ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

THE BETTER WAE CARPET COLLECTION

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Studio Wae
Address	Gansstraat 170, 3582 EP Utrecht
Contact details	tynke@studiowae.nl
Website	www.studiowae.nl

PRODUCT IDENTIFICATION

Product name	The Better Wae Carpet Collection
Additional label(s)	
Product number / reference	The Better Wae Carpet Collection
Place(s) of production	Netherlands
CPC code	272

Self declared

EPDs within the same product category but from different programmes may not be comparable.

EPD INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPD program operator	Self declared
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804 serves as the core PCR. In addition, the Int'l EPD System PCR 2019:14 Construction products, version 1.11 (05.02.2021) is used.
EPD author	A.J.N. van der Brugge MSc- Circle Line
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal certification ☑ External verification
Verification date	
EPD verifier	Ing. E.F.L.M.. Verspeek - Agrodome
EPD number	
ECO Platform nr.	-
Publishing date	
EPD valid until	

PRODUCT INFORMATION

PRODUCT DESCRIPTION

Studio Wae's The Better Wae Carpet Collection is used for the creation of rugs. It is easy to lay in a number of beautiful patterns. Due to this patterns it is easy to swap dirty or damaged tiles after a period of time to extend the total lifetime. This Environmental Product Declaration covers all styles and patterns of Studio Wae's The Better Wae Carpet Collection and is based on the high quality waste streams of Interface (production plant Scherpenzeel - Netherlands) and Desso BV (production plant Waalwijk - Netherlands). The production of The Better Wae Carpet Collection takes place in Utrecht and is carried out by people with limited employment. It is Studio Waes mission to create employment for as many status holders as possible, to give them a solid foundation to build up a future in the Netherlands.

PRODUCT APPLICATION

Flooring, acoustic, energy saving material, custom made aesthetics

TECHNICAL SPECIFICATIONS

Studio Wae's Modular Flooring Tiles are products of high quality as its based on waste of market leaders, such as Interface and Desso BV. We have a guarantee of 2 years on our products and a lifecicle of about 15 years. Easy to swap worn out tiles with new ones without loosing esthetics. In comparison with square tiles this is unique.

PRODUCT STANDARDS

The floor finishes meet at least class 33 (heavy duty use in utility function), according to ISO 10874:2009

PHYSICAL PROPERTIES OF THE PRODUCT

Thickness 10 mm Weight 8,222 kg/m2

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at www.studiowae.nl.

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg	Post-consumer %	Saved from becoming	Country Region of origin
Tiles from carpet industry (waste)	8,0	0	100	Netherlands
Adhesive	0,15	0	0	Germany
Connectors	0,072	0	100	Netherlands
Cardboard Pallet Box	0,065	0	0	Netherlands
Pallet	0,01	100	0	Netherlands

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Studio Wae's The Better Wae Carpet Collection is made out waste of the carpet industry. These modular flooring tiles have imperfections, irregularities or production flaws and are shipped to Studio Wae in Utrecht. Studio Wae manually selects the carpet tiles she wants to use. Due to the variety of designs and possibilities, only 3% of the tiles are not used and, therefore returned to the original factory. The layers of flooring are glued together to create a sturdy carpet tile. The carpet tiles are connected by connectors out of waste polymers. Transport of pallets with waste tiles is executed by 16-32 ton lorries. Studio Wae's designs are part of their unique selling point. All the designs create upscalability with a great deal of customizing. The customer chooses the desired colours and patterns and Studio Wae will cut the tiles in the design with an energy efficient cutting machine and rolled to create the carpet tiles. An average amount of cutting waste (30,86%) is send back to the original factory for pre-consumer recycling.

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

A4: Transport Transport of the packed modular carpet tiles from factory to the place of installation. A5: Installation Installation of the Better Wae Carpet Collection, proceeding installation and packaging waste. Preparing of the floor is not included in this LCA, since it's not part of Studio Wae's primary process.

