ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	James Halstead PLC
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
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Expona ® Domestic - Resilient Vinyl Floor Covering

James Halstead PLC

Institut Bauen und Umwelt e.V.

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

ECO PLATFORM EPD EN 15804 VERIFIED

1. General Information

James Halstead PLC

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

Declaration number
EPD-JHA-20180056-IBA1-EN

This Declaration is based on the Product Category Rules:
Floor coverings, 07.2016
(PCR tested and approved by the SVR)

Issue date
07/06/2018

Valid to
06/06/2023

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

Dr. Burkhart Lehmann
(Managing Director IBU)

Expona ® Domestic - Resilient Vinyl Floor Covering

Owner of the Declaration
James Halstead PLC
Beechfield
Hollinhurst Road
Whitefield
Manchester
M26 1JN
UK

Declared product / Declared unit
Expona ® Domestic - Resilient Vinyl Floor Covering

Scope:
Expona ® Domestic from James Halstead plc, Manchester, UK. The declaration refers to a floor covering of thickness 2.0 mm with a 0.4 mm transparent wear layer. The products are manufactured in Guangdong Province, PR China. The product is distributed by Objectflor Art und Design Belags GmbH, Your Flooring Partner.

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

Prof. Dr. Birgit Grahl
(Independent verifier appointed by SVR)

2. Product

2.1 Product description / Product definition

Expona ® Domestic Luxury Vinyl Tiles from James Halstead PLC are decorative resilient vinyl floor coverings of 2.0 mm total thickness with a 0.4 mm clear wear layer. Expona ® Domestic is manufactured in accordance with /EN ISO 10582/. The uppermost surface is treated with a reinforced PUR surface coating offering enhanced resistance to dirt pick up and staining. The uppermost surface is also embossed to give the product a natural wood, stone or design impression along with slip performance class DS to /EN 13893/ and R10 to /DIN 51130/. The resilience and life time of the product is imparted with the 0.4 mm clear wear layer which meets Type 1>80% for binder content according to /EN ISO 10582/ with over 97% binder. The decorative design is achieved through the use of a 0.07 mm printed vinyl film comprising wood, design and stone images with high definition realistic impressions. The product's performance with regards to resistance to dimensional stability changes and residual indentation is imparted with the use of specially engineered and formulated high density core and backing layers. The product conforms to /EN 14041/ specifying the health, safety and energy saving requirements. As such, it is CE marked and /Declaration of Performance (DoP)/ information can be found at www.Objectflor.de or www.Polyflor.com.

2.2 Application

Expona ® Domestic features a resilient 0.4 mm clear wear layer and is a floor covering for extremely heavy traffic areas in domestic, commercial and industrial applications. It is a high performance resilient floor covering for commercial and professional use e.g. in Retail Shops and Stores, Schools, Healthcare, Office and Administration areas.
Expona ® Domestic is use classified as 23, 32, 41 according to /EN ISO 10874/.

2.3 Technical Data

Placing on the market

Product Standards:
/EN ISO 10582:/ – Resilient Floorcoverings – Heterogeneous vinyl floorcoverings Specification.
/EN ISO 10874:/ – Resilient, Laminate and Textile Floorcoverings Classification.
/EN 13501-1/ – Fire Classification of construction products and building elements.
/EN 14041/ – Resilient, Textile and Laminate Floorcoverings - Essential characteristics
James Halstead plc ® floor coverings conform to European technical approval standards (CE Conformity and marking) and respective national approval standards for building products, e.g. the general technical approval of the German Institute for Building Technology /DIBt/ and the French regulations /DEVL1101903D/ and /DEVL1104875A/.
Excerpts of technical data sheets and /Declaration of Performance (DoP)/ information are available at www.Objectflor.de or www.Polyflor.com.

