

# EPD

## Environmental Product Declaration

ege®

### ReForm Calico WT

surface pile weight: 480 g/m<sup>2</sup>

pile material: polyamide 6 with 100% recycled content

backing: woven textile backing



GUT/Prodis ID:

CAD08B4C

**These EPD data are only valid in combination with the environmental product declaration EPD-EGE-20190079-CCC3-EN published by Institut Bauen und Umwelt e.V. (IBU) and a GUT/Prodis license**

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**This data set gives product specific LCA results based on the calculation procedure described in the above mentioned EPD.**



## Calculation method for similar Products of the EPD document

The EPD document is valid for all products with a surface pile weight lower or equal to the declared maximum pile weight of 1400 g/m<sup>2</sup>.

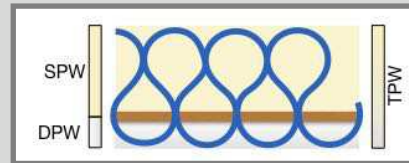
The respective declaration number is EPD-EGE-20190079-CCC3-EN .

This document indicates more specific LCA results for (a) product(s) with identical material compositions and production parameters. The product(s) belong(s) to the same family of products and only differ in its/their pile weight(s).

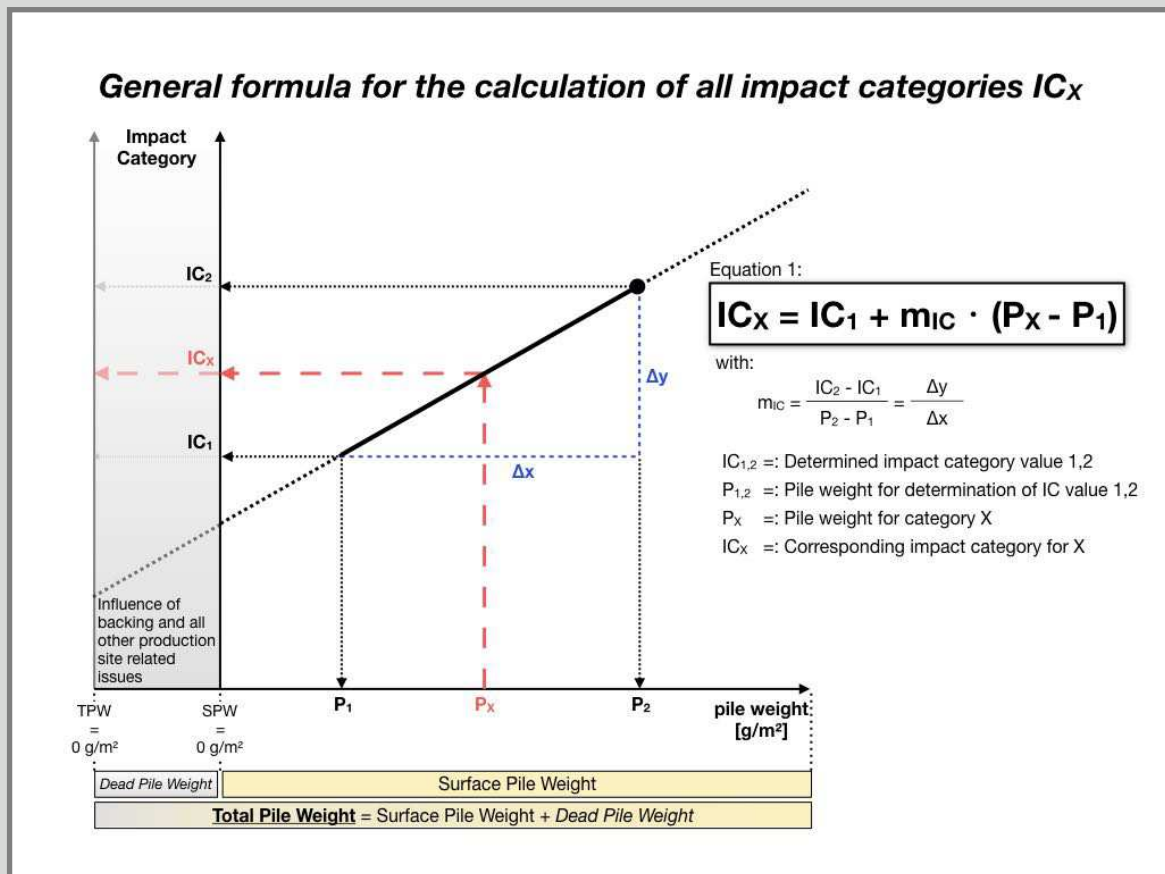
LCA results show a linear correlation with the total pile weight, for all impact categories (IC) and all modules (A-D). It is possible to calculate specific LCA results (IC<sub>x</sub>) for every carpet (x) within the declared group of products in relation to its total pile weight (P<sub>x</sub>).