PRODUCT USE AND MAINTENANCE (B1-B7)

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

Vacuum cleaning - electricity supply

Wet cleaning - water consumption, electricity, cleaning consumables

The declared values are based on a period of one year and are multiplied by the lifespan of the product (10 years).

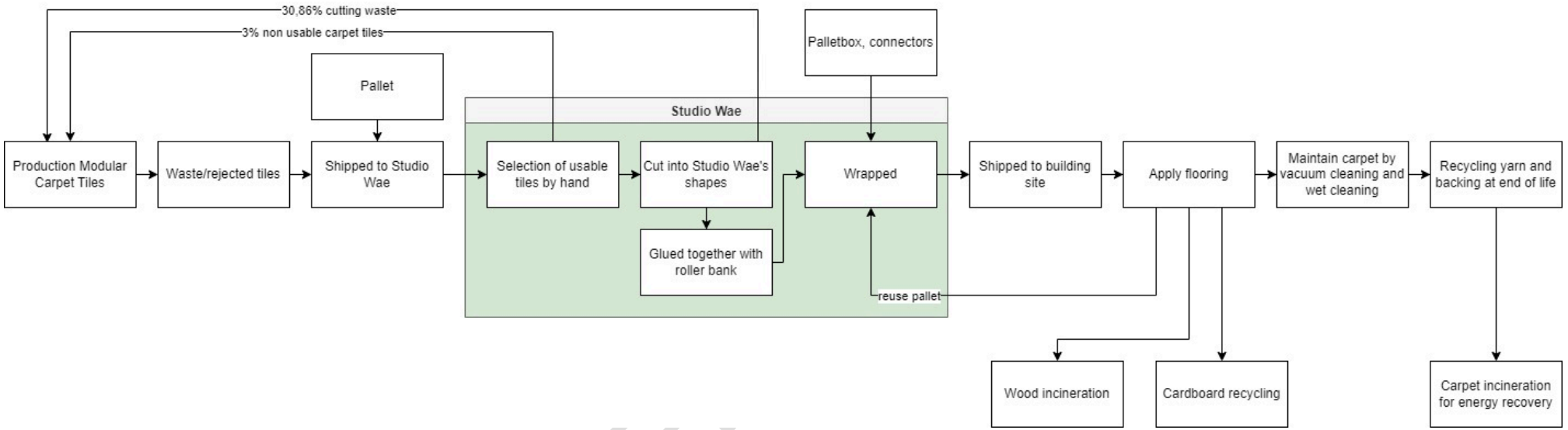
B3-B7: These modules are not relevant and therefore not declared.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

C1: De-construction No industrial process needed. Thecarpets will be manually removed from a building. C2: Transport Transport of the modular carpet tiles to incineration. C3: Waste processing Treatment of the carpet tile waste for energy recovery C4: Disposal 100% of the carpet tiles are used for energy recovery. D: Recycling Potential Recycling of palletbox and energy recovery from pallet.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2021

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 m2
Mass per declared unit	8.222 kg
Functional unit	1 m2
Reference service life	10

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	0
Biogenic carbon content in packaging, kg C	0.102

SYSTEM BOUNDARY

This EPD covers the cradle to grave modules; A1 – D.

Product stage			Assembly stage		Use stage							End of life stage				Beyond the system boundaries		
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	D	D
x	x	x	x	x	MND	x	MND	MND	MND	MND	MND	x	x	x	x	x	x	x
Geography, by two-letter ISO country code or regions. The International EPD System only.																		
EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU	EU		
Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

Modules not declared = MND. Modules not relevant = MNR.

CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

ALLOCATION, ESTIMATES AND ASSUMPTIONS

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order;

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.

3. Allocation should be based on economic values.

No allocations were needed for this LCA.

Allocation used in Ecoinvent 3.6 environmental data sources follows the methodology 'allocation, cut-off by classification'. This methodology is in line with the requirements of the EN 15804 -standard.

