ENVIRONMENTAL PRODUCT DECLARATION
according to ISO 14025 and EN 15804

Declaration owner	Egger Retail Products GmbH & Co
Publisher	Institut Bauen und Umwelt e.V. (Institute for Construction and Environment) (IBU)
Program owner	Institut Bauen und Umwelt e.V. (Institute for Construction and Environment) (IBU)
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Date of issue	21/08/2013
Valid to	20/08/2018

Laminate flooring (DPL)
Egger GmbH

Institut Bauen
und Umwelt e.V.

www.bau-umwelt.com / https://epd-online.com

1. General details

Egger GmbH

Program owner

IBU - Institut Bauen und Umwelt e.V (Institute building and environment e.V.)
Panoramastr. 1
D-10178 Berlin

Declaration number

EPD-EHW-20130012-IBC1-DE

This declaration is based on the product category regulations:

Floor Coverings, 07-2012
(PCR-tested and approved by the independent expert committee)

Date of issue

21/08/2013

Valid to

20/08/2018

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of the Institute for building and environment e.V.)

Prof. Dr.-Ing. Hans-Wolf Reinhardt
(Chairman of the SVA)

Laminate flooring (DPL)

Owner of the declaration

Egger Retail Products GmbH & Co. KG,
Im Kissen 19
59929 Brilon

Declared Product/Declared Unit

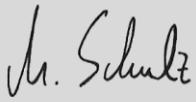
1 m^2 (10.76 square feet) EGGER laminate flooring

Extent of validity:

This document applies to the average of the laminate flooring in application class 31, 32 and 33 (AC3 through AC5) manufactured by EGGER Holzwerkstoffe Wismar GmbH & Co. KG at the plant in Wismar (Germany).
The owner of the declaration is liable for the underlying information and documentation; liability of the IBU in regards to manufacturer information, environmental performance assessment data and documentation is excluded.

Verification

The CEN standard EN 15804 serves as the core PCR
Verification of the EPD through an independent third party according to ISO 14025
☐ internal ☒ external



Matthias Schulz,
independent auditor appointed by the expert committee

2. Product

2.1 Product description

EGGER laminate flooring consists of hard flooring elements with a highly abrasion-resistant surface layer, installed on the floor in floating installation by means of glueless click connections. The individual pattern is achieved by means of printed decorative paper. In order to create a highly abrasion-resistant surface, corundum is added to the uppermost layer. A high-density wood fibreboard is used as the coreboard. The coreboard and impregnated decorative paper are pressed together to create a board, i.e. a so-called half format, using a Conti or short-cycle press. A characteristic texture is applied to the surface in the course of the pressing. After a cooling phase, the half format is trimmed to the respective floor board size and the individual floor boards of the half format are cut lengthwise and crosswise. The finished floor boards are packed in a carton covered in protective film. Laminate flooring is categorised in various application classes – a description of the classes is found in the requirements of /DIN EN 13329/. The average was calculated based on the weight percent of the quantities produced.

2.2 Application

Laminate flooring is used for interior applications in new construction or renovations, with floating installation on screed or other sub floors such as wood, tiles or PVC. Installation must be performed according to the installation instructions and state-of-the-art technology.

2.3 Technical data

Structural engineering data

Description	Value	Unit
Surface weight	515 - 985	kg/m^2
Abrasion Class	AC1-AC5	
Product standard	13329	
Element thickness	6-8 (0.24 – 0.31)	mm (inch)
Length of the surface layer	637/1292 (25.08 / 50.87)	mm (inch)
Width of the surface layer	192/330 (7.56 / 12.99)	mm (inch)
Density	880	kg/m3

2.4 Bringing into circulation/application regulations

• /DIN EN 13329/ – Laminate flooring – elements with a surface layer on the basis of aminoplastic, thermosetting resins – specifications, requirements and test procedures; German version EN 13329:2006+A1:2008
• /DIN EN 14041/ – Elastic, textile and laminate floor coverings – essential characteristics; German version prEN 14041:2011

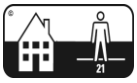
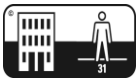
• /DIN EN 622-5/ – Fibreboard – requirements – part 5: requirements for boards according to the drying process (MDF); German version EN 622-5:2009
• Building authority approval of DIBt Berlin for low flammability laminate flooring, /DIBt Z-156.606-429/ and /Z-156.606-430/ – external monitoring WKI Braunschweig, DE.
• PEFC, Chain of Custody HCA-CoC-183

2.5 Supply status

DPL laminate flooring is available in the versions described below.

