

HOLLOW FLOOR – SYSTEM FLOOR and more®

SELF-DECLARATION ACC. TO DIN EN ISO 14021

Holder of the declaration: Lindner AG | Bahnhofstraße 29 | 94424 Arnstorf | Germany

Content of the declaration: Product information
Certification system DGNB
Certification system LEED
Certification system BREEAM
Product certification Cradle to Cradle®

PRODUCT INFORMATION

Green Building Statement

We already think in closed cycles while developing our products. In this connection we act as one of the specialists within the range of sustainable building since many years. Supported by our internal technical department „Green Building“ we ensure the sustainability target of your building project.

Product description

FLOOR and more® - Hollow floor as dry construction

Hollow floors are a sub construction type of system floor constructions that has of a joint less base layer forming a closed composite surface and a laminar or duct-shaped hollow space underneath. The access to the hollow space is realised by means of for example revision openings or raised floor sections.

Application area

System floors are standardized support systems for the interior fit-out that are raised by means of a sub construction. The environmental product declaration is related to the hollow floor system FLOOR and more® with a panel thickness of 30 – 40 mm.

Base material

Base material per m ² raised floor and a construction height of 150 mm FFL		
System components	Material	Weight proportion (%)
Calcium sulphate panel*	FGD gypsum, cellulose	~ 93.0 – 95.0
Pedestals*	Galvanised steel	~ 3.0 – 5.0
Pedestal glue*	Polyurethane / SMP	< 0.5
FLOOR and more® installation glue* very low emission	Polyurethane	< 0.5
1C floor sealant*	Synthetic resin dispersion	< 0.5
2C floor sealant*	Epoxy resin	< 0.5
Locking glue* solvent-free	Synthetic resin dispersion	< 0.5
Edge sealant* solvent-free	Synthetic resin dispersion	< 0.5
Wall connection tape*	PE foam	< 0.5
Factory-made processing		
Glue application*	Polyacrylate dispersion	< 0.5
Humidity protection / steel sheet*	PET-aluminium / steel	< 0.5
Covering*	Depending on covering	< 0.5

*data sheets available on request

Material explanation

FGD gypsum

FGD gypsum is produced industrially by for example desulphurization of flue gas while burning coal. Furthermore, production residues or rather waste (grit, edgings, etc.) can be returned to the production process by means of calcining.

Cellulose fibres

Cellulose fibres are gained as a recycling product from the industry or produced by preparation of recycled paper.

Steel

Steel is a metal alloy with steel as main component and a carbon monoxide content between 0.02 % and 2.06 %.

CERTIFICATION SYSTEM DGNB

Not listed characteristics do not apply to this product.

Environmental Quality

ENV 1.1 Life Cycle Assessment of the Building

For the eco-balance of the Lindner floor systems eco-balance data from the available verified EPD's can be taken.

Declaration number: EPD-LIN-20170194-IBD1-EN

Furthermore, project-specific eco-balance data can be issued contemporary.

In this context an additional expenditure of time and cost shall be considered if applicable.

ENV 1.2 Local Environment Impact

Components	Weight proportion (%)	VOC	GISCODE	Other
FGD gypsum	~ 88.0	-	-	-
Cellulose	~ 6.0	-	-	-
Pedestals	~ 4.0	-	-	-
Installation glue	< 0.5	0 %	EC 1 plus R	-
Pedestal glue	< 0.5	< 0.01 %	EC 1 plus R	-
1C or 2C floor sealant	< 0.5	< 1 g/l	BSW20 / RE 1	-
Locking glue	< 0.5	~ 5 g/l	BSW10	-
Edge sealant	< 0.5	< 1 g/l	BSW20	-
Covering adhesive	< 0.5	-	D1 / EC 1	-
Total	100	< 5 µg/m^{3*}		

^{*)} Test measures showed a value of < 5 µg/m³ = 0,005 mg/m³ after 28 days. The evaluation limit according to AgBB/DIBt is 1 mg/m³.
^{*)} for „not relevant“ according to DGNB 2018

It can be maintained up to quality level 4.

ENV 1.3 Responsible Procurement

The product FLOOR and more® does not contain any wood-based materials. Therefore a FSC / PEFC proof is not required.

Economical Quality

ECO 1.1 Life Cycle Costs

Lindner raised floor systems are produced according to the highest international standards. The useful life of hollow floors is up to 50 years (acc. to BBSR table, code no. 352.911, issue 02/2017, published by the Federal Institute for Building, Urban Affairs and Spatial Development). For hollow floor systems no costs for dismantling or demolition incur. By means of the internal return system it is guaranteed that the components are not disposed but flown into the recycling circuit.

