

Owner: Harris ApS  
No.: MD-23026-EN  
Issued: 27-06-2023  
Valid to: 27-06-2028

3<sup>rd</sup> PARTY VERIFIED

**EPD**

VERIFIED ENVIRONMENTAL PRODUCT DECLARATION | ISO 14025 & EN 15804



**Owner of declaration**  
 Harris ApS  
 Birkedømmervej 31, 2. sal  
 2400 København NV  
 CVR: 39295490



**Issued:**  
27-06-2023

**Valid to:**  
27-06-2028

**Program**  
 EPD Danmark  
[www.epddanmark.dk](http://www.epddanmark.dk)



- Industry EPD
- Product EPD

**Basis of calculation**

This EPD is developed in accordance with the European standard EN 15804+A2 and PCR from Tiles and Bricks Europe.

**Comparability**

EPDs of construction products may not be comparable if they do not comply with the requirements in EN 15804. EPD data may not be comparable if the datasets used are not developed in accordance with EN 15804, and if the background systems are not based on the same database.

**Validity**

This EPD has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue.

**Use**

The intended use of an EPD is to communicate scientifically based environmental information for construction products, for the purpose of assessing the environmental performance of buildings.

**EPD type**

- Cradle-to-gate with modules C1-C4 and D
- Cradle-to-gate with options, modules C1-C4 and D
- Cradle-to-grave and module D
- Cradle-to-gate
- Cradle-to-gate with options

**Declared product(s)**

Reused clinker bricks for different pavement types.

Number of declared datasets/product variations: 1

**Product(s) use**

The reused clinker bricks are used in different pavement types ranging from industrial areas with heavy traffic to street and garden environments.

**Declared/ functional unit**

1 tonne of reused clinker bricks in various dimensions.

**Year of production site data**

1/1-2022 – 31/12-2022.

**EPD version**

Version 1

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data, according to EN ISO 14025

- internal
- external

Third party verifier:

Linda Høiby

Martha Katrine Sørensen  
 EPD Danmark

**Life cycle stages and modules (MND = module not declared)**

Product			Construction process		Use							End of life				Beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport	Installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Re-use, recovery and recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	MND	MND	MND	MND	MND	MND	MND	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>	<b>X</b>

## Product information

### Product description

The main product components are shown in the table below.

Material	Weight-% of declared product
Reused clinker bricks	100

### Product packaging

The composition of the sales- and transport packaging of the product is shown in the table below.

Material	Kg	Weight-% of packaging
Wooden pallets	1.502	60
Foil	0.99	39
Cardboard	0.03	1
Total	2.52	100

### Representativity

This declaration, including data collection and the modeled foreground system including results, represents the delivery of one tonne of reused clinker bricks from the stock site in Spijk in the Netherlands to Denmark where the geographic coverage is Denmark. Product specific data is based on average values collected in the period between January 2022 and December 2022. Background data is based on the ecoinvent 3.9 database (2022) and is less than 10 years old. Generally, the used background datasets are of high quality, and the majority of the datasets are only a couple of years old.

### Hazardous substances

Harris' clinker bricks do not contain substances listed on the "Candidate List of Substances of Very High Concern for authorization".

(<http://echa.europa.eu/candidate-list-table>)

### Essential characteristics

Technical information is stated on Harris' website (<https://harris.dk/>) or can be obtained by contacting Harris.

### Picture of product



# LCA background

## Declared unit

The LCI and LCIA results in this EPD relate to one tonne of reused clinker bricks.

Name	Value	Unit
Declared unit	1	tonne
Density	2331.8	kg/m <sup>3</sup>
Conversion factor to 1 kg.	0.001	-

## PCR

This EPD is developed according to the core rules for the product category of construction products in EN 15804+A2 and the PCR by Tiles & Bricks Europe (2020).