The total pile weight (TPW) is the sum of surface pile weight (SPW) and dead pile weight (DPW):

$$TPW = SPW + DPW$$



The surface pile weight is the technical relevant value according to EN 1307 and has to be mentioned in technical specification. As shown in the figure below alternatively to the total pile weight the surface pile weight can be used to calculate LCA results (IC<sub>x</sub>).



**Graph 1:** General formula for the calculation of all impact categories IC<sub>x</sub>.

## 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 (RSL)

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 cannot be defined for textile floor coverings.

### Total environmental impacts from module B2

Total environmental impacts have to be calculated by taking into account the service life of textile floor coverings. Therefore, the assumed real 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.

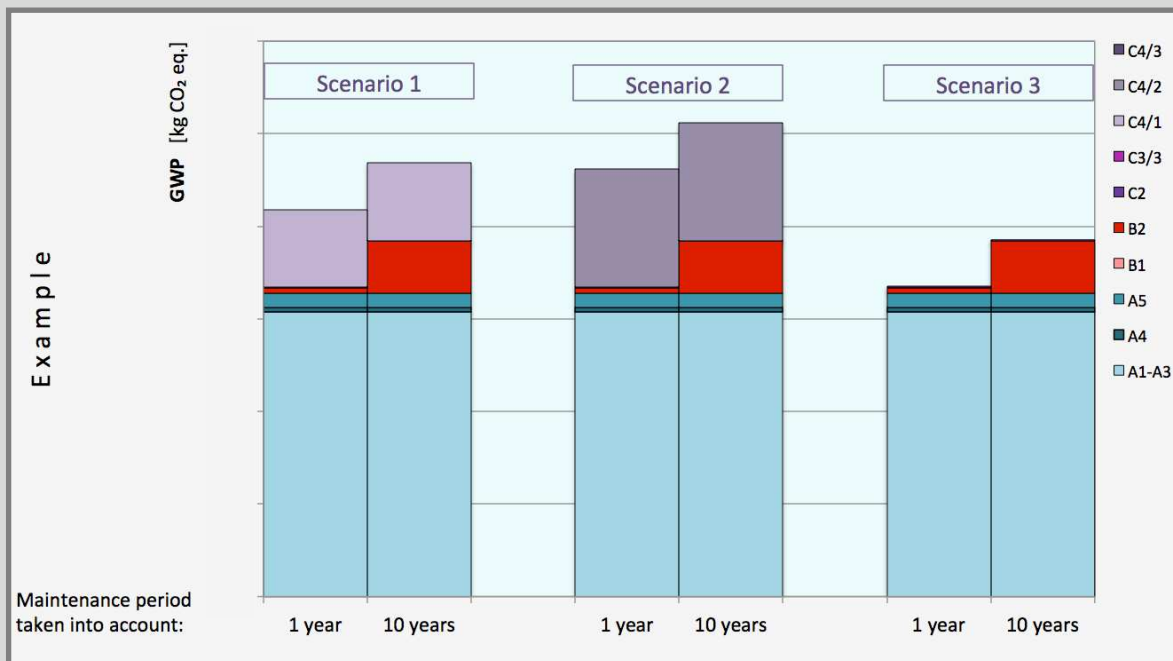
The influence of the maintenance period on the Global Warming Potential (GWP) of the whole life cycle of a textile floor covering - differentiated for 3 end-of-life scenarios - is illustrated in the graph below.

