ENVIRONMENTAL PRODUCT DECLARATION
as per ISO 14025 and EN 15804

<table>
<thead>
<tr>
<th>Owner of the Declaration</th>
<th>European Producers of Laminate Flooring e.V.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programme holder</td>
<td>Institut Bauen und Umwelt e.V. (IBU)</td>
</tr>
<tr>
<td>Publisher</td>
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</tr>
<tr>
<td>Declaration number</td>
<td>EPD-EPL-20150021-CBE1-EN</td>
</tr>
<tr>
<td>Issue date</td>
<td>24.04.2015</td>
</tr>
<tr>
<td>Valid to</td>
<td>23.04.2020</td>
</tr>
</tbody>
</table>

Direct Pressure Laminate Floor Covering (DPL Floor Covering)
European Producers of Laminate Flooring e.V.

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

European Producers of Laminate Flooring e.V.

Programme holder
IBU - Institut Bauen und Umwelt e.V.
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10178 Berlin
Germany

Declaration number
EPD-EPL-20150021-CBE1-EN

This Declaration is based on the Product Category Rules:
Floor coverings, 07.2014
(PCR tested and approved by the independent expert committee)

Issue date
24.04.2015

Valid to
23.04.2020

Scope:
This Environmental Product Declaration refers to an representative European DPL floor covering produced by manufacturers that are members of EPLF®. Data are based upon production during 2013 in Europe.

The laminate floor covering described in this EPD has a thickness of 9 mm and meets the requirements of the use classes: 21-23, 31-34 according to /EN 13329/, EN ISO 10874/. In order to enable the user of the EPD to calculate the LCA results for different thicknesses and use classes, the EPD contains the respective calculation rules.

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.

Verification
The CEN Norm EN 15804 serves as the core PCR
Independent verification of the declaration according to ISO 14025

Internal
External

Product

Product description
DPL floor coverings described in this EPD are produced by member companies of EPLF®. The floor coverings meet the requirements of /EN 13329/.
DPL floorings consist of a number of layers. On the top side there is a decor with a transparent, wear-resistant contact surface; in the middle there is a core layer made of high density wood fibres and on the back side there is a stabilizing layer to guarantee floor stability. The decorative paper of a DPL floor covering can be printed with any design and gives the floor its individual appearance.

According to EPLF the participating companies are representative for the declaration of the product, the weighting was done according to production volumes. For the marketing in the EU/EFTA (with the exception of Switzerland) the Regulation (EU) No 305/2011 applies. The products need a Declaration of Performance under consideration of /EN 13329/ and the CE-marking.

Application
The laminate floor covering described in this EPD is intended to be used within a building and meets the requirements of the use classes: 21-23, 31-34 according to /EN 13329/, EN ISO 10874/.
For the application and use the respective national provisions apply.

Technical Data

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grammage</td>
<td>8.7</td>
<td>kg/m²</td>
</tr>
<tr>
<td>Abrasion Class EN 13329</td>
<td>AC1-AC6</td>
<td>-</td>
</tr>
<tr>
<td>Product Form</td>
<td>Panel</td>
<td></td>
</tr>
<tr>
<td>Thickness of the element</td>
<td>9</td>
<td>mm</td>
</tr>
<tr>
<td>Length of the surface layer</td>
<td>300 - 2500</td>
<td>mm</td>
</tr>
<tr>
<td>Width of the surface layer</td>
<td>70 - 400</td>
<td>mm</td>
</tr>
<tr>
<td>Length and width of squared</td>
<td>250 - 700</td>
<td>mm</td>
</tr>
</tbody>
</table>
Environmental Product Declaration EPLF – DPL laminate flooring

Elements

| Density | 800 - 1200 kg/m³ |

Base materials / Ancillary materials

The composition of a DPL floor covering in mass % is:
- 90-96 % High Density Fibre board (HDF)
- 2-4 % paper
- 4-6 % resin
- <1 % corundum

HDF (high density fibreboard)
The core board is an HDF board composed of wood fibres and a thermosetting resin, mainly MUF (melamine-urea-formaldehyde) resin.