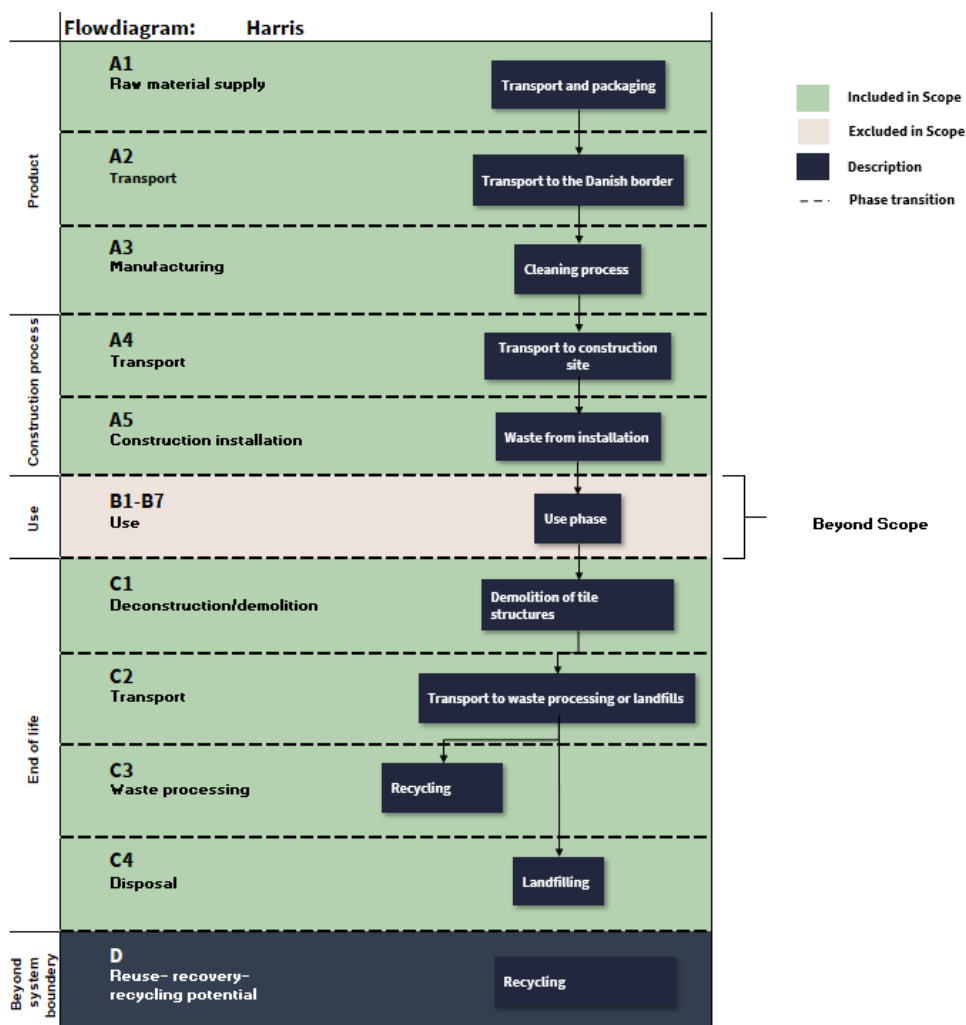
## Guarantee of Origin – certificates and electricity modelling

Foreground system:

No certificates for green electricity are included in the model. Background system:

Upstream processes are modelled using a grid mix. Downstream processes are also modelled using a grid mix.

## Flowdiagram



**System boundary**

This EPD is based on a cradle-to-grave LCA with options (A4+A5), modules A1-A3, A4-A5, C1-C4 and D, in which 100% weight has been accounted for.

The general rules for the exclusion of inputs and outputs follow the requirements in EN 15804, 6.3.5, where the total of neglected input flows per module shall be a maximum of 5 % of energy usage and mass and 1 % of energy usage and mass for unit processes. Also, the cut-off for exclusion at 1% of the renewable and non-renewable primary energy usage, as well as 1% of the total mass input for that specific unit process cf. EN 15804:2012+A2:2019, 6.3.6 is applicable.

The reused clinker bricks originate from demolition waste and renovation projects. In this EPD, the environmental impacts of the original clinker bricks regarding production have not been included, in accordance with EN 15804.