AVERAGES AND VARIABILITY

The declared unit of 8,222 kg is an average of the masses of the main stream waste tiles that are used to create The Better Wae Carpet Collection.

The waste carpet tiles are 50x50 cm and have and area of 0,25m^2 each. Studio Wae cuts these capret tiles into a variety of shapes. The average area used is 0,15m^2, as showed in the table below. Therefore the average cutting waste is 0,10m^2 per carpet tile. This amount is reduced by reusing parts of the cutting waste, predominantly for the shapes Boomerang and City. This creates an average yield of 0,02m2, which gives us a total cutting waste of 0,77 – 30,86%

Averaging data to calculate the cutting waste percentage:

Shape	**Area m2**	**tiles per m2**
Boomerang	0,15	6,55
Beo	0,16	6,09
Polygon	0,16	6,09
Dim	0,16	6,09
City	0,12	8,23
Average area	**0,15**	**6,61**

ENVIRONMENTAL IMPACT DATA

Note: additional environmental impact data may be presented in annexes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate Change –	kg CO_2e	6E-2	3,63E-2	2,03E-1	3E-1	2,17E-1	1,14E-1	MND	3,74E-1	MND	MND	MND	MND	MND	0E0	6,86E-2	1,7E1	0E0	1,66E-1
CC – fossil	kg CO_2e	1,99E-1	3,63E-2	2,98E-1	5,33E-1	2,19E-1	8,47E-3	MND	4,06E-1	MND	MND	MND	MND	MND	0E0	6,85E-2	1,7E1	0E0	-6,66E-
CC – biogenic	kg CO_2e	-1,39E-	2,59E-5	-9,57E-	-2,35E-	1,18E-4	1,05E-1	MND	-4,55E-	MND	MND	MND	MND	MND	0E0	3,66E-5	2,96E-4	0E0	2,31E-1
CC – LULUC	kg CO_2e	3,11E-4	1,11E-5	8,04E-4	1,13E-3	7,91E-5	3,53E-6	MND	1,41E-2	MND	MND	MND	MND	MND	0E0	2,43E-5	3,84E-5	0E0	1,28E-3
Ozone depletion pot.	kg	1,11E-8	8,52E-9	1,95E-8	3,91E-8	4,99E-8	1,15E-9	MND	3,73E-8	MND	MND	MND	MND	MND	0E0	1,56E-8	2,02E-8	0E0	-4,8E-9
Acidification	mol H^+e	1,2E-3	1,52E-4	7,46E-4	2,1E-3	6,29E-4	4,37E-5	MND	1,86E-3	MND	MND	MND	MND	MND	0E0	2,8E-4	3,32E-3	0E0	-3,71E-
EP-freshwater[3)]	kg Pe	1,33E-5	2,96E-7	9,38E-6	2,3E-5	1,86E-6	1,78E-7	MND	2,55E-5	MND	MND	MND	MND	MND	0E0	5,73E-7	2,08E-6	0E0	-6,33E-
EP-marine	kg Ne	2,18E-4	4,58E-5	2,74E-4	5,38E-4	1,25E-4	1,5E-5	MND	5,12E-4	MND	MND	MND	MND	MND	0E0	8,32E-5	1,72E-3	0E0	-5,58E-
EP-terrestrial	mol Ne	2,31E-3	5,06E-4	2,51E-3	5,32E-3	1,39E-3	1,59E-4	MND	4,18E-3	MND	MND	MND	MND	MND	0E0	9,19E-4	1,74E-2	0E0	-6,77E-
POCP (“smog”)	kg NMVOCe	6,31E-4	1,62E-4	6,03E-4	1,4E-3	5,34E-4	5,38E-5	MND	1,05E-3	MND	MND	MND	MND	MND	0E0	2,81E-4	4,18E-3	0E0	-1,79E-4
ADP-minerals &	kg Sbe	5,72E-6	6,45E-7	2,24E-6	8,61E-6	6,04E-6	2,49E-7	MND	8,36E-6	MND	MND	MND	MND	MND	0E0	1,85E-6	2,87E-6	0E0	2,96E-6
ADP-fossil resources	MJ	6,44E0	5,64E-1	2,11E0	9,11E0	3,31E0	9,44E-2	MND	5,81E0	MND	MND	MND	MND	MND	0E0	1,03E0	2,2E0	0E0	-1,49E0
Water use[2)]	m^3e depr.	1,31E-1	2,08E-3	4,89E-2	1,82E-1	1,08E-2	7,81E-4	MND	2,98E-1	MND	MND	MND	MND	MND	0E0	3,33E-3	-2,27E-	0E0	-5,73E-

