

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	modulyss®
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-MOD-20170096-CBC1-EN
Issue date	9-6-2017
Valid to	8-6-2022

Tufted carpet tiles

with a maximum total pile weight of 1100 g/m²,
pile material of 100% regenerated solution dyed
polyamide 6, Back2Back backing

modulyss®

www.ibu-epd.com / <https://epd-online.com>



General Information

<p>modulyss®</p> <hr/> <p>Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-MOD-20170096-CBC1-EN</p> <hr/> <p>This Declaration is based on the Product Category Rules: Floor coverings, 07.2016 (PCR tested and approved by the SVR)</p> <hr/> <p>Issue date 9-6-2017</p> <hr/> <p>Valid to 8-6-2022</p>	<p>Tufted carpet tiles max. total pile weight 1100 g/m², pile material of 100% regenerated solution dyed polyamide 6, Back2Back backing</p> <hr/> <p>Owner of the Declaration modulyss Zevensterrestraat 21 9240 Zele Belgium</p> <hr/> <p>Declared product / Declared unit 1 m² tufted carpet tiles with a surface pile of recycled PA 6 and a Back2Back backing.</p> <hr/> <p>Scope: The manufacturer declaration applies to a group of similar products with a maximum total pile weight of 1100 g/m². The products are manufactured in the modulyss production site Zele, Belgium. Specific LCA results of products having a lower total pile weight can be taken from the corresponding tables of the annex or can be calculated by using equation 1 given in the annex (see annex chapter: 'General Information on the annex'). The result tables of the annex refer to categories of total pile weights in steps of 100 g/m². The declaration is only valid in conjunction with a valid GUT-/PRODIS/ license of the product. 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>Verification</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>	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
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<p></p> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p>	<p></p> <hr/> <p>Angela Schindler (Independent verifier appointed by SVR)</p>						
<p></p> <hr/> <p>Dr. Burkhardt Lehmann (Managing Director IBU)</p>							

Product

Product description / Product definition

Tufted carpet tiles having a surface pile of solution dyed polyamide 6 made of 100% recycled material and a Back2Back backing.

Back2Back backing: Bitumen based heavy backing with recycled content. Recycled content includes recycled limestone and recycled production waste 'B2B' (see more information on the website www.modulyss.com).

The percentage of the recycled content out of total weight depends on the total pile weight of the product. For a total pile weight up to 1100 g/m² the recycled content amounts to at least 66.5%.

The declaration applies to a group of products with a maximum total pile weight of 1100 g/m².

LCA results are calculated for products with the maximum total pile weight.

More specific LCA results of products having a lower total pile weight can be taken from the corresponding tables of the annex. These result tables refer to categories of total pile weights in steps of 100 g/m².

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 annex chapter: 'General Information on the annex').

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 (www.modulyss.com).

Application

The products can be used in commercial areas. The use class as defined in /EN 1307/ can be found on the Product Information System /PRODIS/ using the /PRODIS/ registration number of the product (www.pro-dis.info) or on the manufacturer's technical information section.

Technical Data

Constructional data

Name	Value	Unit
Type of manufacture	Tufted tiles	-
Product Form	Tiles 50 cm x 50 cm	-
Secondary backing	Back2Back backing	-
Yarn type	Polyamide 6, 100% recycled	-
Total pile weight	max. 1100	g/m ²
Total carpet weight	max. 5100	g/m ²

Additional product properties in accordance with /EN 1307/ and performance data of the product in accordance with the Declaration of Performance with respect to its Essential Characteristics according to /EN 14041/ can be found on the Product Information System /PRODIS/ using the /PRODIS/ registration number of the product (www.pro-dis.info) or on the manufacturer's technical information section (www.modulyss.com).

LCA: Calculation rules

Declared Unit

Name	Value	Unit
Declared unit	1	m ²
Conversion factor to 1 kg	0.20	m ² /kg
Mass reference	5.10	kg/m ²

The declared unit refers to 1 m² produced textile floor covering. Output of module A5 'Assembly' is 1 m² installed textile floor covering.

