

# ENVIRONMENTAL PRODUCT DECLARATION

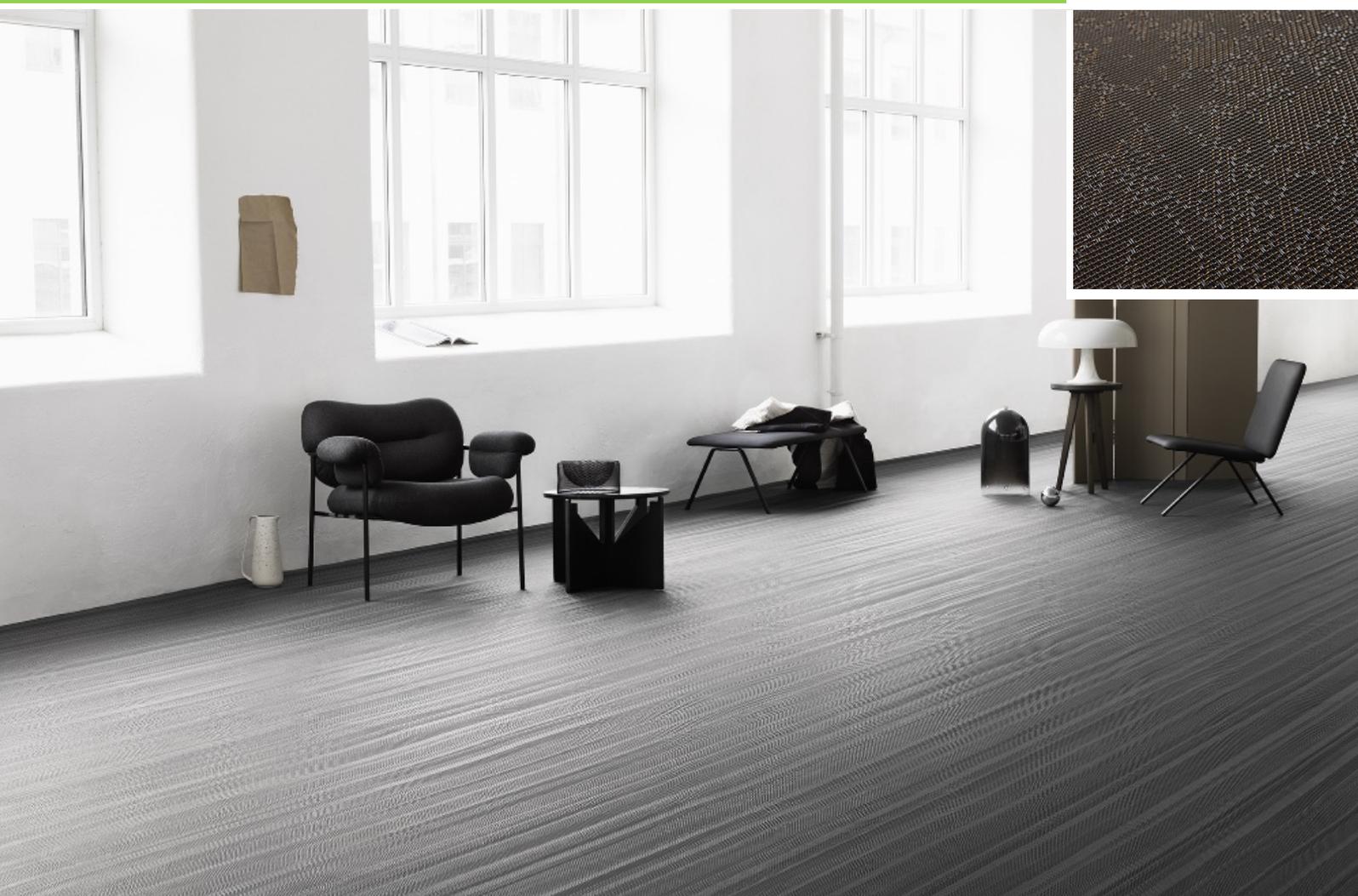
as per ISO 14025 and EN 15804

Owner of the Declaration	Bolon
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Declaration number	EPD-BOL-20160285-CBC1-EN
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Valid to	31.01.2022

**Woven vinyl flooring**  
delivered as rolls,  
total weight up to 3000 g/m<sup>2</sup>

**Bolon**

[www.ibu-epd.com](http://www.ibu-epd.com) / <https://epd-online.com>



## General Information

<p><b>Bolon</b></p> <hr/> <p><b>Programme holder</b>          IBU - Institut Bauen und Umwelt e.V.          Panoramastr. 1          10178 Berlin          Germany</p> <hr/> <p><b>Declaration number</b>          EPD-BOL-20160285-CBC1-EN</p> <hr/> <p><b>This Declaration is based on the Product Category Rules:</b>          Floor coverings, 07.2016          (PCR tested and approved by the SVR)</p> <hr/> <p><b>Issue date</b>          01.02.2017</p> <hr/> <p><b>Valid to</b>          31.01.2022</p> <div style="text-align: center;">  </div> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer          (President of Institut Bauen und Umwelt e.V.)</p> <div style="text-align: center;">  </div> <hr/> <p>Dr. Burkhard Lehmann          (Managing Director IBU)</p>	<p><b>Woven vinyl flooring</b>          delivered as rolls,          total weight up to 3000 g/m<sup>2</sup></p> <hr/> <p><b>Owner of the Declaration</b>          Bolon          Industrivägen 12          52390 Ulricehamn          Sweden</p> <hr/> <p><b>Declared product / Declared unit</b>          1 m<sup>2</sup> woven flooring (output A1-A3: 1m<sup>2</sup> produced flooring, output A5: 1m<sup>2</sup> installed flooring)</p> <hr/> <p><b>Scope:</b>          The declaration applies to a textile vinyl flooring delivered as rolls. It is manufactured in the Bolon production site Ulricehamn, Sweden.          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.</p> <hr/> <p><b>Verification</b></p> <table border="1"> <tr> <td colspan="2">The CEN Norm /EN 15804/ serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration according to /ISO 14025/</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <div style="text-align: center;">  </div> <hr/> <p>Angela Schindler          (Independent verifier appointed by SVR)</p>	The CEN Norm /EN 15804/ serves as the core PCR		Independent verification of the declaration according to /ISO 14025/		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
The CEN Norm /EN 15804/ serves as the core PCR							
Independent verification of the declaration according to /ISO 14025/							
<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally						

## Product

### Product description / Product definition

Woven vinyl flooring delivered as rolls with a total weight up to 3000 g/m<sup>2</sup>.

The vinyl backing compound contains recycled material.

The calculations refer to the average product with a total weight of 2900 g/m<sup>2</sup>.

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The Declaration of Performance of the products taking into consideration /EN 14041/ and the CE-marking of the products can be found on the manufacturer's technical information section.

### Application

The textile flooring can be used in commercial areas. The indication of the use class can be found on the manufacturer's technical information section.

### Technical Data

Name	Value	Unit
Product Form	rolls of 2 m width	-
Type of manufacture	woven flooring	-
Yarn type	solution dyed PVC	-
Secondary backing	Heavy backing based on PVC	-
Total carpet weight	max. 3000	g/m <sup>2</sup>

Additional product properties and performance ratings in accordance with the Declaration of Performance with respect to its Essential Characteristics according to /EN 1307/ can be found on the manufacturer's technical information section.

### Base materials / Ancillary materials

Name	Value	Unit
Polyvinyl chloride	36.7	%
Phthalate-free plasticizer*	17.0	%
Calcium carbonate	39.8	%
Glass fibre	1.4	%
Additives	5.1	%

\* For the LCA calculations Di-isononylphthalat has been used as a dataset for Mesamoll<sup>□</sup> used in Bolon products is not yet available.

## Reference service life

The service life of textile floor coverings strongly depends on the correct installation taking into account

the declared use classification and the adherence to cleaning and maintenance instructions.

A minimum service life of 10 years can be assumed, technical service life can be considerably longer.

## LCA: Calculation rules

### Declared Unit

#### Average product

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Conversion factor to 1 kg	0.34	m <sup>2</sup> /kg
Mass reference	2.9	kg/m <sup>2</sup>

The declared unit refers to 1 m<sup>2</sup> produced textile floor covering (output A1-A3: 1m<sup>2</sup> produced flooring, output A5: 1m<sup>2</sup> installed flooring).

### System boundary

Type of EPD: Cradle to grave

System boundaries of modules A, B, C, D:

#### A1-A3 Production:

Energy supply and production of the basic material, processing of secondary material, auxiliary material, transport of the material to the manufacturing site, emissions, waste water treatment, packaging material and waste processing up to the landfill disposal of residual waste (except radioactive waste). Credits for electricity and steam from the incineration of production waste are aggregated.

