

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1

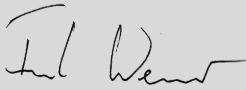
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FLOOR and more® hollow floor Lindner Group

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1. General Information

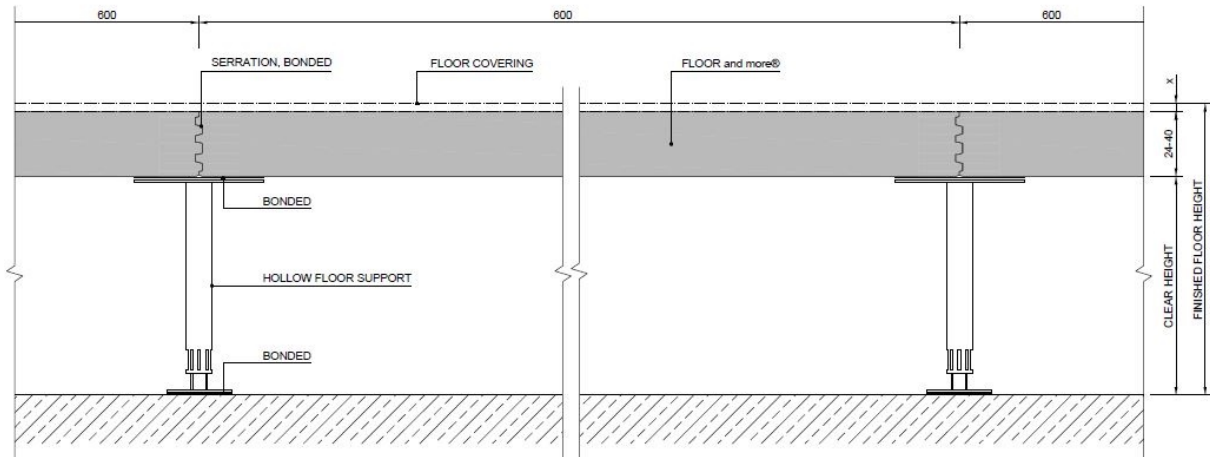
<p>Lindner Group</p> <hr/> <p>Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-LIN-20170194-IBD1-EN</p> <hr/> <p>This declaration is based on the product category rules: System floors, 12.2018 (PCR checked and approved by the SVR)</p> <hr/> <p>Issue date 11.12.2017</p> <hr/> <p>Valid to 10.12.2023</p> <hr/> <p></p> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer (chairman of Institut Bauen und Umwelt e.V.)</p> <hr/> <p></p> <hr/> <p>Dr. Burkhard Lehmann (Managing Director Institut Bauen und Umwelt e.V.)</p>	<p>FLOOR and more® hollow floor system</p> <hr/> <p>Owner of the declaration Lindner Group Bahnhofstr. 29 94424 Arnstorf</p> <hr/> <p>Declared product / declared unit 1 m² FLOOR and more® hollow floor system</p> <hr/> <p>Scope: This EPD relates to the FLOOR and more® hollow floor system. The collected production data are for the year 2016. The hollow floor panel is produced at the Lindner plant in Dettelbach, whereas the substructure is produced in Arnstorf. This document is translated from the German Environmental Product Declaration into English. It is based on the German original version EPD-LIN-20170194-IBD1-DE. The verifier has no influence on the quality of the translation.</p> <p>The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences. The EPD was created according to the specifications of <i>EN 15804+A1</i>. In the following, the standard will be simplified as <i>EN 15804</i>.</p> <hr/> <p>Verification</p> <p>The standard <i>EN 15804</i> serves as the core PCR</p> <p>Independent verification of the declaration and data according to <i>ISO 14025:2010</i></p> <p><input type="checkbox"/> internally <input checked="" type="checkbox"/> externally</p> <hr/> <p></p> <hr/> <p>Dr. Frank Werner (Independent verifier)</p>
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2. Product

2.1 Product description/Product definition

The dry hollow floor system FLOOR and more® is a hollow floor with sealed base course suited for the application of floor coverings; it is supported by a special substructure in order to form a cavity between the base course and the raw ceiling for installation to

accommodate all installations as well as supply and waste lines. Access to the cavity of hollow floors is realised for example by inspection openings or raised floor routes.



The hollow floor system is in essence formed using hollow floor panels and a substructure. For installation, supplementary components (structural adhesive for panel bonding, bare floor sealant, support adhesive, thread sealant, edge sealant and connecting elements for different system floor constructions) are required.