Constructional data

Name	Value	Unit
Product thickness /EN ISO 24346/	2	mm
Grammage Surface Weight /EN ISO 23997/	3700	g/m^2
Product Form Tiles and Planks	Tiles up to 610x610 mm Planks up to 203x1219 mm	-
Wear Layer Binder Content /EN ISO 10582/	Type 1: 97%	-

2.4 Delivery status

Delivery of tiles up to 610x610 mm and planks 203x1219 mm in cardboard packages of average 3.34 m^2.

2.5 Base materials / Ancillary materials

Product composition

Name	Value	Unit
PVC	34.4	%
Filler	54.3	%
Plasticiser	10.5	%
Stabiliser	0.3	%
Pigment	0.2	%
Additive	0.1	%
Polyurethane coating	0.2	%

The floor coverings contain approximately 14% internally recycled production waste (including material recycled from other products made in the same factory).
Vinyl – suspension PVC resin. Vinyl gives the flooring its resilient properties of hard wearing performance in use coupled with aesthetics of design. As vinyl is a thermoplastic it is 100% recyclable.
Filler – dolomite/calcium carbonate powder filler imparts strength, impact resilience and dimensional stability properties to the product. Calcium carbonate is an abundantly available natural mineral.
Plasticiser - gives the product flexibility.
Pigment (colouring) – decorative layers are provided using thin vinyl print films under the resilient wear layer. The films are printed using a wide variety of standard issue printing colours.
Additives – a rosin ester is added to the core and backing layers to aid processing.
Polyurethane coating - a UV cross-linked and reinforced polyurethane coating is added to the surface of the product.
According to the latest revision of Article 59, the Regulation (EC) No 1907/2006 on the Registration, Evaluation, Authorisation and restriction of Chemicals (REACH). "the REACH list", of substances of very high concern' (SVHC) the product is neither manufactured with, nor contains, any of these substances above a concentration of 0.1% by weight.

2.6 Manufacture

The layers are all laminated together under high temperature and pressure in a pressing machine, either continuously or as a batch process, to form a heterogeneous sheet. At the same time the corresponding realistic emboss feel effect is applied. After cooling and conditioning reinforced PUR coating is applied to the surface and the master sheets annealed to relax out. These sheets are then cut in a controlled environment into the respective plank and tile sizes with a supplementary bevelled edge being added to some designs. Finally, the floor coverings are packaged (see chapter 2.10). All left overs which arise during production (trimming, cutting, defect product and bevelled leftovers) are without exception placed back into the calendering process to make new flooring, in a closed loop, internal recycling system.
/EN ISO 9001/ - Certificate FM 95826 Notified body BSI
/EN ISO 14001/ – Certificate EMS 95827 Notified body BSI

2.7 Environment and health during manufacturing

Since 2000, the environmental management system is certified to /EN ISO 14001/ - Environmental management systems /EN ISO 14001/.
Air: exhaust air resulting from production processes is cleaned according to local legal requirements. Emissions are significantly below the permitted tolerances.
Water/Soil: contamination of water and soil does not occur. Effluent resulting from production processes is processed internally and routed back to production. The quality of water is audited on a regular basis.
Noise protection: noise intensive systems such as granulation are structurally enclosed and controlled.

2.8 Product processing/Installation

The relevant installation instructions can be found on the Objectflor website. The appropriate tools for installing vinyl resilient flooring should be used such as a rule, craft knife, measure. Care should be taken when using sharp tools. The installation of the floor covering is based on the technical regulations of /DIN 18365/. When installing resilient floorings acrylic and/or polyurethane adhesive systems are often used. Care should be taken to read fully and understand the precautions that should be adhered to. Observe all liability insurance association regulations for commercial processing operations where appropriate.
Waste vinyl material accumulated on site (off cuts) shall be collected and separated into waste types. Vinyl can be recycled using the /AgPR/ recycling facility. Any other disposal methods such as landfill and incineration should comply with local waste

disposal authority instructions. Where possible vinyl products should always be recycled.