column 1: General requirements (EN13329, schedule 1)

	test methode					
format			**Classic**	**Kingsize**	**Block**	**Medium**
class of use			31,32,33	31,32,33	32	32,33
product structure			DPL, CML	DPL	DPL	DPL, CML
thickness of the element	EN13329	mm	6,0 / 7,0/11,0 ± 0,5	7,0 / 8,0 ± 0,5	8,0 ± 0,5	8,0 ± 0,5
thickness of silenzio® special cellulose		mm	1,0 ± 0,2	1,0 ± 0,2	1,0 ± 0,2	1,0 ± 0,2
length of the surface	EN 13329	mm	1292,0 ± 0,2	1292,0 ± 0,2	637,0 ± 0,2	1292,0 ± 0,2
Width of the surface Pro clic	EN	mm	193,0 ± 0,1	-	-	134,0 ± 0,1
Width of the surface Just clic	13329	mm	192,0 ± 0,1	326,0 ± 0,1	330,0 ± 0,1	-
light fastness						
Blue wool scale B02	EN 20105	-	≥ level 6	≥ level 6	≥ level 6	≥ level 6
Grey wool scale Teil A02	EN 20105	-	≥ level 4	≥ level 4	≥ level 4	≥ level 4
Static indentation with a straight steel cylinder Ø 11,30 mm (constant pressure)	EN 433	-	< 0,01	< 0,01	< 0,01	< 0,01
Surface soundness	EN 13329	N/mm²	≥ 1,4	≥ 1,4	≥ 1,4	≥ 1,4

Class of use	21	22	23	31	32	33	Test method
Symbols							
Classification	domestic			commercial			
	moderate	general	heavy	moderate	general	heavy	
Abrasion resistance	AC 1 IP ≥ 900	AC 2 IP ≥ 1.500	AC 3 IP ≥ 2.000		AC 4 IP ≥ 4.000	AC 5 IP ≥ 6.000	EN 13329 annex E
Impact resistance	**IC 1**				**IC 2**	**IC 3**	EN 13329 annex F
Small ball [N], Big ball [mm]	≥10 N / ≥800 mm ≥8 N / ≥1.000 mm				≥15N / ≥1.000mm ≥12N / ≥1.400mm	≥20N / ≥1.200mm ≥15N / ≥1.600mm	
Resistance to staining							EN 438
Group 1 + 2 Group 3	level 4 level 3	level 5 level 4					
Resistance to cigarette burns	-	level 4					EN 438
Effect of furniture leg	-	No damage shall be visible, when tested with foot Type 0 artefact					EN 424
Effect of a castor chair	-	No change in appearance or damage					EN 425
Antistatic properties	yes, < 2 kV						EN 1815
Thickness swelling	≤ 20 %			≤ 18 %			EN 13329 annex G

Characteristics	31	32	33	Test method
Formaldehyde emission	E 1	E 1	E 1	EN 717
Light fastness	Level 6	Level 6	Level 6	EN 438-2
Flame resistance	Cfl	Cfl	Cfl	EN ISO 11925 - 2
Castor chairs	Type W	Type W	Type W	DIN 68131

General requirements			
Flatness length	concave	∪	‹ 0,50 %
Flatness width	concave	∪	‹ 0,15 %
Flatness length	convex	∩	‹ 1,00 %
Flatness width	convex	∩	‹ 0,20%
Straightness of edge (Banana form)	length		‹ 0,30mm / m
Squareness	width		‹ 0,20 mm
Height difference between elements	length/width	average ≤ 0,1 mm, single value ≤ 0,15 mm acceptable	

2.6 Raw materials/auxiliary materials

HDF coreboards with a thickness between 6 and 11 mm (0.24" and 0.43") and an average density of 880 kg/m³ consisting of (information in weight % per 1 m³ of production):

Description	Value	Unit
Wood fibres, wood type mainly spruce and pine	approx. 82	%
Water	approx. 5-7 %	%
UMF glue (melamine-urea-formaldehyde resin)	approx. 11	%
Paraffin wax emulsion	< 1	%
Decorative, overlay and balancer papers in one grammage	20 to 140	g/m²
Melamine-formaldehyde resin (in overlay paper)	50	%
Corundum (decorative, balancer and overlay papers)	15	%

Wood mass: Decorticated, fresh wood from forest thinnings as well as sawmill waste, main wood type spruce and pine, is used for the production of HDF coreboards.
UMF glue: Mixed resin consisting of urea-melamine-formaldehyde resins. The aminoplastic glue sets fully through polycondensation during the pressing process.
Paraffin wax emulsion: A paraffin wax emulsion is added to the recipe during resin application for hydrophobising (improving the resistance to moisture).

2.7 Production

Breakdown of manufacturing process:
Production of the rawboards:
1. Peeling logs
2. Chipping the wood to produce chips
3. Cooking the chips
4. Defibration in the refiner
5. Application of resin to the fibres
6. Drying the fibres to approximately 9 – 10 % residual moisture
7. After resin application and drying, spreading the fibres onto a forming belt
8. Compression of the fibre mat in a continuously operating hot press
9. Cutting and trimming the fibre strand into rawboard formats
10. Cooling the rawboards in star coolers
11. Piling into large stacks and sanding the upper and lower sides after climatisation
12. Sanding the upper and lower sides after the climatisation phase.

Production of the impregnated papers:
1. Applying impregnation resin (MUF) to the paper in the line
2. Drying the impregnated paper in heated dryers
3. Formatting the endless paper by means of a cross-cutter, followed by stacking on pallets.

Production of the laminated half formats:
1. Laying the impregnated papers onto the upper and lower sides of the HDF board
2. Pressing the impregnated papers with the HDF board in the Conti or short-cycle press, which is equipped with pressing bands or pressing plates
3. Sorting by quality and stacking, including climatisation.