#### 3 end-of-life scenarios:

Scenario 1: 100 % Landfill disposal

Scenario 2: 100 % Municipal waste incineration

Scenario 3: 100 % Recycling in the cement industry



**Graph 2:** 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 three declared end-of-life scenarios.



## 1. Information on the product ReForm Calico WT

### Product description

Name	Value	Unit
Type of manufacture	tufted broadloom	-
Yarn type	polyamide 6 with 100% recycled content	-
Total pile weight	680	g/m <sup>2</sup>
Surface pile weight	480	g/m <sup>2</sup>
Dead pile weight	200	g/m <sup>2</sup>
Secondary backing	woven textile backing	-
Product Form	rolls 400 cm width	-
Max. total carpet weight	2695	g/m <sup>2</sup>

#### Base materials / Ancillary materials

Name	Value for category	Unit
Polyamide 6	25,2	%
Polyester	4,5	%
Polypropylene	3,3	%
Limestone	24,2	%
Aluminiumhydroxide	22,8	%
Polymer dispersion (solid content)	19,5	%
Additives	0,6	%
Recycled content out of total weight	29 %	%

### LCA: Declared Unit

Name	Value for category	Unit
Declared unit	1,0	m <sup>2</sup>
Conversion factor to 1 kg	0,37	m <sup>2</sup> /kg
Mass reference	2,7	kg/m <sup>2</sup>

### LCA: Scenarios and additional technical information

All indicated values refer to the declared functional unit

#### Transport to the construction site (A4)

Name	Value for category	Unit
Litres of fuel (truck, EURO 0-6 mix)	0,0045	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	85	%

#### Installation in the building (A5)

Name	Value for category	Unit
Material lost	0,24	kg

#### Maintenance (B2)

Indication per m<sup>2</sup> and year

Name	Value for category	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)

Name	Value for category	Unit
Collected as mixed construction waste (scenario 1 and 2)	2,70	kg/m <sup>2</sup>
Collected separately (scenario 3)	2,70	kg/m <sup>2</sup>
Landfilling (scenario 1)	2,70	kg/m <sup>2</sup>
Energy recovery (scenario 2)	2,70	kg/m <sup>2</sup>
Energy recovery (scenario 3)	1,43	kg/m <sup>2</sup>
Recycling (scenario 3)	1,27	kg/m <sup>2</sup>



## LCA: Results for ReForm Calico WT

(calculated with a total pile weight of 680 g/m<sup>2</sup>)

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 considered (see chapter: '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, C4/2 and C4/3 cause no additional impact and are therefore not declared.

Module C2 represents the transport for scenarios 1, 2 and 3.

### Description of the system boundary

(X = Included in LCA; MDN = Module not declared)

State of production			State of construction phase		State of use							End of life state				Credits and loads after life
raw material supply	transport	manufacturing	delivery	installation	use	maintenance	repair	replacement	renewal	energy use	water use	stop of use / demolition	transport	waste management	disposal	reuse, recovery and 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 for the LCA - Environmental impact: 1 m<sup>2</sup> floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D/A5	D/1	D/2	D/3
<b>GWP</b>	[kg CO2-eq]	5,74E+00	1,13E-01	1,06E+00	0,00E+00	3,02E-01	6,34E-03	3,89E+00	1,57E-02	1,88E-01	-1,53E-01	0,00E+00	-8,64E-01	-3,10E-01
<b>ODP</b>	[kg CFC11-eq]	1,51E-08	1,88E-17	1,36E-09	0,00E+00	1,30E-08	1,05E-18	1,14E-15	4,36E-16	6,46E-16	-2,09E-15	0,00E+00	-1,17E-14	-2,21E-15
<b>AP</b>	[kg SO2-eq]	1,25E-02	4,65E-04	1,15E-03	0,00E+00	1,23E-03	2,61E-05	2,22E-03	4,42E-05	5,11E-04	-2,57E-04	0,00E+00	-1,44E-03	-1,41E-03
<b>EP</b>	[kg PO4)3-eq]	2,55E-03	1,18E-04	2,72E-04	0,00E+00	3,45E-04	6,62E-06	5,57E-04	4,14E-06	5,17E-04	-2,78E-05	0,00E+00	-1,56E-04	-1,46E-04
<b>POCP</b>	[kg ethen-eq]	1,20E-03	-1,91E-04	8,57E-05	6,29E-05	1,56E-04	-1,07E-05	1,40E-04	2,80E-06	5,75E-05	-2,04E-05	0,00E+00	-1,14E-04	-1,41E-04
<b>ADPE</b>	[kg Sb-eq]	3,38E-06	8,84E-09	2,94E-07	0,00E+00	1,08E-06	4,96E-10	9,46E-08	4,97E-09	3,58E-08	-2,75E-08	0,00E+00	-1,54E-07	-3,29E-07
<b>ADPF</b>	[MJ]	1,07E+02	1,54E+00	7,87E+00	0,00E+00	6,87E+00	8,63E-02	1,70E+00	1,67E-01	2,82E+00	-2,16E+00	0,00E+00	-1,22E+01	-2,07E+01