Paper
The renewable resource wood is the main raw material for paper production.

Resins
The used amino resins are melamine-urea-formaldehyde resins. Amino resins are thermosetting resins that are cured using heat and pressure.

Corundum
Bauxite is the mineral resource of corundum. By using aluminium oxide (Al₂O₃) the surface layer of a laminate flooring obtains abrasion and wear resistance.

DPL floor coverings do not contain substances that are listed in the "Candidate List of Substances of Very High Concern for Authorisation" /REACH/.

Reference service life
The estimated service life of a floor covering depends e.g. on the type of floor covering and the area of application, the user and the maintenance of the product. Comparisons of different floor coverings are only allowed, if these parameters are considered in a consistent way. A minimum service life of 20 years can be assumed according to /BBSR/, technical service life can be considerably longer. The use stage is declared in this EPD for a one year usage.

LCA: Calculation rules

Declared Unit
The declared unit is 1 m² laminate flooring (8.7kg/m², thickness 9mm)

Declared unit

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Declared unit</td>
<td>1</td>
<td>m²</td>
</tr>
<tr>
<td>Conversion factor to 1 kg</td>
<td>0.1149</td>
<td>-</td>
</tr>
</tbody>
</table>

System boundary
Type of EPD: cradle-to-gate - with options
2a) Declaration of a specific product (reference product) as an average from several manufacturers’ plants.

Modules A1-A3 include processes that provide materials and energy input for the system, manufacturing and transport processes up to the factory gate, as well as waste processing.

Module A4 includes the transport to the point of installation.

Module A5 includes packaging waste processing during the construction process. A waste treatment in a waste incineration plant is assumed. Credits from energy substitution are declared in module D.

Module B2 includes the cleaning of the floor covering. Provision of water, cleaning agent and electricity for the cleaning of the floor covering is considered, incl. waste water treatment. The LCA results in this EPD are declared for a one year usage.

Module C is not applicable, because the DPL floor coverings reach the end-of-waste state after dismantling from the building.

Module D includes benefits from all net flows in the end-of-life stage that leave the product boundary system after having passed the end-of-waste stage. It is assumed that post-consumer DPL floor covering waste reaches the end-of-waste stage and is 100% incinerated in a European biomass power plant. Loads from material incineration and resulted energy credits (electricity and thermal energy) are declared within module D.

Module D contains the loads and benefits beyond the system boundaries including the biogenic CO₂ incorporated in the wood fraction of the DPL flooring. The incorporated CO₂ in the wood fraction is 14kg/m². The value declared in module D is the sum of: -8.6 kg CO₂ equiv. + 14kg CO₂ biogenic = 5.4kg CO₂ equiv.

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.
Factors for different thicknesses
The LCA results for the DPL floor covering declared in this EPD refer to a laminate flooring with a thickness of 9mm, which meets the requirements of the use classes: 21-23, 31-34 according to /EN 13329/, /EN ISO 10874/. In order to enable the user of the EPD to calculate the results for different thicknesses and use classes the factors in the following table can be used for the calculation. For A1-A3, A4, A5 and D the LCA results of the declared product (thickness 9mm) have to be multiplied with these factors.

