



Issuance date: 28.09.2017
Validity date: 28.09.2022

ENVIRONMENTAL PRODUCT DECLARATION



3-LAYER WOODEN FLOORBOARDS 1-STRIP AND 3-STRIP



EPD program operator

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The Barlinek Group is a manufacturer of an engineered flooring. As well as the Barlinek flooring, the Barlinek group also produces certified flooring for sporting facilities, skirting boards and wood biofuels.



ENVIRONMENTAL PRODUCT DECLARATION TYPE III NO. 063/2017

Basic information

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment. Their aspects were verified by the independent body according to ISO 14025.

Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).

Life cycle analysis (LCA):	A1-A3 modules in accordance with EN 15804 (Cradle to Gate)
The year of preparing the EPD:	2017
Declared durability:	for standard product – 20 years
Product standard:	EN 13489:2004
PCR:	PCR A (PCR based on EN 15804)
Declared unit:	1 m ²
Reasons for performing LCA:	B2B
Representativeness:	Polish product

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Manufacturer and Product Information

Barlinek Inwestycje Sp. z o.o. is a polish manufacturer of layered wooden floors with potential production of 10 mln m² per annum. The company distributes its products among 55 countries located in 5 continents. As well as the Barlinek floorboards, the group also produces certified flooring for sporting facilities, skirting boards and wood biofuels – wood pellet and fireplace briquette. Barlinek has also initiated many programmes concerning environmental protection and ecological education. For many years now the company has been conducting its 1 for 1 programme, whereby the planting of one tree is co-financed for each purchased pack of Barlinek floorboards marked with a logo of this pro-ecological initiative.

Barlinek floorboarding:

- possible to lay over underfloor heating
- solid construction
- floor resistant to changes in temperature and humidity
- fast and easy DIY installation
- product ready to use immediately after installation
- possible to renovate



Fig. 1. Cross structure of 3-layer wooden floorboard produced by Barlinek Inwestycje Sp. z o.o.

Barlinek floorboard is made from three layers of real wood arranged in a cross structure (Fig. 1) in order to prevent swelling, squeaking or drying out causing splits. The cross construction reduces natural tension and compression of wood, provides a balance between the layers of the board, and thus guarantees the stability of the floor. The Barlinek floorboard's layered structure is suited for underfloor heating. The floorboards are joined using 5Gc joints and Barclick (Fig. 2) which allow to lay the floor without most of the tools which are usually necessary to install a floor. Specification of the product is shown in Table 1.

Joints – 5Gc BARLOCK & BARCLIK systems provide:

- fast & easy installation
- reductions of contamination
- possibility to lay again
- reduction of damage risk during installation or dismantling



Fig. 2. Views of Barlinek floorboards with 5Gc BARLOCK and BARCLIK systems

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Table 1. Specification of 3-layer wooden floorboard produced by Barlinek Inwestycje Sp. z o.o.

3-LAYER WOODEN FLOORBOARD

Series:	Advance, Décor, Easy Basic, Easy Classic, Jean Marc Artisan, Life, Pure, Pure Vintage Line, Pure Advanced, Senses, Sport Extreme, Tastes of life, White pack, customer brand
Wood species:	oak, beech, birch, jatobe, ash, maple, merbau, sapele
Colour:	natural, white, brown, light brown, dark brown, smoked, cocoa, cognac, cream, cream white-wash, espresso, gold, graphite, coffee, creamy-beige, honey, olive, grey, walnut, gold-brown, etc.
Floor board pattern	1-strip, 3-strip, 3-strip, 4-strip, 6-strip
Length [mm]	725, 1082, 1092, 1465, 1800, 2200
Width [mm]	130, 155, 180, 207
Thickness [mm]	10, 14, 15, 16

The 3-layer wooden floorboard is offered in two pattern:

- 1-strip: one row of staves along the width of the board (similar appearance to solid floorboard)
- 3-strip: three rows of staves across the width of the board (similar appearance to a traditional floor).



The Barlinek floorboard can be installed in a floating system, that is glueless and based on modern tongue-and-groove joints. It is a method, that allows to install the floor yourself. The floor is also easy to be dismantled or re-installed. An alternative is to install the floor in a traditional way - by gluing the boards to the subfloor, which ensures stability of the installation even on large surfaces. The Barlinek floorboard does not require any additional preservative treatment. The floor is ready for use immediately after installation. The performance of the product is listed in Table 2.