#### A4 Transport:

Transport of the packed textile floorcovering from factory gate to the place of installation.

#### A5 Installation:

Installation of the textile floorcovering, production and transport of auxiliary material, waste processing up to the landfill disposal of residual waste (except radioactive waste), the production of the amount of carpet that occurs as installation waste incl. its transport to the place of installation.

Credits for electricity and steam from the incineration of packaging and installation waste leave the product system.

#### B1 Use:

Indoor emissions during the use stage. After the first year no product related VOC emissions are relevant due to known VOC decay curves of the product.

#### B2 Maintenance:

Cleaning of the textile floor covering for a period of 1 year:

Vacuum cleaning – electricity supply

Wet cleaning – electricity, water consumption, production of the cleaning agent, waste water treatment.

**The declared values in this module have to be multiplied by the assumed service life of the floor covering in the building considered** (see annex, chapter: 'General Information on use stages B1 to B7').

#### B3 - B7:

The modules are not relevant and therefore not declared.

#### C1 De-construction:

The floorcovering is de-constructed manually and no additional environmental impact is caused.

#### C2 Transport:

C2: Transport of the carpet waste to a landfill site or to a municipal waste incineration plant (MWI)..

#### C3 Waste processing:

C3-1: Landfill disposal need no waste processing.

C3-2: Waste incineration need no waste processing.

#### C4 Disposal

C4-1: Impact from landfill disposal,

C4-2: Impact from waste incineration (credits leave the system boundaries),

#### D Recycling potential:

D-A5: Energy credits from waste incineration of packaging and installation waste (incineration plant with R1<0.6),

D-1: Energy credits from landfill disposal of carpet waste at the end-of-life,

D-2: Energy credits from waste incineration of carpet waste at the end-of-life (incineration plant with R1<0.6),

### 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.

. Background data are taken from the GaBi database 2016, service pack 30 and from the ecoinvent 3.1 database.

## LCA: Scenarios and additional technical information

The following information refers to the declared modules and is the basis for calculations or can be used for further calculations. All indicated values refer to the declared functional unit.

### Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck, EURO 0-5 mix)	0.0058	l/100km
Transport distance , truck (weighted average)	724	km
Transport distance , ship (weighted average)	816	km
Capacity utilisation (including empty runs)	85	%

### Installation in the building (A5)

Name	Value	Unit
Auxiliary (adhesive)	0.325	kg
Material loss	0.26	kg

Packaging waste made of polyethylene, polystyrene or wood and installation waste are considered to be incinerated in a municipal waste incineration plant. Cardboard packaging waste leaves the system for recycling.

### Maintenance (B2)

The values are indicated per m<sup>2</sup> floor covering and per year (see annex 'General Information on use stages B1 to B7').

Name	Value	Unit
Maintenance cycle (wet cleaning)	1.5	1/year
Maintenance cycle (vacuum cleaning)	208	1/year
Water consumption (wet cleaning)	0.004	m <sup>3</sup>
Cleaning agent (wet cleaning)	0.09	kg
Electricity consumption	0.314	kWh

### End of Life (C1-C4)

Two different end-of-life scenarios are declared and the results are indicated separately in module C. Each scenario is calculated as a 100% scenario.

Scenario 1: 100% landfill disposal

Scenario 2: 100% municipal waste incineration (MWI)

If combinations of these scenarios have to be calculated this should be done according to the following scheme:

$$\text{EOL-impact} = x\% \text{ impact (Scenario 1)} + y\% \text{ impact (Scenario 2)}$$

Name	Value	Unit
Collected as mixed construction waste (scenario 1 and 2)	2.9	kg
Landfilling (scenario 1)	2.9	kg
Energy recovery (scenario 2)	2.9	kg

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

The recovery or recycling potentials due to the two end-of-life scenarios (module C) are indicated separately.

## LCA: Results

The declared result figures in module B2 have to be multiplied by the assumed service time (in years) of the floor covering in the building in question (see annex 'General Information on use stages B1 to B7').  
**Information on un-declared modules:**

Modules B3 - B7 are not relevant during the service life of the carpet and are therefore not declared.

Modules C1, C3/1 and C3/2 cause no additional impact (see "LCA: Calculation rules") and are therefore not declared.

Column D represents module D/A5.

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

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

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C4/1	C4/2	D	D/1	D/2
GWP	[kg CO <sub>2</sub> -Eq.]	5.74	0.16	1.25	0.00	0.35	0.01	0.36	3.79	-0.24	0.00	-0.93
ODP	[kg CFC11-Eq.]	4.82E-8	7.14E-13	4.48E-9	0.00E+0	1.36E-8	3.09E-14	7.76E-12	3.37E-9	-1.01E-10	0.00E+0	-2.90E-10
AP	[kg SO <sub>2</sub> -Eq.]	1.28E-2	1.63E-3	2.31E-3	0.00E+0	1.45E-3	2.94E-5	5.74E-4	4.11E-3	-4.47E-4	0.00E+0	-1.42E-3
EP	[kg (PO <sub>4</sub> ) <sup>3-</sup> -Eq.]	3.31E-3	2.47E-4	4.95E-4	0.00E+0	3.06E-4	7.23E-6	5.68E-4	2.23E-4	-4.33E-5	0.00E+0	-1.45E-4
POCP	[kg ethene-Eq.]	4.12E-3	-1.47E-4	5.00E-4	1.52E-4	2.71E-4	-1.11E-5	7.46E-5	1.12E-4	-4.12E-5	0.00E+0	-1.55E-4
ADPE	[kg Sb-Eq.]	2.00E-5	9.46E-9	2.29E-6	0.00E+0	1.21E-6	4.47E-10	4.04E-8	8.79E-7	-4.92E-8	0.00E+0	-1.50E-7
ADPF	[MJ]	127.00	2.20	17.80	0.00	7.18	0.09	2.97	5.62	-3.07	0.00	-12.80

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C4/1	C4/2	D	D/1	D/2
PERE	[MJ]	24.03	0.10	5.81	0.00	0.85	0.01	0.21	0.82	-0.69	0.00	-1.99
PERM	[MJ]	3.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	[MJ]	27.30	0.10	5.81	0.00	0.85	0.01	0.21	0.82	-0.69	0.00	-1.99
PENRE	[MJ]	99.70	2.21	19.20	0.00	8.34	0.09	3.09	6.31	-4.01	0.00	-15.50
PENRM	[MJ]	38.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	[MJ]	138.00	2.21	19.20	0.00	8.34	0.09	3.09	6.31	-4.01	0.00	-15.50
SM	[kg]	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0								
FW	[m <sup>3</sup> ]	7.77E-2	2.53E-4	9.55E-3	0.00E+0	5.58E-3	1.32E-5	1.36E-5	1.06E-2	-1.07E-3	0.00E+0	-3.10E-3

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C4/1	C4/2	D	D/1	D/2
HWD	[kg]	6.48E-6	1.34E-7	2.55E-5	0.00E+0	1.22E-9	7.03E-9	1.75E-8	6.53E-8	-1.80E-9	0.00E+0	-5.80E-9
NHWD	[kg]	3.87E-1	1.51E-4	1.99E-1	0.00E+0	8.09E-3	7.81E-6	2.89E+0	1.78E+0	-1.66E-3	0.00E+0	-5.24E-3
RWD	[kg]	4.42E-3	3.07E-6	5.36E-4	0.00E+0	3.84E-4	1.33E-7	4.71E-5	2.60E-4	-3.73E-4	0.00E+0	-1.07E-3
CRU	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	[MJ]	0.00	0.00	1.08	0.00	0.00	0.00	0.00	3.06	0.00	0.00	0.00
EET	[MJ]	0.00	0.00	1.29	0.00	0.00	0.00	0.00	7.04	0.00	0.00	0.00

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

## References

### **Institut Bauen und Umwelt**

Institut Bauen und Umwelt e.V., Berlin(pub.):  
Generation of Environmental Product Declarations  
(EPDs);  
[www.ibu-epd.de](http://www.ibu-epd.de)

### **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

### **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),  
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Report, April 2013  
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### **PCR Part B**

Institut Bauen und Umwelt e.V., Berlin (pub.):  
Product Category Rules for Construction Products  
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Part B: Requirements on the EPD for floor coverings,  
V1.4, September 2016  
[www.bau-umwelt.de](http://www.bau-umwelt.de)

### **EN 1307**

DIN EN 1307: 2014-07 Textile floor coverings -  
Classification

### **EN 14041**

DIN EN 14041: 2008-05 (+AC:2005 +  
AC:2006) Resilient, textile and laminate floor  
coverings

