

# ENVIRONMENTAL PRODUCT DECLARATION

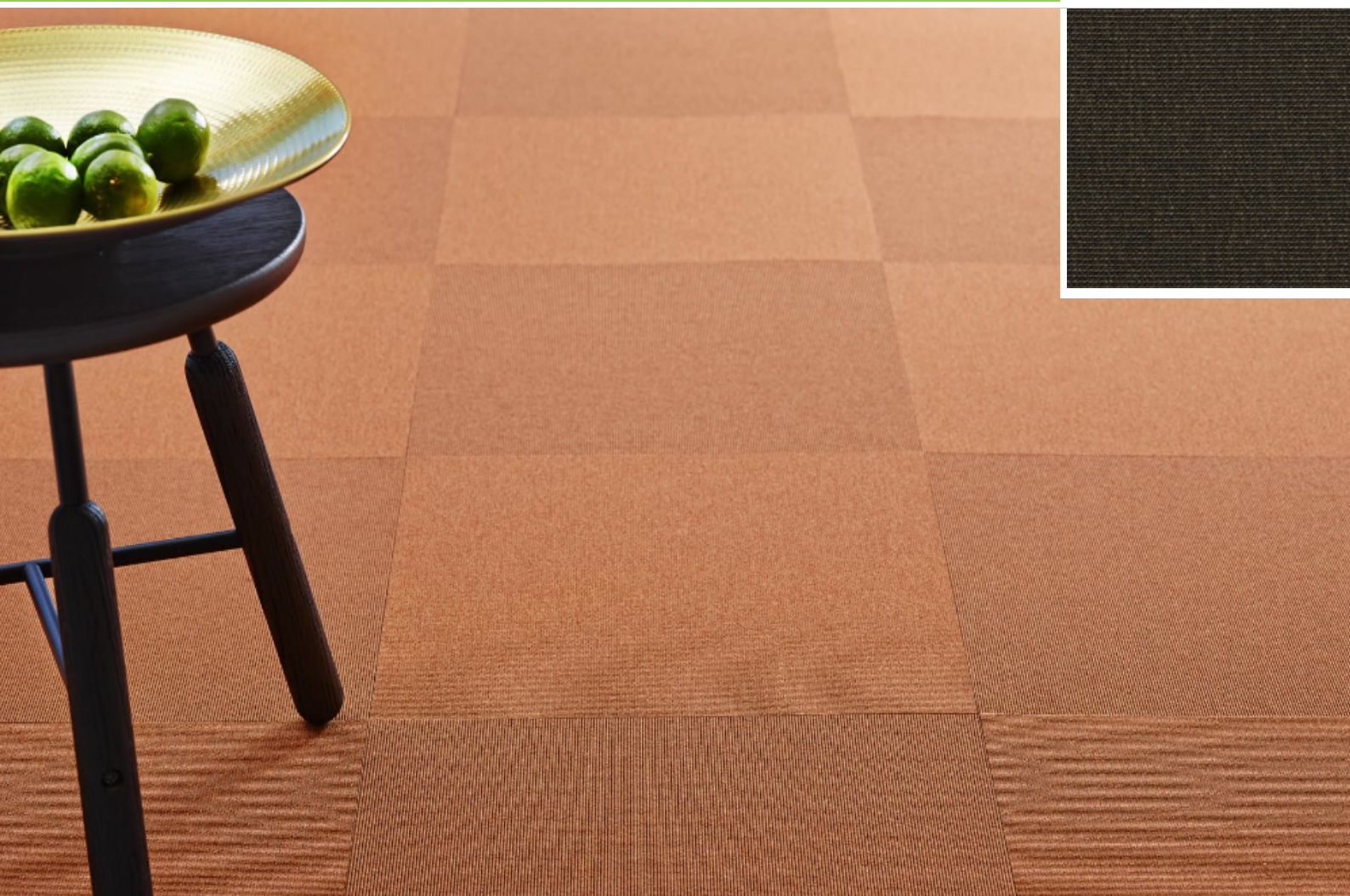
as per ISO 14025 and EN 15804

Owner of the Declaration	Forbo Flooring BV
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-FOR-20140224-CAC1-EN
Issue date	21.01.2014
Valid to	20.01.2019