Production of the finished laminate flooring boards:
1. Cutting the laminated half formats into raw floor boards using a circular saw with multiple blades
2. Profiling the long and short sides of the raw floor board formats
3. Application of underlay to dampen impact sound to the reverse side if applicable / coating the bevels if applicable
4. Quality control and packaging in cartons, stacking and wrapping in film.

All waste generated in the course of production (trimming, cutting and milling waste) is used thermally with no exceptions.

2.8 Environment and health during the production

Measures to prevent injuries to health / health encumbrances during the manufacturing process:
Due to the manufacturing conditions no measures for health protection are necessary over and above the legislative and other regulations. The MAK values (Germany) are substantially undercut at every location of the plant.
Air: The exhaust air that is created in relation to the product is purified according to the legislative regulations. Emissions are significantly below the values imposed by the German technical instructions on air (/TA Luft/).
Water / ground: There is no impact on water or soil. Waste water from production is treated internally and returned to production.
Noise level measurements have shown that all values recorded within and outside the production plant are far below the applicable requirements for Germany. Noise-intensive system parts such as peeling and chipping are structurally enclosed.

2.9 Product processing/installation

Trimming, adapting and fitting the individual panels can be performed with all conventional tools, such as a jigsaw or circular saw. The finest possible toothing should be selected and suitability for wood processing is required. Alternatively, using so-called “laminate punches or shears” is also a possibility.
Occupational safety and environmental protection:
In the course of processing and installing EGGER laminate flooring, compliance with the safety regulations commonly applicable to processing is required (safety goggles, face mask in case of dust development). Remaining sawdust should be vacuumed off. Observe all liability insurance association regulations for commercial processing operations.
Waste material and packaging: Residual material, trimmings and packaging materials produced on the construction site must be sorted by waste classes and collected.

2.10 Packaging

The packaging consists of wooden pallets, cartons, PET packaging straps and PE film.

2.11 Usage condition

Ingredients in utilisation state:
In the course of pressing, the impregnation resin (MUF) is cross-linked in three dimensions through an irreversible
polycondensation reaction with the addition of heat. The bonding agents are chemically stable and permanently bonded to the wood. Only small quantities of formaldehyde are emitted (see formaldehyde certification, Section 7).

2.12 Environment & health during the utilisation

No impairment of or damage to health is to be expected when the EGGER laminate flooring is used normally and in accordance with the intended purpose. With the exception of minor amounts of formaldehyde in quantities that are harmless to health, no emissions of hazardous substances can be detected (see formaldehyde certification, toxicity of fire gases, PCP/Lindane, EOX, radioactivity).

There is no MDI certification because MDI is not used in production. Hazards to water, air and the soil cannot occur when EGGER laminate flooring is used as intended.

2.13 Reference utilisation duration

A reference period of use was not declared in this study since the period of use, module B1, was not taken into account in the model.

The period of use for private residential applications, depending on the product group and according to our guarantee terms, is between 7 and 25 years.
In commercial applications, the period of use is generally 5 years.

2.14 Unusual effects

Fire

Fire protection

Description	Value
Building materials class	Cfl s1
Dropping while burning	d0
Smoke development	S1

Water
According to the eluate analysis, it is possible for certain substances of content to be washed out but only in small, harmless quantities.
Laminate flooring is not resistant to constant water exposure. Defective areas are easy to replace locally.

Mechanical destruction
The fracture pattern of laminate flooring shows relatively brittle behaviour, with the possibility of sharp edges where the boards break (risk of injury).
Abrasion and impact resistance classification: See Section 2.1. Product description

2.15 Reuse phase

Removal & reuse:
Laminate flooring installed without the use of glue can be easily separated, removed and/or reused for the same application at the end of the usage phase. EGGER laminate flooring can be processed and returned to the manufacturing of wood-based materials.

2.16 Disposal

Laminate flooring: Construction site waste of EGGER laminate flooring, and waste from demolition projects, should be primarily used in materials. If this is not possible, laminate flooring waste that is not suitable for further use must be utilised as an energy source – due to the high heating value of approximately 16MJ/kg – and used for the generation of process energy and electricity (cogeneration) instead of being disposed of in a landfill (waste code according to the European waste catalogue: 170201/030103). The model assumes that the product reaches the incineration facility with a moisture content of 6 %.
Packaging: The transport packaging materials – paper / cardboard and PVC packaging straps – can be recycled as long as they are collected separately. In some cases external disposal can be arranged with the manufacturer.

2.17 Other information
www.egger.com

3. LCA: Calculation rules

3.1 Declared unit
The declared unit is one square metre (10.76 square feet) of laminate flooring (6.79 kg/m²). The laminate flooring has a density of 880 kg/$m^{3.}$

Specification of the declared unit

Description	Value	Unit
Declared unit	1	m^2
Conversion factor to 1 kg	6.79	-

3.2 System limit
Type of the EPD: Cradle to plant gates – with options
The lifecycle analysis for the products under consideration encompasses the following segments of the lifecycle: “Product stage” and “Credits and charges beyond the limits of the product system”.
The systems therefore encompass the following stages according to /DIN EN 15804/:
Product stage (module A1-A3):
A1 Procurement and processing of raw materials as well as processing of secondary raw materials serving as inputs.
A2 Transportation to the manufacturer,
A3 Production
The product stages A4-A5, B1-B7, C1, C2, and C4 were not examined in this study.
Once the product has reached the end-of-waste status as chipped scrap wood, it is assumed that the product will be transferred to biomass incineration for the production of thermal energy and electricity. The resulting effects and credits are declared in module D.