### **ISO 10874**

DIN EN ISO 10874: 2012-04 Resilient, textile and  
laminate floor coverings - Classification

### **EN 13501-1:**

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

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## Annex : LCA results according to TRACI, version 2.1

**Owner of the declaration:** Bolon  
**Product:** Woven vinyl flooring delivered as rolls, total weight up to 3000 g/m<sup>2</sup>

This annex indicates the results of the EPD in line with EN 15804 according to TRACI, version 2.1 (Tool for the Reduction and Assessment of Chemical and other environmental Impacts)

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
GWP	[kg CO <sub>2</sub> -Eq.]	5,74E+00	1,64E-01	1,25E+00	0,00E+00	3,50E-01	6,73E-03	3,63E-01	3,79E+00	-2,36E-01	0,00E+00	-9,26E-01
ODP	[kg CFC11-Eq.]	5,47E-08	7,60E-13	5,06E-09	0,00E+00	1,54E-08	3,29E-14	8,25E-12	3,68E-09	-1,07E-10	0,00E+00	-3,08E-10
AP	[kg SO <sub>2</sub> -Eq.]	1,37E-02	1,88E-03	2,55E-03	0,00E+00	1,43E-03	3,91E-05	6,03E-04	4,88E-03	-4,57E-04	0,00E+00	-1,47E-03
EP	[kg N-Eq.]	4,64E-03	1,01E-04	6,09E-04	0,00E+00	5,12E-04	3,34E-06	2,73E-04	1,12E-04	-2,98E-05	0,00E+00	-9,29E-05
SFP	[kg O <sub>3</sub> -Eq.]	2,22E-01	3,69E-02	3,94E-02	1,16E-03	1,67E-02	8,43E-04	1,01E-02	3,51E-02	-6,43E-03	0,00E+00	-2,23E-02

**Caption** GWP = Global warming potential for air emissions; ODP = Ozone depletion potential for air emissions; AP = Acidification potential; EP = Eutrophication potential; SFP = Photochemical smog formation potential for air emissions;

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
PERE	[MJ]	2,40E+01	1,01E-01	5,81E+00	0,00E+00	8,50E-01	5,26E-03	2,11E-01	8,20E-01	-6,92E-01	0,00E+00	-1,99E+00
PERM	[MJ]	3,27E+00	0,00E+00	0,00E+00	0,00E+00							
PERT	[MJ]	2,73E+01	1,01E-01	5,81E+00	0,00E+00	8,50E-01	5,26E-03	2,11E-01	8,20E-01	-6,92E-01	0,00E+00	-1,99E+00
PENRE	[MJ]	9,97E+01	2,21E+00	1,92E+01	0,00E+00	8,34E+00	9,29E-02	3,09E+00	6,31E+00	-4,01E+00	0,00E+00	-1,55E+01
PENRM	[MJ]	3,83E+01	0,00E+00	0,00E+00	0,00E+00							
PENRT	[MJ]	1,38E+02	2,21E+00	1,92E+01	0,00E+00	8,34E+00	9,29E-02	3,09E+00	6,31E+00	-4,01E+00	0,00E+00	-1,55E+01
SM	[kg]	5,03E-02	0,00E+00	4,31E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00								
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00								
FW	[m <sup>3</sup> ]	7,77E-02	2,53E-04	9,55E-03	0,00E+00	5,58E-03	1,32E-05	1,36E-05	1,06E-02	-1,07E-03	0,00E+00	-3,10E-03

**Caption** PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
HWD	[kg]	6,48E-06	1,34E-07	2,55E-05	0,00E+00	1,22E-09	7,03E-09	1,75E-08	6,53E-08	-1,80E-09	0,00E+00	-5,80E-09
NHWD	[kg]	3,87E-01	1,51E-04	1,99E-01	0,00E+00	8,09E-03	7,81E-06	2,89E+00	1,78E+00	-1,66E-03	0,00E+00	-5,24E-03
RWD	[kg]	4,42E-03	3,07E-06	5,36E-04	0,00E+00	3,84E-04	1,33E-07	4,71E-05	2,60E-04	-3,73E-04	0,00E+00	-1,07E-03
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00								
MFR	[kg]	0,00E+00	0,00E+00	3,30E-04	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00								
EEE	[MJ]	0,00E+00	0,00E+00	1,08E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	3,06E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	1,29E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,04E+00	0,00E+00	0,00E+00	0,00E+00

**Caption** HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

## Annex: General Information on use stages B1 to B7

LCA results indicate environmental impacts resulting from use stage B1 to B7.

For textile floor coverings only modules B1 (use) and B2 (maintenance) are taken into account. Modules B3 (repair), B4 (replacement), B5 (refurbishment), B6 (operational energy use) and B7 (operational water use) are not relevant during the service life of textile floor coverings.

**Module B1 'use'** includes emissions to the indoor air during the use stage. Relevant emissions only occur in the first year of life (see LCA: Calculation rules).

**Module B2 'maintenance'** includes cleaning procedures.

### Reference service life

The actual service life of textile floor coverings depends on a wide range of various impact factors such as the allocation of the application area to the use class, maintenance, intensity of use and most often fashion and building related aspects. Therefore technical service life mostly last much longer than real service life.

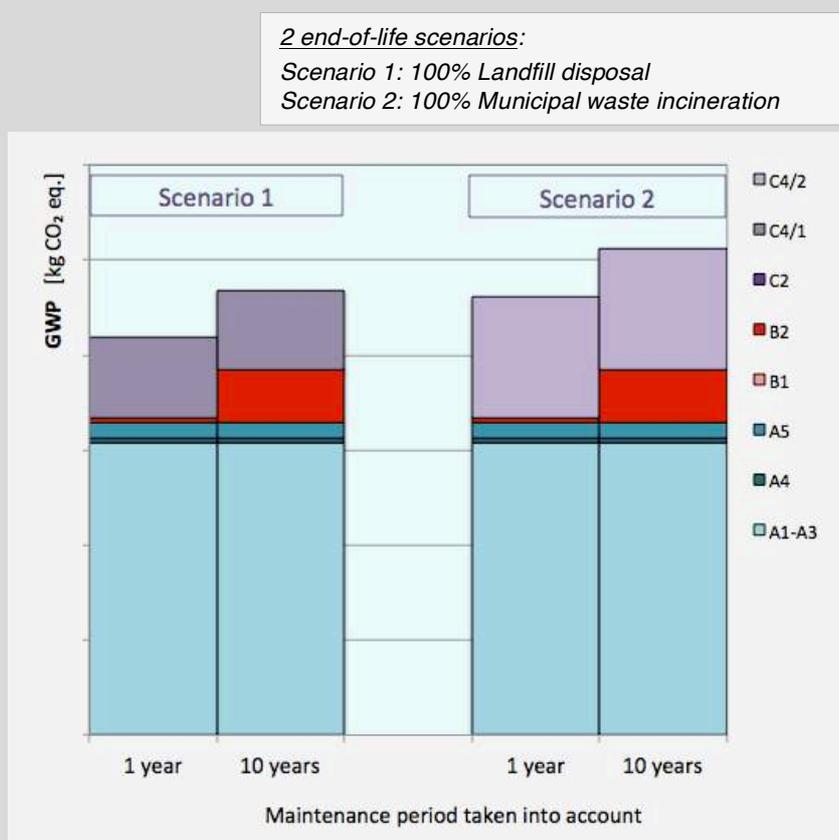
### Total environmental impacts from module B2

The total environmental impacts have to be calculated by taking into account the service life of textile floor coverings. Therefore the assumed real service life (ARSL) has to be used for the calculation of total environmental impacts taking into account the expected use conditions (see RSL).

Module B2 (maintenance) is depending on the service life.

Values for module B2 given in the result tables are indicated for the period of one year. They have to be multiplied by the ARSL of the textile floor covering taking into account building related aspects.

The influence of the maintenance period on the Global Warming Potential (GWP) of the whole life cycle of a textile floorcovering – differentiated for 2 end-of-life scenarios – is illustrated in the graph.



Graph: Global Warming Potential (GWP) – aggregation of module A to module C - taking into account a maintenance period of 1 year compared to a maintenance period of 10 years - for the two declared end-of-life scenarios.

