



## Lindner Metal Ceiling System – LMD-L

Environmental Product Declaration acc. to ISO 14021

### Holder of the declaration

Lindner AG  
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### Content of the declaration

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Certification system LEED  
Certification system BREEAM  
General information

## Product information

**Product description**    **LMD-L Metal Baffle Ceiling**

Metal ceiling system in open version that offers enough space for the inversion of luminaires, sprinklers and ventilation systems between every baffle panel. The modular construction allows access to the ceiling void for maintenance works. The substructure is directly suspended from the raw ceiling or directly installed at it. Baffle ceilings consist of plain or perforated steel sheet, which is folded to cuboid elements in different dimensions. Due to acoustically effective inlays, baffle ceilings are perfectly suitable for the improvement of room acoustics. 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**

<b>Base materials per m<sup>2</sup>/ unit = 3.0 kg *)</b>		
System components	Material	Weight proportions [%]
Metal ceiling panel	Galvanised steel sheet	~ 76.0 %
Visible and hidden substructure	Galvanised steel sheet	~ 17.0 %
Powder coating of visible substructure and metal ceiling panel	Polyester powder	~ 3.0 %
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	~ 4.0 %

\*) Calculation base: room size 10x10 m  
baffle length: 50-3000 mm, baffle height: 200 mm, hanger distance: max. 1200 mm, suspension channel distance: max. 2500 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.

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# Certification system



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

Not listed characteristics do not apply to this product



## 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	~ 76.0 %	-	-	-
Visible and hidden substructure from galvanised steel sheet	~ 17.0 %	-	-	without plumb, quicksilver, cadmium and chrome (VI)
Surface – Powder coating of visible substructure and metal ceiling panel: polyester powder	~ 3.0 %	-	Giscode BS 10 is not used for powder varnishes	without plumb, quicksilver, cadmium and chrome (VI)
Acoustic tissue	~ 4.0 %	-	-	-
<b>Total</b>	<b>100%</b>	<b>10 µg/m³ *</b>		

\*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-L contains no timber, timber-based products or timber-based materials.

**ENV2.1** Life Cycle Impact Assessment – Primary Energy

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**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 element can be dismantled, moved or replaced individually. The substructure of the non-bearing metal ceiling elements is suspended from the raw ceiling or directly installed at it.



**Sociocultural & Functional Quality**

SOC1.2	Indoor Air Quality	A TVOC value of 10 µg/m <sup>3</sup> 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/m <sup>3</sup> .
SOC1.3	Acoustic Comfort	Suspended ceilings are ideally suitable for the improvement of room acoustics. Due to perforated metal ceiling elements as well as acoustically effective inlays, sound absorption values up to 0.8 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.

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### Technical Quality

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 baffle 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.

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<sup>1</sup> © DGNB GmbH

# Certification system LEED



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## 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

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**Building Product Disclosure and Optimization – Sourcing of Raw Materials**

Component	Weight proportion	Recycled content		Production site
		Pre-Consumer	Post-Consumer	
Metal ceiling panel from galvanised steel sheet	~ 76.0 %	0%	25%	Arnstorf
Visible and hidden substructure from galvanised steel sheet	~ 17.0 %	0%	25%	Arnstorf
Surface – Powder coating of visible substructure and metal ceiling panel: polyester powder	~ 3.0 %	0%	0%	Arnstorf
Acoustic tissue	~ 4.0 %	0%	90%	
<b>Total</b>	<b>100%</b>	<b>26.9 %</b>		

The product LMD-L 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 **C**hemicals) 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**

**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.

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**Acoustic Performance**

Suspended ceilings are ideally suitable for the improvement of room acoustics. Due to perforated metal ceiling elements as well as acoustically effective inlays, sound absorption values up to 0.8 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



Not listed characteristics do not apply to this product

## bre Management

Man 01	Sustainable procurement	The product LMD-L 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 ( <i>due to the raw materials, production processes and high production quality</i> ). 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.

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## bre 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.
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Hea 02	Indoor air quality	<p>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.</p> <p>TVOC (AgBB/DIBT) C<sub>6</sub>-C<sub>16</sub>: after 3 days 36 µg/m<sup>3</sup></p>
Hea 05	Acoustic performance	<p>Suspended ceilings are ideally suitable for the improvement of room acoustics. Due to perforated metal ceiling elements as well as acoustically effective inlays, sound absorption values up to 0.8 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.</p>

**bre Energy**

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

Mat 01	Life cycle impacts	<p>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.</p>
Mat 03	Responsible sourcing of materials	<p>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.</p>

**bre Waste**

Wst 01	Construction waste management	<p>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.</p>
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## General information

### CO<sub>2</sub> & 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<sub>2</sub> 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<sub>2</sub> neutral and waste-free locations. We derived concrete aims from the vision to make an entrepreneurial contribution to the reduction of CO<sub>2</sub> 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<sub>2</sub> 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.

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## Energy Management

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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.