3.3 Estimates and assumptions
The end-of-life system limit between waste disposal and module D is set where outputs such as secondary material or fuel reaches its end-of-waste status (/DIN EN 15804/, Section 6.4.3).
It is assumed that scrap wood reaches the end-of-waste status after sorting and processing.

3.4 Cut-off rules
All data from the operational data acquisition were taken into account. Therefore material flows with a proportion of less than 1 percent were also included in the assessment. It can therefore be assumed that the sum of disregarded processes does not exceed 5 % of the impact categories. The cut-off rules according to DIN EN 15804 can therefore be assumed to be met.

3.5 Background data
All relevant background datasets were taken from the database of the GaBi 6 software (GABI 6 2013), with an age of less than 10 years. The data used has been collected subject to consistent time and methodology constraints.

3.6 Data quality
For the products under review, the datas were collected directly at the production site for the 2010 business year based on a questionnaire prepared by PE International.
The input and output data were provided by EGGER and reviewed for plausibility. It can therefore be assumed that the datas are highly representative.

3.7 Time period under examination
The data are representative for the production processes between 01.01.2010 and 31.12.2010.

3.8 Allocation
Energy credits for the electricity and thermal energy produced in the biomass power plant at the end of the lifecycle are allocated according to the heating value of the inputs and based on the efficiency of the plant. The credit for thermal energy is calculated based on the dataset /EU-27: thermal energy from natural gas PE/; the credit for electricity is calculated based on the dataset /EU-27: electricity mix PE/. These credits are incorporated in module D.
The calculation of the emissions dependent on the input (e.g. CO2, HCl, SO2 or heavy metals) at the end of life was performed according to the material composition of the introduced ranges. The technology-related emissions (e.g. CO) are calculated according to exhaust gas quantity.
Waste materials were also added in the total of the production.
The pre-chain for harvesting was recorded according to /Hasch 2002/ and/or in the update by Rüter and Albrecht (2007). With residual sawmill wood the forestry process and associated transport are added to the wood according to volume proportion (respectively dry mass), from the sawmill processes no encumbrances are added to the residual sawmill wood. The CO_2 content and energy content of the scrap wood were considered (1.85 kg CO_2/kg ATRO (absolutely dry) wood). The carbon dioxide bound in wood is allocated in module A1.

3.9 Comparability
In principle, comparing or evaluating EPD data is only possible if all datasets to be compared were prepared according to EN 15804 and the building context and/or the product-specific performance characteristics are taken into account.

4. LCA: Scenarios and further technical information

The calculated scenario encompasses a 100 % recycling rate for laminate flooring without waste.

5. LCA: Results

SPECIFICATION OF THE SYSTEM LIMITS (X = INCLUDED IN ENVIRONMENTAL PERFORMANCE ASSESSMENT; MND = MODULE NOT DECLARED)

Production stage			Construction stage of the structure		Usage stage							Disposal stage				Credits and charges outside the system limits
Supply of raw materials	Transport	Production	Transportation from the manufacturer to the place of use	assembly	Use / application	Plant maintenance	The Repair	Replacement	renewals	Use of energy for the operation of the building	Use of water for the operation of the building	Removal / demolition	Transport	Waste treatment	Disposal	Reuse, recovery or recycling potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X

RESULTS OF THE ENVIRONMENTAL PERFORMANCE ASSESSMENT, ENVIRONMENTAL IMPACT: 1 m2 (10.76 square feet) laminate flooring

Parameter	Unit	A1 - A3	D
Global warming potential	[kg CO_2-equiv.]	-4,03E+0	4,15E+0
Stratospheric ozone layer depletion potential	[kg CFC11 equiv.]	9,23E-10	-3,88E-9
Soil and water acidification potential	[kg SO_2-equiv.]	1,55E-2	-4,98E-3
Eutrophication potential	[kg $(PO_4)^{3-}$-equiv.]	5,32E-3	-6,32E-4
Tropospheric ozone creation potential	[kg ethylene equiv.]	8,13E-3	-3,39E-4
Potential for the abiotic depletion of non-fossil resources	[kg Sb equiv.]	2,42E-6	-7,06E-7
Potential for the abiotic depletion of fossil fuels	[MJ]	1.0E+2	-1,04E+2

RESULTS OF THE ENVIRONMENTAL PERFORMANCE ASSESSMENT, USE OF RESOURCES: 1 m2 (10.76 square feet) laminate flooring

Parameter	Unit	A1 - A3	D
Renewable primary energy as the energy source	[MJ]	6,2E+1	-1,26E+1
Renewable primary energy for use in materials	[MJ]	1,01E+2	0.0E+0
Total renewable primary energy	[MJ]	1,63E+2	-1,26E+1
Non-renewable primary energy as the energy source	[MJ]	8,4E+1	-1,31E+2
Non-renewable primary energy for use in materials	[MJ]	2,2E+1	0.0E+0
Total non-renewable primary energy	[MJ]	1,06E+2	-1,31E+2
Use of secondary substances	[kg]	0.0E+0	0.0E+0
Renewable secondary fuels	[MJ]	2,47E-3	-5,24E-4
Non-renewable secondary fuels	[MJ]	2,57E-2	-5,6E-3
Use of software resources	[m³]	2,51E-2	-2,82E-2