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Bolon
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-BOL-20160286-CBC1-EN
Issue date	01.02.2017
Valid to	31.01.2022

**Woven vinyl flooring**  
delivered as tiles or planks,  
total weight up to 4000 g/m<sup>2</sup>

**Bolon**

[www.ibu-epd.com](http://www.ibu-epd.com) / <https://epd-online.com>



## General Information

<p><b>Bolon</b></p> <hr/> <p><b>Programme holder</b>          IBU - Institut Bauen und Umwelt e.V.          Panoramastr. 1          10178 Berlin          Germany</p> <hr/> <p><b>Declaration number</b>          EPD-BOL-20160286-CBC1-EN</p> <hr/> <p><b>This Declaration is based on the Product Category Rules:</b>          Floor coverings, 07.2016          (PCR tested and approved by the SVR)</p> <hr/> <p><b>Issue date</b>          01.02.2017</p> <hr/> <p><b>Valid to</b>          31.01.2022</p> <div style="text-align: center;">  </div> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer          (President of Institut Bauen und Umwelt e.V.)</p> <div style="text-align: center;">  </div> <hr/> <p>Dr. Burkhard Lehmann          (Managing Director IBU)</p>	<p><b>Woven vinyl flooring</b>          delivered as tiles or planks,          total weight up to 4000 g/m<sup>2</sup></p> <hr/> <p><b>Owner of the Declaration</b>          Bolon          Industrivägen 12          52390 Ulricehamn          Sweden</p> <hr/> <p><b>Declared product / Declared unit</b>          1 m<sup>2</sup> woven flooring (output A1-A3: 1m<sup>2</sup> produced flooring, output A5: 1m<sup>2</sup> installed flooring)</p> <hr/> <p><b>Scope:</b>          The declaration applies to a textile vinyl flooring delivered as tiles. It is manufactured in the Bolon production site Ulricehamn, Sweden.          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.</p> <hr/> <p><b>Verification</b></p> <table border="1"> <tr> <td colspan="2">The CEN Norm /EN 15804/ serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration according to /ISO 14025/</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <div style="text-align: center;">  </div> <hr/> <p>Angela Schindler          (Independent verifier appointed by SVR)</p>	The CEN Norm /EN 15804/ serves as the core PCR		Independent verification of the declaration according to /ISO 14025/		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
The CEN Norm /EN 15804/ serves as the core PCR							
Independent verification of the declaration according to /ISO 14025/							
<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally						

## Product

### Product description / Product definition

Woven vinyl flooring delivered as tiles or planks with a total weight up to 4000 g/m<sup>2</sup>.

The vinyl backing compound contains recycled material.

The calculations refer to the average product with a total weight of 3910 g/m<sup>2</sup>.

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The Declaration of Performance of the products taking into consideration /EN 14041/ and the CE-marking of the products can be found on the manufacturer's technical information section.

### Application

The textile flooring can be used in commercial areas. The indication of the use class can be found on the manufacturer's technical information section.

### Technical Data

Name	Value	Unit
Product Form	tiles or planks	-
Dimensions	500 mm x 500 mm or 222 mm x 667 mm	
Type of manufacture	woven flooring	-
Yarn type	solution dyed PVC	-
Secondary backing	Heavy backing based on PVC	-
Total carpet weight	max. 4000	g/m <sup>2</sup>

Additional product properties and performance ratings in accordance with the Declaration of Performance with respect to its Essential Characteristics according to /EN 1307/ can be found on the manufacturer's technical information section.

## Base materials / Ancillary materials

Name	Value	Unit
Polyvinyl chloride	37.4	%
Phthalate-free plasticizer*	18.5	%
Calcium carbonate	37.0	%
Glass fibre	1.4	%
Additives	5.7	%

\* For the LCA calculations Di-isononylphthalat has been used as a dataset for Mesamoll<sup>□</sup> used in Bolon products is not yet available.

## Reference service life

The service life of textile floor coverings strongly depends on the correct installation taking into account the declared use classification and the adherence to cleaning and maintenance instructions. A minimum service life of 10 years can be assumed, technical service life can be considerably longer.

## LCA: Calculation rules

### Declared Unit

#### Average product

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Conversion factor to 1 kg	0.26	m <sup>2</sup> /kg
Mass reference	3.91	kg/m <sup>2</sup>

The declared unit refers to 1 m<sup>2</sup> produced textile floor covering (output A1-A3: 1m<sup>2</sup> produced flooring, output A5: 1m<sup>2</sup> installed flooring)

### System boundary

Type of EPD: Cradle to grave

System boundaries of modules A, B, C, D:

#### A1-A3 Production:

Energy supply and production of the basic material, processing of secondary material, auxiliary material, transport of the material to the manufacturing site, emissions, waste water treatment, packaging material and waste processing up to the landfill disposal of residual waste (except radioactive waste). Credits for electricity and steam from the incineration of production waste are aggregated.

#### A4 Transport:

Transport of the packed textile floorcovering from factory gate to the place of installation.

#### A5 Installation:

Installation of the textile floorcovering, production and transport of auxiliary material, waste processing up to the landfill disposal of residual waste (except radioactive waste), the production of the amount of carpet that occurs as installation waste incl. its transport to the place of installation.

Credits for electricity and steam from the incineration of packaging and installation waste leave the product system.

#### B1 Use:

Indoor emissions during the use stage. After the first year no product related VOC emissions are relevant due to known VOC decay curves of the product.

#### B2 Maintenance:

Cleaning of the textile floor covering for a period of 1 year:

Vacuum cleaning – electricity supply  
Wet cleaning – electricity, water consumption, production of the cleaning agent, waste water treatment.

**The declared values in this module have to be multiplied by the assumed service life of the floor covering in the building considered** (see annex, chapter: 'General Information on use stages B1 to B7').

#### B3 - B7:

The modules are not relevant and therefore not declared.

#### C1 De-construction:

The floorcovering is de-constructed manually and no additional environmental impact is caused.

#### C2 Transport:

C2: Transport of the carpet waste to a landfill site or to a municipal waste incineration plant (MWI)..

#### C3 Waste processing:

C3-1: Landfill disposal need no waste processing.  
C3-2: Waste incineration need no waste processing.

#### C4 Disposal

C4-1: Impact from landfill disposal,  
C4-2: Impact from waste incineration (credits leave the system boundaries),

#### D Recycling potential:

D-A5: Energy credits from waste incineration of packaging and installation waste (incineration plant with R1<0.6),

D-1: Energy credits from landfill disposal of carpet waste at the end-of-life,

D-2: Energy credits from waste incineration of carpet waste at the end-of-life (incineration plant with R1<0.6),

### 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. Background data are taken from the GaBi database 2016, service pack 30 and from the ecoinvent 3.1 database.

## LCA: Scenarios and additional technical information

The following information refers to the declared modules and is the basis for calculations or can be used for further calculations. All indicated values refer to the declared functional unit.

### Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck, EURO 0-5 mix)	0.0078	l/100km
Transport distance , truck (weighted average)	724	km
Transport distance , ship (weighted average)	816	km
Capacity utilisation (including empty runs)	85	%

### Installation in the building (A5)

Name	Value	Unit
Auxiliary (adhesive)	0.325	kg
Material loss	0.12	kg

Cardboard packaging waste leaves the system for recycling. Installation waste is considered to be incinerated in a municipal waste incineration plant.

### Maintenance (B2)

The values are indicated per m<sup>2</sup> floor covering and per year (see annex 'General Information on use stages B1 to B7').

Name	Value	Unit
Maintenance cycle (wet cleaning)	1.5	1/year
Maintenance cycle (vacuum cleaning)	208	1/year
Water consumption (wet cleaning)	0.004	m <sup>3</sup>
Cleaning agent (wet cleaning)	0.09	kg
Electricity consumption	0.314	kWh

### End of Life (C1-C4)

Two different end-of-life scenarios are declared and the results are indicated separately in module C. Each scenario is calculated as a 100% scenario.

Scenario 1: 100% landfill disposal

Scenario 2: 100% municipal waste incineration (MWI)

If combinations of these scenarios have to be calculated this should be done according to the following scheme:

$$\text{EOL-impact} = x\% \text{ impact (Scenario 1)} + y\% \text{ impact (Scenario 2)}$$

Name	Value	Unit
Collected as mixed construction waste (scenario 1 and 2)	3.91	kg
Landfilling (scenario 1)	3.91	kg
Energy recovery (scenario 2)	3.91	kg

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

The recovery or recycling potentials due to the two end-of-life scenarios (module C) are indicated separately.

## LCA: Results

The declared result figures in module B2 have to be multiplied by the assumed service time (in years) of the floor covering in the building in question (see annex 'General Information on use stages B1 to B7').  
**Information on un-declared modules:**

Modules B3 - B7 are not relevant during the service life of the carpet and are therefore not declared.

Modules C1, C3/1 and C3/2 cause no additional impact (see "LCA: Calculation rules") and are therefore not declared.

