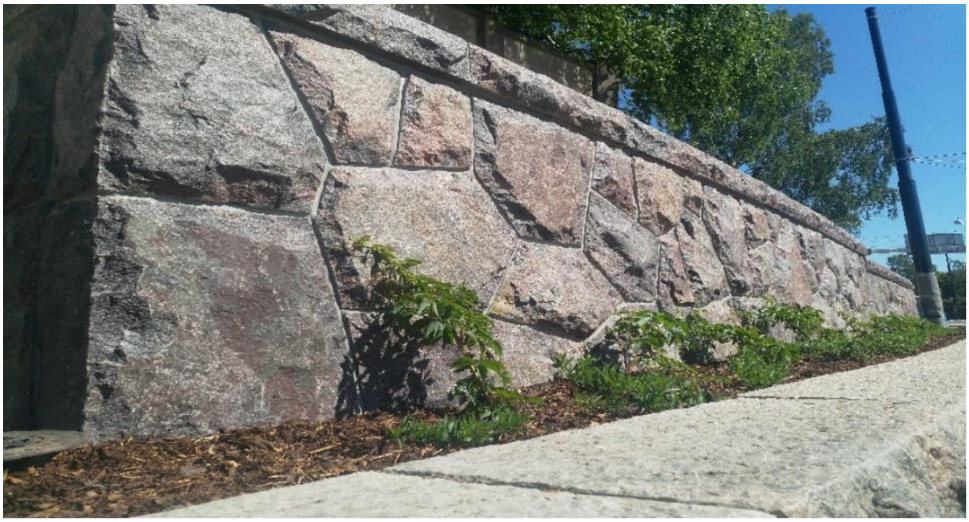


ENVIRONMENTAL PRODUCT DECLARATION

According to EN 15804+A2 & ISO 14025

Solid curbstone, staircase and wall from natural stone

RTS_455_26

Scope of the declaration

This environmental product declaration covers the environmental impacts of curbstone, solid staircase, solid wall and flagstones from Finnish natural stone. The environmental declaration has been prepared in accordance with standards EN15804:2012+A2:2019 and ISO 14025. The RTS PCR method guide (Finnish version, 12.2.2024) has been used as additional guidance.
The environmental declaration describes the stages of the product's life cycle from cradle to gate with options.

18.02.2026
Rakennustieto
Malminkatu 16 A
00100 Helsinki
https://www.rakennustieto.fi/

Jukka Seppänen
RTS EPD Committee Secretary

Laura Apilo
Managing Director

General information, purpose of the declaration and verification

1. **Owner of the declaration**
   Kivi ry,
   Kasarmikatu 5, 15700 LAHTI
   Sini Laine, Executive director
   +358 50 330 1630
   sini.laine@kivi.info

2. **Product name and number**
   Curbstones, solid staircase, solid wall and flagstones made from Finnish natural stone.

3. **Data period**
   January 1, 2024–January 31, 2024

4. **Place of production and manufacturers**
   Place of production: Finland
   Manufacturers: Loimaan Kivi Oy

5. **EPD averaging**
   The EPD for curbstone, solid staircase, solid wall and flagstones is a production volume-weighted average of the manufacturing data reported by seven different manufacturers.

6. **Further information**
   https://kivi.info/

7. **Product category rules and the scope of the declaration**
   The EPD has been prepared in accordance with EN 15804:2012+A2:2019 and ISO 14025 standards with the RTS PCR (Finnish version 12.2.2024).
   The scope of the EPD is cradle to gate with options (A1-A5, and C1-C4, D).
   The geographical representativeness is Finland.
   The manufacturer has sole ownership and responsibility for the EPD. EPDs belonging to the same product group but prepared with different programs are not necessarily comparable. EPDs for construction products are not necessarily comparable if they are not in accordance with EN 15804 and if they are not compared in a construction context.

