Lindner Metal Ceiling System – LMD-B

Environmental Product Declaration acc. to ISO 14021

Holder of the declaration

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Content of the declaration

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Certification system DGNB
Certification system LEED
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General information

Lindner | Building New Solutions

Product information

Product description

LMD-B Metal Post Cap Ceiling
Metal ceiling system in closed version that offers installation space for service and disposal lines with its whole surface. The modular construction allows access to the ceiling void for maintenance works.
The substructure of the non-bearing metal ceiling panels is directly suspended from the raw ceiling or directly installed at it. The visible post cap profiles can be used for the installation of partitions.
The turn-up heights differ depending on the panel sizes. The metal ceiling panels lie with their short sides on the post cap profiles. They can be removed individually.
The post cap profiles are available in different widths / executions and can be installed in linear, cross or radial arrangement.
Excellent functionality, easy maintenance, sound absorption and non-inflammable materials are important characteristics.

Application area

For the application inside of buildings with high architectural as well as technical requirements.

Base materials

Base materials per m²/unit = 7.0 kg *)

System components	Material	Weight proportions [%]
Metal ceiling panel	Galvanised steel sheet	~ 70.0 %
Visible and hidden substructure	Galvanised steel sheet	~ 27.0 %
Powder coating of visible substructure and metal ceiling panel	Polyester powder	< 1.0 %
Acoustic tissue	Knitted fabrics area from glass fibre, polyester fibre, cellulose bounded with binder polyvinyl acetate and flame blocking salt free from halogen and grime pigment	< 1.0 %
Gasket strip	Polyolefin foamed material with flame protective agent and clad siliconized polyethylene foil	< 1.0 %

*) Calculation base: room size 10x10 m, post cap centre distance: 1,250 mm, panel width: 400 mm, panel length: 1,150 mm, post cap width: 100 mm

Material explanation

Steel
All metal alloys whose main component is iron and whose content of carbon dioxide is between 0.02 % and 2.06 % are named steel.
More than 95% of the materials which are used in this product consist of steel.

Certification system

Not listed characteristics do not apply to this product

Lindner Group is member of DGNB
Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

Environmental Quality

ENV1.1	Life Cycle Impact Assessment	LCA data can be gathered from verified EPDs for LCA of Lindner ceiling systems. ** Declaration number: EPD-TAI-20130184-ICG1-DE **Furthermore, project-related LCA data can be created promptly. If applicable, an additional expenditure of time and costs must be considered.

ENV1.2 Local Environment Impact

Component	Weight proportion	VOC	GISCODE	Other
Metal ceiling panel from galvanised steel sheet	~ 70.0 %	-	-	-
Visible and hidden substructure from galvanised steel sheet	~ 27.0 %	-	-	without plumb, quicksilver, cadmium and chrome (VI)
Surface – Powder coating of visible substructure and metal ceiling panel: polyester powder	< 1.0 %	-	Giscode BS 10 is not used for powder varnishes	without plumb, quicksilver, cadmium and chrome (VI)
Acoustic tissue	< 1.0 %	-	-	-
Gasket strip	< 1.0 %	-	-	-
Total	**100%**	10 µg/m³ *		

*Test measures showed a value of 10 µg/m³ = 0.010 mg/m³ after 28 days. The evaluation limit acc. to AgBB/DIBt is 1 mg/m³.

ENV1.3	Responsible Procurement	The product LMD-B contains no timber, timber-based products or timber-based materials.
ENV2.1	Life Cycle Impact Assessment – Primary Energy	LCA data can be gathered from verified EPDs for LCA of Lindner ceiling systems. ** Declaration number: EPD-TAI-20130184-ICG1-DE **Furthermore, project-related LCA data can be created promptly. If applicable, an additional expenditure of time and costs must be considered.

