ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

Owner of the Declaration	James Halstead PLC
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-JHA-20250547-CBA1-EN
Issue date	16.09.2025
Valid to	15.09.2030

Polyflor Geotone QuickLay PUR

James Halstead PLC

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

General Information

James Halstead PLC

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-JHA-20250547-CBA1-EN

This declaration is based on the product category rules:

Floor coverings, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

16.09.2025

Valid to

15.09.2030

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

Polyflor Geotone QuickLay PUR

Owner of the declaration

James Halstead PLC
Beechfield, Hollinhurst Rd. .
M261JN Whitefield, Manchester
United Kingdom

Declared product / declared unit

1 m^2 of installed Polyflor Geotone QuickLay PUR.

Scope:

Polyflor Geotone QuickLay PUR from James Halstead plc, Manchester, UK. The declaration refers to a decorative floor covering of thickness 2.2mm. The product is manufactured in Manchester, UK.
The results in this core-EPD were calculated using an LCA tool verified by IBU in 2024.
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+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR			
Independent verification of the declaration and data according to ISO 14025:2011			
☐	internally	☒	externally

Ms Emma Wilde,
(Independent verifier)

Product

Product description/Product definition

Polyflor Geotone QuickLay PUR is a resilient sheet floor covering with a thickness of 2.2mm, manufactured in accordance with ISO 10582. The uppermost surface features a polyurethane reinforcement (PUR) that protects the floor covering by resisting soiling and scuffing.
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 (CPR) applies. The product needs a declaration of performance taking into consideration EN 14041:2018 Resilient, textile, laminate and modular multilayer floor coverings; Essential characteristics, and CE marking.
For the application and use the respective national provisions apply.
CE Declarations of Performance are available at www.Polyflor.com or www.Objectflor.de.

Application

Polyflor Geotone QuickLay PUR is a loose lay resilient sheet floor covering, suitable for heavy traffic areas within the demanding health & care, education and commercial sectors, in a broad range of colours.
The use area classification of Polyflor Geotone QuickLay PUR is 34, 42, according to ISO 10874.

Example of a use area - Polyflor Geotone QuickLay PUR

Technical Data

Product standards:

- ISO 10582 Resilient floor coverings - Heterogeneous poly(vinyl chloride) floor covering - Specification.
- ISO 10874 Resilient, textile and laminate floor coverings - Classification.
- EN 13501-1 Fire classification of construction products and building elements - Classification using data from reaction to fire tests.
- EN 13893 Resilient, laminate and textile floor coverings. Measurement of dynamic coefficient of friction on dry floor surfaces.
- EN 1815 Resilient and laminate floor coverings. Assessment of static electrical propensity.

Polyflor Geotone QuickLay PUR is classified as B_{fl}-s1 according to EN 13501-1 Fire classification of construction products and building elements. Technical data sheets are available at www.polyflor.com or www.objectflor.de

Constructional data

Name	Value	Unit
Product thickness	2.2	mm
Grammage	2700	g/m^2
Product Form	Sheet	-
Type of manufacture	Plastisol Spread Coating	-

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to EN 14041:2018 Resilient, textile, laminate and modular multilayer floor coverings; Essential characteristics.

Base materials/Ancillary materials

Name	Value	Unit
Polyvinyl Chloride	47 - 50	%
Plasticiser	19 - 21	%
Calcium Carbonate	23 - 26	%
Carrier	1 - 3	%
Epoxidised Ester Blend	1 - 2	%
Stabiliser	<1	%
Pigments	<1	%
Titanium Dioxide	<1	%
Additives	<1	%
Polyurethane Coating	<1	%

Production of the floor coverings can contain up to 10% of recycled material which can consist of either or both post consumer and post industrial material.

1) "This product/article/at least one partial article contains substances listed in the candidate list (date: 27/01/2025) exceeding 0.1 percentage by mass: no".

2) "This product contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass: no".

3) "Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012): no".

Period Under Review

The data collection period for the LCA calculation was 01/01/2024 to 31/12/2024.