2.9 Packaging
Expona ® Domestic is packed in cardboard packages. Packaging material and transportation aids such as wooden pallets, cardboard, paperboard PET strapping and recyclable PE film should be collected separately for later recycling.

2.10 Condition of use
The product is a vinyl resilient floor. It is inert in its supplied state.

2.11 Environment and health during use
According to the current state of knowledge, hazards to water, air and soil cannot occur during the proper use of the described products.
No damage to health or impairment is expected under normal use corresponding to the intended use of resilient flooring. Indoor Air Quality VOC emissions are independently monitored at least three times annually for performance. Expona Design complies with the requirements of:
1. The /DIBt///AgBB/ (February 2015) scheme
2. /Eurofins Indoor Air Comfort Gold/ standard (v6.0 February 2017)
3. The French regulations /DEVL1101903D/ and /DEVL1104875A/ (March and April 2011) Class A+ rating achieved
4. California Department of Public Health /CDPH/ standard method for the testing and evaluation of volatile organic chemical emissions from indoor sources using environmental chambers (version 1.1 2013).

2.12 Reference service life
The reference service life of 20 years used as a RSL for the purpose of this EPD constitutes the minimum service life.

The service life of resilient floor coverings depends on the correct installation taking into account the declared use classification and adherence to the manufacturer's cleaning instructions.

2.13 Extraordinary effects

Fire
Flammability rating Bfl according to /EN 13501-1:2007+A1:2009/, (BTTG, Notified Body 0338, May 2016, test report 26/02031CSupp/09/16).

Fire protection

Name	Value
Building material class /EN 13501-1:2007+A1:2009/	Bfl s1

Water
Water on the surface could present a potential slip hazard. Water spillages should be cleared immediately. For areas where water and contaminants are frequent a safety flooring conforming to /EN 13845/ is advised.

Mechanical destruction
Abrasion and impact loading classification: see product definition in this EPD. The dragging of heavy objects across the floor can cause damage and breaking of edges (risk of injury).

2.14 Re-use phase
Dry adhesive systems are available allowing for ease of removal of vinyl tiles for reuse or recycling where the installation is temporary. The adhesive manufacturer's instructions should be followed. If it has been sorted correctly vinyl tiles can be recycled and put back into new flooring.

2.15 Disposal
Vinyl flooring leftovers that arise from installation at the construction site as well, as those from deconstruction measures, should be primarily routed to a material utilisation stream such as /AgPR/. The producer of flooring as waste is obliged to assign the respective waste code number according to the European waste catalogue. The number depends on its specific application in the use stage.

2.16 Further information
Certified by the /CSTB/ to the quality accreditation NF UPEC system for France. The classification is U4 P3 E2 C2. The approval number is: No 728/348-001.1. See the /CSTB/ website for copies of certificates www.cstb.fr
The product is also classed A+ for use in major use such as Healthcare and Education areas according to the /BRE Green Guide/ Life Cycle Analysis (LCA) - Certificate ENP 437. See the Green Guide to Specification live database at www.greenbooklive.co.uk
The product is certified by /Eco-Specifier Global/ as Green Rate Level A - Silver PLUS according to the Green Tag Plus environmental accreditation system in Australia. See website for more details www.globalgreentag.com.

3. LCA: Calculation rules

3.1 Declared Unit
This declaration refers to a functional unit of 1 m² installed floor covering.

Declared unit

Name	Value	Unit
Declared unit installed	1	m^2
Conversion factor to 1 kg	0.27	-

3.2 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 adhesive for the installation of the floor covering, and incineration of offcuts and packaging material.
Module B2 includes provision of cleaning agent, energy and water consumption for the cleaning of the

floor covering incl. waste water treatment (calculated for the RSL according to section 2,12).
Module C1 considers electricity supply for the deconstruction of the flooring.
Module C2 includes transportation of the postconsumer waste to waste processing.
Module C3 & C4: end of life scenarios are declared for:
- 100% incineration in a waste incineration plant (R1<0.6 so reported in C4)
- 100% landfill (reported in C4)
- 100% recycling according to information from AgPR, (Arbeitsgemeinschaft PVC-Bodenbelag Recycling) (reported in C3)