Economic Quality

ECO1.1	Life Cycle Cost	Lindner metal ceilings are manufactured to the highest international standards. Metal ceilings can be expected to remain durable for up to 50 years (acc. to BBSR table, code no. 353 211, state 11/2011, published by the Federal Institute for Research on Building, Urban Affairs and Spatial Development). If used as suspended ceiling lining, no dismantling or costs for demolition incur for this product. Due to the internal return system, it is guaranteed that components are not disposed but flow into the recycling circuit.
ECO2.1	Flexibility and adaptability	Every ceiling panel can be dismantled, moved or replaced individually. Post cap profiles can be used for the installation of partitions. In connection with this ceiling lining, partitions can be moved in the centre distance of the post caps without interfering with the floor and the ceiling.

Sociocultural & Functional Quality

SOC1.2	Indoor Air Quality	A TVOC value of 10 µg/m³ was measured in the AgBB measurement. Due to the low value, the Lindner metal ceiling positively contributes to the indoor air quality. It is many times lower than the limit value of 500 µg/m³.
SOC1.3	Acoustic Comfort	Suspended ceilings are ideally suitable for the improvement of room acoustics. Due to perforated metal ceiling panels as well as acoustically effective inlays, sound absorption values up to 1.0 can be achieved, depending on the execution. The values are tested in a reverberation room in accordance with ISO 354 and rated in accordance with DIN EN ISO 11654.
SOC1.4	Visual Comfort	A Lindner metal ceiling covers installations in the ceiling void without obstructing the access to it. The ceiling serves as visual highlight according to project-related demands in many different colours, perforations and shapes. LMD-B post cap ceilings can be adapted to the building shape and incorporate axes.

Technical Quality

TEC1.2	Sound Insulation	Lindner post cap ceilings can be executed as longitudinally sound reduced version. The longitudinal sound reduction is performed by heavy plating made from steel sheet, plasterboard or a plasterboard barrier in the post cap. Thus, the sound transmission to adjacent rooms is reduced.
TEC1.5	Cleaning and Maintenance	The powder-coated surfaces are easy to clean. The simple dismantling of metal ceiling panels enables an uncomplicated access to the ceiling void for maintenance works.
TEC1.6	Deconstruction and Disassembly	Lindner metal ceiling systems are produced in such a way that they can be installed on site with as little waste as possible. Waste that cannot be avoided on site is put into recycling processes by means of waste management facilities. Every ceiling panel can be dismantled and replaced individually and non-destructively. The substructure can as well be dismantled non-destructively.

Process Quality

PRO1.5	Documentation for Facility Management	Utilisation, maintenance and care instructions are created to the usual extent and can be provided.
PRO2.1	Environmental Impact of Construction	The compliance with project-related requirements regarding low-waste, low-noise and low-dust site as well as measures for soil and ground water protection are ensured by specialised in-house departments. An appropriate verification can be created and implemented on request by specialised personnel. Due to the delivery of finished ceiling elements that do not have to be processed on site, the product contributes to a noise-free and dust-free site. The packaging is selected project-related to produce as little waste as possible.
PRO2.2	Construction Quality Assurance	All documents relevant for project documentation can be provided.

[1] © DGNB GmbH

Certification system LEED

Not listed credits do not apply for this product

Sustainable Sites

Construction Activity Pollution Prevention	The compliance with project-related requirements of an ESC plan is ensured by specialised in-house departments. A complete ESC plan can be created and implemented on request by specialised personnel.

Materials and Resources

Construction and Demolition Waste Management Planning	Waste that cannot be avoided on site is preferentially put into recycling processes by means of waste management facilities. A complete CWM plan can be created and implemented on request by specialised personnel.
Building Life Cycle Impact Reduction	We can provide product-specific data for the assessment of the building. Due to the long-life cycle of ceiling systems, Lindner guarantees a reuse of products over the whole useful life.
Building Product Disclosure and Optimization – Environmental Product Declaration	LCA data can be gathered from verified EPDs for LCA of Lindner ceiling systems. ** Declaration number: EPD-TAI-20130184-ICG1-DE **Furthermore, project-related LCA data can be created promptly. If applicable, an additional expenditure of time and costs must be considered.