Reference service life

For this product, the stated Reference Service Life (RSL) is 1 year.

James Halstead plc recommend a service life of 25 years, which is based on their experience of flooring manufacture and supply. The recommended service life is applicable as long as the product use complies with that defined by EN 14041 and ISO 10874 in accordance with the Polyflor Geotone QuickLay PUR use classification (class 34 and 42).

It should be noted, however, that the service life of a polyvinyl chloride floor covering may vary depending on the amount & nature of floor traffic, the type & frequency of maintenance, and misuse of the product. Therefore, the RSL is stated as 1 year to allow the effects of maintenance (B2) to be calculated as required for the products anticipated useful life.

LCA: Calculation rules

Declared Unit

This declaration refers to a declared unit of 1 m^2 of installed Polyflor Geotone QuickLay PUR floor covering.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^2
Grammage	2.794	kg/m^2
Product thickness	0.0022	m

The EPD results are calculated based on the measured weight of the declared floor covering provided in the table directly above. The grammage provided in the "construction data" table is the nominal weight for the declared product, which refers to the average/marketed weight.

System boundary

The type of EPD according to EN 15804: "cradle to gate with options, modules C1-C4, and module D". The following modules are declared: A1-A3, C, D and additional modules: A4, A5, and B2.
The following life cycle stages are considered:

Production - Modules A1-A3

The product stage includes:

- Raw material supply (A1): raw material extraction and processing including recycled content.
- Transport to the manufacturer (A2):
- Manufacturing (A3): manufacturing expenses of the products including packaging materials and consumption of electricity (0.39 kg CO_2eq./kWh) and thermal energy (0.064 kg CO_2 eq./MJ).
- The product is manufactured in Manchester, UK.

Construction Stage - Modules A4-A5

The construction process stage includes:

- Transport to the construction site (A4).
- Production and treatment of generated cutting waste at the installation and packaging material (A5). Benefits of potential avoided burdens due to energy substitution of electricity and thermal energy are declared in module D.

Use Stage - Module B2

The Use stage includes:

- Maintenance (B2): detergents, water and electricity consumption.
- Data averaged for standard combination of 80% manual cleaning and 20% machine cleaning.

End-of-life (EOL) Stage - Modules C1-C4

- Mechanical dismantling with electricity consumption (C1).
- Transport to EoL (C2): 25 km distance travelled via truck transport.
- EoL Scenario 0 (C3): 100% thermal treatment of the floor covering with energy recovery (including auxiliaries at installation).
- EoL Scenario 1 (C3/1): 100% recycling of the floor covering (including auxiliaries at installation).
- EoL Scenario 2 (C4): 100% landfill of the floor covering (including auxiliaries at installation).

Benefits and Loads beyond the product system boundary

Benefits for potential avoided burdens during treatment of packaging materials, installation cuttings and/or auxiliaries (from module A5) due to energy substitution of electricity and thermal energy generation and/or material recycling under European condition are declared in Module D (duplicated in D, D/1 and D/2, respectively).

Geographic Representativeness

Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: Europe

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. Sphera LCA software (GaBi ts) content update package (CUP) version 2023.2.

LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

For 1 m^2 of Polyflor Geotone QuickLay PUR floor covering, the biogenic carbon content is declared below:

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	0.041	kg C
Biogenic carbon content in accompanying packaging	0.028	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

Transport to the construction site (A4)

This declaration considers the transport of the floor covering product from the factory gate to an average European customer site calculated from a combination of haulier routes via truck, rail, and ship transport in module A4.

Name	Value	Unit
Transport distance (via truck)	119.8	km
Transport distance (via ship)	33.8	km
Transport distance (via rail)	0	km

Installation in the building (A5)

Name	Value	Unit
Installation cutting waste	6	%
Paper & cardboard packaging	0.0294	kg/m²
Wood packaging	0.0116	kg/m²
Plastic packaging (PE/PET/PS)	0.0246	kg/m²

Maintenance (B2)

This information refers to 1 year (RSL).