ECO 2.2 Market Ability

The hollow floor system is continuously adapted to the current market demands.

Sociocultural & Functional Quality

SOC 1.1 Thermal Comfort

The hollow floor system FLOOR and more® comfort obeys the limiting value of the floor of max. 29 °C.

SOC 1.2 Indoor Air Quality

Lindner floor systems are made of materials that are nearly free of any emission as for example VOC and formaldehyde. Test chamber measurements according to the requirements of the quality mark Indoor Air Comfort GOLD® (e. g. AgBB measurement scheme) are available as proof.

TVOC (AgBB/DIBt): after 28 days < 5 µg/m³

Formaldehyde value: after 28 days < 3 µg/m³

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For the product a Material Health Certificate „Silver“ of the Cradle to Cradle Products Innovation Institute is available.

Sociocultural & Functional Quality

SOC 1.3 Acoustic Comfort

The hollow floor system FLOOR and more® acoustic (variants 1 – 4) with perforated panels is ideal for improvement of the room acoustics. Depending on the execution sound absorption values of 0.45 up to 0.65 can be reached by means of the perforation of panels and the use of qualified top coverings or rather acoustically effective hollow space damping. The values are tested in the echo chamber according to ISO 354 and valuated according to DIN EN ISO 11654.

SOC 2.1 Accessibility

With the hollow floor system all requirements of the generally accepted rules of technology are implemented. This supports the instructed architects or experts during planning and execution.

Technical Quality

TEC 1.2 Sound Insulation

The hollow floor system FLOOR and more® can contribute to achieve DGNB requirements. For the hollow floor system FLOOR and more® laboratory tests according to DIN EN ISO 10140 respectively DIN EN ISO 10848 were executed corresponding to the required sound transmission paths. Depending on the required quality level different improvement values for reaching the total sound protection can be achieved with the different panel thicknesses of 30 mm to 38 mm.

TEC 1.5 Cleanability

The cleaning of the raised floor system depends on the respective laid or rather applied coverings. For the different coverings the cleaning instruction for coverings on system floors as well as the cleaning instructions of the covering manufacturer have to be considered.

TEC 1.6 Deconstruction and Disassembly

A material exploitation of the calcium sulphate panels and the steel components is possible.

Process quality

PRO 1.5 Documentation for Facility Management

User, maintenance and care guidelines for the individual products are available. These are documented and provided to the executing service providers.

PRO 2.1 Environmental Impact of Construction

As the products are delivered in modular components that only have to be modified punctually, they contribute to a low-waste, low-noise and low-dust building site. For the waste of the processing the Lindner intern procedural rules for waste disposal are decisive. The packing for the individual products is chosen in a way that as less waste as possible is caused.

PRO 2.2 Construction Quality Assurance

If required, data sheets for the used products and components can be provided.

CERTIFICATION SYSTEM LEED

Not listed credits do not apply for this product.



Sustainable Site

Construction Activity Pollution Prevention

The compliance with project-specific requirements of an ESC plan is guaranteed by the in-house specialist departments. A complete ESC plan can be issued and implemented by the specialists on request.

Energy and Atmosphere

Fundamental Refrigerant Management

Water is the only coolant which is used for Lindner products. It is free of any additions.

Enhanced Refrigerant Management

Water is the only coolant which is used for Lindner products. It is free of any additions.

Materials and Resources

Construction and Demolition Waste Management Planning

Waste that cannot be avoided on site will be preferentially returned to recycling processes via waste management companies. A complete CWM plan can be issued and implemented by the specialists on request.

Building Life Cycle Impact Reduction

The hollow floor system FLOOR and more® has a long lifetime in which the calcium sulphate panel can be dismantled controlled and reused after minor treatment.

For the product an eco-balance according to DIN EN 15804 is available. Information on the building balance can be taken from this document. The balance can be found on the homepage of the company Lindner.

For this product a project-specific eco-balance can be issued on request in compliance with the applicable regulations. An additional expenditure of time and costs need to be considered if applicable.

Building Product Disclosure and Optimization – Environmental Product Declaration

For the eco-balance of the Lindner floor systems eco-balance data from the available verified EPD's can be taken.

Declaration number: [EPD-LIN-20170194-IBD1-EN](#)

Furthermore, project-specific eco-balance data can be issued contemporary.

In this context an additional expenditure of time and cost shall be considered if applicable.

Building Product Disclosure and Optimization – Material Ingredients

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

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.