RESULTS OF THE ENVIRONMENTAL PERFORMANCE ASSESSMENT, OUTPUT FLOWS AND WASTE CATEGORIES:
1 m2 (10.76 square feet) laminate flooring

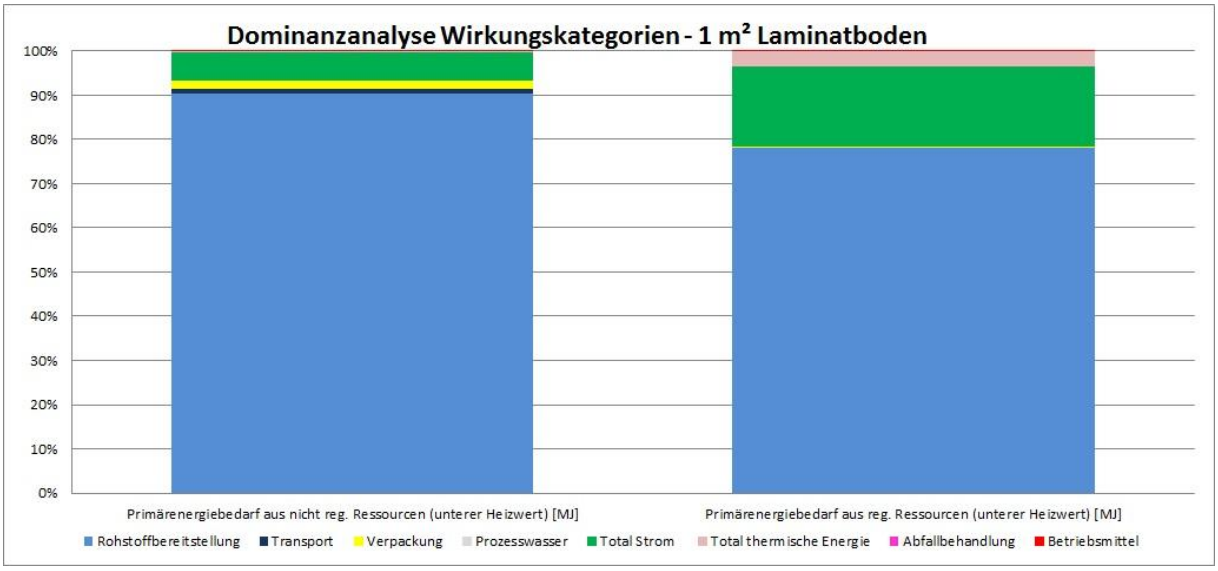
Parameter	Unit	A1 - A3	D
Hazardous waste for disposal	[kg]	2,84E-3	1,97E-5
Disposed non-hazardous waste	[kg]	1,35E-1	8,9E-2
Disposed radioactive waste	[kg]	2,54E-3	-1,2E-2
Components for reuse	[kg]	0.0E+0	0.0E+0
Substances for recycling	[kg]	0.0E+0	0.0E+0
Substances for energy recovery	[kg]	0.0E+0	0.0E+0
Exported electrical energy	[MJ]	0.0E+0	0.0E+0
Exported thermal energy	[MJ]	0.0E+0	0.0E+0