Module D includes benefits from all net flows given in module A5 and C4 that leave the product boundary system after having passed the end-of-waste state in the form of recovery potentials. Module D is declared for each scenario separately.
Even though the waste incineration plant has low efficiency (R1<0.6) energy is still recovered and the potential benefits reported in module D. No potential benefits have been calculated for recycling (see below).

3.3 Estimates and assumptions
End of life is declared for three different scenarios (see chapter 3.2.).
For the assessed floor coverings, it is assumed that no significant degradation of materials occurs during landfilling; no significant emissions are considered for more than 100 years.
In the end of life scenario “100% recycling” the material for recycling leaves the system without environmental burden and without crediting any value.

3.4 Cut-off criteria
All available data from production processes have been considered, i.e. all raw materials, thermal energy, and electrical power used. The only exception is the use of rosin-based process aid that was excluded due to lack of data but accounts for less than 0.1% of mass inputs to the manufacturing process. Therefore, the study meets the cut-off criteria requirements specified in the PCR, Part A.

3.5 Background data
Background data are sourced from the GaBi 2017 databases.

3.6 Data quality
Foreground data are from 2010 as used in the previous EPD published in 2013. The manufacturer has confirmed that these are still valid as there have been no important changes to product composition and production technology, energy consumption and sourcing, direct emissions and solid waste.

3.7 Period under review
The period under review is the year 2010. As noted above, the manufacturer has confirmed that the production process has not significantly changed since that date and so the results are representative of current production in 2018.

3.8 Allocation
In most cases the assessed production sites use the same assembly line to produce different product types. The allocation of material and energy to produce the declared product was determined by the manufacturer during the data collection process. The products considered in this study and the respective EPD are considered to be homogenous and qualitatively comparable over time. Allocation is applied where renewable materials are used as input substances. Specific information is given in the GaBi datasets documentation.

3.9 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. The EPD has been produced using GaBi v8.5.79 and the GaBi 2017 database, DB version 8.7, SP 34. .

4. LCA: Scenarios and additional technical information

Details relating to the downstream scenarios modelled following manufacture of the flooring are provided below.

Transport to the construction site (A4)

Name	Value	Unit
Litres of fuel per m2 (truck)	0.0059	l/100km
Transport distance (truck)	2000	km
Capacity utilisation (including empty runs) (truck)	85	%
Litres of fuel per m2 (ship)	0.0015	l/100km
Transport distance (ship)	21000	km

The scenario for the transport to the point of installation considers a transport to the European market by ship and distribution in Europe by truck.

Installation in the building (A5)

Name	Value	Unit
Auxiliary	0.3	kg
Material loss	4.5	%

Maintenance (B2)

Name	Value	Unit
Maintenance cycle (per year)	3120	Number/RSL
Water consumption	0.0644	m^3
Auxiliary (detergent)	0.832	kg
Electricity consumption	10.9	kWh

Reference service life*

Name	Value	Unit
Life Span according to the manufacturer	20	a
Declared product properties (at the gate) and finishes	See section 2.1 of this EPD	-
Design application parameters (if instructed by the manufacturer), including the references to the appropriate practices and application codes	See section 2.2 of this EPD	-
Usage conditions, e.g. frequency of use, mechanical exposure	See section 2.2 of this EPD	-

*Results for module B2 (maintenance) are reported for the full 20 year RSL.