Column D represents module D/A5.

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

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

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C4/1	C4/2	D	D/1	D/2
GWP	[kg CO <sub>2</sub> -Eq.]	8.25	0.22	0.54	0.00	0.35	0.01	0.44	5.23	-0.04	0.00	-1.31
ODP	[kg CFC11-Eq.]	6.08E-8	9.44E-13	1.95E-9	0.00E+0	1.36E-8	4.17E-14	1.05E-11	4.24E-9	-1.22E-11	0.00E+0	-4.08E-10
AP	[kg SO <sub>2</sub> -Eq.]	1.73E-2	2.16E-3	1.45E-3	0.00E+0	1.45E-3	3.97E-5	7.74E-4	5.67E-3	-6.00E-5	0.00E+0	-2.00E-3
EP	[kg (PO <sub>4</sub> ) <sup>3-</sup> -Eq.]	4.45E-3	3.26E-4	3.18E-4	0.00E+0	3.06E-4	9.75E-6	7.66E-4	3.09E-4	-6.13E-6	0.00E+0	-2.04E-4
POCP	[kg ethene-Eq.]	5.72E-3	-1.95E-4	3.16E-4	1.52E-4	2.71E-4	-1.50E-5	1.01E-4	1.55E-4	-6.56E-6	0.00E+0	-2.19E-4
ADPE	[kg Sb-Eq.]	2.70E-5	1.25E-8	1.31E-6	0.00E+0	1.21E-6	6.03E-10	5.45E-8	1.26E-6	-6.35E-9	0.00E+0	-2.12E-7
ADPF	[MJ]	176.00	2.91	11.60	0.00	7.18	0.13	4.00	7.70	-0.54	0.00	-18.10

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C4/1	C4/2	D	D/1	D/2
PERE	[MJ]	25.07	0.13	4.25	0.00	0.85	0.01	0.29	1.14	-0.08	0.00	-2.81
PERM	[MJ]	3.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	[MJ]	28.70	0.13	4.25	0.00	0.85	0.01	0.29	1.14	-0.08	0.00	-2.81
PENRE	[MJ]	138.42	2.92	12.40	0.00	8.34	0.13	4.16	8.63	-0.66	0.00	-21.90
PENRM	[MJ]	53.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	[MJ]	192.00	2.92	12.40	0.00	8.34	0.13	4.16	8.63	-0.66	0.00	-21.90
SM	[kg]	0.19	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0								
FW	[m <sup>3</sup> ]	9.53E-2	3.35E-4	4.42E-3	0.00E+0	5.58E-3	1.78E-5	1.83E-5	1.45E-2	-1.31E-4	0.00E+0	-4.36E-3

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C4/1	C4/2	D	D/1	D/2
HWD	[kg]	9.36E-6	1.77E-7	2.52E-5	0.00E+0	1.22E-9	9.47E-9	2.36E-8	9.03E-8	-2.45E-10	0.00E+0	-8.18E-9
NHWD	[kg]	5.40E-1	2.00E-4	9.46E-2	0.00E+0	8.09E-3	1.05E-5	3.90E+0	2.46E+0	-2.21E-4	0.00E+0	-7.38E-3
RWD	[kg]	6.02E-3	4.05E-6	3.17E-4	0.00E+0	3.84E-4	1.79E-7	6.35E-5	3.54E-4	-4.53E-5	0.00E+0	-1.51E-3
CRU	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	[kg]	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MER	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	[MJ]	0.00	0.00	0.13	0.00	0.00	0.00	0.00	4.31	0.00	0.00	0.00
EET	[MJ]	0.00	0.00	0.30	0.00	0.00	0.00	0.00	9.95	0.00	0.00	0.00

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

## References

### **Institut Bauen und Umwelt**

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(EPDs);  
[www.ibu-epd.de](http://www.ibu-epd.de)

### **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  
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Declarations — Core rules for the product category of  
construction products

### **PCR Part A**

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Report, April 2013  
[www.bau-umwelt.de](http://www.bau-umwelt.de)

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Part B: Requirements on the EPD for floor coverings,  
V1.4, September 2016  
[www.bau-umwelt.de](http://www.bau-umwelt.de)

### **EN 1307**

DIN EN 1307: 2014-07 Textile floor coverings -  
Classification

### **EN 14041**

DIN EN 14041: 2008-05 (+AC:2005 +  
AC:2006) Resilient, textile and laminate floor  
coverings

### **ISO 10874**

DIN EN ISO 10874: 2012-04 Resilient, textile and  
laminate floor coverings - Classification

### **EN 13501-1:**

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

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## Annex : LCA results according to TRACI, version 2.1

**Owner of the declaration:** Bolon  
**Product:** Woven vinyl flooring delivered as tiles or planks, total weight up to 4000 g/m<sup>2</sup>

This annex indicates the results of the EPD in line with EN 15804 according to TRACI, version 2.1 (Tool for the Reduction and Assessment of Chemical and other environmental Impacts)

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
GWP	[kg CO <sub>2</sub> -Eq.]	8,25E+00	2,17E-01	5,38E-01	0,00E+00	3,50E-01	9,07E-03	4,35E-01	5,23E+00	-3,92E-02	0,00E+00	-1,31E+00
ODP	[kg CFC11-Eq.]	6,89E-08	1,00E-12	2,20E-09	0,00E+00	1,54E-08	4,43E-14	1,11E-11	4,62E-09	-1,30E-11	0,00E+00	-4,34E-10
AP	[kg SO <sub>2</sub> -Eq.]	1,85E-02	2,48E-03	1,61E-03	0,00E+00	1,43E-03	5,28E-05	8,13E-04	6,73E-03	-6,22E-05	0,00E+00	-2,07E-03
EP	[kg N-Eq.]	6,15E-03	1,33E-04	3,80E-04	0,00E+00	5,12E-04	4,50E-06	3,68E-04	1,55E-04	-3,92E-06	0,00E+00	-1,31E-04
SFP	[kg O <sub>3</sub> -Eq.]	3,02E-01	4,87E-02	2,59E-02	1,16E-03	1,67E-02	1,14E-03	1,36E-02	4,85E-02	-9,45E-04	0,00E+00	-3,15E-02

**Caption** GWP = Global warming potential for air emissions; ODP = Ozone depletion potential for air emissions; AP = Acidification potential; EP = Eutrophication potential; SFP = Photochemical smog formation potential for air emissions;

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
PERE	[MJ]	2,51E+01	1,34E-01	4,25E+00	0,00E+00	8,50E-01	7,09E-03	2,85E-01	1,14E+00	-8,42E-02	0,00E+00	-2,81E+00
PERM	[MJ]	3,63E+00	0,00E+00	0,00E+00	0,00E+00							
PERT	[MJ]	2,87E+01	1,34E-01	4,25E+00	0,00E+00	8,50E-01	7,09E-03	2,85E-01	1,14E+00	-8,42E-02	0,00E+00	-2,81E+00
PENRE	[MJ]	1,38E+02	2,92E+00	1,24E+01	0,00E+00	8,34E+00	1,25E-01	4,16E+00	8,63E+00	-6,57E-01	0,00E+00	-2,19E+01
PENRM	[MJ]	5,36E+01	0,00E+00	0,00E+00	0,00E+00							
PENRT	[MJ]	1,92E+02	2,92E+00	1,24E+01	0,00E+00	8,34E+00	1,25E-01	4,16E+00	8,63E+00	-6,57E-01	0,00E+00	-2,19E+01
SM	[kg]	1,91E-01	0,00E+00	5,56E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00								
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00								
FW	[m <sup>3</sup> ]	9,53E-02	3,35E-04	4,42E-03	0,00E+00	5,58E-03	1,78E-05	1,83E-05	1,45E-02	-1,31E-04	0,00E+00	-4,36E-03

**Caption** PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
HWD	[kg]	9,36E-06	1,77E-07	2,52E-05	0,00E+00	1,22E-09	9,47E-09	2,36E-08	9,03E-08	-2,45E-10	0,00E+00	-8,18E-09
NHWD	[kg]	5,40E-01	2,00E-04	9,46E-02	0,00E+00	8,09E-03	1,05E-05	3,90E+00	2,46E+00	-2,21E-04	0,00E+00	-7,38E-03
RWD	[kg]	6,02E-03	4,05E-06	3,17E-04	0,00E+00	3,84E-04	1,79E-07	6,35E-05	3,54E-04	-4,53E-05	0,00E+00	-1,51E-03
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00								
MFR	[kg]	0,00E+00	0,00E+00	1,22E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00								
EEE	[MJ]	0,00E+00	0,00E+00	1,29E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,31E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	2,99E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	9,95E+00	0,00E+00	0,00E+00	0,00E+00

**Caption** HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

## Annex: General Information on use stages B1 to B7

LCA results indicate environmental impacts resulting from use stage B1 to B7.