8. **Author of the life cycle assessment and declaration**
   Olivia Kuronen and Sanni Mallat
   Sitowise Oy
   www.sitowise.com
   Date of study. 5.8.2025

9. **Verification**
   Independent, third-party verification of the environmental product declaration has been carried out in accordance with EN ISO 14025:2010, EN 15804+A2:2019 and RTS PCR standards. The impartial verifier is Valtteri Kainila, Ramboll Finland Oy.
   Verification date. 23.12.2025.

10. Declaration issue date and validity

Valid through: 18.02.2026-18.02.2031

European standard EN 15804+A2:2019 serves as the core PCR
An independent certification body in accordance with the international standard EN ISO 14025:2010 is Internal ☑ External
Third-party verification has been performed by: Valtteri Kainila Ramboll Finland Oy

Product information

11. Product description

This environmental declaration represents the average curbstone, solid staircase, solid wall and flagstones manufactured in Finland.

12. Declared unit

1 ton of curbstone, solid staircase, solid wall and flagstones.

13. Technical description of the product and its use

Curbstones, solid staircases, solid wall and flagstones are made from Finnish natural stone. As their names suggest, they are used outdoors to support the edges of streets, in outdoor stairs, stone walls and as flagstones.

The production begins when the quarried block of stone arrives at the production site, after which the stones are processed by sawing them into blanks, pre-treating the surface, cutting them into smaller pieces and finalizing the surface. Surface treatment can include rough grinding, burning the surface and making bevels. Electricity is consumed and waste stone is generated in all stages. The process for wall and flagstones is otherwise very similar, but the end result is a slightly rougher surface than for curbstones and staircases. The production processes for these stones are very similar, so they are treated in the same category.

14. Product standard

SFS-EN 1343:2013, Kerbs of natural stone for external paving.

15. Physical properties

The size and shape of the stones vary greatly depending on their intended use.

Common sizes:

Curbstone: length 100–140 cm, height 25–27 cm, width 15–22 cm.

Solid staircase: length 50–140 cm, height 5–15 cm, width 35–60.

Solid wall: length 60–120 cm, height 30–40 cm and width 20–30 cm.

16. Product raw materials

Main materials	Share	Usability			Origin
		Renewable	Non-renewable	Recycled	
Natural stone	100 %		X		Finland

17. Biogenic carbon

The biogenic carbon content of the product per unit declared, at the factory gate.

Biogenic carbon contained in the product kg C	0 kg
Biogenic carbon contained in the product packaging kg C	3,76 kg

18. List of REACH SVHC substances contained in the product according to the European Chemicals Agency (ECHA)

The product does not contain SVHC substances as specified in the Reach Regulation.

19. Environmental impacts per 1 kg of product

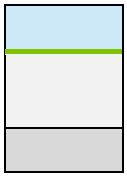
Parameter	Unit	A1-A3	A4	A5	C2	C3	C4	D
GWP – total[1)]	kg CO_2eq.	2,98E-01	1,88E-01	3,48E-03	0,00E+00	6,08E-03	6,19E-05	1,56E-03
ADP-minerals & metals[4)]	kg Sbe	3,76E-07	5,25E-08	1,30E-10	0,00E+00	1,70E-08	1,49E-10	2,48E-09
ADP-fossil resources	MJ	4,38E+00	2,73E-01	6,22E-04	0,00E+00	8,83E-02	1,42E-03	3,83E-02
Water use[5)]	m^3e depr.	3,09E-02	1,35E-03	6,63E-05	0,00E+00	4,36E-04	3,63E-05	1,11E-04
Biogenic carbon content in the product	kg C	0,00E+00	NA	NA	NA	NA	NA	NA
Biogenic carbon content in the packaging	kg C	3,76E+00	NA	NA	NA	NA	NA	NA
Use of secondary material	kg/kg	0,00E+00	NA	NA	NA	NA	NA	NA

System boundary

The modules whose information is presented in this report are marked with a tick below. Mandatory items to be reported are marked in blue in the table. The report type is "cradle to gate with options".