Name	Value	Unit
Maintenance cycle	156	Number/RSL
Water consumption	0.003	m^3
Electricity consumption	0.037	MJ
Auxiliary (detergent)	0.044	kg

End of Life (C1-C4)

Name	Value	Unit
Electricity consumption for deconstruction (C1)	0.09	MJ
Transport distance (via truck) (C2)	25	km
Energy recovery, (100%, scenario 0)	2.794	kg
Recycling (100%, Scenario 1)	2.794	kg
Landfilling (100%, Scenario 2)	2.794	kg

Recovery, Reuse and or Recycling potentials (D), relevant scenario information

Benefits for potential avoided burdens during treatment of packaging materials, installation cuttings and/or auxiliaries (from module A5) due to energy substitution of electricity and thermal energy generation and/or material recycling under European conditions are declared in module D (duplicated in modules D/1 and D/2) and affects only the rate of primary material (no secondary materials).

Loads and benefits beyond the product system boundary from thermal treatment of the floor covering with benefits for potential avoided burdens due to energy substitution of electricity and thermal energy under European conditions is declared in module D.
No benefits were accounted from the recycling EoL scenario (C3/1) in module D/1.
No benefits were accounted from the landfill EoL scenario (C4) in module D/2.

LCA: Results

Results provided in this section are presented in relation to 1 m^2 of the Polyflor Geotone QuickLay PUR floor covering product. For the maintenance scenario (B2), the results refer to a period of one year. For the calculation of impacts of module B2 for a certain service life, the impacts results for module B2 have to be multiplied by the estimated service life in years.

For the End-of-Life (EoL) stage, three scenarios are considered:

- Scenario 0 (C3) considers 100% thermal treatment. Corresponding loads & benefits beyond system boundary are declared in Module D.
- Scenario 1 (C3/1) considers 100% recycling. Corresponding loads & benefits beyond system boundary are declared in Module D/1.
- Scenario 2 (C4) applies to 100% landfilling. Corresponding loads & benefits beyond system boundary are declared in Module D/2.

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

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	X	X	MND	X	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1 m2 Polyflor Geotone QuickLay PUR

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C3/1	C4	D	D/1	D/2
GWP-total	kg CO_2 eq	6.44E+00	2.34E-02	7.61E-01	3.71E-02	8.14E-03	4.59E-03	2.39E+00	1.52E-01	3.03E-01	-6.79E-01	-9.53E-02	-9.53E-02
GWP-fossil	kg CO_2 eq	6.65E+00	2.34E-02	6.74E-01	3.54E-02	8.06E-03	4.59E-03	2.24E+00	0	1.51E-01	-6.75E-01	-9.48E-02	-9.48E-02
GWP-biogenic	kg CO_2 eq	-2.14E-01	-6.02E-07	8.7E-02	1.71E-03	7.01E-05	2.4E-07	1.52E-01	1.52E-01	1.52E-01	-3.09E-03	-4.37E-04	-4.37E-04
GWP-luluc	kg CO_2 eq	1.01E-02	2.61E-05	6.29E-04	2.04E-05	8.77E-07	5.3E-06	2.53E-04	0	1.25E-04	-4.41E-05	-6.22E-06	-6.22E-06
ODP	kg CFC11 eq	3.71E-11	2.89E-15	2.43E-12	8.39E-14	1.49E-13	5.71E-16	2.38E-12	0	2.55E-13	-5.31E-12	-7.54E-13	-7.54E-13
AP	mol H^+ eq	1.78E-02	3.54E-05	1.16E-03	1.57E-04	1.72E-05	4.38E-06	7.81E-04	0	4.55E-04	-8.45E-04	-1.19E-04	-1.19E-04
EP-freshwater	kg P eq	7.67E-05	1.13E-07	4.67E-06	2.01E-06	3.01E-08	2.29E-08	9.14E-07	0	2.92E-05	-1.1E-06	-1.55E-07	-1.55E-07
EP-marine	kg N eq	6.19E-03	1.55E-05	4E-04	3.41E-05	4.12E-06	1.85E-06	2.7E-04	0	1.04E-04	-2.47E-04	-3.48E-05	-3.48E-05
EP-terrestrial	mol N eq	6.63E-02	1.72E-04	4.35E-03	2.95E-04	4.31E-05	2.08E-05	3.28E-03	0	1.14E-03	-2.65E-03	-3.73E-04	-3.73E-04
POCP	kg NMVOC eq	2.1E-02	3.82E-05	1.34E-03	9.42E-05	1.1E-05	4.24E-06	7.46E-04	0	3.31E-04	-6.89E-04	-9.69E-05	-9.69E-05
ADPE	kg Sb eq	2.42E-06	1.55E-09	1.47E-07	6.62E-08	1.25E-09	3.06E-10	2.18E-08	0	4.01E-09	-4.85E-08	-6.88E-09	-6.88E-09
ADPF	MJ	1.6E+02	3.1E-01	1.01E+01	9.82E-01	1.7E-01	6.11E-02	5.29E+00	0	2.26E+00	-1.25E+01	-1.75E+00	-1.75E+00
WDP	m^3 world eq deprived	1.41E+00	1.34E-03	1.23E-01	1.15E-02	1.8E-03	2.72E-04	3.48E-01	0	-2.14E-03	-6.44E-02	-9.13E-03	-9.13E-03