Use of this product is subject to the respective national provisions at the place of use, in Germany for example the building regulations of the federal states and the technical provisions based on this legislation.

The FLOOR and more® hollow floor panels are made from fibre-reinforced plasterboard (with a density of approx. 1,300 – 1,530 kg/m³ and a panel thickness of 24 – 40 mm). Hollow floor panels are by default delivered in dimensions 600 x 600 mm.

Steel supports are used for the substructure and these cater for different construction heights (40 – 2,000 mm).

The EPD results for the production of the FLOOR and more® hollow floor system is applicable to hollow floor panels with a thickness between 24 mm and 40 mm. These different panel types can be combined with different supports. The production processes do not differ.

Surface coverings are not considered in the life cycle assessment, since the possibilities for surface coverings are very varied. This could be a choice of stone, parquet, carpet, etc. Its consideration would not be meaningful for the FLOOR and more® system.

2.2 Application

The hollow floor system named in 2.1 and made from plasterboard, supports and supplementary components is mainly intended for creating cavities / installation spaces in public, commercial and private buildings. The hollow floor system can be covered with all the usual floor coverings, but must be aligned to the system variants.

2.3 Technical Data

Construction data

Name	Value	Unit
System construction (total, FFL)	144 - 160	mm

Layer thickness base course	24 - 40	m
Substructure	120	mm
Grammage system weight	38 - 54	kg/m ²
Density base course	1300 - 1530	kg/m ³
Break load /EN 13213/	4 - 10	N
Point load /EN 13213/	2 - 5	kN
Deflection /EN 13213/	2	mm
Fire protection /EN 13501/DIN 4102/ building material class resistance*	A1/A2	-
Fire protection /EN 13501/DIN 4102/ fire resistance*	REI 30/60 F30	-
Noise protection laboratory values; VDI 3762 is to be observed)* standard side noise level difference D nfw	42 - 59	dB
Formaldehyde emissions acc. to EN 717-1	-	µg/m ³
Sound insulation (laboratory values; VDI 3762 is to be observed)* sound insulation factor R w	62 - 64	dB
Sound insulation (laboratory values; VDI 3762 is to be observed)* standard side footfall noise level L nfw	73 - 37	dB
Sound insulation insulation (laboratory values; VDI 3762 is to be observed)* footfall noise level abatement ΔLw	10 - 31	dB

*= The listed values show the complete testing range of the FLOOR and more® hollow floor.

The values for the system variants may deviate and were evidenced by individual test reports.

Product performance values in terms of its characteristics as per the decisive technical stipulation. (Not a CE approval mark).

2.4 Delivery status

Hollow floor panels (600 mm x 600 mm) are delivered stacked on pallets. Steel supports and further individual components are packed in cardboard boxes and delivered on pallets.

2.5 Base materials/Ancillary materials

Description	Value	Unit
Fibre-reinforced plasterboard	94-96	%
Supports (zinc-plated)	2-4	%
Support adhesive (PU/SMP)	< 0.5	%
Structural adhesive	< 0.5	%
Bare floor sealant (synthetic resin dispersion, epoxy resin)	< 0.5	%
Thread sealant (synthetic resin dispersion)	< 0.5	%
Edge sealant (synthetic resin dispersion)	< 0.5	%
Wall connection strip (PE foam)	< 0.5	%

The product weight with regard to the declared unit is approx. 48.40 kg.

2.6 Manufacture

Production and treatment of the fibre-reinforced plasterboard:

The main raw materials Alpha hemihydrate, Beta gypsum and cellulose fibre are mixed, water is added, and then they are pressed under high pressure to form rugged panels which are dried and cut to the required formats.

Further production steps include the milling of serrations into the sides of the panels.

Production of the supports:

The supports are produced by resistance welding or clinching the individual components; tubes, threaded rods and sheet steel.

Electroplating (galvanic zinc coating) applies a zinc coating to the supports to protect them from corrosion.

Lindner Group operates a quality management system in conformity with /EN ISO 9001/.

2.7 Environment and health during manufacturing

The production of fibre-reinforced plasterboards and hollow floor supports is carried out in facilities approved under environmental protection provisions. As far as possible, process water used is contained in a closed circle. Most of the gypsum waste is recycled within the plant.

Lindner Group operates an energy management system in conformity with /EN ISO 50001/ and an environmental management system as per /EN ISO 14001/.

2.8 Product processing/Installation

The individual components delivered to a construction site are joined to create a FLOOR and more® flooring system.

Please refer to the installation guideline for further instructions. Installation must be carried out by trained personnel.