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

Base materials / Ancillary materials

Name	Value	Unit
Polyamide 6	21.6	%
Polyester	3.5	%
Polypropylene	0.6	%
Limestone	50.0	%
Aluminiumhydroxide	5.8	%
SBR-latex/SBS-copolymer	5.1	%
Bitumen	13.0	%
Glass fibre	0.2	%
Additives	0.2	%

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

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.

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 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 need no waste processing.
C3-2: Impact from waste incineration (plant with $R1 > 0.1$), 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:

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 2017/, service pack 33 and from the /ecoinvent 3.3/ 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 all products with a total pile weight up to 1100 g/m^2 . Specific information on products having a lower total pile weight can be taken from the annex.

Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel (truck, EURO 0-5 mix)	0.0102	l/100km
Transport distance	700	km
Capacity utilisation (including empty runs)	85	%

Installation in the building (A5)

Name	Value	Unit
Material loss	0.15	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)

Indication per m^2 floor covering and per year (see annex, chapter 'General Information on use stage')

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^3
Cleaning agent (wet cleaning)	0.09	kg
Electricity consumption	0.314	kWh

Further information on cleaning and maintenance see www.modulyss.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:

$$\begin{aligned} \text{EOL-impact} &= x\% \text{ impact (Scenario 1)} \\ &+ y\% \text{ impact (Scenario 2)} \\ &+ z\% \text{ impact (Scenario 3)} \end{aligned}$$

Name	Value	Unit
Collected as mixed construction waste (scenario 1 and 2)	5.1	kg
Collected separately (scenario 3)	5.1	kg
Landfilling (scenario 1)	5.1	kg
Energy recovery (scenario 2)	5.1	kg
Energy recovery (scenario 3)	2.24	kg
Recycling (scenario 3)	2.86	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)

/VDZ e.V./

The organic material of the carpet is used as secondary fuel in a cement kiln. It mainly substitutes for lignite (61.9%), hard coal (26.8%) and petrol coke (11.3%).

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

LCA: Results

The results are valid for all declared products with a maximum total pile weight of 1100 g/m².

LCA results for product groups having a lower total pile weight can be taken from the corresponding tables of the annex. 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 annex chapter: 'General Information on the annex').

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 annex, chapter 'General Information on use stage').

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 C4/2 cause no additional impact (see "LCA: Calculation rules") and are therefore not declared. Module C2 represents the transport for scenarios 1, 2 and 3. Column D represents module D/A5.

The CML characterisation factors version April 2015 are applied.

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	MNR	MNR	MNR	MND	MND	MND	X	X	X	X	