Product phase			Construction phase		Use phase							End of life				Impacts outside the life cycle		
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**	**D**	**D**
X	X	X	X	X	NR	NR	NR	NR	NR	NR	NR	X	X	X	X	X	X	X
Raw material supply	Transport	Manufacturing	Transport	Construction – installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction, demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

NR= not relevant



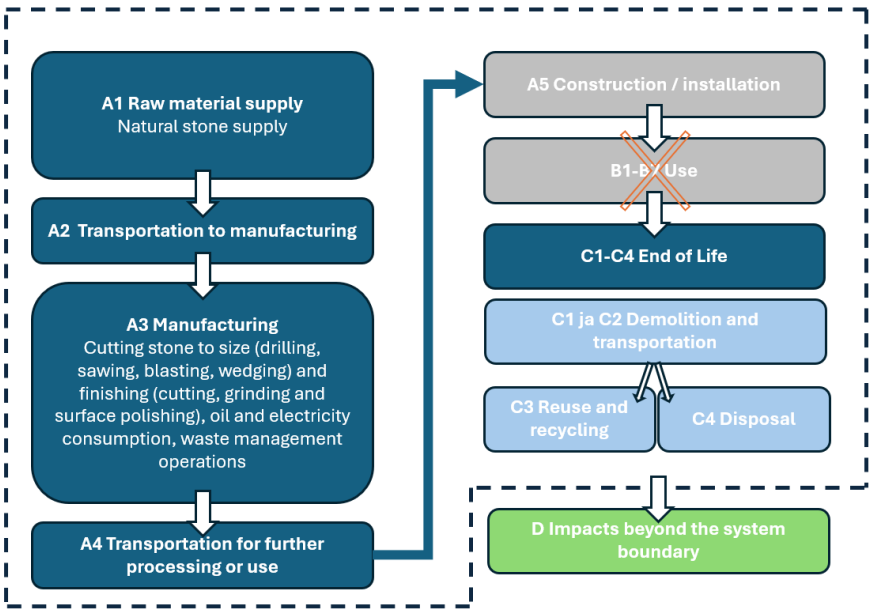
Mandatory modules

Mandatory according to the rules and conditions of section 5.2 of the RTS EPD Methodology Guide

Optional modules based on scenarios

20.Production process

The steps involved in manufacturing the product are: removing the stone from the rock and cutting it into stone blanks and then cutting it to the required dimensions. The system outline of the process is presented below.



21.Cut off criteria

The study does not exclude any modules or processes that are mandatory based on the applied standards and the PCR. The study does not exclude hazardous materials or substances. The study takes into account all significant raw material and energy consumption. All inputs and outputs of the unit processes for which data are available are included in the calculation, with the exception of steel straps, plastic packaging and cardboard used in the packaging of finished products, which were excluded due to their small amount (less than 0.005 % of the mass of the finished product). The most significant packaging material is wood-based pallets and crates, which are taken into account in the model.

22.Allocation, estimates and assumptions

Allocation is needed if, for example, some materials, energy, water or waste data cannot be measured separately for the product under study. In this study, allocation was used when the production data of different operators were averaged using a weighted average per unit reported.

Since some producers produce only some of the products included in the study and some all of them as well as other processed stone products, there is some difference in the allocation of the input data from the annual level to the product level. For those producers who only produce the products covered in this report, the production data per tonne was compiled by dividing the annual consumption amounts by the annual production amount. For those producers who also produce other products, not all flows could be separated by product, but the allocation had to be made among several products. In this case, the allocation of flows between curbstone, solid staircase, solid stone wall and flagstone and other manufactured stone products was made using a coefficient created using the production volumes and sales prices of the products. Due to this difference in allocation methods, there may be some differences in the flows of different producers.