**Forbo Peace tile**  
*Woven carpet tiles,*  
*pile material 550-650 g/m<sup>2</sup> polyamide 6.6*

## Forbo Flooring Systems

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



## General Information

### Forbo Flooring Systems

#### Programme holder

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

#### Declaration number

EPD-FOR-20140224-CAC1-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

21.01.2014

#### Valid to

20.01.2019



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



Dr. Burkhard Lehmann  
(Managing Director IBU)

### Forbo Peace tiles

Woven carpet tiles,  
pile material 550-650 g/m<sup>2</sup> PA 6.6

#### Owner of the Declaration

Forbo Flooring BV  
P.O. Box 13  
1560 AA Krommenie  
The Netherlands

#### Declared product / Declared unit

1 m<sup>2</sup> woven carpet tiles Forbo Peace tiles

#### Scope:

The declaration applies for a group of similar products with a pile material of 550-650 g/m<sup>2</sup>.

It is only valid in conjunction with a valid PRODIS licence.

The carpet is woven, dyed and precoated at the manufacturing site, Bording, Denmark and it is back coated at the manufacturing site Hameln, Germany.

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

☐ internally ☒ externally



Dr. Eva Schmincke  
(Independent tester appointed by SVA)

## Product

### Product description

Forbo Peace tiles - woven carpet tiles having a pile material of polyamide 6.6 and a heavy-duty polyolefin layer with recycled material. It includes a multi-axial glass fabric reinforcement and it is covered with a fleece fabric backing from 100% recycled polyester. The woven upper side is continuous dyed. The declaration applies for a group of products with a total pile material input of 550-650 g/m<sup>2</sup>. The calculations refer to the average pile material of 600 g/m<sup>2</sup>.

Recycled content out of total weight: 50,7%

### Application

According to the use class as defined in /EN 1307/ the products can be used in all professional areas which require class 33 or less.



### Technical Data

of the average product according to /EN 1307/

Name	Value	Unit
Product Form	Tiles	-
Type of manufacture	Woven loop pile carpet	-
Yarn type	PA 6.6	-
Secondary backing	Heavy-duty backing	-
Total pile weight	550-650	g/m <sup>2</sup>
Total carpet weight	3700 - 3800	g/m <sup>2</sup>

Additional product properties and performance ratings according to /EN 1307/ can be found on the Product Information System (PRODIS) using the PRODIS registration number of the product ([www.pro-dis.info](http://www.pro-dis.info)) or on the technical information of the declared product by Forbo Flooring Systems ([www.forbo-flooring.com](http://www.forbo-flooring.com))

## Base materials / Ancillary materials

Name	Value	Unit
Polyamide 6.6	16,0	%
Polyester	22,4	%
SBR-latex	4,7	%
Aluminiumhydroxide	2,8	%
Iron oxide	37,4	%
Ethylene vinyl acetate (EVA)	16,0	%
Glass fibre	0,4	%
Additives	0,3	%

## Reference service life

The service life of textile floorcoverings strongly depends on the correct installation taking into account the declared use classification and the adherence of cleaning and maintenance instructions.

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

## LCA: Calculation rules

### Declared Unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Conversion factor to 1 kg (average product)	0.27	-
Mass reference (average product)	3,75	kg/m <sup>2</sup>

### System boundary

Type of the EPD: Cradle-to-grave

System boundaries of the 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 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 manufacturing 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 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. Due to known VOC-decay curves of the product after the first year no product related VOC-emissions are relevant.

#### 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 with the assumed service life of the floor covering in the building considered.

#### B3 - B7:

The modules are not relevant and therefore not declared.

#### C1 De-construction:

De-construction of the floorcovering is made by handcraft and causes no additional impacts.

#### C2 Transport:

Transport of the carpet waste to landfill, to the municipal waste incineration (MWI) or to the waste collection for recycling.

#### C3 Waste processing:

C3-0, C3-1: Landfill and waste incineration need no waste processing.

C3-2: Collection of the carpet waste, waste processing (granulating).

#### C4 Disposal

C4-0, C4-1: Impacts from landfill or from waste incineration (credits leave the system boundaries), C4-2: The processed carpet waste leaves the system and need no disposal.