Construction and Demolition Waste Management

The compliance with project-specific requirements with regards to a low-waste, low-noise and low-dust building site as well as measures for ground and groundwater protection is guaranteed by our in-house specialist department. A corresponding proof can be issued and implemented on request by the specialists. Due to the delivery of ready-made floor elements that do not need to be treated on site, our product contributes to a low-noise and low-dust building site. The packing for the individual products is chosen in a way that as less waste as possible is caused.



LEED v4.0 Building for High Performance Green Buildings



Materials and Resources

Building Product Disclosure and Optimization – Sourcing of Raw Materials

Components	Weight proportion (%)	Recycling part (%)		Production site
		Pre-Consumer	Post-Consumer	
Calcium sulphate panel	~ 95.0	100	0	Dettelbach
Hollow floor pedestal	~ 4.0	0	30	Arnstorf
Pedestal glue	< 0.5	0	0	Arnstorf
Installation glue	< 0.5	0	0	Arnstorf
Floor sealant	< 0.5	0	0	Arnstorf
Gaskets	< 0.5	0	0	Arnstorf
Locking glue	< 0.5	0	0	Arnstorf
Edge sealant	< 0.5	0	0	Arnstorf
Wall connection tape	< 0.5	0	0	Arnstorf
Glue application	< 0.5	0	0	Arnstorf
Hot-melt glue	< 0.5	0	0	Arnstorf
Edge trim	< 0.5	0	0	Arnstorf
Humidity protection	< 0.5	0	0	Arnstorf
Covering	< 0.5	0	0	
Total	100		48.2	

The product FLOOR and more® does not contain any wood-based materials. Therefore a FSC / PEFC proof is not required.



Indoor Environmental Quality

Minimum Acoustic Performance

The hollow floor system FLOOR and more® can contribute to achieve the LEED requirements. For the hollow floor system FLOOR and more® laboratory tests according to DIN EN ISO 10140 respectively DIN EN ISO 10848 were executed corresponding to the required sound transmission paths. Depending on the required quality level different improvement values for reaching the total sound protection can be achieved with the different panel thicknesses of 30 mm to 38 mm.

Low Emitting Materials

Lindner floor systems are made of materials that are nearly free of any emission as for example VOC and formaldehyde. Test chamber measurements according to the requirements of the quality mark Indoor Air Comfort GOLD® (e. g. AgBB measurement scheme) are available as proof.

TVOC (AgBB/DIBt): after 28 days < 5 µg/m³

Formaldehyde value: after 28 days < 3 µg/m³

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Construction Indoor Air Quality Management Plan

The compliance with project-specific requirements of an IAQ plan is guaranteed by our in-house specialist departments. A complete IAQ plan can be issued and implemented by the specialists on request.

Indoor Air Quality Assessment

Lindner floor systems are made of materials that are nearly free of any emission as for example VOC and formaldehyde. Test chamber measurements according to the requirements of the quality mark Indoor Air Comfort GOLD® (e. g. AgBB measurement scheme) are available as proof.

TVOC (AgBB/DIBt): after 28 days < 5 µg/m³

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Acoustic Performance

The hollow floor system FLOOR and more® acoustic (variants 1 – 4) with perforated panels is ideal for improvement of the room acoustics. Depending on the execution sound absorption values of 0.45 up to 0.65 can be reached by means of the perforation of panels and the use of qualified top coverings or rather acoustically effective hollow space damping. The values are tested in the echo chamber according to ISO 354 and valued according to DIN EN ISO 11654.

CERTIFICATION SYSTEM BREEAM

Not listed characteristics do not apply for this product.



Management

Man 02 Life cycle cost and service life planning

Lindner products have a long lifetime in consequence of the raw materials, the manufacturing processes as well as the high production quality. Furthermore, certain products can be dismantled controlled and reused after minor treatment (C2C). For the hollow floor system FLOOR and more® an eco-balance according to DIN EN 15804 which provides information on the building balance is available.

The useful life of hollow floors is up to 50 years (acc. to BBSR table, code no. 352.911, issue 02/2017, published by the Federal Institute for Building, Urban Affairs and Spatial Development). By means of the internal return system it is guaranteed that the components are not disposed but flow into the recycling circuit.

Man 03 Responsible construction practices

All companies of the Lindner Group comply with the requirements of the environmental management system. For companies within the Lindner Group which are certified according to ISO 14001, ISO 50001, SCC** and OHAS further specific environmental and safety aims are defined in connection with the yearly management review.

The realization of environmental protection and all of relevant statutory rules are defined in the Lindner-intern guideline called “environmental protection”.



Health and Wellbeing

Hea 02 Indoor air quality

Lindner floor systems are made of materials that are nearly free of any emission as for example VOC and formaldehyde. Test chamber measurements according to the requirements of the quality mark Indoor Air Comfort GOLD® (e. g. AgBB measurement scheme) are available as proof.