**Product stage (A1-A3) includes:**

A1 – Acquisition and processing of raw materials

A2 – Transport to the production site

A3 – Manufacturing processes

The product stage comprises the acquisition of all raw materials, products and energy, transport to the stock site, packaging, and waste processing up to the “end-of-waste” state or final disposal. This entails the waste of clinker bricks from Holland, where a 10% wastage is included. The clinker bricks that are not reused directly, are sent to recycling to be used for road filling. The LCA results are declared in aggregated form for the product stage, which means, that the sub-modules A1, A2, and A3 are declared as one module A1-A3.

The production of clinker bricks is allocated to new clinker bricks. Therefore, reused clinker bricks do not have an environmental impact in A3.

The clinker bricks are sorted at the demolition sites as a part of the waste treatment from

demolition and renovation projects. They are transported directly to a stock site in Holland. Subsequently the clinker bricks are transported to Padborg and then to different building sites in Denmark. The transportation in A2 includes only the transportation from the stock site to Padborg.

**Construction process stage (A4-A5)**

**includes:**

Harris delivers used clinker bricks to customers around Denmark. The estimated distance included in A4 is 397 km – the longest route in Denmark used as worst case scenario. The construction process consists of the waste related to the packaging of the reused clinker bricks. No energy is required during the installation process of the used clinker bricks as they are installed manually.

**End of Life (C1-C4) includes:**

The end-of-life stage comprises the transport and processing of material for disposal and recycling.

The PCR by Tiles & Bricks Europe (2020) states that environmental impacts attributed to module C1 are very low, hence can be ignored.

. The transportation distances are based upon the scenario established in the PCR by TBE.

End-of-Life Scenario, Denmark	Proportion (%)
Recycling	99
Landfilling	1

**Re-use, recovery, and recycling potential (D) includes:**

It is assumed that the reused clinker bricks are crushed after use and substitute the use of new gravel made from virgin stone materials.

# LCA results

ENVIRONMENTAL IMPACTS PER TONNE OF REUSED CLINKER BRICKS									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO <sub>2</sub> eq.	9.83E+01	7.45E+01	2.44E+01	0.00E+00	7.22E+00	3.53E+00	1.31E-01	-9.16E+00
GWP-fossil	kg CO <sub>2</sub> eq.	1.23E+02	7.44E+01	3.54E-01	0.00E+00	7.21E+00	3.53E+00	1.31E-01	-9.13E+00
GWP-biogenic	kg CO <sub>2</sub> eq.	-2.48E+01	6.82E-02	2.48E+01	0.00E+00	6.60E-03	8.09E-04	9.93E-05	-2.47E-02
GWP-luluc	kg CO <sub>2</sub> eq.	6.41E-02	3.67E-02	2.40E-04	0.00E+00	3.56E-03	3.97E-04	1.58E-04	-9.19E-03
ODP	kg CFC 11 eq.	2.63E-06	1.62E-06	3.17E-09	0.00E+00	1.57E-07	5.61E-08	2.90E-09	-8.56E-08
AP	mol H <sup>+</sup> eq.	2.79E-01	1.63E-01	7.47E-04	0.00E+00	1.58E-02	3.27E-02	9.78E-04	-5.64E-02
EP-freshwater	kg P eq.	9.40E-03	5.29E-03	3.81E-05	0.00E+00	5.12E-04	1.08E-04	9.75E-06	-3.10E-03
EP-marine	kg N eq.	7.05E-02	4.10E-02	2.72E-04	0.00E+00	3.97E-03	1.52E-02	4.02E-04	-1.33E-02
EP-terrestrial	mol N eq.	7.18E-01	4.17E-01	1.91E-03	0.00E+00	4.04E-02	1.65E-01	4.32E-03	-1.60E-01
POCP	kg NMVOC eq.	4.25E-01	2.53E-01	8.70E-04	0.00E+00	2.45E-02	4.88E-02	1.40E-03	-4.50E-02
ADPm <sup>1</sup>	kg Sb eq.	4.02E-04	2.43E-04	1.28E-06	0.00E+00	2.36E-05	1.23E-06	2.01E-07	-4.77E-05
ADPf <sup>1</sup>	MJ	1.79E+03	1.06E+03	3.51E+00	0.00E+00	1.02E+02	4.62E+01	2.46E+00	-1.13E+02
WDP <sup>1</sup>	m <sup>3</sup> world eq. deprived	8.33E+00	4.36E+00	6.36E-02	0.00E+00	4.22E-01	9.95E-02	7.07E-02	-1.31E+01
Caption	<p>GWP-total = Global Warming Potential - total; GWP-fossil = Global Warming Potential - fossil fuels; GWP-biogenic = Global Warming Potential - biogenic; GWP-luluc = Global Warming Potential - land use and land use change; ODP = Ozone Depletion; AP = Acidification;</p> <p>EP-freshwater = Eutrophication – aquatic freshwater; EP-marine = Eutrophication – aquatic marine; EP-terrestrial = Eutrophication – terrestrial; POCP = Photochemical zone formation; ADPm = Abiotic Depletion Potential – minerals and metals; ADPf = Abiotic Depletion Potential – fossil fuels; WDP = water use</p>								
Disclaimer	<p><sup>1</sup> The results of this environmental indicator shall be used with care as the uncertainties on these results are high, or as there is limited experienced with the indicator.</p>								

