

# ENVIRONMENTAL PRODUCT DECLARATION

as per /EN 16810/ and  
as per ISO 14025 and EN 15804+A1

Owner of the Declaration	<b>ERFMI - European Resilient Flooring Manufacturers' Institute</b>
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
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**Polyvinyl chloride floor coverings with foam layer  
according to EN 651**

**ERFMI**

**European Resilient Flooring Manufacturers'  
Institute**

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ECO PLATFORM  
**EPD**  
VERIFIED



## General Information

### ERFMI- European Resilient Flooring Manufacturers' Institute

**Programme holder**

IBU – Institut Bauen und Umwelt e.V.  
Panoramastr. 1  
10178 Berlin  
Germany

**Declaration number**

EPD-ERF-20180178-CC11-EN

**This declaration is based on the product category rules:**

Floor coverings, 02/2018  
(PCR checked and approved by the SVR)

**Issue date**

05.03.2019

**Valid to**

04.03.2024



Prof. Dr.-Ing. Horst J. Bossenmayer  
(chairman of Institut Bauen und Umwelt e.V.)



Dr. Alexander Röder  
(Managing Director Institut Bauen und Umwelt e.V.)

### Polyvinyl chloride floor coverings with foam layer according to EN 651

**Owner of the declaration**

ERFMI vzw, European Resilient Flooring Manufacturers' Institute  
24, Rue Montoyer  
B-1000 Brussels

**Declared product / declared unit**

1m<sup>2</sup> Polyvinyl chloride floor coverings with foam layer

**Scope:**

In this EPD polyvinyl chloride floor coverings with foam layer are declared. The application of this EPD is restricted to polyvinyl chloride floor coverings with foam layer produced by the members of the European Resilient Flooring Manufacturers' Institute (ERFMI). Data are based upon production during 2017 in Europe. Data have been provided by 7 companies of ERFMI which represent 100% of ERFMI members.

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.

The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.

**Verification**

The standard *EN 15804* serves as the core PCR

Independent verification of the declaration and data according to *ISO 14025:2010*

☐ internally ☒ externally



Prof. Dr. Birgit Grahl  
(Independent verifier)

## Product

**Information about the enterprise**

ERFMI is the European Resilient Flooring Manufacturers' Institute. Our members offer a wide variety of durable, flexible and impermeable flooring products made of both synthetic and natural material. The overwhelming choice in colour, design, size and construction means there is a resilient floor covering for any interior surface and budget.

**Product description/Product definition**

Resilient floor coverings are an entire product family of flexible flooring solutions available in sheet, tiles and planks. It is classified in heterogeneous or homogeneous composition based on plastics, linoleum, cork or rubber. Resilient floor coverings can provide different functionalities (acoustic, static control, slip resistance, easy maintenance etc.) to match a wide range of domestic, commercial and industrial applications. It is available in an enormous range of patterns and colours fitting with inspiration and decorative needs.

Polyvinyl chloride floor coverings with foam layer are based on polyvinyl chloride with a polyvinyl chloride foam layer.

For the placing on the market of the product on the EU/EFTA (with exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a Declaration of Performance taking into consideration /EN 14041: 2004/AC 2006 Resilient, textile and laminate floor coverings. Essential characteristics/and the CE-marking. For the application and use the respective national provisions apply.

**Application**

According to /EN ISO 10874/ (EN685) the area of application for resilient floor coverings is indicated by use classes. The declared product group covers the use classes 23, 34, 42.

**Technical Data**

The following table contains the construction data of the declared product group:

## Constructional data

Name	Value	Unit
Product thickness	2.3	mm
Surface weight	2.7	kg/m <sup>2</sup>
Product Form	sheet	-

The data set out in the Declaration of Performance apply.

## Base materials/Ancillary materials

The product group has the following composition:

- Additives 2%
- Filler 25%
- Plasticizer 23%
- Pigments <1%
- Polymers (PVC) 42%
- Auxiliaries 2%

- Lacquer <1%
- Flooring Recyclate (PVC) 4%

## Reference service life

The service lifetime of a floor covering for a certain application on a floor is too widespread to give one common number. For this EPD model the reference service lifetime (RSL) is set to one year. This means that all impacts for the use phase are based on the cleaning and maintenance model for one year. Depending on the area of use based on /EN ISO 10874/, the technical lifetime advised by the manufacturer and the estimated time on the floor by the customer, the service lifetime can be determined. The use phase impacts should be calculated with the foreseen service life to arrive at the total environmental impact /EN 16810/.

ERFMI provides an online tool for the calculation of a specific service life on the ERFMI home page ([www.erfmi.com](http://www.erfmi.com)) for the end-user.

## LCA: Calculation rules

### Declared Unit

1m<sup>2</sup> of floor covering.