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 for the LCA - Resource use: 1 m<sup>2</sup> floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D/A5	D/1	D/2	D/3
PERE	[MJ]	4,65E+01	8,95E-02	3,69E+00	0,00E+00	1,16E+00	5,03E-03	2,62E-01	1,13E-01	2,01E-01	-5,44E-01	0,00E+00	-3,04E+00	-4,82E-01
PERM	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	[MJ]	4,65E+01	8,95E-02	3,69E+00	0,00E+00	1,16E+00	5,03E-03	2,62E-01	1,13E-01	2,01E-01	-5,44E-01	0,00E+00	-3,04E+00	-4,82E-01
PENRE	[MJ]	9,19E+01	1,55E+00	6,01E+00	0,00E+00	8,11E+00	8,67E-02	1,90E+00	2,81E-01	2,92E+00	-2,70E+00	0,00E+00	-1,52E+01	-2,11E+01
PENRM	[MJ]	2,08E+01	0,00E+00	1,87E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	[MJ]	1,13E+02	1,55E+00	7,87E+00	0,00E+00	8,11E+00	8,67E-02	1,90E+00	2,81E-01	2,92E+00	-2,70E+00	0,00E+00	-1,52E+01	-2,11E+01
SM	[kg]	8,30E-01	0,00E+00	7,47E-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	0,00E+00	1,27E+00
RSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,08E+01
FW	[m <sup>3</sup> ]	7,39E-02	1,51E-04	8,13E-03	0,00E+00	4,27E-03	8,51E-06	1,21E-02	1,34E-04	4,95E-05	-6,42E-04	0,00E+00	-3,58E-03	-2,23E-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 for the LCA - Output flows and waste categories: 1 m<sup>2</sup> floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D/A5	D/1	D/2	D/3
HWD	[kg]	2,70E-03	8,62E-08	2,42E-04	0,00E+00	1,19E-09	4,84E-09	1,09E-08	1,35E-10	1,23E-08	-1,11E-09	0,00E+00	-6,25E-09	2,98E-09
NHWD	[kg]	1,01E+00	1,26E-04	1,96E-01	0,00E+00	5,22E-03	7,05E-06	5,90E-01	2,05E-04	2,69E+00	-1,16E-03	0,00E+00	-6,51E-03	-2,92E-01
RWD	[kg]	2,20E-03	2,09E-06	-6,60E-06	0,00E+00	3,81E-04	1,18E-07	7,87E-05	4,54E-05	3,90E-05	-2,17E-04	0,00E+00	-1,21E-03	-1,47E-04
CRU	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	[kg]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,27E+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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,43E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,14E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET	[MJ]	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	1,30E+01	0,00E+00	0,00E+00	0,00E+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

# ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804+A1

Owner of the Declaration	Ege Carpets A/S
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-EGE-20190079-CCC3-EN
Issue date	24/11/2020
Valid to	23/11/2025

## Tufted broadloom carpet

print design, pile material polyamide 6 with 100% recycled content, maximum total pile weight 1400 g/m<sup>2</sup>  
woven textile backing