1) CC = Climate Change; EP = Eutrophication potential; POCP = Photochemical ozone formation; ADP = Abiotic depletion potential. 2) EN 15804+A2 disclaimer for Abiotic depletion and Water use and optional indicators except Particulate matter and Ionizing radiation, human health. The results of these environmental impact indicators shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. 3) Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO_4e.

USE OF NATURAL RESOURCES

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Renew. PER as energy	MJ	1,6E0	7,15E-3	1,38E0	2,99E0	4,74E-2	4,87E-3	MND	1,09E0	MND	MND	MND	MND	MND	0E0	1,46E-2	3,78E-2	0E0	-1,23E0

Renew. PER as material	MJ	1,53E0	0E0	9,4E-1	2,47E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	-9,73E-1
Total use of renew. PER	MJ	3,13E0	7,15E-3	2,32E0	5,46E0	4,74E-2	4,87E-3	MND	1,09E0	MND	MND	MND	MND	MND	0E0	1,46E-2	3,78E-2	0E0	-2,21E0
Non-re. PER as energy	MJ	4,88E0	5,64E-1	2,11E0	7,55E0	3,31E0	9,44E-2	MND	5,81E0	MND	MND	MND	MND	MND	0E0	1,03E0	2,2E0	0E0	-1,49E0
Non-re. PER as material	MJ	1,86E0	0E0	0E0	1,86E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Total use of non-re. PER	MJ	6,74E0	5,64E-1	2,11E0	9,41E0	3,31E0	9,44E-2	MND	5,81E0	MND	MND	MND	MND	MND	0E0	1,03E0	2,2E0	0E0	-1,49E0
Secondary materials	kg	1,17E-3	0E0	0E0	1,17E-3	0E0	0E0	MND	1,7E-3	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	9,56E-2
Renew. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Non-ren. secondary fuels	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Use of net fresh water	m³	5,54E-3	1,16E-4	3,93E-3	9,59E-3	5,72E-4	2,32E-5	MND	1,36E-2	MND	MND	MND	MND	MND	0E0	1,77E-4	3,81E-3	0E0	-5,04E-4

6) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Hazardous waste	kg	1,46E-2	5,49E-4	7,02E-3	2,21E-2	3,41E-3	3,68E-4	MND	2,75E-2	MND	MND	MND	MND	MND	0E0	1,05E-3	0E0	0E0	6,87E-3
Non-hazardous waste	kg	3,51E-1	5,91E-2	3,31E-1	7,41E-1	2,35E-1	1,19E-2	MND	7,6E-1	MND	MND	MND	MND	MND	0E0	7,2E-2	0E0	0E0	-2,38E-1
Radioactive waste	kg	1,23E-4	3,87E-6	7,36E-6	1,34E-4	2,27E-5	6,07E-7	MND	9,97E-6	MND	MND	MND	MND	MND	0E0	7,08E-6	0E0	0E0	-8,9E-6

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Components for re-use	kg	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

Materials for recycling	kg	0E0	0E0	5,42E0	5,42E0	0E0	1,3E-1	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0
Materials for energy rec	kg	0E0	0E0	0E0	0E0	0E0	4,32E-2	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	8,22E0	0E0	0E0
Exported energy	MJ	0E0	0E0	0E0	0E0	0E0	0E0	MND	0E0	MND	MND	MND	MND	MND	0E0	0E0	0E0	0E0	0E0

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Market for electricity, low voltage (Reference product: electricity, low voltage)
Electricity CO_2e / kWh	0.19
District heating data source and quality	Electricity, from municipal waste incineration to generic market for electricity, medium voltage (Reference product: electricity, medium voltage)
District heating CO_2e / kWh	0

BIBLIOGRAPHY

ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations. Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

Ecoinvent database v3.6 (2019) and One Click LCA database.

EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

ABOUT THE MANUFACTURER

Studio Wae makes impact on raw material extraction by converting residual flows into scalable and beautiful products. Studio Wae believes it is important that everyone realizes that waste can have a positive value. By using production waste, we extend the life cycle of these sources.

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Studio Wae
EPD author	A.J.N. van der Brugge MSc - Circle Line
EPD verifier	Ing. E.F.L.M. Verspreek - Agrodome
EPD program operator	Self declared
Background data	This EPD is based on Ecoinvent 3.6 (cut-off) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA Pre-Verified EPD Generator for

VERIFICATION STATEMENT

VERIFICATION PROCESS FOR THIS EPD

This EPD has been verified in accordance with ISO 14025 by an independent, third-party verifier by reviewing results, documents and compliancy with EN 15804, ISO 14025 and ISO 14040/14044, following the process and checklists of the program operator for:

- This Environmental Product Declaration
- The Life-Cycle Assessment used in this EPD
- The background report (project report) for this EPD

Why does verification transparency matter? Read more online.

VERIFICATION OVERVIEW

Following independent third party has verified this specific EPD:

EPD verification information	Answer
Independent EPD verifier rd-party verifier for EPD	
EPD verification started on	Date when started
EPD verification completed on	Date when completed
Supply-chain specific data %	
Approver of the EPD verifier	Self declared

Author & tool verification	Answer
EPD author	A.J.N. van der Brugge - Circle Line
EPD author training completion	Date when firm onboarded
EPD Generator module	
Independent software verifier	Name of third party
Software verification date	17 January 2021

THIRD-PARTY VERIFICATION STATEMENT

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.

I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.

I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.