TVOC (AgBB/DIBt): after 28 days < 5 µg/m³

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Hea 05 Acoustic performance

The hollow floor system FLOOR and more® acoustic (variants 1 – 4) with perforated panels is ideal for improvement of the room acoustics. Depending on the execution sound absorption values of 0.45 up to 0.65 can be reached by means of the perforation of panels and the use of qualified top coverings or rather acoustically effective hollow space damping.

The values are tested in the echo chamber according to ISO 354 and valuated according to DIN EN ISO 11654.

Hea 18 Volatile organic compounds (In-Use only)

Lindner floor systems are made of materials that are nearly free of any emission as for example VOC and formaldehyde. Test chamber measurements according to the requirements of the quality mark Indoor Air Comfort GOLD®

(e. g. AgBB measurement scheme) are available as proof.

TVOC (AgBB/DIBt): after 28 days < 5 µg/m³

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Materials

Mat 01 Life cycle impacts

For the balance of the building we can provide product-specific information. Due to the longevity of the floor systems Lindner guarantees a reuse of the products for the whole useful time.

Mat 03 Responsible sourcing of construction products

The hollow floor system consists of materials with high recycling part. The calcium sulphate panel (main part of the system) is 100 % recyclable (pre-consumer). The scrap iron part of the steel pedestals is about 30% (post-consumer). Close suppliers are preferred. The company Lindner is certified according to DIN EN ISO 14001.

Mat 06 Material efficiency

Lindner hollow floor systems are produced project-specific so that they can be installed on site as low-waste as possible. Waste that cannot be avoided on site will be preferentially returned to recycling processes via waste management companies.

Waste

Wst 01 Construction waste management

Lindner hollow floor systems are produced project-specific so that they can be installed on site as low-waste as possible. Waste that cannot be avoided on site will be preferentially returned to recycling processes via waste management companies.

Due to the controlled assembly in the factory, unnecessary sources of error can be avoided.

A complete CWM plan can be issued and implemented by the specialists on request.

Wst 06 Functional adaptability (non-residential only)

Lindner products have a long lifetime. The useful life of hollow floors is up to 50 years (acc. to [BBSR table](#), code no. 352.911, issue 02/2017, published by the Federal Institute for Building, Urban Affairs and Spatial Development). The hollow floor system FLOOR and more® is a product with optimum reuse and further utilization possibilities.

With leasing systems and redemption guarantees all materials can be integrated in our production cycles. In this context complete material components can be reused or made available as raw material by means of recycling.

The calcium sulphate panel (main part of the system) is 100 % recyclable (pre-consumer). The scrap iron part of the steel pedestals is about 30% (post-consumer). Lindner products are designed in a way that they can be easily dismantled without any damages what enables to easy changes of the use of the building.

Pollution

Pol 05 Reduction of noise pollution

The hollow floor system FLOOR and more® acoustic (variants 1 – 4) with perforated panels is ideal for improvement of the room acoustics. Depending on the execution sound absorption values of 0.45 up to 0.65 can be reached by means of the perforation of panels and the use of qualified top coverings or rather acoustically effective hollow space damping.

The values are tested in the echo chamber according to ISO 354 and valuated according to DIN EN ISO 11654.