2.9 Packaging

Hollow floor panels are delivered stacked on pallets, wrapped with paper or cardboard, strapped with plastic tape and wrapped in plastic film, if required. Hollow floor supports and the other individual components are stacked or layered in cardboard packaging.

The packaging material is easy to separate and could be used or utilised elsewhere. The remainder can be collected unmixed and taken to the regional recycling

centre. Residual materials are to be disposed of according to the relevant national provisions.

2.10 Condition of use

The service life of the hollow floor system taken into account in this document is generally intended as indoor construction for the whole lifetime of the building. Long years of experience show that there are no relevant changes to be expected with regard to the material composition during the time of use of the FLOOR and more® hollow floor system.

2.11 Environment and health during use

No health hazards and impairments are to be expected based on current knowledge in the case of normal, appropriate use intended for hollow floor systems. For further details see Section 7. Exposure to air, water and soil cannot arise with proper use of the described products according to the current state of knowledge.

2.12 Reference service life

A reference service life according to ISO 15686 cannot be calculated for this product. The technical service life is therefore derived from the table "Service life of components for life-cycle analysis according to the rating system for sustainable construction (Bewertungssystem Nachhaltiges Bauen – BNB) – Code No. 352.911" of the Federal Office for Construction and Regional Planning /BBSR/. The BNB assumes that hollow floor systems will last for more than 50 years. Proper use, preservation and care are prerequisites for the stated service life.

2.13 Extraordinary effects

Fire

Fibre-reinforced plasterboards are "non-flammable" and are classified in building material class A1 and A2 according to /EN 13501-1/ and /DIN 4102-1/.

Fire prevention

Name	Value	Unit
Building material class	A1/A2	-

Water

Lindner's FLOOR and more® hollow floor system is to be constructed indoors and should not generally come into contact with water. Short exposure to moisture will not damage the system provided it can then dry completely. Exposure of the hollow floor system to greater amounts of water over a longer period will not give rise to the leaching of substances that could pollute watercourses. There may however be impairment of its technical properties, as Lindner hollow floor systems are not water resistant and the panels tend to swell and the supports corrode in very damp, wet surroundings.

Mechanical destruction

The durability and functionality of the system will be impaired in the event of mechanical destruction. Depending on the extent of the destroyed areas, these can be rebuilt by replacement or new installation without impairing functionality.

2.14 Re-use phase Reuse / recycling

After appropriate treatment, fibre-reinforced plasterboards can be recirculated as raw material into the production process of new panels thus closing the material circle.

It is recommended that the hollow floor supports are 100% recycled.

2.15 Disposal

Any hollow floor panel remnants on the construction site or from dismantling activities should first and foremost be sent for material recycling.

If this is not possible, disposal is to be effected according to the following waste codes: /17 08 02/ Materials on gypsum basis except for those subject to /17 08 01/. /17 04 05/ Iron and steel.

2.16 Further information

Further product information at:
www.Lindner-Group.com

3. LCA: Calculation rules

3.1 Declared Unit

The declared unit relates to 1 m² FLOOR and more® hollow floor without floor covering and with an average floor panel thickness of 36.46 mm and average density of 1,304 kg/m³. For the installation of the floor panel, 4 support per m² are required.

The panel thickness within the product family varies from 24 – 40 mm and the raw density from 1,300 – 1,530 kg/m³.

The declared unit has a weight of 47.6 kg/m² for the panel plus 0.805 kg for the corresponding supports (0.2014 kg per support). The total weight of the hollow floor system is 48.4 kg.

For the steel supports, the most widely used common supports are declared: Type L1, 120 mm, unit weight 0.2014 kg/unit

Optionally, it is possible to combine the panels with supports for construction heights between 40 and 2,000 mm.

A surface covering is not considered in the life cycle assessment, since the possibilities for coverings are very varied. This could be a choice of parquet, linoleum, carpet, etc.

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Grammage (including substructure)	48.4	kg/m ²
Gross density	1425	kg/m ³
conversion factor [Mass/Declared Unit]	48.4	-
Layer thickness	0.034	m

For IBU core EPDs (where clause 3.6 is part of the EPD): for average EPDs, an estimate of the robustness of the LCA values must be made, e.g. concerning variability of the production process, geographical representativeness and the influence of background data and preliminary products compared to the environmental impacts caused by actual production.

3.2 System boundary

The life cycle analysis for the FLOOR and more® hollow floor system includes the stages "cradle to gate with options".