#### D Recycling potential:

D-0, D-1: Energy credits from landfill and from waste incineration (processing with < 60% efficiency),

D-2: Transport from the reprocessing plant to the cement plant, substitution of material and fuel input in the cement kiln (substantial and energetic credits).

### 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.

## LCA: Scenarios and additional technical information

The following information refer to the declared modules and are 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)	29.4	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	750	kg/m <sup>3</sup>

### Installation in the building (A5)

Name	Value	Unit
Auxiliary (adhesive)	0.2	kg
Material loss	0.11	kg

Packaging waste leaves the system for recycling.  
Carpet installation waste is considered to be incinerated in a municipal waste incineration plant.

### Maintenance (B2)

Name	Value	Unit
Maintenance cycle (wet cleaning)	1.5	1/year
Maintenance cycle (vacuum cleaning)	208	1/year
Water consumption (wet cleaning)	0.003	m <sup>3</sup>
Cleaning agent (wet cleaning)	0.06	kg
Electricity consumption	0.314	kWh

Further information on cleaning and maintenance see [www.forbo-flooring.com](http://www.forbo-flooring.com)

### End-of-Life (C1-C4)

Three 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 0: 100% landfill

Scenario 1: 100% municipal waste incineration (MWI)

Scenario 2: 100% recycling in the cement industry

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

$$\begin{aligned} \text{EOL-impact} &= x\% \text{ impact (Scenario 0)} \\ &+ y\% \text{ impact (Scenario 1)} \\ &+ z\% \text{ impact (Scenario 2)} \end{aligned}$$

Name	Value	Unit
Collected as mixed construction waste (scenario 0 and 1)	3.75	kg
Collected separately (scenario 2)	3.75	kg
Landfilling (scenario 0)	3.75	kg
Energy recovery (scenario 1)	3.75	kg
Energy recovery (scenario 2)	2.23	kg
Recycling (scenario 2)	1.52	kg

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

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

#### Recycling in the cement industry (scenario 2) /VDZ e.V./

The organic material of the carpet is used as secondary fuel in a cement kiln. It substitutes mainly lignite (62,7%), hard coal (27,3%) and petrol coke (10,0%).

The inorganic material is substantially integrated in the cement clinker and substitutes original material input.



## LCA: Results

### Information on not declared modules:

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

Module C1 causes no additional impact (see "LCA: Calculation rules", "C1 De-construction") and is therefore not declared.

Module C2 represents the transport for scenario 0, 1 and 2.

### 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 <sup>1)</sup>	Refurbishment <sup>1)</sup>	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	C3/1	C3/2	C4	C4/1	C4/2	D	D/1	D/2
GWP	[kg CO <sub>2</sub> -Eq.]	14.00	0.16	2.01	0.00	0.29	0.01	0.00	0.00	0.03	8.37	7.06	0.00	-0.21	-2.18	-2.41
ODP	[kg CFC11-Eq.]	5.19E-8	2.70E-12	1.95E-8	0.00E+0	6.45E-9	2.00E-13	0.00E+0	0.00E+0	2.30E-11	1.00E-10	3.40E-10	0.00E+0	-1.90E-10	-4.50E-10	-8.97E-8
AP	[kg SO <sub>2</sub> -Eq.]	2.88E-2	7.16E-4	3.82E-3	0.00E+0	1.37E-3	3.99E-5	0.00E+0	0.00E+0	1.19E-4	1.03E-3	4.66E-3	0.00E+0	-1.00E-3	-3.56E-3	-7.31E-3
EP	[kg (PO <sub>4</sub> ) <sup>3-</sup> -Eq.]	4.31E-3	1.65E-4	8.44E-4	0.00E+0	1.99E-4	9.22E-6	0.00E+0	0.00E+0	6.26E-6	4.82E-3	1.22E-3	0.00E+0	-5.28E-5	-2.94E-4	-1.04E-3
POCP	[kg Ethene Eq.]	4.94E-3	2.59E-4	5.48E-4	1.11E-4	1.79E-4	1.44E-5	0.00E+0	0.00E+0	7.00E-6	1.24E-3	3.32E-4	0.00E+0	-5.90E-5	-3.75E-4	-1.12E-3
ADPE	[kg Sb Eq.]	1.06E-5	5.85E-9	1.74E-6	0.00E+0	5.44E-7	3.30E-10	0.00E+0	0.00E+0	3.45E-9	3.89E-8	1.34E-6	0.00E+0	-2.91E-8	-1.29E-7	-4.38E-6
ADPF	[MJ]	283.00	2.17	29.40	0.00	6.55	0.12	0.00	0.00	0.44	2.87	5.84	0.00	-3.72	-36.30	-96.30