Fig. 3. The view of 3-layer wooden floorboard produced by Barlinek Inwestycje Sp. z o.o. during installation

Characteristics	Declared performance	Harmonized standard
Reaction to fire	Dfl – s1, Cfl-s1 for Jean Marc Artisan, Sport Extreme	EN 14342:2013
Minimal density	500 kg/m ³	
Minimal thickness	10 mm	
Release of formaldehyde	E-1	
Content of pentachlorophenol	≤ 5 ppm	
Thermal conductivity	0,14 W/mK	

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LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Allocation

The allocation rules used for this EPD are based on general ITB-PCR A. 3-layer wooden floorboard production is a line process with multiple co-products in one factory in Barlinek. Allocation was done on product mass basis.

All impacts from raw materials extraction are allocated in A1 module of EPD. 100% of impacts from line production were inventoried and allocated to all 3-layer wooden floorboard production. Municipal waste and waste water of whole factory were allocated to module A3. Energy supply was inventoried for whole production process. Emissions in Barlinek Inwestycje are measured and were allocated to module A3.

System limits

The life cycle analysis of the examined products covers "Product Stage", A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB-PCR A. The details of systems limits are provided in product technical report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

A1 and A2 Modules: Raw materials supply and transport

Raw materials such as softwood and hardwood logs come from local suppliers while prefabricated elements come from Ukraine, Germany and Russia. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include trucks and Polish and European fuel averages are applied.

A3: Production

Diagram 4., Shows the production process of three-layer wooden floors. The production of floors is basically a three-step process which involves cutting logs at a leaf and coniferous sawmill, drying timber and surface layer finishing. Wood logs are delivered to the factory situated in Barlinek, where they are cut into coniferous and sawn timber. Next, the timber is moved to the dryer and, after it had left there, the quality of semi-finished products is checked. Leaf timber is classified in accordance with the internal Barlinek standard, taking into account the species and characteristic features of the wood. After finishing the surface layer, the quality of the product is checked and it is then packed and stored in a warehouse before being shipped to the customer.

Data collection period

The data for manufacture of the examined products refer to period between January – December 2016. The life cycle assessments were prepared for Poland as reference area.

Data quality

The values determined to calculate the LCA originate from verified Barlinek Inwestycje Sp. z o.o. inventory data.

Assumptions and estimates

The impacts of the representative 3-layer wooden floorboard were aggregated using weighted average. Impacts were inventoried and calculated for all products in 3-layer wooden floorboard product group.

Calculation rules

LCA was done in accordance with PCR A document.

Databases

The data for the processes come from the following databases: Ecoinvent, Ullmann's, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2013+A1 version. (PN EN 15804+A1:2014-04)