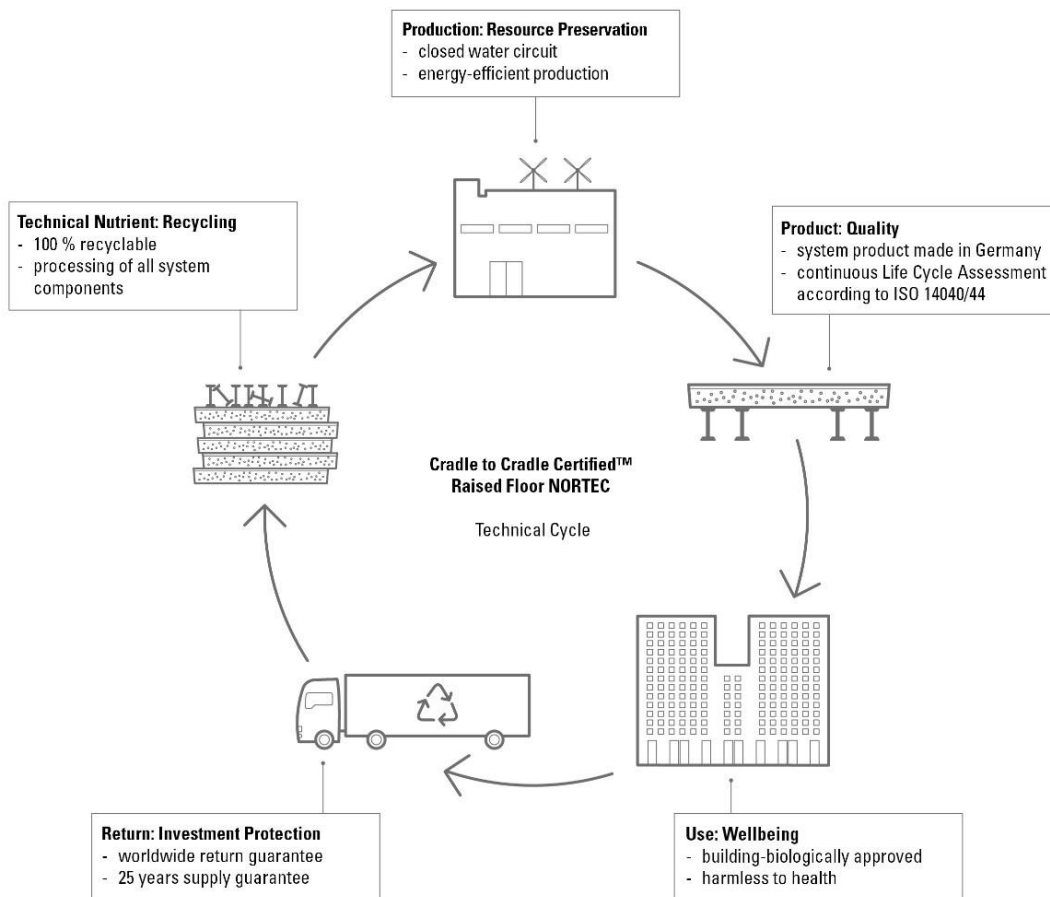
PRODUCT CERTIFICATION CRADLE TO CRADLE®

Information on Cradle to Cradle®

The hollow floor system FLOOR and more® is worldwide the first in its kind with a Cradle to Cradle® certification TM. Certificate number: 3340

Due to the transfer of the Cradle to Cradle® thoughts we avoid waste, toxic substances and pollution. The 100 % technical cycle, we are striving for, allows a separation of types and nearly a whole reuse of all materials.

- Protection of prospective generations and eco systems through care of natural resources
- Security by choosing high-quality and contaminant-free materials
- Redemption guarantee ensured / offers waste disposal safety
- Safe environment for all building user





Material Health



The parts of the hollow floor system FLOOR and more® have to be secure and easily digestible for health and environment.

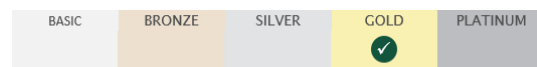
Lindner develops hollow floor systems which are environmentally friendly and also healthy for the human being from the production up to the usage and reuse.

We know the chemical components of the material our products are made of and we are still optimizing to develop even safer materials. To fulfil several criteria of environmental tolerance and also the human health, system components were modified and also replaced.

Emission tests according to national and international standards (e. g. AgBB scheme) assure low-emission and harmless materials.



Material Reutilization



The hollow floor system FLOOR and more® is a product with optimal reuse and further utilization possibilities. By means of easy screw and hooking-in systems a damage-free dismantling with subsequent reuse is possible. At the end of the utilization phase a correctly sorted separation of all components is possible.



Renewable Energy



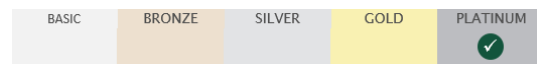
With certified environment management and in-house eco-balancing, the whole Lindner Group takes a stand for e.g. energy reduction to reduce their ecological footprint of their production process.

Currently the part of sustainable energy is 37 %.

We are still working on an increase of the share of sustainable energy in our production. Our prioritized aim is it, to save energy in all of our production processes.



Water Stewardship

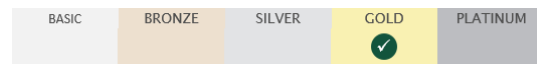


A water cycle concept systematically reduces our water consumption.

Due to sedimentation and cleaning of the solid matter, the necessary process water can stay in the water cycle. In this way the fresh water consumption is reduced to a minimum.



Social Fairness



The most important principle of the company is that the employee is the middle of the company. For this reason the compliance rules for employees were defined: "Our values".

The Lindner Group is involved in several social projects which are oriented regional and also national.

In 1991 the "Hans Lindner Stiftung" was founded which is a benefit to the public.

As we are a responsible producer, we are certified acc. to the international environment management norm ISO 14001. It serves the further development of our management for low resources and the further environment.