End of Life (C1-C4)

Name	Value	Unit
Incineration [100%, scenario 1]	3.7	kg
Landfill [100%, scenario 2]	3.7	kg
Recycling [100%, scenario 3]	3.7	kg

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

Name	Value	Unit

For module D the potential benefits given in module A5 and C4 are declared.
D1 relates to potential benefits from scenario 1: 100% incineration at EoL (includes potential benefits from energy recovery from incineration processes in A5 and C4).
D2 relates to potential benefits from scenario 2: 100% landfill at EoL (includes potential benefits from energy recovery from incineration processes in A5, no benefits from recycling are reported).
D3 relates to potential benefits from scenario 3: 100% recycling at EoL (includes potential benefits from energy recovery from incineration processes in A5).

5. LCA: Results

The results for module B2 refer to the RSL of 20 years.
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.
Three different scenarios are modelled for the end of life as referenced by the following numbers in the tables below: 1 = 100% Incineration, 2 = 100% landfill, 3 = 100% recycling. So, for example, modules C4/1, C4/2 and C4/3 refer to disposal impacts associated with incineration, landfill and recycling scenarios respectively and D1, D2, D3 refer to the potential benefits of these scenarios. Note that for module D3 (recycling) the benefits of avoided production of virgin material have not been assessed as it was not possible to determine the exact material that would be avoided (benefits shown here relate to energy recovery of packaging material in module A5 only).

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m2 Expona ® Domestic - Resilient Vinyl Floor Covering

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3/3	C4/1	C4/2	C4/3	D/1	D/2	D/3
GWP	[kg CO_2-Eq.]	6.72E+0	1.51E+0	1.13E+0	5.96E+0	1.33E-2	3.73E-2	8.44E-1	5.69E+0	2.85E-1	2.15E-2	-1.47E+0	-8.32E-2	-8.32E-2
ODP	[kg CFC11-Eq.]	2.44E-10	4.20E-13	1.30E-11	2.70E-10	5.91E-13	1.23E-14	1.14E-11	2.32E-12	7.00E-13	5.28E-14	-2.89E-11	-1.64E-12	-1.64E-12
AP	[kg SO_2-Eq.]	3.77E-2	3.51E-2	4.29E-3	1.56E-2	3.81E-5	8.25E-5	1.52E-3	4.87E-3	7.87E-4	5.94E-5	-2.35E-3	-1.33E-4	-1.33E-4
EP	[kg $(PO_4)^{3-}$-Eq.]	2.55E-3	3.69E-3	4.40E-4	1.92E-3	3.44E-6	2.01E-5	2.05E-4	3.00E-4	7.80E-4	5.88E-5	-2.46E-4	-1.39E-5	-1.39E-5
POCP	[kg ethene-Eq.]	3.60E-3	1.60E-3	3.50E-4	1.27E-3	2.43E-6	-2.62E-5	1.02E-4	1.29E-4	8.98E-5	6.77E-6	-2.20E-4	-1.24E-5	-1.24E-5
ADPE	[kg Sb-Eq.]	1.60E-5	5.96E-8	9.71E-7	2.87E-6	5.32E-9	2.96E-9	4.05E-7	1.61E-6	5.90E-8	4.45E-9	-2.93E-7	-1.66E-8	-1.66E-8
ADPF	[MJ]	1.21E+2	1.89E+1	1.61E+1	7.05E+1	1.42E-1	5.08E-1	8.41E+0	7.15E+0	4.09E+0	3.08E-1	-2.05E+1	-1.15E+0	-1.15E+0

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 Expona ® Domestic - Resilient Vinyl Floor Covering