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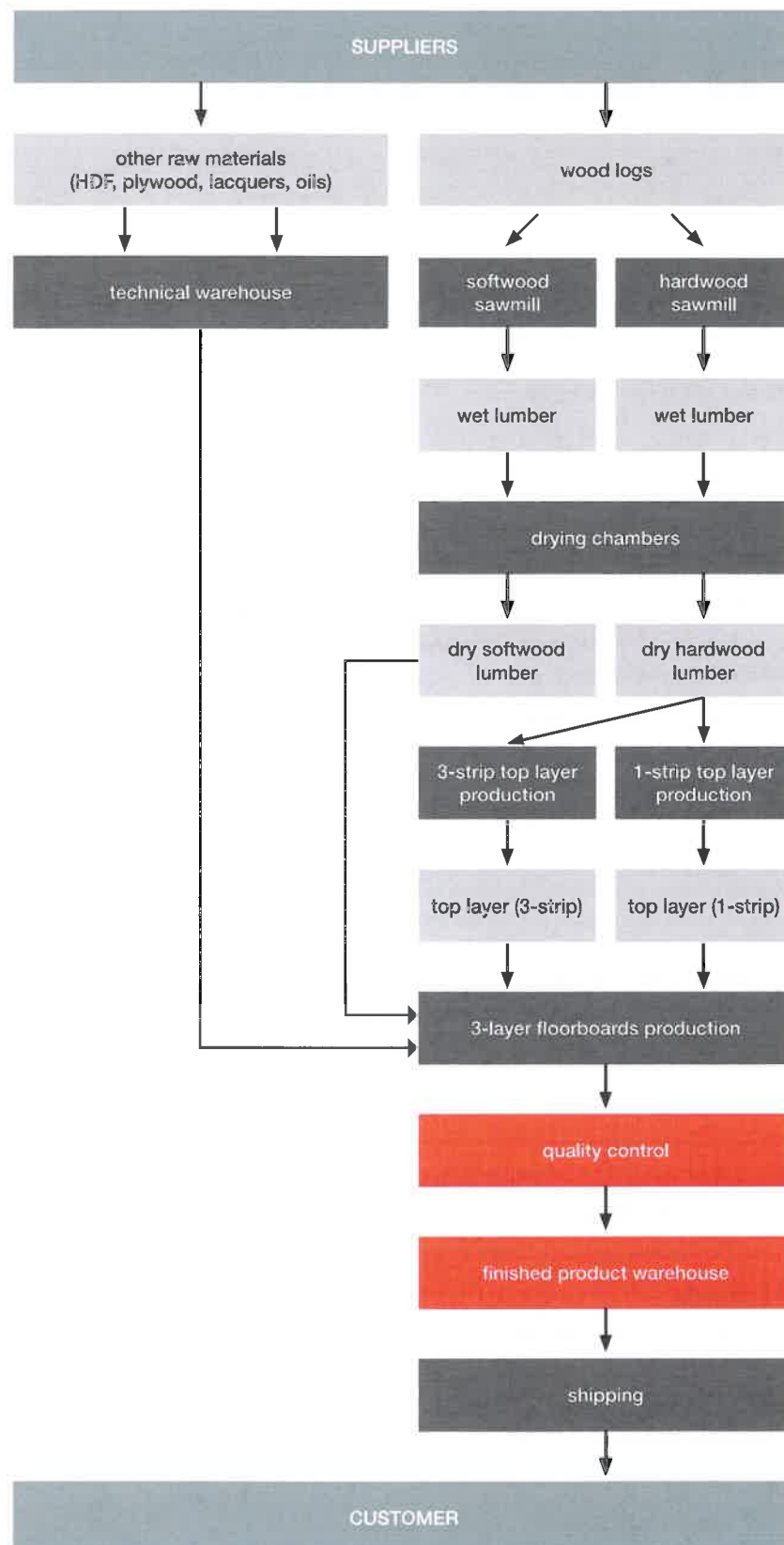


Fig. 4. 3-layer wooden floorboard production scheme in Barlinek factory (Poland)

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LIFE CYCLE ASSESSMENT (LCA) - Results

Table 2. System boundaries for environmental characteristic for 3-layer wooden floorboard

Environmental assessment information (MNA – Module not assessed, MD – Module Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Construction process							Construction process				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Relubishment	Operational energy use	Operational water use	Deconstruction 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
MD	MD	MD	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA

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3-layer floor board with thickness of 10 mm

Environmental impacts: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.] (100 years)	-3.07E+00	3.27E-01	3.77E+00	1.03E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	3.13E-07	0.00E+00	0.00E+00	3.13E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	8.90E-03	2.00E-03	6.20E-03	1.71E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.26E-03	1.65E-04	5.52E-06	2.43E-03
Eutrophication potential	[kg (PO ₄) ₃ ⁻ eq.]	2.44E-03	3.41E-04	1.15E-03	3.93E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4.27E-04	0.00E+00	1.40E-05	4.41E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.18E+01	2.39E+00	2.95E+01	4.36E+01
Environmental aspects on resource use: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	6.13E+00	2.39E-01	2.72E-03	6.37E+00
Use of renewable primary energy resources used as raw materials	[MJ]	6.04E+01	8.76E-04	0.00E+00	6.04E+01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	6.53E+01	2.40E-01	2.72E-03	6.56E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	3.15E+01	INA	INA	3.15E+01
Use of non-renewable primary energy resources used as raw materials	[MJ]	7.54E+00	INA	INA	7.54E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	3.91E+01	2.51E+00	3.24E+01	7.40E+01
Use of secondary material	[kg]	1.57E-05	0.00E+00	0.00E+00	1.57E-05
Use of renewable secondary fuels	[MJ]	7.05E-01	0.00E+00	2.83E+01	2.90E+01
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[dm ³]	2.88E+00	2.16E-06	1.10E+01	1.39E+01
Other environmental information describing waste categories: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	1.56E-02	5.60E-04	8.72E-03	2.49E-02
Non-hazardous waste disposed	[kg]	7.40E-01	5.20E-01	5.38E-02	1.31E+00
Radioactive waste disposed	[kg]	1.11E-04	0.00E+00	0.00E+00	1.11E-04
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	4.87E-05	0.00E+00	1.90E-02	1.91E-02
Materials for energy recover	[kg]	0.00E+00	0.00E+00	8.85E-02	8.85E-02
Exported energy	[MJ per energy carrier]	5.78E-03	INA	INA	5.78E-03

