

# Raised Floor – System NORTEC

**Self-declaration acc. to DIN EN ISO 14021**

**Holder of the declaration:** Lindner SE | 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

#### Raised floor NORTEC

Raised floors are a sub construction type of system floor constructions for the interior fit-out of buildings that consist of factory-made industrial prefabricated modular components (raised floor panels, substructure elements and building elements as accessories).

#### 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 raised floor system NORTEC with a panel thickness of 30 – 38 mm.

### Base material

#### Base material per m<sup>2</sup> raised floor and a construction height of 150 mm FFL

System components	Material	Weight proportion (%)
Calcium sulphate panel*	FGD gypsum, cellulose	~ 95.0
Pedestals*	Galvanised steel	~ 3.5
Pedestal glue*	Polyurethane / SMP	< 0.5
1C floor sealant*	Synthetic resin dispersion	< 0.5
2C floor sealant*	Epoxy resin	< 0.5
Gaskets*	PP/PE	< 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
Hot-melt glue*	Ethylene vinyl acetate	< 0.5
Edge trim*	PVC / ABS	< 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. Therefore the most NORTEC variants are certified FSC™ Recycled 100%.

#### 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 credits do not apply for 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 can be taken from the available verified EPD's.

Declaration number: EPD-LIN-20210022-IBA1-ENN

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/EMICODE	Other
FGD gypsum	~ 89.0	-	-	-
Cellulose	~ 6.0	-	-	-
Pedestals	~ 3.5	-	-	-
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	-	EC 1 (plus)	-
Edge trim	< 0.5	-	-	-
<b>Total</b>	<b>100</b>	<b>13 µg/m<sup>3</sup>*</b>		

\*) Test measures showed a value of 13 µg/m<sup>3</sup> = 0.013 mg/m<sup>3</sup> after 28 days. The evaluation limit according to AgBB/DIBt is 1 mg/m<sup>3</sup>.  
 „-“ for „not relevant“ according to DGNB 2018

It can be maintained up to quality level 4.

### ENV 1.3 Responsible Procurement

Our calcium sulphate panels can be delivered FSC<sup>TM</sup>-certified and comply to all necessary requirements.

Certificate number: TUEV-COC-000515

Licence number: FSC-C119815

## Economical Quality

### ECO 1.1 Life Cycle Costs

Lindner raised floor systems are produced according to the highest international standards. The useful life of raised 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 raised 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 2.1 Flexibility and Adaptability

Every raised floor panel can be revised, moved or replaced individually.

### ECO 2.2 Market Ability

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



### Soziokulturelle & Funktionale Qualität



Die Lindner Group ist  
Mitglied der  
**DGNB**<sup>1</sup>  
Deutsche Gesellschaft für Nachhaltiges Bauen  
German Sustainable Building Council

#### SOC 1.1 Thermal Comfort

The raised floor system NORTEC comfort obeys the limiting value of the floor of max. 29 °C.

#### SOC 1.2 Indoor Air Quality

Lindner raised 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 (EN 16516): after 28 days 13 µg/m<sup>3</sup>

Formaldehyde value: after 28 days < 3 µg/m<sup>3</sup>

Report number: 392-2019-00277901\_A\_EN

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

#### SOC 1.3 Acoustic Comfort

The raised floor system NORTEC 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 raised 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 raised floor system NORTEC can contribute to achieve DGNB requirements.

For the raised floor NORTEC laboratory tests according to DIN EN ISO 10140 respectively DIN IN 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

Every raised floor panel can be dismantled individually and damage-free and separated by type. The substructure can also be dismantled damage-free. 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 raised floor system NORTEC 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-20210022-IBA1-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 **C**hemicals) 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 v4.1 BD+C: Commercial Interiors © 2017 U.S. Green Building Council (USGBC) Inc.

### 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
Raised floor pedestal	~ 3.5	0	30	Arnstorf
Pedestal 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	
<b>Total</b>	<b>100</b>		<b>48.6</b>	

Our calcium sulphate panels can be delivered FSC™-certified and comply to all necessary requirements.  
 Certificate number: TUEV-COC-000515  
 Licence number: FSC-C119815

### Indoor Environmental Quality

#### Minimum Acoustic Performance

The raised floor system NORTEC can contribute to achieve the LEED requirements.  
 For the raised floor NORTEC laboratory tests according to DIN EN ISO 10140 respectively DIN IN 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 / Indoor Air Quality Assessment

Lindner raised 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 (EN 16516): after 28 days 13 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.

#### Acoustic Performance

Das Doppelbodensystem NORTEC acoustic (Variante 1 – 4) mit perforierten Platten eignet sich ideal zur Verbesserung der Raumakustik. Durch Lochung der Hohlbodenplatten und durch Einsatz qualifizierter Oberbeläge bzw. akustisch wirksamer Hohlraumbedämpfung werden je nach Ausführung Schallabsorptionsgrade von 0,45 bis 0,65 erreicht. Die Werte werden im Hallraum nach ISO 354 geprüft und nach DIN EN ISO 11654 bewertet.

### 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 raised floor system NORTEC an eco-balance according to DIN EN 15804 which provides information on the building balance is available.

The useful life of raised 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 flown 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 raised 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.