ADDITIONAL ENVIRONMENTAL IMPACTS PER TONNE OF REUSED CLINKER BRICKS									
Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	[Disease incidence]	9.87E-06	5.55E-06	1.86E-08	0.00E+00	5.37E-07	8.27E-06	9.72E-08	-8.23E-07
IRP <sup>2</sup>	[kq U235 eq.]	2.60E+00	1.43E+00	1.34E-02	0.00E+00	1.39E-01	2.19E-02	1.77E-03	-9.36E-01
ETP-fw <sup>1</sup>	[CTUe]	1.70E+03	1.04E+03	2.66E+00	0.00E+00	1.01E+02	4.41E+01	2.57E+00	-7.41E+01

HTP-c <sup>1</sup>	[CTUh]	1.16E-07	6.78E-08	6.24E-10	0.00E+00	6.57E-09	2.16E-09	1.15E-10	-1.52E-08
HTP-nc <sup>1</sup>	[CTUh]	2.46E-06	1.50E-06	6.28E-10	0.00E+00	1.45E-07	1.50E-08	1.56E-09	-1.94E-07
SQP <sup>1</sup>	-	INA	INA	INA	INA	INA	INA	INA	INA
Caption	PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Soil Quality; INC = Indicator not assessed								
Disclaimers	<sup>1</sup> The results of this environmental indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator. <sup>2</sup> 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.								

**RESOURCE USE PER TONNE OF REUSED CLINKER BRICKS**

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	6.14E+01	1.66E+01	1.81E-01	0.00E+00	1.61E+00	2.63E-01	2.52E-02	-1.01E+01
PERM	[MJ]	4.03E+02	0.00E+00	1.95E+02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	[MJ]	6.14E+01	1.66E+01	1.95E+02	0.00E+00	1.61E+00	2.63E-01	2.52E-02	-1.01E+01
PENRE	[MJ]	1.79E+03	1.06E+03	3.51E+00	0.00E+00	1.02E+02	4.62E+01	2.46E+00	-1.13E+02
PENRM	[MJ]	0.00E+00	0.00E+00	4.21E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PENRT	[MJ]	1.79E+03	1.06E+03	3.86E+01	0.00E+00	1.02E+02	4.62E+01	2.46E+00	-1.13E+02
SM	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
RSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
NRSF	[MJ]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
FW	[m <sup>3</sup> ]	2.76E-01	1.52E-01	1.72E-03	0.00E+00	1.86E-02	3.63E-03	1.77E-03	-3.77E-01
Caption	PERE = Use of primary renewable 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 = Net Use of fresh water								