ege®

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



## General Information

<p><b>ege®</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-EGE-20190079-CCC3-EN</p> <hr/> <p><b>This declaration is based on the product category rules:</b>          Floor coverings, 02/2018          (PCR checked and approved by the SVR)</p> <hr/> <p><b>Issue date</b>          24/11/2020</p> <hr/> <p><b>Valid to</b>          23/11/2025</p>	<p><b>Tufted broadloom carpet</b>          print design, pile material polyamide 6 with 100% recycled content          maximum total pile weight 1400 g/m<sup>2</sup>          woven textile backing</p> <hr/> <p><b>Owner of the declaration</b>          Ege Carpets A/S          Industrivej Nord 25          7400 Herning          Denmark</p> <hr/> <p><b>Declared product / declared unit</b>          1 m<sup>2</sup> tufted broadloom carpet with a pile material of 100% recycled polyamide 6</p> <hr/> <p><b>Scope:</b>          The manufacturer declaration applies to a group of similar products with a maximum total pile weight of 1400 g/m<sup>2</sup>.          The products are produced in the ege® manufacturing site Herning, Denmark.</p> <p>LCA results for product groups having a lower total pile weight can be taken from the corresponding tables of the annexe. Specific data can be calculated by using equation 1 given in the annex (see annexe chapter: 'General Information on the annexe').</p> <p>It is only valid in conjunction with a valid GUT-PRODIS license of the product.</p> <p>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.</p> <hr/> <p><b>Verification</b></p> <table border="1"> <tr> <td colspan="2">The standard EN 15804 serves as the core PCR</td> </tr> <tr> <td colspan="2">Independent verification of the declaration and data according to ISO 14025:2010</td> </tr> <tr> <td><input type="checkbox"/> internally</td> <td><input checked="" type="checkbox"/> externally</td> </tr> </table>	The standard EN 15804 serves as the core PCR		Independent verification of the declaration and data according to ISO 14025:2010		<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally
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<input type="checkbox"/> internally	<input checked="" type="checkbox"/> externally						
<p></p> <hr/> <p>Dipl. Ing. Hans Peters          (chairman of Institut Bauen und Umwelt e.V.)</p>	<p></p> <hr/> <p>Angela Schindler          (Independent verifier)</p>						
<p></p> <hr/> <p>Dr. Alexander Röder          (Managing Director Institut Bauen und Umwelt e.V.)</p>							

## Product

### Information about the enterprise

Founded in 1938 and consistently using the most advanced technology in the industry, Ege Carpets have developed into one of Europe's leading carpet companies. Guided by the strategy; "We design beautiful carpets for a sustainable future", Ege Carpets craft unique textile flooring sustainably by turning waste into resources while striving to keep components in closed circles and become CO<sub>2</sub> positive.

### Product description/Product definition

Tufted broadloom carpet having a pile material of polyamide 6 with 100% recycled content, a polyester primary backing with 90% recycled content and a woven textile backing out of polypropylene with 100% recycled content.  
 The carpet is colored by an injection printing system, which allows the creation of various designs. The calculations refer to a total pile weight of 1400g/m<sup>2</sup>.



The recycled content out of total weight amounts to 44%.

The declaration applies to a group of products with a maximum total pile weight of 1400 g/m<sup>2</sup>. The LCA results are calculated for products with the maximum total pile weight. LCA results for product groups having a lower total pile weight can be taken from the corresponding tables of the annexe. The LCA results always refer to the highest total pile weight of the corresponding pile weight category. Results for similar products with any other total pile weight can be calculated by using equation 1 given in the annex (see annexe chapter: 'General Information on the annexe').

For the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) *Regulation (EU) No. 305/2011* Construction Product Regulation (CPR) applies. The product needs a Declaration of Performance (DoP) taking into consideration *EN 14041*, Resilient, textile and laminate floor coverings - Essential characteristics, May 2018, and the CE-marking. The DoP of the product can be found on the manufacturer's technical information section. For the application and use of the product the respective national provisions apply.

### 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

The performance data listed in the DoP apply.

Name	Value	Unit
Product Form	Broadloom	-
Type of manufacture	Tufted loop pile carpet	-
Yarn type	100% recycled Polyamide 6	-
Coloration	Injection printing system	
Primary	90% recycled Polyester	
Secondary backing	Woven textile made of PP	-
Total pile weight	1400	g/m <sup>2</sup>
Total carpet weight	3415	g/m <sup>2</sup>

## LCA: Calculation rules

### Declared Unit

Name	Value	Unit
Declared unit	1	m <sup>2</sup>
Grammage	-	kg/m <sup>2</sup>
Conversion factor to 1 kg	0.29	-
Layer thickness	-	m
Mass reference	3.42	kg/m <sup>2</sup>

The declared unit refers to 1 m<sup>2</sup> produced textile floor covering. Output of module A5 'Assembly' is 1 m<sup>2</sup> installed textile floor covering.