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### Hea 05 Acoustic performance

The raised floor system NORTEC 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 raised 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 (EN 16516): after 28 days 13 µg/m<sup>3</sup>

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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 raised floor systems Lindner guarantees a reuse of the products for the whole useful time.

#### **Mat 03 Responsible sourcing of construction products**

The raised floor system consists of materials with high recycling part. The scrap iron part of the steel pedestals is about 30% (post-consumer). Close suppliers are preferred. The calcium sulphate panel (main part of the system) is 100 % recyclable (pre-consumer).

Furthermore our calcium sulphate panels can be delivered FSC™-certified and comply to all necessary requirements.

Certificate number: TUEV-COC-000515

Licence number: FSC-C119815

The company Lindner is certified according to DIN EN ISO 14001.

#### **Mat 06 Material efficiency**

Lindner raised 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 raised 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 raised 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 raised floor NORTEC 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 raised floor system NORTEC 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.





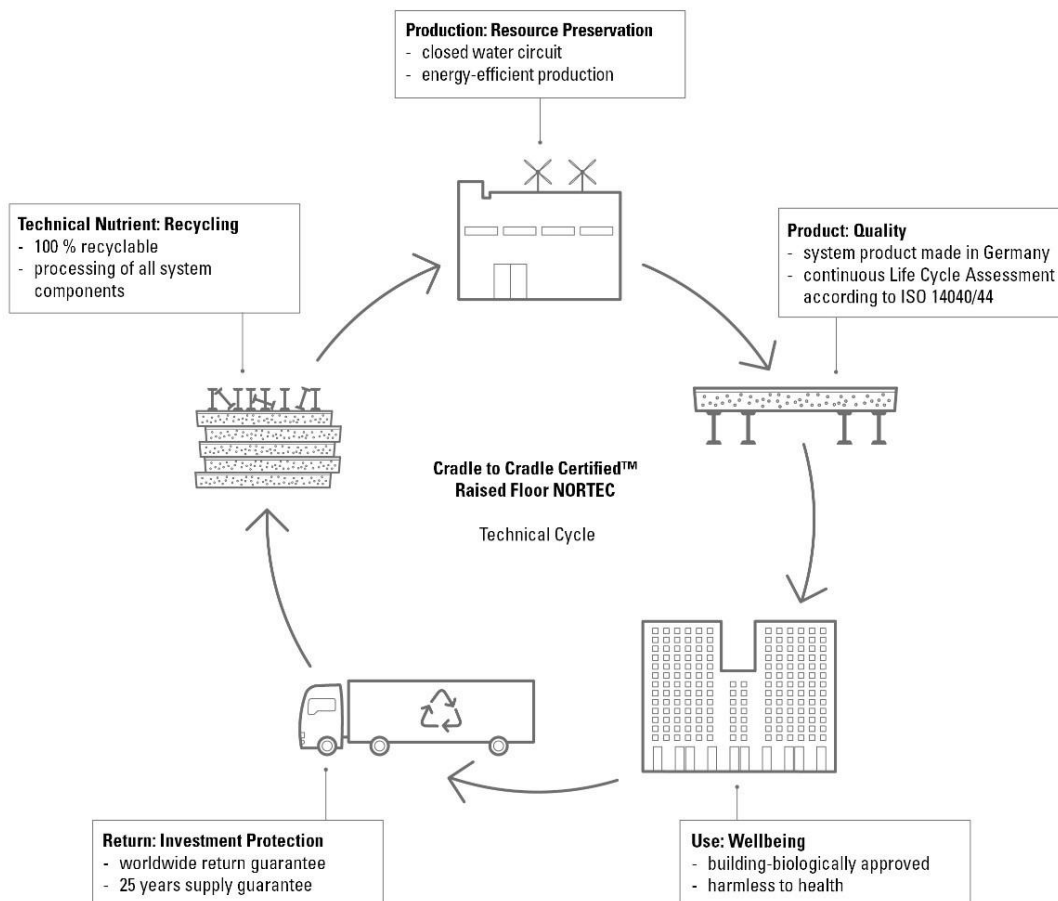
### PRODUCT CERTIFICATION CRADLE TO CRADLE®

#### Information on Cradle to Cradle®

The raised floor system NORTEC is worldwide the first in its kind with a Cradle to Cradle® certification TM. Certificate number: 3873

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 floor system have to be secure and easily digestible for health and environment.

Lindner develops raised 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 raised floor NORTEC is a product with ideal reuse and recycling possibilities. A separation of all components is possible at the end of the phase of usage. The carrier panel from calcium sulphate can be recycled to 100 % and be returned to the production cycle. The steel pedestals can also be recycled after conversions or demolition.



### Renewable Energy



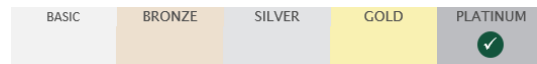
With certified environment management and in-house eco-balancing, the whole Lindner Group takes a stand for e.g. energy reduction to reduce their ecological footprint of their production process.

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

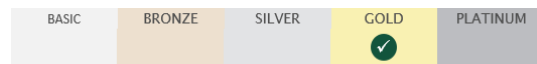


A water cycle concept systematically reduces our water consumption.

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.