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	C3/1	C3/2	C4	C4/1	C4/2	D	D/1	D/2
PERE	[MJ]	15.30	0.09	2.89	0.00	0.50	0.00	0.00	0.00	0.07	0.14	0.30	0.00	-0.62	-1.45	-3.84
PERM	[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	0.00	0.00
PERT	[MJ]	15.30	0.09	2.89	0.00	0.50	0.00	0.00	0.00	0.07	0.14	0.30	0.00	-0.62	-1.45	-3.84
PENRE	[MJ]	229.65	2.17	29.40	0.00	6.55	0.12	0.00	0.00	0.44	2.87	5.84	0.00	-3.73	-36.30	-96.30
PENRM	[MJ]	53.35	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
PENRT	[MJ]	283.00	2.17	29.40	0.00	6.55	0.12	0.00	0.00	0.44	2.87	5.84	0.00	-3.73	-36.30	-96.30
SM	[kg]	1.52	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	[MJ]	5.48E-3	1.37E-5	5.52E-4	0.00E+0	2.03E-4	7.66E-7	0.00E+0	0.00E+0	9.03E-6	2.29E-3	1.66E-4	0.00E+0	-7.62E-5	-4.20E-4	-3.07E-2
NRSF	[MJ]	5.74E-2	1.44E-4	5.78E-3	0.00E+0	2.13E-3	8.02E-6	0.00E+0	0.00E+0	9.46E-5	5.48E-3	1.72E-3	0.00E+0	-7.98E-4	-4.40E-3	-3.22E-1
FW	[m <sup>3</sup> ]	1.47E+1	8.49E-3	1.79E+0	0.00E+0	8.49E-1	4.73E-4	0.00E+0	0.00E+0	9.58E-2	1.06E-1	2.91E-1	0.00E+0	-8.08E-1	-1.89E+0	-3.57E+0

PERE = Use of renewable primary energy excluding non 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	C3/1	C3/2	C4	C4/1	C4/2	D	D/1	D/2
HWD	[kg]	4.34E-6	0.00E+0	3.81E-7	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NHWD	[kg]	1.89E+1	7.74E-3	1.92E+0	0.00E+0	6.20E-1	4.31E-4	0.00E+0	0.00E+0	1.00E-1	2.86E+0	1.30E+0	0.00E+0	-8.44E-1	-1.98E+0	-5.50E+1
RWD	[kg]	9.29E-3	3.02E-6	9.06E-4	0.00E+0	3.95E-4	1.68E-7	0.00E+0	0.00E+0	6.50E-5	5.26E-5	1.81E-4	0.00E+0	-5.49E-4	-1.28E-3	-2.23E-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	0.00	0.00	0.00	0.00
MFR	[kg]	0.03	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	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	0.00	0.00	0.00	0.00
EEE	[MJ]	0.00	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	1.58	3.35	0.00	0.00	0.00	0.00
EET	[MJ]	0.00	0.00	2.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	22.90	0.00	0.00	0.00	0.00

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

The declared values in module B2 have to be multiplied with the assumed service time (in years) of the floor covering in the building considered.

## References

### **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

### **General Principles**

for the EPD range of Institut Bauen und Umwelt e.V.  
(IBU), 2013-04  
[www.bau-umwelt.de](http://www.bau-umwelt.de)

### **PCR Part A**

Institut Bauen und Umwelt e.V., Königswinter (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](http://www.bau-umwelt.de)

### **PCR Part B**

Institut Bauen und Umwelt e.V., Königswinter (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 floor coverings,  
V1.6, July 2014  
[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: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

### **VDZ e.V.:**

Umweltdaten der deutschen Zementindustrie 2010

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