Consideration is given to Modules A1–A3 as a combined module for the production phase, A4–A5 (deployment phase), and B1-B2 (use as well as maintenance and repair).

In particular, the following processes were included in information module A1–A3 for production of the FLOOR and more® hollow floor system:

- Raw material provision processes (gypsum, cellulose, steel – module A1)
- Transport of the raw and auxiliary materials and consumables to the plant (A2)
- Production processes for the system product in the plant, including the energy costs (power, thermal energy and disposal of residual substances (A3)
- Production of packaging materials (A3)
- Transport from the factory gate to the construction site (A4)
- Disposal of the packaging materials (A5)
- Use of the hollow floor (B1) and its maintenance and repair (B2)

The modules are declared with 0 for the use phase (B1–B2). During the use phase the product causes no environmental impacts.

The product itself has no need of maintenance.

3.3 Estimates and assumptions

Approximate data sets are applied for cellulose fibres and adhesives as well as for certain chemicals used in the process for electroplating the raised floor supports.

3.4 Cut-off criteria

All data collected from operation data were taken into account for balancing: Materials with < 1 % by weight of the total system and with no adequate background data were neglected. A total of less than 0.8 % of the input data of the whole dry hollow floor system were not balanced.

3.5 Background data

The software system for holistic balancing /GaBi 8/ developed by thinkstep AG was used for modelling the life cycle of the product concerned (ServicePack 33).

The data required for the prior chain, for which no specific details are available, were taken from the GaBi database:

/http://www.gabisoftware.com/support/gabi/gabi-database-2016-lcidocumentation/.

3.6 Data quality

Small uncertainties arise from the background data resulting from provision of the GaBi databases and these have to be considered in interpreting the results. The background data are not more than 5 years old. The quality of the data can be rated as good.

3.7 Period under review

The base data for the life cycle assessment was collected in 2016.

3.8 Allocation

The total production of Lindner AG includes further products in addition to the concerned product. The data collection values for thermal and electrical energy and raw materials accordingly relate to the product being declared.

The production processes of the fibre-reinforced plasterboards cannot be divided into different subprocesses. The declared product and further products produced in the production line follow the same production steps.

The only difference between the FLOOR and more® fibre-reinforced plasterboard and the other products is the density and thickness of the panel. This panel is referred to as raw panel. Therefore, the allocation is based on physical properties, which is mass in this case. The production data are allocated according to the annual quantity of the FLOOR and more® panel

according to mass. The raw materials and energy are calculated according to this allocation key.

In the production of the supports, the amounts of raw materials and energy for the reference year 2016 are also known so that a clear allocation according to weight is possible; the conversion on the basis of the existing input materials and the weight of the supports was taken into account.

3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.

The used background database has to be mentioned. The GaBi database was used. (See Section 8, References).

4. LCA: Scenarios and additional technical information

There follows a more detailed description of the scenarios upon which the life cycle assessment was based.

Transport from the manufacturer to the point of use (A4)

Name	Value	Unit
Litres of fuel	0.0437	l/100km
Transport distance	500	km

Maintenance and repair (B2)

The product itself does not require any maintenance; floor cleaning will always depend on the surface covering and usage. The EPD refers purely to the dry hollow floor construction. With normal use repair or replacement is not to be expected during use of the building.

Name	Value	Unit
Information on maintenance	0	-
Maintenance cycle	0	Number/ RSL
Water consumption	0	m ³
Auxiliary	0	kg
Other resources	0	kg
Electricity consumption	0	kWh
Other energy carriers	0	MJ
Material loss	0	kg

Reference service life

A reference service life cannot be calculated for this product. A technical service life of around 50 years is assumed according to the BNB.

Name	Value	Unit
Life Span (according to BBSR)	50	a

5. LCA: Results

Information on the environmental impacts is determined using the characterisation factors given in the CML publication dated April 2015. Long-term emissions are not taken into account. The characterisation factors applied comply with the requirements of Annex C of /EN 15804/.