If the producer has reported that waste is generated in the production process that has value and is sold as waste stone, the environmental impacts allocated to the waste stone have been taken into account in the processing of the initial data reported by the producer. Although curbstone, solid staircase, solid wall stone and flagstone may have different production volumes and sales prices within the same company, it has been assumed that the production of each product consumes the same amount of all resources on average.

The raw material of the products is assumed to be Finnish natural stone in accordance with the Kivi Ry EPD.

23.Averages and variation

The product consists of production data reported by seven different producers and the size and weight of the final product may vary. Raw materials per tonne produced have been calculated on a weighted average basis.

24.LCA software and bibliography

This EPD was created using the One Click LCA EPD Generator software. The LCA and EPD were prepared in accordance with standards and ISO 14040/14044. The EPD Generator uses the Ecoinvent v3.10.1 database (allocation, Cut-off, EN 15804+A2) from 2024 as its source of environmental data.

Environmental impact data

The impacts are presented per declared unit, 1 ton of studied stone products. The environmental impacts consist mainly of emissions from energy used in the production phase. The results are presented in scientific form, example of data interpretation:

3.54E-2 = 3.54*10-2 = 0.0354.

The producer-specific environmental impacts of natural stone vary between -35% and +80 % compared to the average.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP – total[1)]	kg CO_2e	2,98E+02	1,88E+01	3,48E+00	0,00E+00	6,08E+00	6,19E-02	1,56E+00	-7,43E+01
GWP – fossil	kg CO_2e	3,01E+02	1,88E+01	5,48E-02	0,00E+00	6,08E+00	6,17E-02	1,56E+00	-7,42E+01
GWP – biogenic	kg CO_2e	-3,41E+00	0,00E+00	3,42E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	1,03E-01	8,43E-03	1,93E-05	0,00E+00	2,72E-03	1,83E-04	8,92E-04	-2,69E-02
Ozone depletion pot.	kg $CFC\text{-}_{11}e$	4,25E-06	2,78E-07	7,01E-10	0,00E+00	8,98E-08	1,03E-09	4,52E-08	-1,01E-06
Acidification potential	mol H^+e	1,55E+00	6,42E-02	4,01E-04	0,00E+00	2,07E-02	3,11E-04	1,11E-02	-3,81E-01
EP-freshwater[2)]	kg Pe	6,55E-02	1,47E-03	1,52E-05	0,00E+00	4,73E-04	5,29E-05	1,28E-04	-1,65E-02
EP-marine	kg Ne	5,78E-01	2,11E-02	1,96E-04	0,00E+00	6,81E-03	5,47E-05	4,22E-03	-1,40E-01
EP-terrestrial	mol Ne	6,27E+00	2,30E-01	1,92E-03	0,00E+00	7,41E-02	4,82E-04	4,61E-02	-1,52E+00
POCP ("smog")[3)]	kg NMVOCe	1,93E+00	9,47E-02	5,30E-04	0,00E+00	3,06E-02	1,63E-04	1,65E-02	-4,67E-01
ADP-minerals & metals[4)]	kg Sbe	3,76E-04	5,25E-05	1,30E-07	0,00E+00	1,70E-05	1,49E-07	2,48E-06	-8,21E-05
ADP-fossil resources	MJ	4,38E+03	2,73E+02	6,22E-01	0,00E+00	8,83E+01	1,42E+00	3,83E+01	-1,08E+03
Water use[5)]	m^3e depr.	3,09E+01	1,35E+00	6,63E-02	0,00E+00	4,36E-01	3,63E-02	1,11E-01	-1,12E+01

1) GWP = Global Warming Potential; 2) EP = Eutrophication potential. Required characterisation method and data are in kg P-eq. Multiply by 3,07 to get PO4e; 3) POCP = Photochemical ozone formation; 4) ADP = Abiotic depletion potential; 5) 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 experience with the indicator.