Building Product Disclosure and Optimization – Sourcing of Raw Materials

Component	Weight proportion	Recycled content		
		Pre-Consumer	Post-Consumer	Production site
Metal ceiling panel from galvanised steel sheet	~ 70.0 %	0%	25%	Arnstorf
Visible and hidden substructure from galvanised steel sheet	~ 27.0 %	0%	25%	Arnstorf
Surface – Powder coating of visible substructure and metal ceiling panel: polyester powder	~ 1.0 %	0%	0%	Arnstorf
Acoustic tissue	~ 1.0 %	0%	90%	
Gasket strip	~ 1.0 %	0%	0%	
Total	**100%**	**25.2 %**		

The product LMD-B contains no timber-based materials. Thus, a FSC proof is not necessary.

Building Product Disclosure and Optimization – Material Ingredients

The aim of the **REACH** regulation (**R**egistration, **E**valuation and **A**uthorization of **CH**emicals) is to capture materials produced and used in the EU and to determine and record their impact on health and environment.

As manufacturer of products, Lindner fulfils the obligations towards the EU chemical directive “REACH” and created its own REACH declaration.

Construction and Demolition Waste Management

The compliance with project-related requirements regarding low-waste, low-noise and low-dust site as well as measures for soil and ground water protection are ensured by specialised in-house departments. An appropriate verification can be created and implemented on request by specialised personnel. Due to the delivery of finished ceiling elements that do not have to be processed on site, the product contributes to a noise-free and dust-free site. The packaging is selected project-related to produce as little waste as possible.

Indoor Environmental Quality

Minimum Acoustic Performance

Lindner post cap ceilings can be executed as longitudinally sound reduced version. The longitudinal sound reduction is performed by heavy plating made from steel sheet, plasterboard or a plasterboard barrier in the post cap.
Thus, the sound transmission to adjacent rooms is reduced.

Low Emitting Materials

A TVOC value of 10 µg/m³ was measured in the AgBB measurement. The use of coating materials on site is omitted as the ceiling panels are coated in factory.

Construction Indoor Air Quality Management Plan

The compliance with project-related requirements of an IAQ plan is ensured by specialised in-house departments. A complete IAQ plan can be created and implemented on request by specialised personnel.

Indoor Air Quality Assessment

A TVOC value of 10 µg/m³ was measured in the AgBB measurement Due to the low value, the Lindner metal ceiling positively contributes to the indoor air quality.

Daylight	Due to the high light reflection of approx. 82% of a white (9010 acc. to Lindner) powder-coated metal ceiling, the incident daylight is transferred to the room.
Acoustic Performance	Suspended ceilings are ideally suitable for the improvement of room acoustics. Due to perforated metal ceiling panels as well as acoustically effective inlays, sound absorption values up to 1.0 can be achieved, depending on the execution. The values are tested in a reverberation room in accordance with ISO 354 and rated in accordance with DIN EN ISO 11654.

Certification system

BREEAM®

Not listed characteristics do not apply to this product

Management

Man 01	Sustainable procurement	The product LMD-B contains no timber-based materials.
Man 02	Responsible construction practices	Generally, all companies of the Lindner Group largely fulfil the requirements of an environmental management system. For companies of the Lindner Group certified according to ISO 14001, ISO 50001, SCC**- and OHSAS, further specific environmental and safety targets are defined in conjunction with the annual management review. The implementation of environmental protection and relevant legal regulations are defined in the Lindner intern guideline “Environmental protection”.
Man 03	Construction site impacts	The compliance with project-related requirements regarding low-waste, low-noise and low-dust site as well as measures for soil and ground water protection are ensured by specialised in-house departments. An appropriate verification can be created and implemented on request by specialised personnel.
Man 05	Life cycle cost and service life planning	Lindner products have a long life expectancy *(due to the raw materials, production processes and high production quality).* Moreover, certain products can systematically be dismantled and reused after small processing (C2C). Metal ceilings can be expected to remain durable for up to 50 years (acc. to BBSR table, code no. 353 211, state 11/2011, published by the Federal Institute for Research on Building, Urban Affairs and Spatial Development). If used as suspended ceiling lining, no dismantling or costs for demolition incur for this product.

Health and Wellbeing

Hea 01	Visual comfort	Due to the high light reflection of approx. 82% of a white (9010 acc. to Lindner) powder-coated metal ceiling, the incident daylight is transferred to the room.