For textile floor coverings only modules B1 (use) and B2 (maintenance) are taken into account. Modules B3 (repair), B4 (replacement), B5 (refurbishment), B6 (operational energy use) and B7 (operational water use) are not relevant during the service life of textile floor coverings.

**Module B1 'use'** includes emissions to the indoor air during the use stage. Relevant emissions only occur in the first year of life (see LCA: Calculation rules).

**Module B2 'maintenance'** includes cleaning procedures.

### Reference service life

The actual service life of textile floor coverings depends on a wide range of various impact factors such as the allocation of the application area to the use class, maintenance, intensity of use and most often fashion and building related aspects. Therefore technical service life mostly last much longer than real service life.

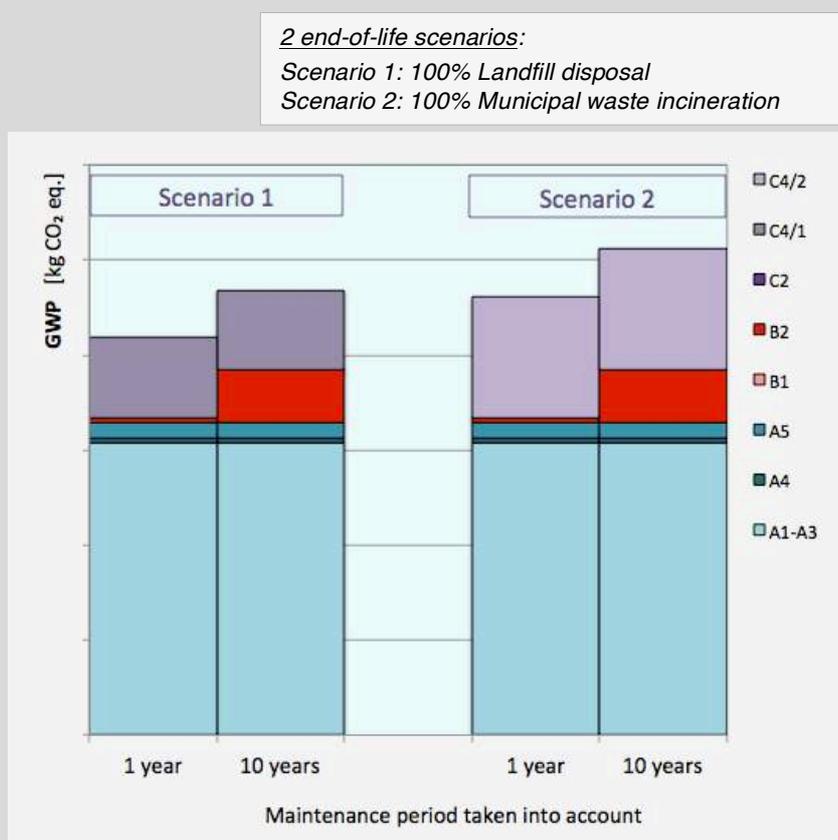
### Total environmental impacts from module B2

The total environmental impacts have to be calculated by taking into account the service life of textile floor coverings. Therefore the assumed real service life (ARSL) has to be used for the calculation of total environmental impacts taking into account the expected use conditions (see RSL).

Module B2 (maintenance) is depending on the service life.

Values for module B2 given in the result tables are indicated for the period of one year. They have to be multiplied by the ARSL of the textile floor covering taking into account building related aspects.

The influence of the maintenance period on the Global Warming Potential (GWP) of the whole life cycle of a textile floorcovering – differentiated for 2 end-of-life scenarios – is illustrated in the graph.



Graph: Global Warming Potential (GWP) – aggregation of module A to module C - taking into account a maintenance period of 1 year compared to a maintenance period of 10 years - for the two declared end-of-life scenarios.

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Bolon
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-BOL-20160287-CBC1-EN
Issue date	01.02.2017
Valid to	31.01.2022

**Woven vinyl flooring**  
with ISI backing,  
total weight up to 4200 g/m<sup>2</sup>

**Bolon**

[www.ibu-epd.com](http://www.ibu-epd.com) / <https://epd-online.com>



## General Information

<p><b>Bolon</b></p> <hr/> <p><b>Programme holder</b>          IBU - Institut Bauen und Umwelt e.V.          Panoramastr. 1          10178 Berlin          Germany</p> <hr/> <p><b>Declaration number</b>          EPD-BOL-20160287-CBC1-EN</p> <hr/> <p><b>This Declaration is based on the Product Category Rules:</b>          Floor coverings, 07.2016          (PCR tested and approved by the SVR)</p> <hr/> <p><b>Issue date</b>          01.02.2017</p> <hr/> <p><b>Valid to</b>          31.01.2022</p> <div style="text-align: center;">  </div> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer          (President of Institut Bauen und Umwelt e.V.)</p> <div style="text-align: center;">  </div> <hr/> <p>Dr. Burkhard Lehmann          (Managing Director IBU)</p>	<p><b>Woven vinyl flooring</b>          with ISI backing,          total weight up to 4200 g/m<sup>2</sup></p> <hr/> <p><b>Owner of the Declaration</b>          Bolon          Industrivägen 12          52390 Ulricehamn          Sweden</p> <hr/> <p><b>Declared product / Declared unit</b>          1 m<sup>2</sup> woven flooring (output A1-A3: 1m<sup>2</sup> produced flooring, output A5: 1m<sup>2</sup> installed flooring).</p> <hr/> <p><b>Scope:</b>          The declaration applies to a textile vinyl flooring with ISI backing. It is manufactured in the Bolon production site Ulricehamn, Sweden.           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.</p> <hr/> <p><b>Verification</b></p> <table border="1"> <tr> <td colspan="2">The CEN Norm /EN 15804/ serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration according to /ISO 14025/</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table> <div style="text-align: center;">  </div> <hr/> <p>Angela Schindler          (Independent verifier appointed by SVR)</p>	The CEN Norm /EN 15804/ serves as the core PCR		Independent verification of the declaration according to /ISO 14025/		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
The CEN Norm /EN 15804/ serves as the core PCR							
Independent verification of the declaration according to /ISO 14025/							
<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally						

## Product

### Product description / Product definition

Woven vinyl flooring with ISI backing delivered as rolls, tiles or planks with a total weight up to 4200 g/m<sup>2</sup>.

The calculations refer to the average product with a total weight of 4100 g/m<sup>2</sup>.

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The Declaration of Performance of the products taking into consideration /EN 14041/ and the CE-marking of the products can be found on the manufacturer's technical information section.

### Application

The textile flooring can be used in commercial areas. The indication of the use class can be found on the manufacturer's technical information section.

### Technical Data

Name	Value	Unit
Product Form	Rolls, tiles or planks	-
Dimensions	rolls of 2 m width, tiles 500mm x 500 mm, planks 222 mm x 667 mm	
Type of manufacture	woven flooring	-
Yarn type	solution dyed PVC	-
Secondary backing	Heavy backing based on PVC	-
Total carpet weight	max. 4200	g/m <sup>2</sup>

Additional product properties and performance ratings in accordance with the Declaration of Performance with respect to its Essential Characteristics according to /EN 1307/ can be found on the manufacturer's technical information section.

## Base materials / Ancillary materials

Name	Value	Unit
Polyvinyl chloride	37.4	%
Phthalate-free plasticizer*	18.4	%
Calcium carbonate	37.4	%
Glass fibre	1.4	%
Additives	5.4	%

\* For the LCA calculations Di-isononylphthalat has been used as a dataset for Mesamoll<sup>□</sup> used in Bolon products is not yet available.

## Reference service life

The service life of textile floor coverings strongly depends on the correct installation taking into account the declared use classification and the adherence to cleaning and maintenance instructions. A minimum service life of 10 years can be assumed, technical service life can be considerably longer.

## LCA: Calculation rules

### Declared Unit

#### Average product

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Conversion factor to 1 kg	0.24	m <sup>2</sup> /kg
Mass reference	4,10	kg/m <sup>2</sup>

The declared unit refers to 1 m<sup>2</sup> produced textile floor covering (output A1-A3: 1m<sup>2</sup> produced flooring, output A5: 1m<sup>2</sup> installed flooring).

### System boundary

Type of EPD: Cradle to grave

System boundaries of modules A, B, C, D:

#### A1-A3 Production:

Energy supply and production of the basic material, processing of secondary material, auxiliary material, transport of the material to the manufacturing site, emissions, waste water treatment, packaging material and waste processing up to the landfill disposal of residual waste (except radioactive waste). Credits for electricity and steam from the incineration of production waste are aggregated.