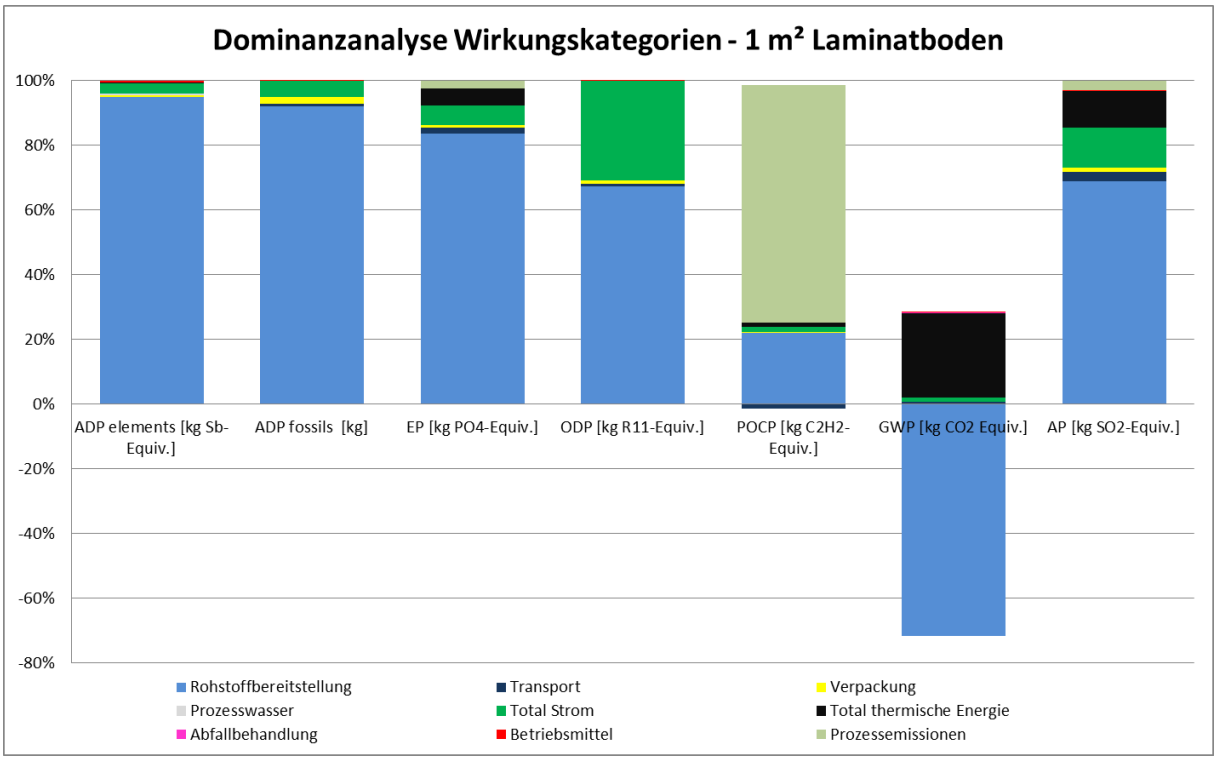
6. LCA: Interpretation

The environmental performance assessment and estimated effects are based on the specifications of the European standard (/CML, 2001-Nov 2010/)
The relevant influences on the various impact categories and the use of primary energy are determined within the scope of a dominance analysis of the environmental performance assessment results for laminate flooring in reference to the declared unit of 1 m² (10.76 square feet).
The interpretation was carried out under consideration of the assumptions and restrictions of the EPD as well as the methodology and data.

Very high data quality can generally be expected. All primary data from the operational data acquisition by the company EGGER GmbH in the year 2010 were taken into account.

As a matter of principle, PE INTERNATIONAL conducts numerous different audits throughout the course of the entire project in order to ensure that the project is realised at a high level of quality. This encompasses an extensive review of the project-specific environmental performance assessment model as well as the underlying datasets that are used.



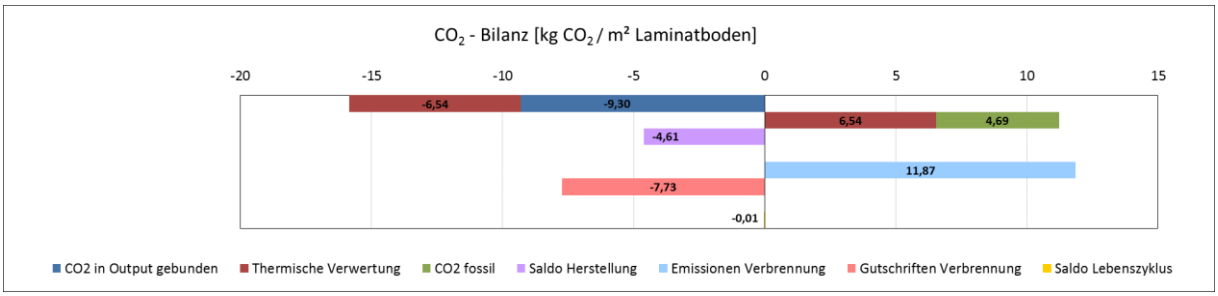


1. Water consumption
The net fresh water consumption (“blue water consumption”) for 1 m² (10.76 square feet) of EGGER laminate flooring in the product state (A1-A3) is 0.025 m³ (0.88 cubic feet) of water. Over 0.028 m³ (0.99 cubic feet) is consumed in stage D.
Most of the water consumption results from the net fresh water consumption during glue and resin production (more than 50 % of total consumption during production).

2. Primary energy renewable and non-renewable
The non-renewable demand for primary energy is influenced almost exclusively by the supply of raw materials and consumption of electricity (97 %). Here the supply of raw materials is included in the calculation at approximately 76 % and the electricity demand at approximately 19 % of the total renewable primary energy demand.
Among others, the UF adhesive system, melamine and urea (glue and resin production) account for the largest share of the energy demand for non-renewable energy sources.

3. Waste
The largest proportion of the waste that is produced consists of disposed, non-hazardous waste. The disposed radioactive waste is mainly generated by glue and resin production as well as the use of energy in the pre-chains of the preliminary products (generation of electricity).

4. Global warming potential
The global warming potential is dominated by the production of carbon dioxide. Through the use of wood, CO2 is bound in the renewable raw materials required for production. Outside the system under consideration, the emissions relevant for GWP are caused by combustion. Due to the credit for bound carbon dioxide, part of the greenhouse gas emissions that are generated is substituted. The CO2 balance in the illustration that follows shows that production of one m² (10.76 square feet) of laminate flooring (product mix) generates 11.23 kg (24.78 pounds) of CO2 emissions, of which 6.54 kg (14.42 pounds) of CO2 are due to the direct thermal use of wood in the production phase and another 4.69 kg (10.34 pounds) represent CO2 emissions from fossil sources. By comparison, the production of 1 m² (10.76 square feet) of laminate flooring stores a total of 15.83 kg (34.90 pounds) of CO2 from the air in the wood as a result of photosynthesis during tree growth. Out of this amount, 9.30 kg (20.50 pounds) of CO2 remain bound in the wood for each m² (10.76 square feet). The CO2 stored in laminate flooring is only released again at the end of the lifecycle, e.g. during thermal use of the flooring. When the CO2 absorption and CO2 emissions in the course of production are offset, this results in a net CO2 reduction of 3.36 kg (7.41 pounds) per m² (10.76 square feet) of laminate flooring for this phase of the lifecycle due to binding in the product and the substitution of non-renewable energy sources.