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3-layer floor board with thickness of 14 mm

Environmental impacts: (FU) 1 m ²					
indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.] (100 years)	-5.11E+00	3.27E-01	3.77E+00	-1.01E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	3.13E-07	0.00E+00	0.00E+00	3.13E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	9.60E-03	2.00E-03	6.20E-03	1.78E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.59E-03	1.65E-04	5.52E-06	2.76E-03
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2.60E-03	3.41E-04	1.15E-03	4.10E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4.27E-04	0.00E+00	1.40E-05	4.41E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.30E+01	2.39E+00	2.95E+01	4.49E+01
Environmental aspects on resource use: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	6.65E+00	2.39E-01	2.72E-03	6.89E+00
Use of renewable primary energy resources used as raw materials	[MJ]	8.28E+01	8.76E-04	0.00E+00	8.28E+01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	8.80E+01	2.40E-01	2.72E-03	8.82E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	3.28E+01	INA	INA	3.28E+01
Use of non-renewable primary energy resources used as raw materials	[MJ]	7.54E+00	INA	INA	7.54E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4.03E+01	2.51E+00	3.24E+01	7.53E+01
Use of secondary material	[kg]	1.57E-05	0.00E+00	0.00E+00	1.57E-05
Use of renewable secondary fuels	[MJ]	1.01E+00	0.00E+00	2.83E+01	2.93E+01
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[dm ³]	3.08E+00	2.16E-06	1.10E+01	1.41E+01
Other environmental information describing waste categories: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	1.57E-02	5.60E-04	8.72E-03	2.49E-02
Non-hazardous waste disposed	[kg]	7.48E-01	5.20E-01	5.38E-02	1.32E+00
Radioactive waste disposed	[kg]	1.21E-04	0.00E+00	0.00E+00	1.21E-04
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	4.87E-05	0.00E+00	1.90E-02	1.91E-02
Materials for energy recover	[kg]	0.00E+00	0.00E+00	8.85E-02	8.85E-02
Exported energy	[MJ per energy carrier]	5.78E-03	INA	INA	5.78E-03

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3-layer floor board with thickness of 15 mm

Environmental impacts: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.] (100 years)	-5.44E+00	3.27E-01	3.77E+00	-1.34E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	3.13E-07	0.00E+00	0.00E+00	3.13E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	9.97E-03	2.00E-03	6.20E-03	1.82E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	2.88E-03	1.65E-04	5.52E-06	3.05E-03
Eutrophication potential	[kg (PO ₄) ₃ -eq.]	2.69E-03	3.41E-04	1.15E-03	4.18E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4.27E-04	0.00E+00	1.40E-05	4.41E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.35E+01	2.39E+00	2.95E+01	4.54E+01
Environmental aspects on resource use: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	6.81E+00	2.39E-01	2.72E-03	7.05E+00
Use of renewable primary energy resources used as raw materials	[MJ]	8.73E+01	8.76E-04	0.00E+00	8.73E+01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	9.24E+01	2.40E-01	2.72E-03	9.26E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	3.33E+01	INA	INA	3.33E+01
Use of non-renewable primary energy resources used as raw materials	[MJ]	7.54E+00	INA	INA	7.54E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4.09E+01	2.51E+00	3.24E+01	7.58E+01
Use of secondary material	[kg]	1.57E-05	0.00E+00	0.00E+00	1.57E-05
Use of renewable secondary fuels	[MJ]	1.06E+00	0.00E+00	2.83E+01	2.94E+01
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[dm ³]	3.27E+00	2.16E-06	1.10E+01	1.43E+01
Other environmental information describing waste categories: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	1.57E-02	5.60E-04	8.72E-03	2.49E-02
Non-hazardous waste disposed	[kg]	7.52E-01	5.20E-01	5.38E-02	1.33E+00
Radioactive waste disposed	[kg]	1.23E-04	0.00E+00	0.00E+00	1.23E-04
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	4.87E-05	0.00E+00	1.90E-02	1.91E-02
Materials for energy recover	[kg]	0.00E+00	0.00E+00	8.85E-02	8.85E-02
Exported energy	[MJ per energy carrier]	5.78E-03	INA	INA	5.78E-03

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3-layer floor board with thickness of 16 mm