<table>
<thead>
<tr>
<th>Use class</th>
<th>6mm</th>
<th>7mm</th>
<th>8mm</th>
<th>10mm</th>
<th>11mm</th>
<th>12mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP</td>
<td>0.73</td>
<td>0.99</td>
<td>1.26</td>
<td>1.23</td>
<td>1.49</td>
<td>1.76</td>
</tr>
<tr>
<td>ODP</td>
<td>0.69</td>
<td>0.76</td>
<td>0.84</td>
<td>1.08</td>
<td>1.15</td>
<td>1.23</td>
</tr>
<tr>
<td>AP</td>
<td>0.66</td>
<td>0.74</td>
<td>0.82</td>
<td>1.06</td>
<td>1.14</td>
<td>1.23</td>
</tr>
<tr>
<td>EP</td>
<td>0.63</td>
<td>0.70</td>
<td>0.77</td>
<td>1.05</td>
<td>1.13</td>
<td>1.20</td>
</tr>
<tr>
<td>PCOP</td>
<td>0.65</td>
<td>0.74</td>
<td>0.83</td>
<td>1.07</td>
<td>1.16</td>
<td>1.25</td>
</tr>
<tr>
<td>ADPE</td>
<td>0.63</td>
<td>0.68</td>
<td>0.73</td>
<td>1.04</td>
<td>1.09</td>
<td>1.15</td>
</tr>
<tr>
<td>ADPF</td>
<td>0.63</td>
<td>0.69</td>
<td>0.76</td>
<td>1.05</td>
<td>1.12</td>
<td>1.19</td>
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<tr>
<td>PERT</td>
<td>0.65</td>
<td>0.75</td>
<td>0.84</td>
<td>1.07</td>
<td>1.17</td>
<td>1.26</td>
</tr>
<tr>
<td>PENRT</td>
<td>0.63</td>
<td>0.70</td>
<td>0.77</td>
<td>1.06</td>
<td>1.12</td>
<td>1.19</td>
</tr>
</tbody>
</table>

Factors to calculate the results for module A4 and A5 for different DPL floorings

<table>
<thead>
<tr>
<th>Use class</th>
<th>6mm</th>
<th>7mm</th>
<th>8mm</th>
<th>10mm</th>
<th>11mm</th>
<th>12mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valid for all parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A4</td>
<td>0.65</td>
<td>0.75</td>
<td>0.84</td>
<td>1.08</td>
<td>1.17</td>
<td>1.27</td>
</tr>
<tr>
<td>A5</td>
<td>0.73</td>
<td>0.73</td>
<td>0.73</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Factors to calculate the results for module D for different DPL floorings

<table>
<thead>
<tr>
<th>Use class</th>
<th>6mm</th>
<th>7mm</th>
<th>8mm</th>
<th>10mm</th>
<th>11mm</th>
<th>12mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parameter</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GWP</td>
<td>0.64</td>
<td>0.74</td>
<td>0.84</td>
<td>1.08</td>
<td>1.19</td>
<td>1.29</td>
</tr>
<tr>
<td>ODP</td>
<td>0.64</td>
<td>0.74</td>
<td>0.84</td>
<td>1.08</td>
<td>1.19</td>
<td>1.28</td>
</tr>
<tr>
<td>AP</td>
<td>0.64</td>
<td>0.74</td>
<td>0.84</td>
<td>1.08</td>
<td>1.18</td>
<td>1.27</td>
</tr>
<tr>
<td>EP</td>
<td>0.76</td>
<td>0.73</td>
<td>0.70</td>
<td>0.98</td>
<td>0.95</td>
<td>0.92</td>
</tr>
<tr>
<td>PCOP</td>
<td>0.63</td>
<td>0.74</td>
<td>0.84</td>
<td>1.09</td>
<td>1.19</td>
<td>1.30</td>
</tr>
<tr>
<td>ADPE</td>
<td>0.64</td>
<td>0.74</td>
<td>0.84</td>
<td>1.08</td>
<td>1.18</td>
<td>1.28</td>
</tr>
<tr>
<td>ADPF</td>
<td>0.64</td>
<td>0.74</td>
<td>0.84</td>
<td>1.08</td>
<td>1.18</td>
<td>1.28</td>
</tr>
<tr>
<td>PERT</td>
<td>0.64</td>
<td>0.74</td>
<td>0.84</td>
<td>1.08</td>
<td>1.18</td>
<td>1.28</td>
</tr>
<tr>
<td>PENRT</td>
<td>0.64</td>
<td>0.74</td>
<td>0.84</td>
<td>1.08</td>
<td>1.18</td>
<td>1.28</td>
</tr>
</tbody>
</table>
LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules or can be used for developing specific scenarios in the context of a building assessment.