#### A4 Transport:

Transport of the packed textile floorcovering from factory gate to the place of installation.

#### A5 Installation:

Installation of the textile floorcovering, production and transport of auxiliary material, waste processing up to the landfill disposal of residual waste (except radioactive waste), the production of the amount of carpet that occurs as installation waste incl. its transport to the place of installation.

Credits for electricity and steam from the incineration of packaging and installation waste leave the product system.

#### B1 Use:

Indoor emissions during the use stage. After the first year no product related VOC emissions are relevant due to known VOC decay curves of the product.

#### B2 Maintenance:

Cleaning of the textile floor covering for a period of 1 year:

Vacuum cleaning – electricity supply  
Wet cleaning – electricity, water consumption, production of the cleaning agent, waste water treatment.

**The declared values in this module have to be multiplied by the assumed service life of the floor covering in the building considered** (see annex, chapter: 'General Information on use stages B1 to B7').

#### B3 - B7:

The modules are not relevant and therefore not declared.

#### C1 De-construction:

The floorcovering is de-constructed manually and no additional environmental impact is caused.

#### C2 Transport:

C2: Transport of the carpet waste to a landfill site or to a municipal waste incineration plant (MWI)..

#### C3 Waste processing:

C3-1: Landfill disposal need no waste processing.  
C3-2: Waste incineration need no waste processing.

#### C4 Disposal

C4-1: Impact from landfill disposal,  
C4-2: Impact from waste incineration (credits leave the system boundaries),

#### D Recycling potential:

D-A5: Energy credits from waste incineration of packaging and installation waste (incineration plant with R1<0.6),

D-1: Energy credits from landfill disposal of carpet waste at the end-of-life,

D-2: Energy credits from waste incineration of carpet waste at the end-of-life (incineration plant with R1<0.6),

### 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. Background data are taken from the GaBi database 2016, service pack 30 and from the ecoinvent 3.1 database.

## LCA: Scenarios and additional technical information

The following information refers to the declared modules and is the basis for calculations or can be used for further calculations. All indicated values refer to the declared functional unit.

### Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck, EURO 0-5 mix)	0.0082	l/100km
Transport distance , truck (weighted average)	724	km
Transport distance , ship (weighted average)	816	km
Capacity utilisation (including empty runs)	85	%

### Installation in the building (A5)

Name	Value	Unit
Auxiliary (adhesive)	0.325	kg
Material loss	0.25	kg

Cardboard packaging waste leaves the system for recycling. Packaging waste made of polyethylene, polystyrene or wood and installation waste are considered to be incinerated in a municipal waste incineration plant.

### Maintenance (B2)

The values are indicated per m<sup>2</sup> floor covering and per year (see annex 'General Information on use stages B1 to B7').

Name	Value	Unit
Maintenance cycle (wet cleaning)	1.5	1/year
Maintenance cycle (vacuum cleaning)	208	1/year
Water consumption (wet cleaning)	0.004	m <sup>3</sup>
Cleaning agent (wet cleaning)	0.09	kg
Electricity consumption	0.314	kWh

### End of Life (C1-C4)

Two different end-of-life scenarios are declared and the results are indicated separately in module C. Each scenario is calculated as a 100% scenario.

Scenario 1: 100% landfill disposal

Scenario 2: 100% municipal waste incineration (MWI)

If combinations of these scenarios have to be calculated this should be done according to the following scheme:

$$\text{EOL-impact} = x\% \text{ impact (Scenario 1)} + y\% \text{ impact (Scenario 2)}$$

Name	Value	Unit
Collected as mixed construction waste (scenario 1 and 2)	4.1	kg
Landfilling (scenario 1)	4.1	kg
Energy recovery (scenario 2)	4.1	kg

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

The recovery or recycling potentials due to the two end-of-life scenarios (module C) are indicated separately.

## LCA: Results

The declared result figures in module B2 have to be multiplied by the assumed service time (in years) of the floor covering in the building in question (see annex 'General Information on use stages B1 to B7').  
**Information on un-declared modules:**

Modules B3 - B7 are not relevant during the service life of the carpet and are therefore not declared.

Modules C1, C3/1 and C3/2 cause no additional impact (see "LCA: Calculation rules") and are therefore not declared.

Column D represents module D/A5.

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

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

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/3	C4/1	C4/2	C4/3	D	D/1	D/2	D/3
GWP	[kg CO <sub>2</sub> -Eq.]	8.50	0.23	1.09	0.00	0.35	0.01	0.03	0.45	5.46	0.00	-0.15	0.00	-1.36	-0.34
ODP	[kg CFC11-Eq.]	6.20E-8	9.92E-13	3.92E-9	0.00E+0	1.36E-8	4.37E-14	1.88E-11	1.10E-11	4.49E-9	0.00E+0	-5.93E-11	0.00E+0	-4.25E-10	-5.91E-12
AP	[kg SO <sub>2</sub> -Eq.]	1.80E-2	2.27E-3	2.22E-3	0.00E+0	1.45E-3	4.16E-5	7.36E-5	8.12E-4	5.94E-3	0.00E+0	-2.70E-4	0.00E+0	-2.09E-3	-1.37E-3
EP	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	4.57E-3	3.43E-4	4.73E-4	0.00E+0	3.06E-4	1.02E-5	6.59E-6	8.03E-4	3.23E-4	0.00E+0	-2.65E-5	0.00E+0	-2.13E-4	-1.25E-4
POCP	[kg ethene-Eq.]	6.00E-3	-2.05E-4	4.95E-4	1.52E-4	2.71E-4	-1.57E-5	5.07E-6	1.06E-4	1.62E-4	0.00E+0	-2.60E-5	0.00E+0	-2.28E-4	-2.28E-4
ADPE	[kg Sb-Eq.]	2.81E-5	1.31E-8	2.21E-6	0.00E+0	1.21E-6	6.33E-10	8.56E-9	5.71E-8	1.31E-6	0.00E+0	-2.94E-8	0.00E+0	-2.21E-7	-3.75E-8
ADPF	[MJ]	184.00	3.06	17.60	0.00	7.18	0.13	0.29	4.19	8.07	0.00	-2.00	0.00	-18.90	-56.30

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/3	C4/1	C4/2	C4/3	D	D/1	D/2	D/3
PERE	[MJ]	28.31	0.14	5.25	0.00	0.85	0.01	0.13	0.30	1.19	0.00	-0.41	0.00	-2.93	-0.25
PERM	[MJ]	2.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	[MJ]	30.90	0.14	5.25	0.00	0.85	0.01	0.13	0.30	1.19	0.00	-0.41	0.00	-2.93	-0.25
PENRE	[MJ]	145.68	3.07	18.90	0.00	8.34	0.13	0.46	4.36	9.05	0.00	-2.55	0.00	-22.80	-56.50
PENRM	[MJ]	55.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PENRT	[MJ]	201.00	3.07	18.90	0.00	8.34	0.13	0.46	4.36	9.05	0.00	-2.55	0.00	-22.80	-56.50
SM	[kg]	0.13	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69
RSF	[MJ]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	5.49E+1										
FW	[m <sup>3</sup> ]	9.74E-2	3.52E-4	8.12E-3	0.00E+0	5.58E-3	1.86E-5	1.99E-4	1.92E-5	1.52E-2	0.00E+0	-6.33E-4	0.00E+0	-4.55E-3	-4.93E-3

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/3	C4/1	C4/2	C4/3	D	D/1	D/2	D/3
HWD	[kg]	9.75E-6	1.86E-7	2.55E-5	0.00E+0	1.22E-9	9.93E-9	2.93E-10	2.48E-8	9.45E-8	0.00E+0	-1.09E-9	0.00E+0	-8.53E-9	-1.24E-9
NHWD	[kg]	5.62E-1	2.10E-4	1.93E-1	0.00E+0	8.09E-3	1.10E-5	2.78E-4	4.09E+0	2.58E+0	0.00E+0	-1.00E-3	0.00E+0	-7.69E-3	-5.82E-4
RWD	[kg]	6.32E-3	4.26E-6	5.22E-4	0.00E+0	3.84E-4	1.88E-7	6.95E-5	6.66E-5	3.71E-4	0.00E+0	-2.20E-4	0.00E+0	-1.58E-3	-9.50E-5
CRU	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	[kg]	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00
MER	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.41	0.00	0.00	0.00	0.00
EEE	[MJ]	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.00	4.50	0.00	0.00	0.00	0.00	0.00
EET	[MJ]	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	10.40	0.00	0.00	0.00	0.00	0.00