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² floorcovering

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 ₂ -Eq.]	8.23E+0	2.13E-1	6.52E-1	0.00E+0	3.32E-1	1.18E-2	6.15E+0	3.14E-2	3.65E-1	-1.63E-1	0.00E+0	-2.86E+0	-5.79E-1
ODP	[kg CFC11-Eq.]	5.26E-8	7.14E-14	1.54E-9	0.00E+0	1.26E-8	3.97E-15	2.11E-12	1.40E-12	8.97E-13	-3.05E-12	0.00E+0	-5.33E-11	-1.51E-11
AP	[kg SO ₂ -Eq.]	2.21E-2	8.95E-4	8.26E-4	0.00E+0	1.34E-3	4.98E-5	3.76E-3	8.99E-5	1.01E-3	-2.52E-4	0.00E+0	-4.42E-3	-2.25E-3
EP	[kg (PO ₄) ³⁻ -Eq.]	6.07E-3	2.23E-4	2.20E-4	0.00E+0	3.21E-4	1.24E-5	9.40E-4	8.13E-6	1.00E-3	-2.66E-5	0.00E+0	-4.67E-4	-2.35E-4
POCP	[kg ethene-Eq.]	1.81E-3	-3.65E-4	5.12E-5	6.29E-5	1.62E-4	-2.03E-5	2.43E-4	5.74E-6	1.15E-4	-2.41E-5	0.00E+0	-4.22E-4	-2.89E-4
ADPE	[kg Sb-Eq.]	6.79E-6	1.71E-8	2.09E-7	0.00E+0	1.14E-6	9.52E-10	2.22E-7	1.26E-8	7.56E-8	-3.12E-8	0.00E+0	-5.46E-7	-2.19E-7
ADPF	[MJ]	1.46E+2	2.94E+0	4.50E+0	0.00E+0	6.89E+0	1.64E-1	3.06E+0	3.36E-1	5.24E+0	-2.28E+0	0.00E+0	-4.01E+1	-8.18E+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 - RESOURCE USE: 1 m² floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
PERE	[MJ]	4.19E+1	1.48E-1	1.25E+0	0.00E+0	9.87E-1	8.24E-3	4.25E-1	1.88E-1	3.99E-1	-4.11E-1	0.00E+0	-7.19E+0	-5.71E-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]	4.19E+1	1.48E-1	1.25E+0	0.00E+0	9.87E-1	8.24E-3	4.25E-1	1.88E-1	3.99E-1	-4.11E-1	0.00E+0	-7.19E+0	-5.71E-1
PENRE	[MJ]	1.07E+2	2.95E+0	4.68E+0	0.00E+0	8.05E+0	1.64E-1	4.73E+1	4.44E+1	5.45E+0	-2.75E+0	0.00E+0	-4.83E+1	-8.23E+1
PENRM	[MJ]	4.39E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-4.39E+1	-4.39E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	1.51E+2	2.95E+0	4.68E+0	0.00E+0	8.05E+0	1.64E-1	3.43E+0	5.51E-1	5.45E+0	-2.75E+0	0.00E+0	-4.83E+1	-8.23E+1
SM	[kg]	3.65E+0	0.00E+0	1.07E-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	2.86E+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	7.91E+1
FW	[m ³]	1.12E+0	2.74E-4	3.40E-2	0.00E+0	4.25E-3	1.53E-5	2.14E-2	2.68E-4	1.30E-5	-5.87E-4	0.00E+0	-1.03E-2	-7.41E-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 m² floorcovering

Parameter	Unit	A1-A3	A4	A5	B1	B2	C2	C3/2	C3/3	C4/1	D	D/1	D/2	D/3
HWD	[kg]	3.43E-3	1.55E-7	1.00E-4	0.00E+0	1.13E-9	8.62E-9	1.96E-8	2.24E-10	2.11E-8	-6.65E-10	0.00E+0	-1.17E-8	-3.02E-9
NHWD	[kg]	2.75E-1	2.25E-4	5.08E-2	0.00E+0	8.17E-3	1.26E-5	1.27E+0	3.63E-4	5.09E+0	-9.74E-4	0.00E+0	-1.71E-2	-1.41E-1
RWD	[kg]	1.66E-3	4.02E-6	5.65E-5	0.00E+0	3.81E-4	2.24E-7	1.49E-4	8.58E-5	8.25E-5	-1.88E-4	0.00E+0	-3.28E-3	-1.90E-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]	1.39E-2	0.00E+0	4.08E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.86E+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	2.24E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	5.38E-1	0.00E+0	0.00E+0	0.00E+0	9.41E+0	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	1.28E+0	0.00E+0	0.00E+0	0.00E+0	2.25E+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.

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www.ibu-epd.de

/ISO 14025/

DIN EN /ISO 14025:2011-10/, Environmental labels
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/EN 15804/

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Declarations — Core rules for the product category of
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PCR Part A

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Part A: Calculation Rules for the Life Cycle
Assessment and Requirements on the Background
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www.bau-umwelt.de

PCR Part B

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EN 1307

DIN EN 1307: 2014+A1:2016: Textile floor coverings -
Classification

EN 14041

DIN EN 14041: 2008-05: Resilient, textile and laminate
floor coverings - Essential characteristics

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

ISO 15686

ISO 15686: Buildings and constructed assets -
Service life planning

ISO 15686-1: 2011-05: Part 1: General principles and
framework

ISO 15686-2: 2012-05: Part 2: Service life prediction
procedures

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 2015

CPR

Construction Products Regulation, Regulation (EU) No
305/2011 of the European Parliament and of the
Council of 9 March 2011

PRODIS

Product Information System (PRODIS) of the
European Carpet Industry, Gemeinschaft
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REACH

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