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	X	X	MNR	MNR	MNR	MND	MND	MND	MND	MND	MND	MND

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² hollow floor system Type FLOOR and more®

Parameter	Unit	A1-A3	A4	A5	B1	B2
Global warming potential	[kg CO ₂ -Eq.]	1.32E+1	1.26E+0	1.26E+0	0.00E+0	0.00E+0
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	1.82E-10	1.59E-13	2.74E-13	0.00E+0	0.00E+0
Acidification potential of land and water	[kg SO ₂ -Eq.]	3.13E-2	2.77E-3	1.27E-4	0.00E+0	0.00E+0
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	5.78E-3	6.51E-4	2.59E-5	0.00E+0	0.00E+0
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	2.53E-3	-8.90E-4	1.02E-5	0.00E+0	0.00E+0
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	6.33E-4	1.31E-7	1.17E-8	0.00E+0	0.00E+0
Abiotic depletion potential for fossil resources	[MJ]	2.74E+2	1.70E+1	2.26E-1	0.00E+0	0.00E+0

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m² hollow floor system Type FLOOR and more®

Parameter	Unit	A1-A3	A4	A5	B1	B2
Renewable primary energy as energy carrier	[MJ]	2.01E+2	1.13E+0	4.02E-2	0.00E+0	0.00E+0
Renewable primary energy resources as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of renewable primary energy resources	[MJ]	2.01E+2	1.13E+0	4.02E-2	0.00E+0	0.00E+0
Non-renewable primary energy as energy carrier	[MJ]	2.98E+2	1.71E+1	2.69E-1	0.00E+0	0.00E+0
Non-renewable primary energy as material utilization	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Total use of non-renewable primary energy resources	[MJ]	2.98E+2	1.71E+1	2.69E-1	0.00E+0	0.00E+0
Use of secondary material	[kg]	8.97E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m ³]	1.14E-1	1.31E-3	3.06E-3	0.00E+0	0.00E+0

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m² hollow floor system Type FLOOR and more®

Parameter	Unit	A1-A3	A4	A5	B1	B2
Hazardous waste disposed	[kg]	3.15E-6	1.08E-6	1.60E-10	0.00E+0	0.00E+0
Non-hazardous waste disposed	[kg]	2.62E+0	1.25E-3	3.00E-3	0.00E+0	0.00E+0
Radioactive waste disposed	[kg]	9.74E-3	1.96E-5	1.73E-5	0.00E+0	0.00E+0
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	1.12E+0	0.00E+0	2.28E-1	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	3.66E+0	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	1.57E+0	0.00E+0	0.00E+0

6. LCA: Interpretation

Global warming potential (GWP)

The global warming potential for the overall product (fibre-reinforced plasterboard and 4 steel supports) is positive relating to the pure production phase. Even if the primary and secondary cellulose used as raw material has a certain share of bonded carbon, this is of little importance. Both the production of steel and the production of Alpha and β hemihydrate causes greenhouse emissions.

The transport to the construction site in A4 as well as the disposal of the packaging only accounts for a minor contribution to the greenhouse potential.

Ozone depletion potential (ODP)

The very low values in the impact category ODP are due to the provided electricity mix. The production of secondary cellulose (test liner) with a percentage of approx. 72 % accounts for a major share.

Acidification potential (AP)

The generation of electrical energy with approx. 27 % accounts for a major share. Just like for the greenhouse potential, the production of steel for the substructure ranks second with 17 % followed by the processing of secondary cellulose in the form of the "test liner" with approx. 15 %.

Eutrophication potential (EP)

For this environmental impact, the production of secondary cellulose is of importance. It has a share of 27 %, followed by the generation of electrical energy. The low amount of steel which is required for the

substructure accounts for approx. 9 % of the eutrophication potential, gypsum for approx. 8 %.

Photochemical oxidant creation potential (POCP)

The photochemical oxidant creation potential is mainly caused by the production of steel with a total share of approx 52 %, both by the generation of electrical energy and by the provision of primary and secondary cellulose. The use of thermal energy also makes a relatively average contribution.

Abiotic degradation potential for fossil fuels (ADPF)

Fossil resources are mainly required for the provision of gypsum (27 %), the production of secondary cellulose and the generation of electrical energy.

Abiotic degradation potential for elemental fuels (ADPE)

The provision of plaster for the β hemihydrate accounts for a significant share. With a contribution of 98 %, it is the major consumer of non-renewable resources.

Non-renewable primary energy consumption

The provision of gypsum rock accounts for the consumption of non-renewable primary energy with a share of approx. 26 %, in addition to the provision of electrical energy (24 %), thermal energy generated from natural gas (17 %) and secondary cellulose (16 %).

7. Requisite evidence

7.1 Formaldehyde

For the production of the product, no formaldehydes are used.

7.2 MDI

For the production of the product, no MDI adhesive systems are used.

7.3 Inspection for pretreatment of the input materials

The declared product does not contain any "waste wood" resources in its basic materials. A basis for inspection according to the AltholzVO (German Waste Wood Ordinance) is not given.