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 14041*. Additional product properties in accordance with *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 manufacturer's technical information section ([www.egecarpets.com](http://www.egecarpets.com)).

### Base materials/Ancillary materials

Name	Value	Unit
Polyamide 6	41.0	%
Polyester	3.5	%
Polypropylen	2.6	%
Limestone	19.1	%
Aluminium hydroxide	18.0	%
Polymer dispersion (solid content)	15.4	%
Additives	0.4	%

The products are registered in the GUT-*PRODIS* Information System. The *PRODIS* system ensures the compliance with limitations of various chemicals and Volatile Organic Compound (VOC)-emissions and a ban on use of all substances that are listed as 'Substances of Very High Concern' (SVHC) under *REACH*.

This product contains substances listed in the *candidate list* (27.06.2018) exceeding 0.1 percentage by mass: no

### Reference service life

A calculation of the reference service life according to *ISO 15686* is not possible.

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.

### System boundary

*Type of EPD:* Cradle-to-grave

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

Modules C3, C4 and D are indicated separately for three end-of-life scenarios:

- 1 - landfill disposal
- 2 - municipal waste incineration
- 3 - recovery in a cement plant

**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). Benefits for generated electricity and steam due to the incineration of production waste are aggregated.

**A4 Transport:**

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

**A5 Installation:**

Installation of the textile floor covering, processing of installation waste and packaging waste up to the landfill disposal of residual waste (except radioactive waste), the production of the amount of carpet that occurs as installation waste including its transport to the place of installation.

Generated electricity and steam due to the incineration of waste are listed in the result table as exported energy.

Preparing of the floor and auxiliary materials (adhesives, fixing agents, PET connectors) are beyond the system boundaries and not taken into account.

**B1 Use:**

Indoor emissions during the use stage. After the first year, no product related Volatile Organic Compound (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 in question (see annex, chapter 'General information on use stage').

**B3 - B7:**

The modules are not relevant and therefore not declared.

**C1 De-construction:**

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

**C2 Transport:**

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

**C3 Waste processing:**

C3-1: Landfill disposal needs no waste processing.

C3-2: Impact from waste incineration (plant with  $R1 > 0.6$ ), generated electricity and steam are listed in the result table as exported energy.

C3-3: Collection of the carpet waste, waste processing (granulating).

**C4 Disposal**

C4-1: Impact from landfill disposal,

C4-2: The carpet waste leaves the system in module C3-2,

C4-3: The pre-processed carpet waste leaves the system in module C3-3.

**D Recycling potential:**

Calculated benefits result from materials exclusive secondary materials (net materials).

D-A5: Benefits for generated energy due to incineration of packaging and installation waste (incineration plant with  $R1 > 0.6$ ),

D-1: Benefits for generated energy due to landfill disposal of carpet waste at the end-of-life,

D-2: Benefits for generated energy due to incineration of carpet waste at the end-of-life (incineration plant with  $R1 > 0.6$ ),

D-3: Benefits for saved fossil energy and saved inorganic material due to recovery of the carpet in a cement plant at the end-of-life, transport from the reprocessing plant to the cement kiln.

**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 2018*, service pack 37. Remaining data gaps are covered by the *ecoinvent 3.5* database.

**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. The indicated values refer to the declared functional unit of the product.

**Transport to the construction site (A4)**

Name	Value	Unit
Litres of fuel (truck, EURO 0-6 mix)	0.006	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	85	%

**Installation in the building (A5)**

Name	Value	Unit
Material loss	0.307	kg

Packaging waste and installation waste are considered to be incinerated in a municipal waste incineration plant.

Preparation of the floor and auxiliaries (adhesives, fixing agents, PET connectors etc.) are not taken into account.

**Maintenance (B2)**

The values for cleaning refer to 1 m<sup>2</sup> floor covering used in commercial areas per year. Depending on the application based on *ISO 10874*, the technical service life recommended by the manufacturer and the anticipated strain on the floor by customers, the case-specific useful life can be established. The effects of Module B2 need to be

calculated on the basis of this useful life in order to obtain the overall environmental impacts.