5. Ozone depletion potential
The ozone depletion potential is dominated primarily by the supply of raw materials and the use of electricity. Through the substitution of energy that is used by EGGER laminate flooring at the end of the lifecycle, the overall ozone depletion potential is reduced. Here organic emissions containing halogen are responsible for the ozone depletion potential. The supply of raw materials at 67 % is primarily responsible for the **ozone depletion potential**.

6. Acidification potential
The acidification potential is mainly due to the emissions during fibre processing in the plant and within the system under consideration with around 34 % of the overall impact in A1-A3. The sawdust due to its processing generates a large proportion of 45 % of the acidification potential from chip processing. Here sulphur dioxide, ammonia and nitrogen oxides have the largest share of the acidification potential. Here sulphur dioxide, ammonia and nitrogen oxides have the largest share of the acidification potential.

7. Eutrophication potential
With the inclusion of production, the supply of raw materials accounts for around 83.6 % of the electricity consumption while production contributes 6.03 %, thermal energy during production 5.27 % and transportation and packaging between 1.97 % and 0.71 % of the eutrophication potential.

8. Photochemical oxidant creation potential
The photochemical oxidant creation potential is largely due to the emissions from fibre processing, lamination and HDF board production. Here, 73 % of the overall impact results from the production phase (A1-A3). Non-methane volatile organic compounds (NMVOCs) and carbon monoxide emissions have the largest share of the photochemical oxidant creation potential. A negative POCP value is presented for transportation. This is due to the NO emissions from transportation. NO is offset against POCP.

9. Abiotic resource consumption (fossil)
The fossil abiotic resource consumption is mainly caused by glue and resin production.

10. Abiotic resource consumption (elementary)
The elementary abiotic resource consumption is mainly caused by non-renewable substance resources such as salts and various metals, and largely results from glue and resin production.

7. Determinations

7.1 Formaldehyde

Measurement authority: WKI Fraunhofer Wilhelm-Klauditz Institute
Testing, monitoring and certification authority, Braunschweig, DE.
Test reports, date: QA-2012-0879 laminated HDF boards dated 04.05.2012 CML QA-2012-0879, laminated HDF boards dated 04.05.2012 DPL QA-2012-2048 raw HDF boards dated 26.09.2012
Results: The formaldehyde content was tested using the perforator method according to /DIN EN 120/ and the test chamber method according to /DIN EN 717-2/. The results for the raw boards are significantly below the limit of 8.0 mg HCHO/100g ATRO (absolutely dry) board (at 6.5% moisture content in the material) according to /DIBt directive 100/ and according to the /banned chemicals ordinance/, appendix to section 1, paragraph 3 in conjunction with the BGA (German health ministry) statements in the German health gazette of October 1991 about "Prüfverfahren für Holzwerkstoffe" (test procedures for wood-based materials).
The average results for the coreboard thickness of 7mm (0.28") are:

• Raw HDF boards 6.1 mg HCHO/100g according to /DIN EN 120/
• Laminated HDF boards 0.7mg HCHO/m²h according to /DIN EN 717-2/

7.2 Toxicity of the fire gases

Measurement authority: MFPA Leipzig GmbH, business area I – materials in the building trade Akkreditiertes Prüflabaratorium, Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH, Leipzig, D
Test reports, date: UB 1.1 / 07 - 520 - 01 EGGER laminate flooring (DPL) dated 29.02.2008
Results: The determination of the toxic fire gases was carried out according to /DIN 38406-4/ and /DIN 4102/ part 1 – class A at 400° C. The results show that 5,000 ppm of carbon monoxide was measured in the inhalation room after 30 minutes. All other chemical compounds are not detectable for this time period. After 60 minutes, the concentrations in the inhalation room were as follows: Carbon monoxide 11,000 (>50 % COHb calculated on this basis), carbon dioxide 10,000 ppm, hydrogen cyanide 80 ppm and ammonia 1,000 ppm. Hydrogen chloride, nitrous fumes, nitrogen dioxide and sulphur dioxide could not be detected. The relative weight reduction at a test temperature of 400° C was 65.5 %. There was dense white smoke in the inhalation room at the end of the test. The emissions released under the chosen test conditions contain 1,000 ppm of ammonia.
Since the recipe has not changed, the test reports listed above retain their validity.