7.4 Toxicity of fire gases

The product is non-flammable and evidence of the toxicity of fire gases is thus not relevant. A toxicological study was conducted.

7.5 VOC emissions

Test report no. G02003A2 of 22 July 2010 is available for the FLOOR and more® hollow floor system. The test institute was /Eurofins Product Testing/ A/S, Smedeskovvej 38, DK-8464 Galten, Denmark.

German Committee for Health-Related Evaluation of Building Products (AgBB) performance summary (28 days)

Name	Value	Unit
TVOG (C6 - C16)	5,1	$\mu\text{g}/\text{m}^3$
Sum SVOC (C16 - C22)	4 - 5	$\mu\text{g}/\text{m}^3$
R (dimensionless)	0.0035	-
VOC without NIK	4 - 5	$\mu\text{g}/\text{m}^3$

The investigated product is suitable for being used in indoor spaces according to the "admission principles for health-related evaluation of building products in indoor spaces" (DIBt report 10/2008) in connection with the AgBB NIK values in the version dated March 2008.

8. References

Standards

EN 15804

EN 15804:2012-04+A1 2013, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

EN 15804

EN 15804:2019+A2 (in press), Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products.

ISO 14025

DIN EN ISO 14025:2011-10, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

Further References**Title of the software/database**

Title of the software/database. Addition to the title, version. Place: Publisher, Date of publication [Access on access date].

IBU 2016

Institut Bauen und Umwelt e.V.: General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V. Version 1., Berlin: Institut Bauen und Umwelt e.V., 2016.
www.ibu-epd.com

/DIN EN 1081/

DIN EN 1081:1998-04, Resilient floor coverings - Determination of the electrical resistance

/DIN EN 13501-01/

DIN EN 13501-01:2010-01, Fire classification of construction products and building elements - part 1: Classification using data from reaction to fire tests

/DIN EN 13501-02/

DIN EN 13501-02:2016-12, Fire classification of construction products and building elements - part 2: Classification using data from fire resistance tests, excluding ventilation services

/DIN EN 13213/

DIN EN 13213:2001-12: Hollow floors

/AgBB/

AgBB: The German Committee for Health-Related Evaluation of Building Products

/BBSR/

The Federal Institute for Building, Urban Affairs and Spatial Research

/DIN 4102/

DIN 4102-1:1998: Fire behaviour of building materials and building components – part 1: Building materials; concepts, requirements and tests

DIN 4102-2:1977-09: Fire behaviour of building materials and building components – part 2: Components; concepts, requirements and tests

/ISO 9001/

ISO 9001:2015-09, Quality management systems - requirements

/ISO 14001/

ISO 14001:2015-09, Environmental management systems - requirements with guidance for use

/ISO 50001/

ISO 50001:2011-06, Energy management systems - requirements with guidance for use

/IBU 2017 part A/

PCR – part A: Calculation rules for life cycle assessment and requirements for the background report, Version 1.6, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2017

/IBU 2016 part B/

PCR – part B: Requirements for the EPD for floor coverings, Institut Bauen und Umwelt e.V. www.bau-umwelt.com, 2017-04
www.ibu-epd.com

/VDI 3762/

VDI 3762:2012-01, Acoustic insulations of raised and hollow floors

/AVV/

Directive on the European Waste Catalogue (Abfallverzeichnis-Verordnung - AVV). Issue date: 10/12/2001. Last amended by Article 1 V dated 4/3/2016 I 382.

/Eurofins/

Eurofins Product Testing A/S
Smedeskovvej 38, DK-8464 Galten, Denmark

/GaBi 8/

thinkstep AG; GaBi 6:
Software system and database for holistic balancing. Copyright, TM. Stuttgart, Leinfelden-Echterdingen, 1992-2013

/GaBi 2017 D/

GaBi 8: Documentation of GaBi 8. Data sets of the database for holistic balancing. Copyright, TM. Stuttgart, Leinfelden-Echterdingen, 1992-2013.

/GaBi 8 Data/

GaBi 8 dataset documentation for the software system and databases, LBP, University of Stuttgart and thinkstep AG, Leinfelden-Echterdingen, 2017 (<http://www.gabi-software.com/international/support/gabi/gabi-database-2017-ici-documentation/>)

Institut Bauen und Umwelt e.V., Berlin (publisher):
Production of environmental product declarations (EPDs);

/ISO 14025/

DIN EN /ISO 14025:2011-10/, Environmental labels and declarations — Type III environmental declarations — Principles and procedures.

/EN 15804/

/EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental product declarations — Core rules for the product category of construction products.

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