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

Further information on cleaning and maintenance see [www.egecarpets.com](http://www.egecarpets.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 1: 100% landfill disposal

Scenario 2: 100% municipal waste incineration (MWI) with  $R1 > 0.6$

Scenario 3: 100% recycling in the cement industry

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

EOL-impact = x% impact (Scenario 1)  
 + y% impact (Scenario 2)  
 + z% impact (Scenario 3)  
 with  $x\% + y\% + z\% = 100\%$

Name	Value	Unit
Collected as mixed construction waste (scenario 1 and 2)	3.42	kg
Collected separately (scenario 3)	3.42	kg
Landfilling (scenario 1)	3.42	kg
Energy recovery (scenario 2)	3.42	kg
Energy recovery (scenario 3)	2.1	kg
Recycling (scenario 3)	1.3	kg

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

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

##### Recycling in the cement industry (scenario 3)

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The organic material of the carpet is used as secondary fuel in a cement kiln. It mainly substitutes for lignite (62.2%), hard coal (27.3%) and petrol coke (10.5%).

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

## LCA: Results

The results refer to all declared products with a maximum total pile weight of 1400 g/m<sup>2</sup>.

LCA results for product groups having a lower total pile weight can be taken from the corresponding tables of the annexe. Results for similar products with any specific total pile weight can be calculated by using equation 1 given in the annexe (see annex e chapter: 'General Information on the annexe').

The declared result figures in module B2 have to be multiplied by the assumed service life (in years) of the floor covering in the building under consideration (see annexe, chapter 'General Information on use stage'). Modules B6 - B7 are not relevant during the service life of the textile floor covering and are marked as 'not declared'.

Modules C1, C3/1, C4/2 and C4/3 cause no additional impact (see "LCA: Calculation rules") and are therefore marked as 'not declared'. Module C2 represents the transport for scenarios 1, 2 and 3. Column D represents module D/A5. The Institute for Environmental Science /CML/ characterisation factors January 2016 are applied.

**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	X	X	MNR	MNR	MNR	MND	MND	MND	X	X	X	X		

### RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m<sup>2</sup> floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
GWP	[kg CO <sub>2</sub> -Eq.]	8.09E+0	1.43E-1	1.43E+0	0.00E+0	3.02E-1	8.04E-3	5.54E+0	1.98E-2	2.37E-1	-1.53E-1	0.00E+0	-8.64E-1	-3.05E-1
ODP	[kg CFC11-Eq.]	2.81E-8	2.37E-17	2.53E-9	0.00E+0	1.30E-8	1.33E-18	1.51E-15	5.53E-16	8.19E-16	-2.09E-15	0.00E+0	-1.17E-14	-2.21E-15
AP	[kg SO <sub>2</sub> -Eq.]	1.88E-2	5.87E-4	1.91E-3	0.00E+0	1.23E-3	3.31E-5	4.19E-3	5.60E-5	6.47E-4	-2.57E-4	0.00E+0	-1.44E-3	-1.39E-3
EP	[kg (PO <sub>4</sub> ) <sup>3</sup> -Eq.]	4.26E-3	1.49E-4	4.74E-4	0.00E+0	3.45E-4	8.39E-6	1.07E-3	5.24E-6	6.56E-4	-2.78E-5	0.00E+0	-1.56E-4	-1.41E-4
POCP	[kg ethene-Eq.]	1.65E-3	-2.41E-4	1.32E-4	6.29E-5	1.56E-4	-1.36E-5	2.56E-4	3.56E-6	7.28E-5	-2.04E-5	0.00E+0	-1.14E-4	-1.48E-4
ADPE	[kg Sb-Eq.]	5.50E-6	1.12E-8	4.86E-7	0.00E+0	1.08E-6	6.28E-10	1.10E-7	6.29E-9	4.54E-8	-2.75E-8	0.00E+0	-1.54E-7	-3.28E-7
ADPF	[MJ]	1.34E+2	1.94E+0	1.04E+1	0.00E+0	6.87E+0	1.09E-1	2.45E+0	2.12E-1	3.57E+0	-2.16E+0	0.00E+0	-1.22E+1	-2.07E+1