Transport to the construction site (A4)

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Litres of fuel (consumption per kg)</td>
<td>0.00159</td>
<td>l/100km</td>
</tr>
<tr>
<td>Transport distance</td>
<td>250</td>
<td>km</td>
</tr>
<tr>
<td>Capacity utilisation (including empty runs)</td>
<td>85</td>
<td>%</td>
</tr>
<tr>
<td>Gross density of products transported</td>
<td>approx.</td>
<td>880 kg/m³</td>
</tr>
</tbody>
</table>

Installation in the building (A5)

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output substances following waste treatment on site packaging waste</td>
<td>0.232</td>
<td>kg</td>
</tr>
</tbody>
</table>

The amount of installation waste varies and is not declared in this EPD. For the calculation of the environmental impact of 1m² laminate flooring including a certain amount of installation waste the values for the production stage (A1-A3), delivery (A4) and end of life (D) have to be multiplied with the amount of waste (e.g. 3% installation waste, factor 1.03).

Maintenance (B2)

<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintenance cycle (cleaning frequency per year)</td>
<td>120</td>
<td>times/year</td>
</tr>
<tr>
<td>Water consumption (per year)</td>
<td>0.0068</td>
<td>m³</td>
</tr>
<tr>
<td>Auxiliary (per year)</td>
<td>0.0507</td>
<td>kg</td>
</tr>
<tr>
<td>Electricity consumption (per year)</td>
<td>0.074</td>
<td>kWh</td>
</tr>
</tbody>
</table>

The common cleaning method for laminate floor coverings is damp mopping. Loose dirt should be removed by means of a dry mop or a vacuum cleaner. In case of higher requirements on hygiene (e.g. hospitals, care homes) or strongly frequented areas (shops) a need of a higher cleaning frequency is possible.

Reuse, recovery and/or recycling potentials (D), relevant scenario information

100% of post-consumer waste (8.7kg) is incinerated in a biomass power plant.
LCA: Results
The results for module B2 refer to a period of one year. The module D contains the loads and benefits beyond the system boundaries including the biogenic CO₂, which is incorporated in the wood fraction of the DPL flooring. The incorporated CO₂ in the wood fraction is 14kg/m².

The value declared in module D is the sum of: -8.6 kg CO₂ equiv. + 14kg CO₂ biogenic = 5.4kg CO₂ equiv.

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1m² DPL Floor Covering (9mm)

RESULTS OF THE LCA - RESOURCE USE: 1m² DPL Floor Covering (9mm)

RESULTS OF THE LCA - OUTPUT FLOWS AND WASTE CATEGORIES: 1m² DPL Floor Covering (9mm)

References

PCR Part A
Institut Bauen und Umwelt e.V., Berlin (pub.): Product Category Rules for Construction Products from the range of Environmental Product Declarations of Institut Bauen und Umwelt (IBU), Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report. April 2013. www.bau-umwelt.de

PCR Part B
Institut Bauen und Umwelt e.V.: Requirements on the EPD for floor coverings, July 2014

EN 13329
EN 13329: 2009-01: Laminate floor coverings - Elements with a surface layer based on aminoplast and thermostetting resins - Specifications, requirements and test methods

EN ISO 10874
ISO 10874:2009: Resilient, textile and laminate floor coverings - Classification
EN 14041
EN 14041:2004: Resilient, textile and laminate floor coverings - Essential characteristics

BBSR

GaBi Software
GaBi 6 dataset documentation for the software-system and databases, LBP. University of Stuttgart and PE INTERNATIONAL AG, Leinfelden-Echterdingen, 2014 (http://documentation.gabi-software.com/)

REACH

Institut Bauen und Umwelt
Institut Bauen und Umwelt e.V., Berlin (pub.): Generation 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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