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; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1 m2 Polyflor Geotone QuickLay PUR

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C3/1	C4	D	D/1	D/2
PERE	MJ	1.87E+01	1.29E-02	2.38E+00	8.77E-02	1.01E-01	2.61E-03	2.63E+00	0	2.04E-01	-3.63E+00	-5.15E-01	-5.15E-01
PERM	MJ	2.28E+00	0	-1.02E+00	0	0	0	-1.26E+00	-1.26E+00	0	0	0	0
PERT	MJ	2.1E+01	1.29E-02	1.36E+00	8.77E-02	1.01E-01	2.61E-03	1.37E+00	-1.26E+00	2.04E-01	-3.63E+00	-5.15E-01	-5.15E-01
PENRE	MJ	1.21E+02	3.33E-01	1.03E+01	9.82E-01	1.7E-01	6.56E-02	4.43E+01	0	2.26E+00	-1.25E+01	-1.75E+00	-1.75E+00
PENRM	MJ	3.93E+01	0	-2.32E-01	0	0	0	-3.91E+01	-3.91E+01	0	0	0	0
PENRT	MJ	1.6E+02	3.33E-01	1.01E+01	9.82E-01	1.7E-01	6.56E-02	5.29E+00	-3.91E+01	2.26E+00	-1.25E+01	-1.75E+00	-1.75E+00
SM	kg	1E-01	0	6.02E-03	0	0	0	0	0	0	0	2.14E+00	0
RSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0	0	0	0	0	0
FW	m^3	5.01E-02	4.43E-05	3.95E-03	2.88E-04	8.19E-05	8.96E-06	8.73E-03	0	2.23E-05	-2.94E-03	-4.17E-04	-4.17E-04

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+A2: 1 m2 Polyflor Geotone QuickLay PUR

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C3/1	C4	D	D/1	D/2
HWD	kg	8.27E-06	9.57E-13	4.96E-07	3.05E-06	0	1.89E-13	5.19E-11	0	1.91E-10	-6.66E-10	-9.14E-11	-9.14E-11
NHWD	kg	2.11E-01	2.86E-05	1.27E-01	3.32E-03	1.24E-04	5.71E-06	1.41E+00	0	2.2E+00	-6.16E-03	-8.69E-04	-8.69E-04
RWD	kg	3.59E-03	9.53E-07	2.29E-04	2.31E-05	2.7E-05	1.88E-07	2.34E-04	0	2.68E-05	-9.62E-04	-1.37E-04	-1.37E-04
CRU	kg	0	0	0	0	0	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0	2.2E+00	0	0	0	0
MER	kg	0	0	0	0	0	0	0	0	0	0	0	0
EEE	MJ	0	0	4.55E-01	0	0	0	2.75E+00	0	0	0	0	0
EET	MJ	0	0	8.06E-01	0	0	0	4.98E+00	0	0	0	0	0