### Declared unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	2.7	kg/m <sup>2</sup>
Conversion factor to 1 kg	2.7	kg/m <sup>2</sup>
Layer thickness	0.0023	m

The declaration refers to an average product from 11 production sites of ERFMI members. The data have been weighted according to the annual square meters produced by each site. The life cycle impact assessment is conducted based on the vertical average.

### System boundary

Type of EPD: cradle to grave

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 transport of the floor covering to the place of installation.

Module A5 includes the production of offcuts and adhesive for the installation of the floor covering, and incineration of offcuts and packaging material.

Module B2 is including provision of cleaning agent, energy and water consumption for the cleaning of the

floor covering incl. waste water treatment. The LCA results in this EPD are declared for a one-year usage.

Module C1 considers electricity supply for the deconstruction of the flooring.

Module C2 includes transportation of the postconsumer waste to waste processing.

End of life scenarios are declared for:

- 100% incineration in a waste incineration plant (WIP) (Scenario 1, C3/1)
- 100% landfilling (Scenario 2, C4/2)
- 100% recycling according to information from AgPR, (Arbeitsgemeinschaft PVC-Bodenbelag Recycling) (Scenario 3 - for the recycling scenario the end of waste state is reached after removal from the building)

Module D includes potential benefits from all net flows given in module A5 and C3 that leave the product boundary system after having passed the end-of-waste state in the form of recovery and/or recycling potentials.

Module D is declared for each scenario separately.

### 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.

As background database /GaBi ts/ is used.

## LCA: Scenarios and additional technical information

The following technical information is a basis for the declared modules

### Transport to the construction site (A4)

Name	Value	Unit
Transport distance	2000	km
Capacity utilisation (including empty runs)	85	%

## Installation in the building (A5)

Name	Value	Unit
Material loss (installation waste)	6	%
Auxiliary (adhesive)	0.3	kg

Biogenic carbon incorporated in the packaging material is released as CO<sub>2</sub> emissions in module A5.

## Maintenance (B2)

Name	Value	Unit
Water consumption	0.003	m <sup>3</sup>
Auxiliary	0.04	kg
Electricity consumption	0.55	kWh
Maintenance cycle (vacuuming cleaning & wet cleaning)	156	number/a

## End of Life (C1-C4)

Name	Value	Unit
Energy recovery [100%, Scenario 1]	2.7	kg
Landfilling [100%, Scenario 2]	2.7	kg
Recycling [100%, Scenario 3]	2.7	kg

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

For module D the potential benefits given in module A5 and C3 are declared. For waste incineration combustion in a WIP ( $R_1 > 0.6$ ) with energy recuperation is considered.

## LCA: Results

The results for module B2 refer to a period of one year. For the calculation of the impact of B2 for a certain service life the values for B2 have to be multiplied by the estimated service life in years.

ERFMI provides an online tool for this calculation on the ERFMI home page ([www.erfmi.com](http://www.erfmi.com)) for the end-user.

Scenario 1 applies to 100% incineration.

Scenario 2 applies to 100% landfilling.

Scenario 3 applies to 100% recycling.

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

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	MND	X	MNR	MNR	MNR	MND	MND	X	X	X	X	X

## RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m<sup>2</sup> polyvinyl chloride floor coverings with foam layer (2.7 kg/m<sup>2</sup>)

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3/1	C4/2	D/1	D/2	D/3
GWP	[kg CO <sub>2</sub> -Eq.]	6.28	0.25	0.97	0.28	0.01	0.02	4.13	0.19	-1.15	-0.08	-0.08
ODP	[kg CFC11-Eq.]	5.39E-10	6.92E-15	3.54E-11	1.03E-12	5.53E-14	6.77E-16	1.65E-12	5.08E-14	-2.15E-12	-1.53E-13	-1.53E-13
AP	[kg SO <sub>2</sub> -Eq.]	9.64E-3	5.53E-4	1.44E-3	7.28E-4	3.53E-5	5.41E-5	3.50E-3	5.14E-4	-1.75E-3	-1.24E-4	-1.24E-4
EP	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	1.75E-3	1.40E-4	2.65E-4	9.38E-5	3.31E-6	1.37E-5	1.76E-4	5.25E-4	-1.96E-4	-1.37E-5	-1.37E-5
POCP	[kg ethene-Eq.]	8.38E-3	-1.81E-4	6.14E-4	5.93E-5	2.21E-6	-1.77E-5	8.93E-5	5.62E-5	-1.45E-4	-1.01E-5	-1.01E-5
ADPE	[kg Sb-Eq.]	2.47E-5	2.08E-8	1.77E-6	1.64E-7	6.61E-9	2.03E-9	1.17E-6	4.12E-8	-2.87E-7	-2.03E-8	-2.03E-8
ADPF	[MJ]	141.92	3.45	18.70	3.36	0.13	0.34	4.98	2.73	-16.38	-1.13	-1.13

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 - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m<sup>2</sup> polyvinyl chloride floor coverings with foam layer (2.7 kg/m<sup>2</sup>)