**WASTE CATEGORIES AND OUTPUT FLOWS PER TONNE OF REUSED CLINKER BRICKS**

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	1.09E-02	6.72E-03	1.22E-05	0.00E+00	6.51E-04	3.11E-04	1.42E-05	-4.23E-04
NHWD	[kg]	8.46E+01	5.25E+01	1.68E-01	0.00E+00	5.08E+00	6.61E-02	1.00E+01	-1.93E+00
RWD	[kg]	6.36E-04	3.47E-04	3.39E-06	0.00E+00	3.36E-05	5.06E-06	4.18E-07	-2.28E-04

CRU	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MFR	[kg]	1.00E+02	0.00E+00	9.90E-01	0.00E+00	0.00E+00	9.90E+02	0.00E+00	0.00E+00
MER	[kg]	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EEE	[MJ]	0.00E+00	0.00E+00	2.35E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
EET	[MJ]	0.00E+00	0.00E+00	4.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Caption	HWD = Hazardous waste disposed. NHWD = Non-hazardous waste disposed. RWD = Radioactive waste disposed. CRU = Components for re-use; MFR = Materials for recycling. MER = Materials for energy recovery. EEE = Exported electrical energy. EET = Exported thermal energy								

BIOGENIC CARBON CONTENT PER TONNE		
Parameter	Unit	At the factory gate
Biogenic carbon content in product	[kg C]	0
Biogenic carbon content in accompanying packaging	[kg C]	6.76
Note	1 kg biogenic carbon is equivalent to 44/12 kg of CO <sub>2</sub>	

## Additional information

### Technical information on scenarios

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

Scenario information	Value	Unit
Fuel type	Diesel	-
Vehicle type	Lorry, 16-32 tonnes, EURO5 & EURO6	-
Transport distance	397	km

#### Installation of the product in the building (A5)

Scenario information	Value	Unit
Waste Material, wood pallets	1.5	kg
Waste Material, foil	0.99	kg

#### End of life (C1-C4)

Scenario information	Value	Unit
Collected separately	1000	kg
Collected with mixed waste	0	kg
For reuse	0	kg
For recycling	990	kg
For energy recovery	0	kg
For final disposal	10	kg

#### Re-use, recovery, and recycling potential (D)

Scenario information/Materiel	Value	Unit
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Crushed clinker bricks (used as gravel)	990	kg
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**Indoor air**

*The EPD does not give information on release of dangerous substances to indoor air because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.1.*

**Soil and water**

*The EPD does not give information on release of dangerous substances to soil and water because the horizontal standards on the relevant measurements are not available. Read more in EN15804+A1 chapter 7.4.2.*

## References

<b>Publisher</b>	 epddanmark <a href="http://www.epddanmark.dk">www.epddanmark.dk</a> <small>Template version 2022.2</small>
<b>Program operator</b>	Danish Technological Institute Buildings & Environment Gregersensvej DK-2630 Taastrup <a href="http://www.teknologisk.dk">www.teknologisk.dk</a>
<b>LCA-practitioner</b>	Transition ApS Mariane Thomsensgade 2F, 11. 8000 Aarhus C  Att.: Lukas Blander Enevoldsen, Astrid Larsen, Annika Karmann, and Kristine Holse Hansen
<b>LCA software / background data</b>	Simapro 9.5 / ecoinvent v. 3.9 database
<b>3<sup>rd</sup> party verifier</b>	Linda Højbye Life Cycle Assessment Consulting

### General program instructions

General Program Instructions, version 2.0, spring 2020  
[www.epddanmark.dk](http://www.epddanmark.dk)

### EN 15804

DS/EN 15804 + A2:2019 –“ Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products”

### PCR

Tiles & Bricks Europe (2020) PCR for Clay Construction Products – “Guidance document for developing an EPD”

### EN 15942

DS/EN 15942:2011 –“ Sustainability of construction works – Environmental product declarations – Communication format business-to-business”

### ISO 14025

DS/EN ISO 14025:2010 –“ Environmental labels and declarations – Type III environmental declarations – Principles and procedures”

### ISO 14040

DS/EN ISO 14040:2008 –“ Environmental management – Life cycle assessment – Principles and framework”

**ISO 14044**

DS/EN ISO 14044:2008 –“ Environmental management – Life cycle assessment – Requirements and guidelines”