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; EET = Exported thermal energy

RESULTS OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1 m2 Polyflor Geotone QuickLay PUR

Parameter	Unit	A1-A3	A4	A5	B2	C1	C2	C3	C3/1	C4	D	D/1	D/2
PM	Disease incidence	2.88E-07	5.4E-10	1.87E-08	1.18E-09	1.45E-10	3.03E-11	1.62E-08	0	4.41E-09	-7.17E-09	-1.01E-09	-1.01E-09
IR	kBq U235 eq	3.67E-01	8.04E-05	2.37E-02	3.24E-03	4.49E-03	1.59E-05	3.42E-02	0	3.96E-03	-1.6E-01	-2.27E-02	-2.27E-02
ETP-fw	CTUe	6.06E+01	2.6E-01	3.97E+00	6.8E-01	4.72E-02	5.11E-02	3.14E+00	0	1.93E+00	-1.74E+00	-2.46E-01	-2.46E-01
HTP-c	CTUh	6.29E-09	4.14E-12	3.9E-10	1.82E-11	2.5E-12	8.15E-13	1.25E-10	0	9.91E-11	-1.38E-10	-1.95E-11	-1.95E-11
HTP-nc	CTUh	7.74E-08	9.56E-11	5.64E-09	1.07E-09	3.98E-11	1.89E-11	9.33E-09	0	7.91E-09	-3.4E-09	-4.77E-10	-4.77E-10
SQP	SQP	4.74E+01	5.67E-02	2.95E+00	5.52E-02	6.66E-02	1.15E-02	1.22E+00	0	1.96E-01	-2.38E+00	-3.38E-01	-3.38E-01

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

This EPD was created using a software tool.

References

Standards

EN 13501-1
Fire classification of construction products and building elements. Classification using data from fire resistance and/or smoke control tests, excluding ventilation services.

EN 13893
Resilient, laminate and textile floor coverings. Measurement of dynamic coefficient of friction on dry floor surfaces.

EN 14041
Resilient, textile, laminate and modular multilayer floor coverings. Essential characteristics.

EN 15804
Sustainability of construction works. Environmental product declarations. Core rules for the product category of construction products.

EN 1815
Resilient and laminate floor coverings. Assessment of static electrical propensity.

ISO 10582
Resilient floor coverings. Heterogeneous poly(vinyl chloride) floor covering. Specifications.

ISO 10874
Resilient, textile and laminate floor coverings. Classification.

ISO 10425
Environmental labels and declarations - Type III environmental declarations - Principles and procedures.

Further References

IBU 2021
Institut Bauen und Umwelt e.V.: General Instructions for the EPD programme of Institut Bauen und Umwelt e.V., Version 2.0, Berlin: Institut Bauen und Umwelt e.V., 2021 www.ibu-epd.com

PCR Part A
PCR - Part A: Calculation rules for the Life Cycle Assessment and Requirements on the BackgroundReport, version 1.4, Institut Bauen und Umwelt e.V., 15.04.2024.

PCR Part B
PCR – Part B:Requirements of the EPD for Floor coverings, v10, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 01.08.2021.

Polyflor LCA tool
LCA tool for PVC floor coverings
LCA Tool No.: IBU-JHA-202401-LT1-EN
Developed by Sphera Solutions

Sphera LCA FE (GaBi ts)
GaBi ts dataset documentation for the software-system and databases, LBP, University of Stuttgart and thinkstep,Leinfelden-Echterdingen, 2023 (https://www.gabi software.com/support/gabi).

Sphera LCA Calculator Software (GaBi Envision)
GaBi Envision 5.0 Sphera Solution GmbH, the LCA, EPD and Ecodesign tool, http://www.gabisoftware. com/international/software/gabi-envision/, 2023

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