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3/1	C4/2	D/1	D/2	D/3
PERE	[MJ]	13.53	0.19	4.24	1.59	0.09	0.02	2.32	0.21	-3.33	-0.24	-0.24
PERM	[MJ]	1.40	0.00	-0.81	0.00	0.00	0.00	-1.40	0.00	0.00	0.00	0.00
PERT	[MJ]	14.93	0.19	3.43	1.59	0.09	0.02	0.92	0.21	-3.33	-0.24	-0.24
PENRE	[MJ]	109.37	3.46	19.89	5.13	0.23	0.34	49.94	2.83	-20.06	-1.39	-1.39
PENRM	[MJ]	44.40	0.00	-0.15	0.00	0.00	0.00	-44.40	0.00	0.00	0.00	0.00
PENRT	[MJ]	153.77	3.46	19.74	5.13	0.23	0.34	5.54	2.83	-20.06	-1.39	-1.39
SM	[kg]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.70
RSF	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
NRSF	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
FW	[m <sup>3</sup> ]	3.30E-2	3.52E-4	4.44E-3	2.47E-3	1.16E-4	3.44E-5	1.15E-2	-7.28E-6	-4.54E-3	-3.23E-4	-3.23E-4

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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m<sup>2</sup> polyvinyl chloride floor coverings with foam layer (2.7 kg/m<sup>2</sup>)

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3/1	C4/2	D/1	D/2	D/3
HWD	[kg]	3.33E-6	2.00E-7	2.52E-7	2.43E-9	1.07E-10	1.96E-8	3.65E-8	1.21E-8	-7.99E-9	-5.57E-10	-5.57E-10
NHWD	[kg]	3.19E-1	2.90E-4	1.48E-1	8.38E-3	1.60E-4	2.83E-5	2.04E+0	2.67E+0	-7.79E-3	-5.49E-4	-5.49E-4
RWD	[kg]	4.68E-3	4.74E-6	4.13E-4	7.02E-4	3.77E-5	4.63E-7	2.22E-4	4.02E-5	-1.46E-3	-1.04E-4	-1.04E-4
CRU	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
MFR	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	2.70
MER	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	2.70	IND	IND
EEE	[MJ]	IND	IND	0.24	IND	IND	IND	4.08	IND	IND	IND	IND
EET	[MJ]	IND	IND	0.59	IND	IND	IND	9.88	IND	IND	IND	IND

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

### **/PCR 2017, 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. 04/2017  
[www.bau-umwelt.de](http://www.bau-umwelt.de)

### **/PCR 2018, Part B/**

*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 B: Requirements on the EPD for floorcoverings, Institut Bauen und Umwelt e.V., [www.bau-umwelt.com](http://www.bau-umwelt.com), 02/2018

### **/EN ISO 10874/**

EN ISO 10874: 2012 Resilient, textile and laminate floor coverings - Classification (ISO 10874:2009)

### **/EN 16810/**

EN 16810: Resilient, textile and laminate floor coverings - Environmental product declarations - Product category rules, May 2017

### **/EN 651/**

EN 651: Resilient floor coverings - Polyvinyl chloride floor coverings with foam layer - Specification

### **/EN ISO 14041/**

EN ISO 14041: Health, safety and energy saving requirements; EN 14041: Resilient, textile and laminate floor coverings - Essential characteristics

### **/GaBi ts/**

GaBi ts dataset documentation for the software-system and databases, LBP, University of Stuttgart and thinkstep, Leinfelden-Echterdingen, 2017  
(<http://documentation.gabi-software.com/>)



**Publisher**

Institut Bauen und Umwelt e.V.  
Panoramastr. 1  
10178 Berlin  
Germany

Tel +49 (0)30 3087748- 0  
Fax +49 (0)30 3087748- 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)

**Programme holder**

Institut Bauen und Umwelt e.V.  
Panoramastr 1  
10178 Berlin  
Germany

Tel +49 (0)30 - 3087748- 0  
Fax +49 (0)30 – 3087748 - 29  
Mail [info@ibu-epd.com](mailto:info@ibu-epd.com)  
Web [www.ibu-epd.com](http://www.ibu-epd.com)

**Author of the Life Cycle  
Assessment**

Sphera Solutions GmbH  
Hauptstraße 111- 113  
70771 Leinfelden-Echterdingen  
Germany

Tel +49 711 341817-0  
Fax +49 711 341817-25  
Mail [info@sphera.com](mailto:info@sphera.com)  
Web [www.sphera.com](http://www.sphera.com)



EUROPEAN RESILIENT FLOORING MANUFACTURERS' INSTITUTE

**Owner of the Declaration**

ERFMI vzw, European Resilient  
Flooring Manufacturers' Institute  
Rue Montoyer 24  
1000 Brussels  
Belgium

Tel + 32 2 2 87 08 72  
Fax .  
Mail [info@erfmi.com](mailto:info@erfmi.com)  
Web [www.erfmi.com](http://www.erfmi.com)