I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

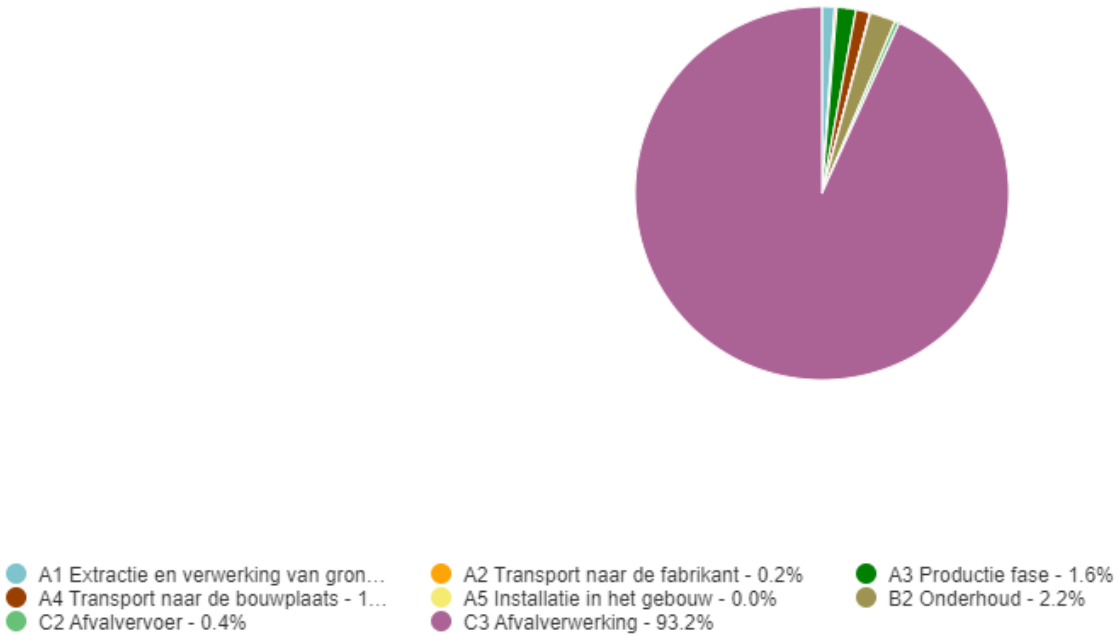
Signature

ANNEX 1 : ENVIRONMENTAL IMPACTS – EN 15804+A1, CML / ISO 21930

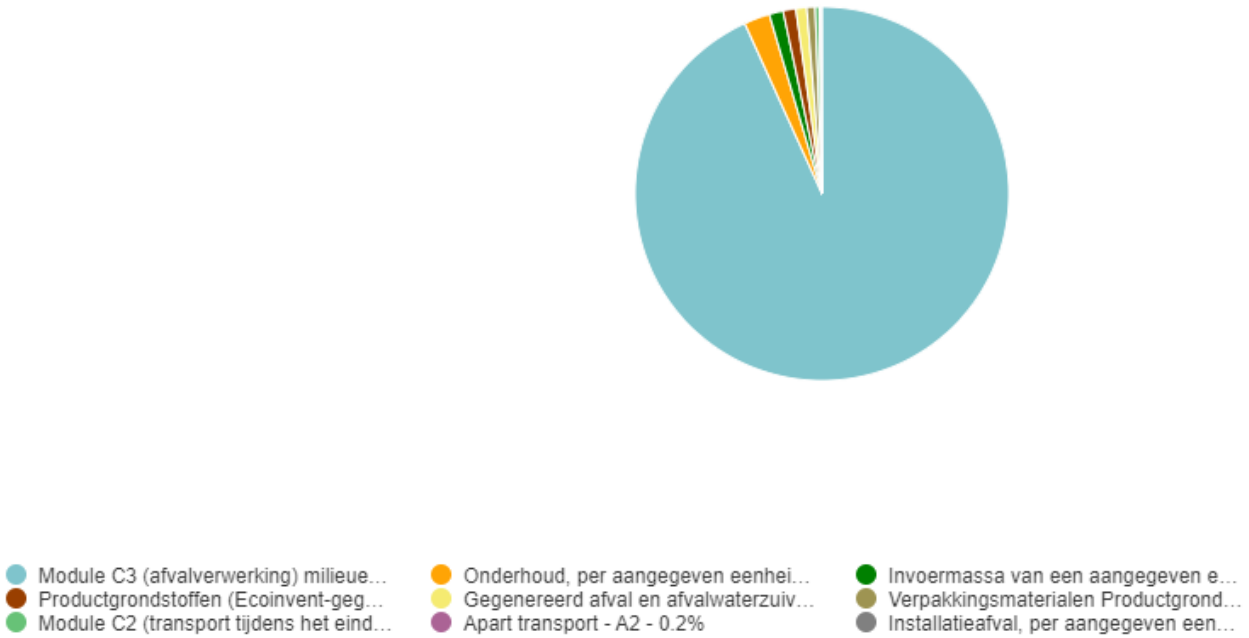
Impact	Unit	A1	A2	A3	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Global Warming Pot.	kg CO_2e	3,41E-	3,6E-2	2,95E-	6,72E-1	2,17E-	9,19E-	MND	3,96E-	MND	MND	MND	MND	MND	0E0	6,79E-	1,7E1	0E0	-6,4E-
Ozone depletion Pot.	kg CFC_{-11}e	1,14E-	6,77E-	1,65E-	3,46E-8	3,97E-	9,48E-	MND	4,38E-	MND	MND	MND	MND	MND	0E0	1,24E-	1,71E-	0E0	-
Acidification	kg SO_2e	1,45E-	7,38E-	4,71E-	2E-3	4,42E-	3,31E-	MND	1,48E-	MND	MND	MND	MND	MND	0E0	1,37E-	2,29E-	0E0	-3,11E-
Eutrophication	kg PO_4^3e	3,91E-	1,49E-	7,52E-	1,16E-3	9,14E-	1,9E-5	MND	7,83E-	MND	MND	MND	MND	MND	0E0	2,82E-	1,73E-	0E0	-
POCP (“smog”)	kg C_2H_4e	1,47E-	4,69E-	3,44E-	1,86E-4	2,65E-	2,08E-	MND	8,49E-	MND	MND	MND	MND	MND	0E0	9,05E-	4,05E-	0E0	-
ADP-elements	kg Sbe	5,72E-	6,45E-	2,24E-	8,61E-6	6,04E-	2,49E-	MND	8,36E-	MND	MND	MND	MND	MND	0E0	1,85E-	2,87E-	0E0	2,96E-
ADP-fossil	MJ	6,44E0	5,64E-	2,11E0	9,11E0	3,31E0	9,44E-	MND	5,81E0	MND	MND	MND	MND	MND	0E0	1,03E0	2,2E0	0E0	-