7.3 VOC emissions

Measurement authority: WKI Fraunhofer Wilhelm-Klauditz Institute
Test report: Determination of VOC emissions from laminate flooring according to the /AgBB/ schema (test report number: MAIC-2012-1243) dated 23.04.2012 and MAIC-2012-1242 dated 23.04.2012
Procedure: Test in the 1 m3 (35.31 cubic feet) chamber based on the AgBB schema /AgBB/. Results according to AgBB evaluation schema, sample designation P26251, P26250
AgBB overview of results (28 days)

Description	Value	Unit
TVOC (C6 - C16)	<1	µg/m^3
Total SVOC (C16 - C22)	<1	µg/m^3
R (dimensionless)	0	-
VOC without LCI	<1	µg/m^3
Carcinogenics	<1	µg/m^3

7.4 PCP/Lindane

Measurement authority: WKI Fraunhofer Wilhelm-Klauditz Institute
Testing, monitoring and certification authority, Braunschweig, DE
Test reports, date:
B43/07 external monitoring of the PCP and Lindane content dated 09.01.2007 B357/04 External monitoring of the PCP and Lindane content dated 17.02.2004
Results: After extracting the substances of content, the solutions were derivatised, prepared and then analysed using gas-phase chromatography. The values for PCP and Lindane are below the detection limit of 0.1 mg/kg (see certificates / manufacturer declaration).

7.5 Extracted organic halogen compounds

Measurement authority: MFPA Leipzig GmbH, business area I – materials in the building trade Akkreditiertes Prüflabaratorim, Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH, Leipzig, D
Test reports: Date: UB 1.1 / 07 – 520 - 01 EGGER laminate flooring (DPL) dated 29.02.2008
Result: The determination of the extractable organic compounds (EOX) was performed according to /DIN 38414/-S17 and resulted in a measured value of <2mg/kg
Since the recipe has not changed, the test reports listed above retain their validity.

7.6 Eluate analysis

Measurement centre: MFPA Leipzig GmbH, business area I – materials in the building trade Akkreditiertes Prüflabaratorim, Gesellschaft für Materialforschung und Prüfungsanstalt für das Bauwesen Leipzig mbH, Leipzig, D

Test reports: Date: UB 1.1 / 07 – 520 - 01 EGGER laminate flooring (DPL) dated 29.02.2008
Results: The analysis was carried out according to /DIN 38406/-4, the selection of the eluate criteria according to /DIN 38414/-S4. The following values were determined [mg/l]: Arsenic <0.001, lead 0.003; cadmium 0.009; chrome VI < 0.02; copper 0.008; nickel 0.005; quicksilver < 0.0001; zinc 0.09; barium 0.05; chrome est. < 0.002; molybdenum < 0.01; antimony < 0.01 and selenium < 0.01.
Since the recipe has not changed, the test reports listed above retain their validity.

8. Literature references

Institut Bauen und Umwelt e.V., Königswinter (publisher):

Allgemeine Grundsätze für das EPD-Programm des Instituts Bauen und Umwelt e.V. (IBU) (General Principles for the EPD Programme of the Institute for Construction and the Environment (IBU)), 2011-09.

Product category rules, Part A: Calculation rules for the ecological balancing and requirements towards the background report. 2011-07 2012-09.

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

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

CML 2001-Nov 2010 Institute of Environmental Sciences, Leiden University, The Netherlands: Handbook on impact categories "CML 2001 ", http://www.leidenuniv.nl/cml/ssp/projects/lca2/index.html

DIN EN 13329 – Laminate flooring – elements with a surface layer on the basis of aminoplastic, thermosetting resins – specifications, requirements and test procedures; German version /DIN EN 13329:2006+A1:2008/

DIN EN 120: 1992-08, Wood-based materials; determination of the formaldehyde content; extraction procedure called perforator method.

DIN EN 14041: 2011, Elastic, textile and laminate floor coverings – essential characteristics; German version /prEN 14041:2011.

DIN EN 717-2: 1995-01, Wood-based materials – determination of the formaldehyde emissions – part 2: Formaldehyde emissions according to the gas analysis method.

DIN EN 622-5 Fibreboard – requirements – part 5: Requirements for boards according to the drying process (MDF); German version EN 622-5:2009

DIN 4102-1: 1998-05, Reaction to fire of building materials and components – part 1: Building materials; terminology, requirements and tests.

DIBt /Z-156.606-725/ Building authority approval of DIBt Berlin for low flammability laminate flooring, DIBt /Z-156.606-725/ – External monitoring WKI Braunschweig, DE.

DIN 38414-4: 1984-10, Harmonised German procedure for water, waste water and sludge testing; sludge and sediments (group S); determination of extractability with water (page 4).

DIN 38406-4: 1983-05, Harmonised German procedure for water, waste water and sludge testing.

GaBi 6, 2013a Integrated assessment software and database**.** LBP, Stuttgart University and PE International, 2013.

GaBi 6, 2013b Documentation of the GaBi 6 datasets of the integrated assessment database. LBP, Stuttgart University and PE International, 2013. http://documentation.gabi-software.com

Hasch 2002, Hasch, J. (2002), Ökologische Betrachtung von Holzspan und Holzfaserplatten (Ecological Evaluation of Chipboard and Wood Fibreboard, dissertation, Hamburg University – revised 2007: Rueter, S. (BFH HAMBURG; Holztechnologie), Albrecht, S. (Stuttgart University, GaBi.

German Technical Instructions on Air Quality. Technical instructions for maintaining the purity of air. General administrative directive, Germany 1964-2002.

Directive on prohibitions and restrictions on bringing hazardous substances, preparations and products into circulation according to the Chemicals Act
Chemicals prohibition directive. Federal directive, Germany 2003-2012.

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