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3/3	C4/1	C4/2	C4/3	D/1	D/2	D/3
PERE	[MJ]	1.27E+1	2.84E-1	1.18E+0	2.96E+1	7.96E-2	2.56E-2	4.71E+0	1.46E+0	3.11E-1	2.35E-2	-3.90E+0	-2.21E-1	-2.21E-1
PERM	[MJ]	1.70E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.70E-1	-1.70E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	1.28E+1	2.84E-1	1.18E+0	2.96E+1	7.96E-2	2.56E-2	4.54E+0	1.29E+0	3.11E-1	2.35E-2	-3.90E+0	-2.21E-1	-2.21E-1
PENRE	[MJ]	8.80E+1	1.90E+1	1.65E+1	1.05E+2	2.34E-1	5.10E-1	1.16E+1	4.61E+1	4.25E+0	3.20E-1	-2.49E+1	-1.41E+0	-1.41E+0
PENRM	[MJ]	3.45E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-3.45E+1	-3.45E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	1.22E+2	1.90E+1	1.65E+1	1.05E+2	2.34E-1	5.10E-1	-2.29E+1	7.93E+0	4.25E+0	3.20E-1	-2.49E+1	-1.41E+0	-1.41E+0
SM	[kg]	7.02E-1	IND	3.31E-2	IND	IND	IND	IND	IND	IND	IND	IND	IND	2.94E+0
RSF	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
NRSF	[MJ]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
FW	[m^3]	8.77E-2	5.41E-4	6.59E-3	4.83E-2	1.14E-4	4.74E-5	4.16E-3	1.57E-2	1.02E-5	7.67E-7	-5.57E-3	-3.16E-4	-3.16E-4

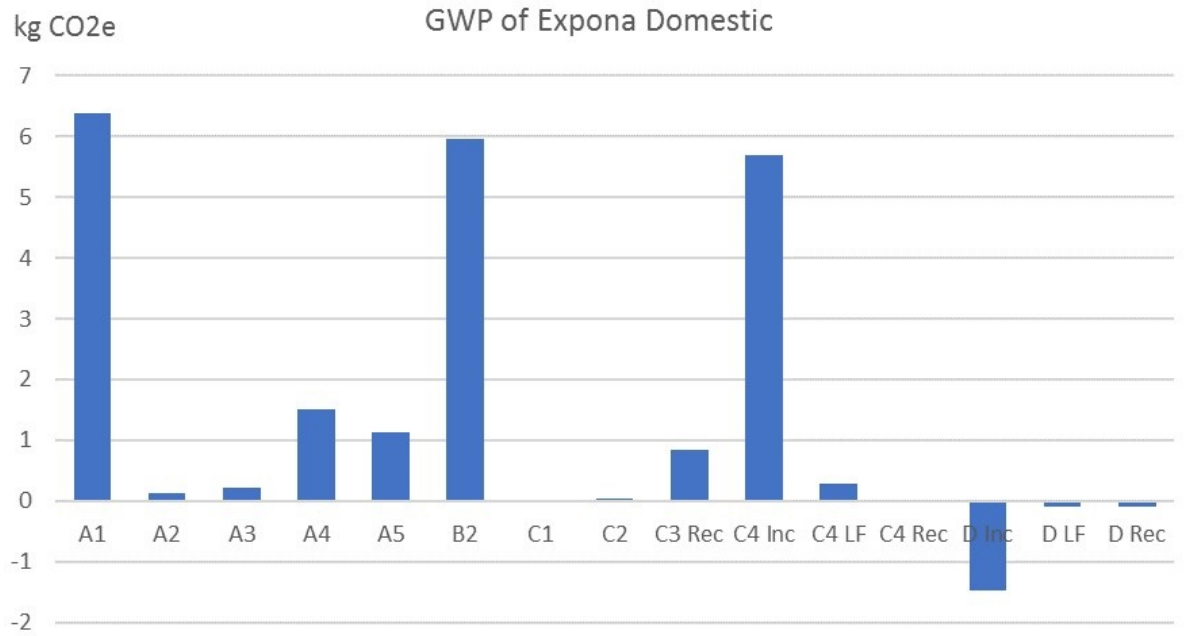
Caption	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable 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 – OUTPUT FLOWS AND WASTE CATEGORIES: 1 m2 Expona ® Domestic - Resilient Vinyl Floor Covering