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> floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
PERE	[MJ]	6.76E+1	1.13E-1	5.60E+0	0.00E+0	1.16E+0	6.37E-3	3.38E-1	1.44E-1	2.55E-1	-5.44E-1	0.00E+0	-3.04E+0	-4.78E-1
PERM	[MJ]	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	0.00E+0
PERT	[MJ]	6.76E+1	1.13E-1	5.60E+0	0.00E+0	1.16E+0	6.37E-3	3.38E-1	1.44E-1	2.55E-1	-5.44E-1	0.00E+0	-3.04E+0	-4.78E-1
PENRE	[MJ]	1.19E+2	1.95E+0	8.57E+0	0.00E+0	8.11E+0	1.10E-1	2.70E+0	3.57E-1	3.70E+0	-2.70E+0	0.00E+0	-1.52E+1	-2.10E+1
PENRM	[MJ]	2.08E+1	0.00E+0	1.87E+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
PENRT	[MJ]	1.40E+2	1.95E+0	1.04E+1	0.00E+0	8.11E+0	1.10E-1	2.70E+0	3.57E-1	3.70E+0	-2.70E+0	0.00E+0	-1.52E+1	-2.10E+1
SM	[kg]	1.58E+0	0.00E+0	1.42E-1	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	1.27E+0
RSF	[MJ]	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	0.00E+0
NRSF	[MJ]	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	2.08E+1
FW	[m <sup>3</sup> ]	1.34E-1	1.91E-4	1.39E-2	0.00E+0	4.27E-3	1.08E-5	1.62E-2	1.69E-4	6.27E-5	-6.42E-4	0.00E+0	-3.58E-3	-2.22E-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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m<sup>2</sup> floor covering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
HWD	[kg]	5.53E-3	1.09E-7	4.97E-4	0.00E+0	1.19E-9	6.14E-9	1.13E-8	1.71E-10	1.55E-8	-1.11E-9	0.00E+0	-6.25E-9	6.21E-9
NHWD	[kg]	1.68E+0	1.58E-4	2.57E-1	0.00E+0	5.22E-3	8.93E-6	5.98E-1	2.60E-4	3.40E+0	-1.16E-3	0.00E+0	-6.51E-3	-2.92E-1
RWD	[kg]	2.24E-3	2.64E-6	-7.17E-8	0.00E+0	3.81E-4	1.49E-7	1.01E-4	5.75E-5	4.93E-5	-2.17E-4	0.00E+0	-1.21E-3	-1.47E-4
CRU	[kg]	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	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.27E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.15E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.05E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.90E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

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

Not all of the life cycle inventories applied in this study support the methodological approach for the waste and water indicators. The data are based on publications of industry. The indicators for waste and water of the system are evaluated but contain a higher degree of uncertainty.

## References

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### EN 14041

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### ISO 15686

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ISO 15686-7: 2006-03: Part 7: Performance evaluation for feedback of service life data from practice  
ISO 15686-8: 2008-06: Part 8: Reference service life and service-life estimation

### VDZ e.V.

Umweltdaten der deutschen Zementindustrie 2016

### Regulation (EU) No. 305/2011

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### CML

Institute of Environmental Science (CML), University Leiden, The Netherlands

### PRODIS

Product Information System (PRODIS) of the European Carpet Industry, *Gemeinschaft umweltfreundlicher Teppichboden e.V (GUT)* and *European Carpet and Rug Association (ECRA)*, <http://www.pro-dis.info>

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### GaBi database 2018

GaBi Software-System and Database for Life Cycle Engineering, *thinkstep AG*, Leinfelden-Echterdingen, service pack 37, 2018

### ecoinvent 3.5

ecoinvent, Zurich, Switzerland, Database Version 3.5, 23<sup>th</sup> August 2018

### candidate list

Candidate List of substances of very high concern for Authorisation  
<https://echa.europa.eu/candidate-list-table>

**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**

Gemeinschaft umweltfreundlicher  
Teppichboden (GUT) e.V.  
Schönebergstraße 2  
52068 Aachen  
Germany

Tel +49 (0)241 96843 410  
Fax +49 (0)241 96843 400  
Mail [mail@gut-ev.de](mailto:mail@gut-ev.de)  
Web [www.gut-ev.org](http://www.gut-ev.org)

**Owner of the Declaration**

Ege Carpets A/S  
Industrivej Nord 25  
7400 Herning  
Denmark

Tel +45 (0) 97 11 88 11  
Fax +45 (0) 97 11 63 30  
Mail [ege@ege.dk](mailto:ege@ege.dk)  
Web [www.egecarpets.com](http://www.egecarpets.com)