Environmental impacts: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	[kg CO ₂ eq.] (100 years)	-5.77E+00	3.27E-01	3.77E+00	-1.67E+00
Depletion potential of the stratospheric ozone layer	[kg CFC 11 eq.]	3.13E-07	0.00E+00	0.00E+00	3.13E-07
Acidification potential of soil and water	[kg SO ₂ eq.]	1.03E-02	2.00E-03	6.20E-03	1.85E-02
Formation potential of tropospheric ozone	[kg Ethene eq.]	3.17E-03	1.65E-04	5.52E-06	3.34E-03
Eutrophication potential	[kg (PO ₄) ³⁻ eq.]	2.77E-03	3.41E-04	1.15E-03	4.27E-03
Abiotic depletion potential (ADP-elements) for non-fossil resources	[kg Sb eq.]	4.27E-04	0.00E+00	1.40E-05	4.41E-04
Abiotic depletion potential (ADP-fossil fuels) for fossil resources	[MJ]	1.41E+01	2.39E+00	2.95E+01	4.60E+01
Environmental aspects on resource use: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	[MJ]	6.97E+00	2.39E-01	2.72E-03	7.21E+00
Use of renewable primary energy resources used as raw materials	[MJ]	9.18E+01	8.76E-04	0.00E+00	9.18E+01
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	9.68E+01	2.40E-01	2.72E-03	9.70E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	[MJ]	3.39E+01	INA	INA	3.39E+01
Use of non-renewable primary energy resources used as raw materials	[MJ]	7.54E+00	INA	INA	7.54E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	[MJ]	4.14E+01	2.51E+00	3.24E+01	7.64E+01
Use of secondary material	[kg]	1.57E-05	0.00E+00	0.00E+00	1.57E-05
Use of renewable secondary fuels	[MJ]	1.10E+00	0.00E+00	2.83E+01	2.94E+01
Use of non-renewable secondary fuels	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net use of fresh water	[dm ³]	3.45E+00	2.16E-06	1.10E+01	1.44E+01
Other environmental information describing waste categories: (FU) 1 m ²					
Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	[kg]	1.57E-02	5.60E-04	8.72E-03	2.49E-02
Non-hazardous waste disposed	[kg]	7.56E-01	5.20E-01	5.38E-02	1.33E+00
Radioactive waste disposed	[kg]	1.25E-04	0.00E+00	0.00E+00	1.25E-04
Components for re-use	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	[kg]	4.87E-05	0.00E+00	1.90E-02	1.91E-02
Materials for energy recover	[kg]	0.00E+00	0.00E+00	8.85E-02	8.85E-02
Exported energy	[MJ per energy carrier]	5.78E-03	INA	INA	5.78E-03

The Barlinek Group is a manufacturer of an engineered flooring. As well as the Barlinek flooring, the Barlinek group also produces certified flooring for sporting facilities, skirting boards and wood biofuels.

Verification

The process of verification of this EPD is in accordance with EN ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 & 8.3.1. ☒ external ☐ internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCi audit and input data verification: PhD. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl; PhD. Eng. Michał Piasecki, m.piasecki@itb.pl Verification of LCA: PhD Eng. Michał Piasecki, m.piasecki@itb.pl

- ITB PCR A- General Product Category Rules for Construction Products
- EN 15860 - Plastics. Thermoplastic semi-finished products for machining. Requirements and test methods,
- EN ISO 9054:2001 - Cellular plastics, rigid - Test methods for self-skinned, high-density materials
- ISO 14025:2006, Environmental management – Type III environmental declarations – Principles and procedure
- ISO 21930:2007, Sustainability in building and construction – Environmental declaration of building products
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2000, Buildings and constructed assets – Service life planning – Part 1: General principles
- ISO 15686-8:2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
- EN 15804:2012+A1:2013, Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
- EN15942:2011, Sustainability of construction- Environmental product declarations. Communication format business-to-business

KIEROWNIK
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CERTIFICATE No 063/2017 of TYPE III ENVIRONMENTAL DECLARATION

Product:

3-layer floorboard

1-strip and 3-strip

Manufacturer:

Barlinek

Przemysłowa 1, 74-320 Barlinek, Poland

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

PN-EN 15804+A1:2014-04

Sustainability of construction works.

Environmental product declarations.

Core rules for the product category of construction products.

This certificate, issued for the first time on 28th September 2017 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physics, Acoustics
and Environment Department

Michał Piasecki
Michał Piasecki, PhD



Deputy Director
for Research and Innovation

Krzysztof Kuczyński
Krzysztof Kuczyński, PhD

Warsaw, September 2017