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

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## Annex : LCA results according to TRACI, version 2.1

**Owner of the declaration:** Bolon  
**Product:** Woven vinyl flooring with ISI backing, total weight up to 4100 g/m<sup>2</sup>

This annex indicates the results of the EPD in line with EN 15804 according to TRACI, version 2.1 (Tool for the Reduction and Assessment of Chemical and other environmental Impacts)

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
GWP	[kg CO <sub>2</sub> -Eq.]	8,50E+00	2,28E-01	1,09E+00	0,00E+00	3,50E-01	9,51E-03	4,49E-01	5,46E+00	-1,51E-01	0,00E+00	-1,36E+00
ODP	[kg CFC11-Eq.]	7,04E-08	1,06E-12	4,43E-09	0,00E+00	1,54E-08	4,65E-14	1,17E-11	4,90E-09	-6,31E-11	0,00E+00	-4,53E-10
AP	[kg SO <sub>2</sub> -Eq.]	1,93E-02	2,61E-03	2,46E-03	0,00E+00	1,43E-03	5,53E-05	8,53E-04	7,05E-03	-2,77E-04	0,00E+00	-2,16E-03
EP	[kg N-Eq.]	6,29E-03	1,40E-04	5,75E-04	0,00E+00	5,12E-04	4,72E-06	3,86E-04	1,62E-04	-1,79E-05	0,00E+00	-1,36E-04
SFP	[kg O <sub>3</sub> -Eq.]	3,16E-01	5,12E-02	3,80E-02	1,16E-03	1,67E-02	1,19E-03	1,42E-02	5,07E-02	-3,98E-03	0,00E+00	-3,28E-02

**Caption** GWP = Global warming potential for air emissions; ODP = Ozone depletion potential for air emissions; AP = Acidification potential; EP = Eutrophication potential; SFP = Photochemical smog formation potential for air emissions;

### RESULTS OF THE LCA - RESOURCE USE: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
PERE	[MJ]	2,83E+01	1,41E-01	5,25E+00	0,00E+00	8,50E-01	7,44E-03	2,99E-01	1,19E+00	-4,08E-01	0,00E+00	-2,93E+00
PERM	[MJ]	2,59E+00	0,00E+00	0,00E+00	0,00E+00							
PERT	[MJ]	3,09E+01	1,41E-01	5,25E+00	0,00E+00	8,50E-01	7,44E-03	2,99E-01	1,19E+00	-4,08E-01	0,00E+00	-2,93E+00
PENRE	[MJ]	1,46E+02	3,07E+00	1,89E+01	0,00E+00	8,34E+00	1,31E-01	4,36E+00	9,05E+00	-2,55E+00	0,00E+00	-2,28E+01
PENRM	[MJ]	5,53E+01	0,00E+00	0,00E+00	0,00E+00							
PENRT	[MJ]	2,01E+02	3,07E+00	1,89E+01	0,00E+00	8,34E+00	1,31E-01	4,36E+00	9,05E+00	-2,55E+00	0,00E+00	-2,28E+01
SM	[kg]	1,33E-01	0,00E+00	7,70E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00								
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00								
FW	[m <sup>3</sup> ]	9,74E-02	3,52E-04	8,12E-03	0,00E+00	5,58E-03	1,86E-05	1,92E-05	1,52E-02	-6,33E-04	0,00E+00	-4,55E-03

**Caption** PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non renewable primary energy excluding non renewable primary energy resources used as raw materials; PENRM = Use of non renewable primary energy resources used as raw materials; PENRT = Total use of non renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non renewable secondary fuels; FW = Use of net fresh water

### RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m<sup>2</sup> floorcovering

Parameter	Unit	A1 - A3	A4	A5	B1	B2	C2	C4/1	C4/2	D/A5	D/1	D/2
HWD	[kg]	9,75E-06	1,86E-07	2,55E-05	0,00E+00	1,22E-09	9,93E-09	2,48E-08	9,45E-08	-1,09E-09	0,00E+00	-8,53E-09
NHWD	[kg]	5,62E-01	2,10E-04	1,93E-01	0,00E+00	8,09E-03	1,10E-05	4,09E+00	2,58E+00	-1,00E-03	0,00E+00	-7,69E-03
RWD	[kg]	6,32E-03	4,26E-06	5,22E-04	0,00E+00	3,84E-04	1,88E-07	6,66E-05	3,71E-04	-2,20E-04	0,00E+00	-1,58E-03
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00								
MFR	[kg]	0,00E+00	0,00E+00	6,81E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MER	[kg]	0,00E+00	0,00E+00	0,00E+00								
EEE	[MJ]	0,00E+00	0,00E+00	6,35E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	4,50E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	9,19E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,04E+01	0,00E+00	0,00E+00	0,00E+00

**Caption** HWD = Hazardous waste disposed; NHWD = Non hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

## Annex: General Information on use stages B1 to B7

LCA results indicate environmental impacts resulting from use stage B1 to B7.

For textile floor coverings only modules B1 (use) and B2 (maintenance) are taken into account. Modules B3 (repair), B4 (replacement), B5 (refurbishment), B6 (operational energy use) and B7 (operational water use) are not relevant during the service life of textile floor coverings.

**Module B1 'use'** includes emissions to the indoor air during the use stage. Relevant emissions only occur in the first year of life (see LCA: Calculation rules).

**Module B2 'maintenance'** includes cleaning procedures.

### Reference service life

The actual service life of textile floor coverings depends on a wide range of various impact factors such as the allocation of the application area to the use class, maintenance, intensity of use and most often fashion and building related aspects. Therefore technical service life mostly last much longer than real service life.

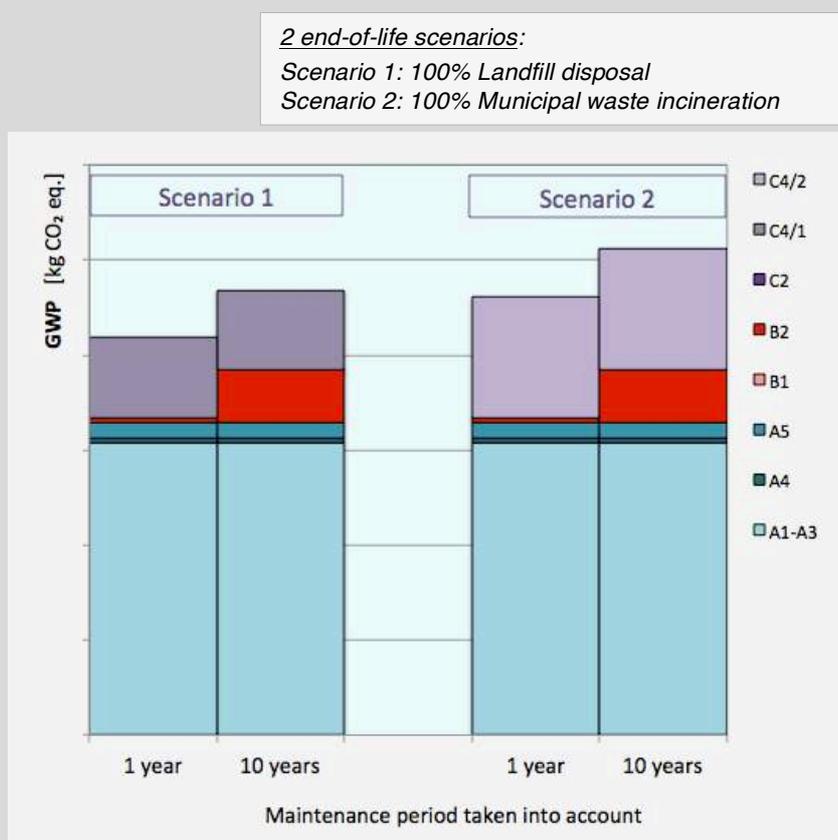
### Total environmental impacts from module B2

The total environmental impacts have to be calculated by taking into account the service life of textile floor coverings. Therefore the assumed real service life (ARSL) has to be used for the calculation of total environmental impacts taking into account the expected use conditions (see RSL).

Module B2 (maintenance) is depending on the service life.

Values for module B2 given in the result tables are indicated for the period of one year. They have to be multiplied by the ARSL of the textile floor covering taking into account building related aspects.

The influence of the maintenance period on the Global Warming Potential (GWP) of the whole life cycle of a textile floorcovering – differentiated for 2 end-of-life scenarios – is illustrated in the graph.



Graph: Global Warming Potential (GWP) – aggregation of module A to module C - taking into account a maintenance period of 1 year compared to a maintenance period of 10 years - for the two declared end-of-life scenarios.