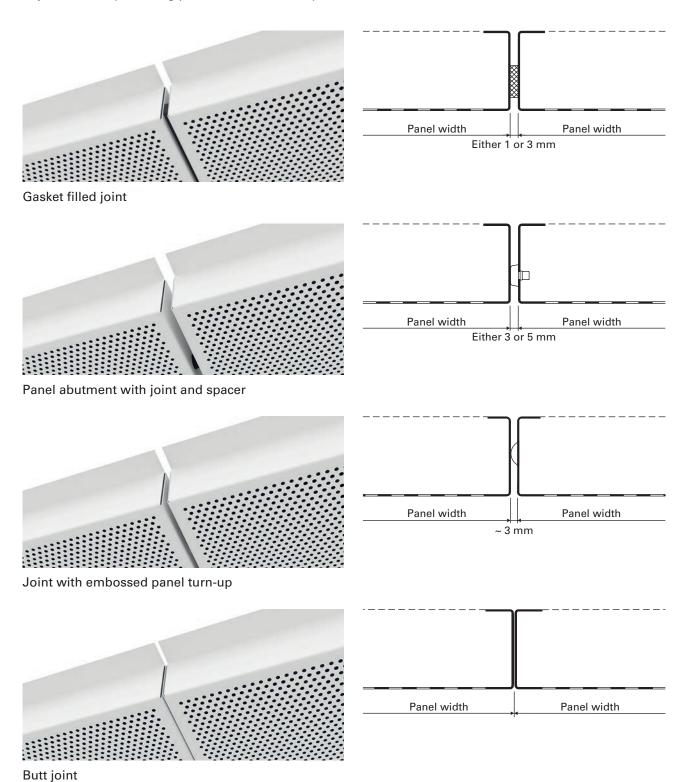
Post Cap Options

Installation possibilities



Joint Designs

The visual of the ceiling system can be influenced by a selection of different joint designs. Besides aesthetic aspects, the joint design can also have an effect on the acoustic performance. Determine your choice of joint width by ordering panels with different spacers.



Wall Connections

Wall connections can be realised in different ways - with and without shadow gap. To ensure that cut panels rest entirely on the trim's supporting finish without any corrugation, hold-down clips and sheets are applied. Specially designed trims for columns provide for a clean connection to curved shapes.





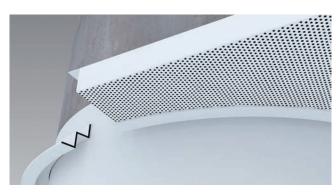
L-trim





Shadow gap trim





Pillar semiring

Further wall connections available on request.

Surfaces

Lindner has a wide range of ceiling surfaces for different demands – so that your rooms are not only extraordinary but unique. We apply various colours, patterns, graphics, 3D textures and perforations to your metal ceiling. In particularly challenging areas, we furnish our systems with coatings that are more than just eye-catchers: They create a significant improvement of room quality.









Possible surfaces

- Powder Coating
- Design Surface

ARTline – Design Powder Coating GRAPHICline – Print Technology EFFECTline – Grinding Technology SPREADline – Customised, image and scattered perforation

- Functional Surfaces

Meteo - Corrosion Coating

Mutex - Absorber Coating

- Special Surfaces
 - INOXlook Aluminium with appearance of stainless steel
- Structured Surfaces

TOUCHdesign - 3D Surface

TOUCHdesign Lunar - 3D high-gloss Surface

TOUCHdesign Venas – 3D Structured Surface

TOUCHdesign Viva - 3D Expanded Metal Surface

- Expanded Metal
- Perforations



A responsible approach to humans and nature is a matter of course for us as a manufacturer of long lasting ceiling systems in premium quality. We are continuously optimizing our wide range with the objective to further reduce their impact on the environment. Every production step is subject to a thorough control of the ambitious energy, material and quality requirements. This ensures that our clients do not only get a sophisticated product but that they can also rely on the ecological suitability.

Validated environmental product declarations according to ISO 14025 are available for the procedure of proof of the environmental performance of Lindner ceiling systems.







Lindner is a founding member of the German Sustainable Building Council (DGNB) and member of the US Green Building Council. We are actively involved in building up awareness for the principles of sustainable construction and the development of relevant standards.

Sustainable construction with Lindner ceiling systems:

- Extremely durable products with best functional characteristics and high economic efficiency
- End-to-end procedure of proof of the ecological material characteristics by environmental product declarations
- Consultancy service with all current building certifications, as for example according to DGNB, LEED, BREEAM

Simply healthier: Lindner ceiling systems.

- High recycling percentage up to 45 %
- VOC values are considerably below the limit according to AgBB / DIBt
- Free from toxicological gases, thus it is toxicologically inoffensive in case of fire according to DIN 53436
- The substances used for pre-cleaning of powder coating are no hazardous substances according to the Ordinance on Hazardous Substances.
- Powder recovery of surface coating of approx. 25 %
- Reference useful life is 70 years according verified EPD
- Up to 30 % of the primary energy demand can be saved with Plafotherm® heated and chilled ceiling systems

We can do it all for you.

Lindner Concepts:

- Airports and Railways
- Clean Rooms and Operating Theatres
- Cruise Liner and Ship Fit-out
- General Contracting
- Hotels and Resorts
- Insulation and Industrial Service
- Interior Fit-out and Furnishings
- Special-Purpose Constructions and Stadiums
- Studios and Concert Halls
- System Buildings

Lindner Products:

- Ceiling Systems
- Doors
- Dry Lining Systems
- Facades
- Floor Systems
- Heating and Cooling Technologies
- Lights and Lighting Systems
- Partition Systems
- Roofing Systems
- Steel & Glass

Lindner Service:

- Clearance of Harmful Substances
- Construction Management and Project Development
- Deconstruction and Interior Demolition
- General Planning
- Global Product Supplies
- Green Building
- Industrial Scaffolding
- Installation and Building Services
- Research and Development

Lindner Group

Bahnhofstrasse 29 94424 Arnstorf Germany Phone +49 8723 20-3679 Fax +49 8723 20-2893

ceilingsystems-ps@Lindner-Group.com

www.Lindner-Group.com

This document is the intellectual property of Lindner, Arnstorf (Germany). All the information contained in this brochure agrees with the information available at the time of its printing and only serves as advance information. Any possible colour deviations there might be from the original product are caused by printing-related reasons. Lindner is the sole and exclusive owner of the copyrights as well as the ancillary copyright. All use, and in particular any distribution, reprinting, exploitation or adaptation of this document shall only be allowed with express, written approval by Lindner.