Hea 02	Indoor air quality	Lindner metal ceiling systems are made from materials that show almost no emissions of e.g. VOC and formaldehyde. Test chamber measurements according to the AgBB test method are available as proof. TVOC (AgBB/DIBT) C_6-C_{16}: after 3 days 36 µg/m³
Hea 05	Acoustic performance	Suspended ceilings are ideally suitable for the improvement of room acoustics. Due to perforated metal ceiling panels as well as acoustically effective inlays, sound absorption values up to 1.0 can be achieved, depending on the execution. The values are tested in a reverberation room in accordance with ISO 354 and rated in accordance with DIN EN ISO 11654.

Energy

Ene 01	Energy efficiency	LCA data can be gathered from verified EPDs for LCA of Lindner ceiling systems. ** Declaration number: EPD-TAI-20130184-ICG1-DE **Furthermore, project-related LCA data can be created promptly. If applicable, an additional expenditure of time and costs must be considered.

Materials

Mat 01	Life cycle impacts	We can provide product-specific data for the assessment of the building. Due to the long-life cycle of ceiling systems, Lindner guarantees a reuse of products over the whole useful life.
Mat 03	Responsible sourcing of materials	Lindner metal ceiling systems are made from materials with a high recycling content. The recycling content of scrap metal of the main component steel is approx. 25% (Post-Consumer), depending on the required quality of used material components. Local suppliers are preferred. The company Lindner is certified according to the environmental management system according to DIN EN ISO 14001.

Waste

Wst 01	Construction waste management	Lindner metal ceiling systems are produced in such a way that they can be installed on site with as little waste as possible. Waste that cannot be avoided on site is put into recycling processes by means of waste management facilities.

General information

CO_2 & Waste

In order to reduce waste from demolition and building measures, waste streams are dedicated to recycling processes. The verification can be done by the company Lindner.

The used transport packaging (timber, cardboard, foils) can be recycled. Where possible, they are collected separately and supplied to a proper recycling (packaging regulation).

Lindner system products are delivered to the construction site in ready-for-assembly condition. This means that no work or possibly minor work has to be done on the product. In this way, only little waste or no waste is generated on site. The used transport packaging can in large part be recycled. Only certified waste management companies are entrusted with the disposal conforming to the law for waste that cannot be avoided.

Vision 2020: Co_2 neutral and waste-free location

Less is more. Much less is our aim!

The vision: It is our aim to further develop Lindner production sites in CO_2 neutral and waste-free locations. We derived concrete aims from the vision to make an entrepreneurial contribution to the reduction of CO_2 emissions as well as all commercial waste.
The analysis of major pollutants is of course given top priority.

Environmental Management – Acting sustainably, saving resources

For Lindner, responsibility towards humans and environment is as important as the quality of the products. For this reason, an environmental management system acc. to DIN EN ISO 14001 is established company-wide and largely certified.

Our central environment programme comprises the responsible and sustainable use of resources, the reduction of CO_2 emissions and a continuous improvement process to achieve our environmental objectives. An integrated management system evaluates the production of Lindner products regularly according to ecological aspects and adapts the processes to current standards.

Our principles comprise an active waste management in all business units – from waste prevention concept to waste balance. We also keep an eye on preceding stages of the value added chain. Environmental aspects also play a major role in the selection of our suppliers.

Energy Management

Towards an environmentally friendly future.

The national and international supply situation asks for a targeted and effective use of resources and environmentally friendly forms of energy. At Lindner, an energy management system based on DIN EN ISO 50001 controls the procurement of energy sources centrally for all locations as well as their transformation, delivery and distribution to affiliated companies.
Energy saving and the change of fossil and nuclear energy to ecological sources of energy are the core of all measurements to implement energetic business objectives. Thus, every single employee is aware of its role in sustainable, operative project management. Due to many small improvements, for example the improvement of compressed air loss, the utilisation of waste heat and targeted light control, we could achieve massive energy savings in the last years. Especially at future-oriented investments, for example the installation of new production plants, we pay attention to the implementation of resource-saving solutions.