ANNEX 6 : LIFE-CYCLE ASSESSMENT RESULT VISUALIZATION

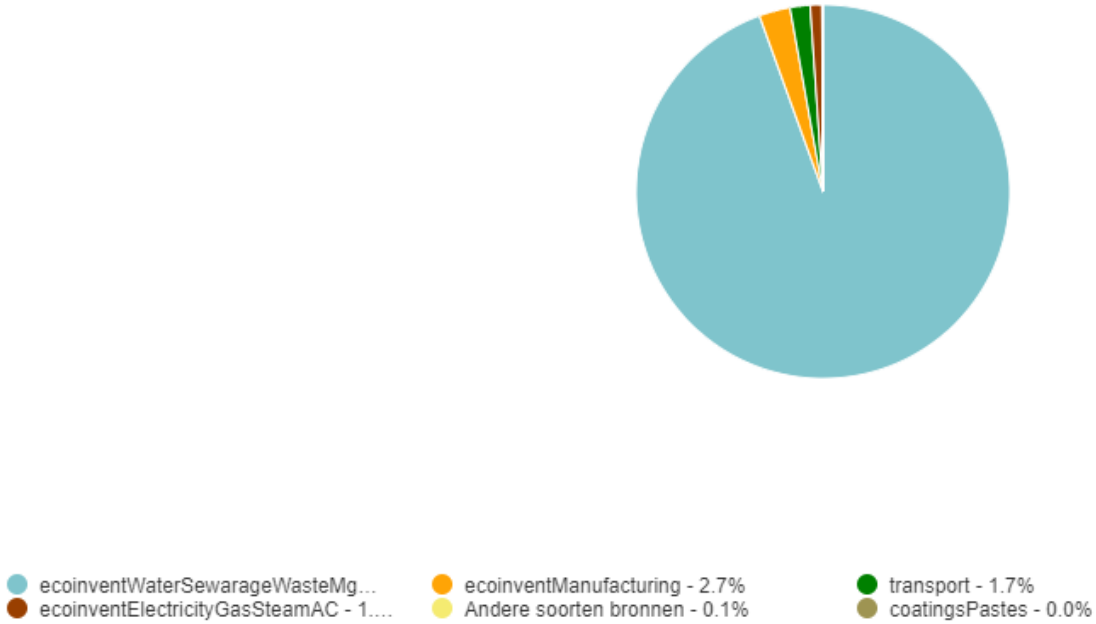
Climate Change fossil kg CO2e - Levenscyclusstadia



Climate Change fossil kg CO2e - Classificatie



Climate Change fossil kg CO2e – Resource types


ecoinventWaterSewarageWasteMg...
ecoinventElectricityGasSteamAC - 1....
ecoinventManufacturing - 2.7%
Andere soorten bronnen - 0.1%
transport - 1.7%
coatingsPastes - 0.0%