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3/3	C4/1	C4/2	C4/3	D/1	D/2	D/3
HWD	[kg]	1.60E-6	2.58E-7	1.13E-7	4.37E-8	9.47E-11	2.68E-8	9.66E-9	5.14E-8	1.64E-8	1.24E-9	-6.19E-9	-3.50E-10	-3.50E-10
NHWD	[kg]	1.89E-1	4.57E-4	1.40E-1	1.65E-1	1.54E-4	3.90E-5	1.01E-2	3.10E+0	3.97E+0	2.99E-1	-9.27E-3	-5.25E-4	-5.25E-4
RWD	[kg]	5.15E-4	2.40E-5	1.44E-4	1.36E-2	3.63E-5	6.95E-7	1.28E-3	3.09E-4	6.44E-5	4.85E-6	-1.78E-3	-1.01E-4	-1.01E-4
CRU	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
MFR	[kg]	IND	IND	1.10E-1	IND	IND	IND	3.68E+0	IND	IND	IND	IND	IND	IND
MER	[kg]	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND	IND
EEE	[MJ]	IND	IND	3.37E-1	IND	IND	IND	IND	5.60E+0	IND	IND	IND	IND	IND
EET	[MJ]	IND	IND	8.07E-1	IND	IND	IND	IND	1.36E+1	IND	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

6. LCA: Interpretation



GWP

The raw material extraction and processing (A1) is the main contributor in the product stage (A1-A3) with over 90% of the total impacts in this aggregated module. Thermal and electrical energy consumed for the manufacturing of the flooring contributes about 5% of the impact in the aggregated module (A1-A3). For the end of life scenario “100% incineration” the emissions of the combustion process have a large influence on the GWP for the products. Potential benefits are reported in module D for exported energy from incineration. Impacts from the use phase associated with cleaning and maintenance are also significant over the product life cycle.

For the assessed floor covering it is assumed that no significant degradation of materials occurs during landfilling; no significant emissions are considered for more than 100 years. Comparing the EoL scenarios incineration and landfilling, the emissions influencing the GWP in module C are much higher for the incineration scenario. This is partly compensated when considering the resulting energy generation from the incineration process, which is declared in module D. An evaluation of the “best” EoL-scenario should not only consider the environmental effect of climate change, but further declared impact categories as well as aspects like avoidance of combustion of fossil fuels when using waste materials instead, long-term effects and demand on land for landfilling.

AP, EP

AP and EP in the product stage are predominantly determined by the extraction and processing of the raw materials (A1). The large AP and EP impacts in A4 is due to the considered transport scenario via ship form China to Europe and distribution in Europe per truck.

POCP

The main contributor for POCP in the product stage is raw material extraction and processing (A1). POCP is mainly influenced by the upstream process for the PVC production (ca. 45%). Transportation to the point of installation and impacts associated with the use phase are also relevant for POCP.

General

For all impact categories the transport processes in A2 and C2, installation (A5) and demolition of the flooring (C2) are visible but have a negligible influence on the overall result.

The methodological approach of recycling materials in this study does consider processing required to prepare the material (electricity for grinding) in module A1-A3. In the end of life scenario “100% recycling” the material for recycling leaves the system without environmental burden; no potential benefits or loads are reported in module D.

7. Requisite evidence

Accreditation relating to VOC testing.

VOC Emissions
VOC Test Report (9 August 2017) by Eurofins Product Testing A/S, Galten, Denmark.
Confirms compliance with a range of regulations and protocols on VOC emissions including:

- French VOC regulations /DEVL1101903D/ and /DEVL1104875A/
- /AgBB/ method
- /Eurofins Indoor Air Comfort GOLD/

VOC Test Report (22 February 2013) by Eurofins Product Testing A/S, Galten, Denmark
Confirms conformity with California Specification 01350 (standard method v1.1) for the school classroom and private office parameters; also in compliance with 9µg/m3 formaldehyde CREL for all parameters (Eurofins report No. G20636B).

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