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## 3-layer wooden floorboards 1-strip and 3-strip PurePlank



### Owner of the EPD\*:

Havwoods limited  
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United Kingdom  
<http://www.havwoods.com>

\*with the permission  
based on the ITB-EPD no. 063/2017

### EPD Program Operator:

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### 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 (cradle-to-gate) in accordance with EN 15804  
(Cradle-to-Gate with options)

**The year of preparing the EPD:** 2017

**Product standard:** EN 13489:2004

**Service Life:** 20 years for standard product

**PCR:** ITB-PCR A (PCR based on EN 15804)

**Declared unit:** 1 m<sup>2</sup>

**Reasons for performing LCA:** B2B

**Representativeness:** Polish product

## MANUFACTURER

**PurePlank** is a brand of layered wooden floors from Poland with potential production of 10 mln m<sup>2</sup> per annum. The company distributes its products among 55 countries located in 5 continents. As well as the PurePlank floorboards, the group also produces certified flooring for sporting facilities, skirting boards and wood biofuels – wood pellet and fi replace briquette. The manufacturer has also initiated many programs concerning environmental protection and ecological education. For many years now the company has been conducting its 1 for 1 program, whereby the planting of one tree is co-financed for each purchased pack of PurePlank floorboards marked with a logo of this pro-ecological initiative.

## PRODUCTS DESCRIPTION AND APPLICATION

PurePank 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

PurePlank 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 PurePlank 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 PurePlank floorboards with 5Gc BARLOCK and BARCLIK systems

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Table 1. Specification of 3-layer PurePlank wooden floorboard offered by Havwoods Limited.

<b>3-LAYER WOODEN FLOORBOARD</b>	
Series:	PurePlank
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 PurePlank floorboard can be installed in a floating system, that is glue-less 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 PurePlank 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 during installation

Table 2. Performance of 3-layer PurePlank wooden floorboard offered by Havwoods Limited.

<b>Characteristics</b>	<b>Declared performance</b>	<b>Harmonized standard</b>
Reaction to fire	Dfl – s1,	EN 14342:2013
Minimal density	500 kg/m <sup>3</sup>	
Minimal thickness	10 mm	
Release of formaldehyde	E-1	
Content of pentachlorophenol	≤ 5 ppm	
Thermal conductivity	0.14 W/mK	

### 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 Poland. 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 the manufacturing plant. 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

The Fig. 4 shows the working process during the production of the 3-layer wooden floorboards. The floor manufacturing is basically a three step process including drying, milling and finishing. Green lumber logs are delivered to factory located in Poland, where they are fed into a stacking machine prior to kiln drying. Dried lumber then undergoes planing, ripping, trimming and moulding during milling to produce unfinished flooring boards which are future used for the production of 3-layer floorboards. Then the flooring product is sorted by grade and type, packaged and then stored prior to the shipment of the final product. The facility is PN EN ISO 9001 certified.

#### 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 manufacturer 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.

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### 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).



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

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### LIFE CYCLE ASSESSMENT (LCA) – Results

#### Declared unit

The declaration refers to declared unit (DU) – 1 m<sup>2</sup> of 3-layer wooden floorboard offered by Havwoods Limited.

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

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																	
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary	
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	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	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	

Table 4. Life cycle assessment (LCA) results of the 3-layer floor board with thickness of 10 mm offered by Havwoods Limited

Environmental impacts: (FU) 1 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	kg CO <sub>2</sub> eq.	-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 <sub>2</sub> 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 <sub>4</sub> ) <sup>3-</sup> 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 <sup>2</sup>					
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	MJ	1.57E-05	0.00E+00	0.00E+00	1.57E-05

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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 <sup>3</sup>	2.88E+00	2.16E-06	1.10E+01	1.39E+01
<b>Other environmental information describing waste categories: (FU) 1 m<sup>2</sup></b>					
<b>Indicator</b>	<b>Unit</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A1-A3</b>
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

Table 5. Life cycle assessment (LCA) results of the 3-layer floor board with thickness of 14 mm offered by Havwoods Limited.

<b>Environmental impacts: (FU) 1 m<sup>2</sup></b>					
<b>Indicator</b>	<b>Unit</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A1-A3</b>
Global warming potential	kg CO <sub>2</sub> eq.	-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 <sub>2</sub> 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 <sub>4</sub> ) <sup>3-</sup> 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
<b>Environmental aspects on resource use: (FU) 1 m<sup>2</sup></b>					
<b>Indicator</b>	<b>Unit</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A1-A3</b>
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	MJ	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 <sup>3</sup>	3.08E+00	2.16E-06	1.10E+01	1.41E+01
<b>Other environmental information describing waste categories: (FU) 1 m<sup>2</sup></b>					
<b>Indicator</b>	<b>Unit</b>	<b>A1</b>	<b>A2</b>	<b>A3</b>	<b>A1-A3</b>
Hazardous waste disposed	kg	1.57E-02	5.60E-04	8.72E-03	2.49E-02

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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

Table 6. Life cycle assessment (LCA) results of the 3-layer floor board with thickness of 15 mm offered by Havwoods Limited.

Environmental impacts: (FU) 1 m <sup>2</sup>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	kg CO <sub>2</sub> eq.	-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 <sub>2</sub> 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 <sub>4</sub> ) <sup>3-</sup> 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 <sup>2</sup>					
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	MJ	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 <sup>3</sup>	3.27E+00	2.16E-06	1.10E+01	1.43E+01
Other environmental information describing waste categories: (FU) 1 m <sup>2</sup>					
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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Table 7. Life cycle assessment (LCA) results of the 3-layer floor board with thickness of 16 mm offered by Havwoods Limited

<b>Environmental impacts: (FU) 1 m<sup>2</sup></b>					
Indicator	Unit	A1	A2	A3	A1-A3
Global warming potential	kg CO <sub>2</sub> eq.	-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 <sub>2</sub> 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 <sub>4</sub> ) <sup>3-</sup> 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
<b>Environmental aspects on resource use: (FU) 1 m<sup>2</sup></b>					
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	MJ	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 <sup>3</sup>	3.45E+00	2.16E-06	1.10E+01	1.44E+01
<b>Other environmental information describing waste categories: (FU) 1 m<sup>2</sup></b>					
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

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### Verification

The process of verification of this EPD is in accordance with 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 (subclause 8.1.3.) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: PhD. Eng. Halina Prejzner LCA, LCI audit and input data verification: PhD. Eng. Justyna Tomaszewska, j.tomaszewska@itb.pl Verification of LCA: PhD. D.Sc. Eng. Michał Piasecki, m.piasecki@itb.pl

### Normative references

- 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

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