ADDITIONAL (OPTIONAL) ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Particulate matter	Incidence	3,16E-05	1,89E-06	5,99E-09	0,00E+00	6,09E-07	1,41E-09	2,52E-07	-7,66E-06
Ionizing radiation6)	kBq U235e	4,19E+01	2,38E-01	6,15E-04	0,00E+00	7,69E-02	3,84E-02	2,41E-02	-1,04E+01
Ecotoxicity (freshwater)	CTUe	4,75E+02	3,87E+01	2,58E-01	0,00E+00	1,25E+01	1,57E-01	3,21E+00	-1,13E+02
Human toxicity, cancer	CTUh	5,10E-08	3,11E-09	6,13E-11	0,00E+00	1,00E-09	2,27E-11	2,88E-10	-1,23E-08
Human tox. non-cancer	CTUh	1,79E-06	1,77E-07	4,08E-09	0,00E+00	5,71E-08	1,06E-09	6,61E-09	-4,34E-07
SQP7)	-	1,74E+03	2,75E+02	4,28E-01	0,00E+00	8,89E+01	2,44E-01	7,54E+01	-4,47E+02

6) EN 15804+A2 disclaimer for Ionizing radiation, human health. 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; 7) SQP = Land use related impacts/soil quality.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Renew. PER as energy[8)]	MJ	1,79E+02	3,75E+00	-3,35E+01	0,00E+00	1,21E+00	3,22E-01	3,70E-01	-4,58E+01
Renew. PER as material	MJ	3,00E+01	0,00E+00	-3,00E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of renew. PER	MJ	2,09E+02	3,75E+00	-6,35E+01	0,00E+00	1,21E+00	3,22E-01	3,70E-01	-4,58E+01
Non-re. PER as energy	MJ	4,28E+03	2,73E+02	6,22E-01	0,00E+00	8,83E+01	1,42E+00	3,83E+01	-1,05E+03
Non-re. PER as material	MJ	4,36E+00	0,00E+00	-1,98E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	4,28E+03	2,73E+02	-1,36E+00	0,00E+00	8,83E+01	1,42E+00	3,83E+01	-1,05E+03
Secondary materials	kg	1,48E+00	1,16E-01	7,87E-04	0,00E+00	3,76E-02	8,73E-04	9,63E-03	-3,83E-01
Renew. secondary fuels	MJ	2,26E+00	1,48E-03	3,40E-06	0,00E+00	4,77E-04	9,48E-07	1,99E-04	-5,52E-01
Non-ren. secondary fuels	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
Use of net fresh water	m^3	3,36E+00	4,04E-02	4,49E-04	0,00E+00	1,30E-02	1,16E-03	3,98E-02	-9,04E-01

8) PER = Primary energy resources.

END OF LIFE – WASTE

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1,98E+01	4,63E-01	1,34E-02	0,00E+00	1,50E-01	3,83E-03	4,23E-02	-5,00E+00
Non-hazardous waste	kg	4,22E+02	8,57E+00	2,04E+00	0,00E+00	2,77E+00	2,61E-01	5,00E+02	-1,06E+02
Radioactive waste	kg	9,76E-03	5,83E-05	1,52E-07	0,00E+00	1,88E-05	9,87E-06	5,87E-06	-2,43E-03

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02
Materials for recycling	kg	7,59E-01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	2,50E+02	0,00E+00	-1,89E-01
Materials for energy rec	kg	4,18E+00	0,00E+00	1,98E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	-1,04E+00
Exported energy	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
Exported energy – Electricity	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
Exported energy – Heat	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

Scenario documentation and technical information

25.Manufacturing energy scenario documentation

Parameter	Value
Origin of electricity	Electricity, medium voltage, residual mix (Reference product: electricity, high voltage), Ecoinvent
Electricity CO_2 -eq. /kWh	0.67 kgCO2 eq. /kWh
Fuel oil	Diesel, burned in building machine (Reference product: diesel, burned in building machine), Ecoinvent
Fuel oil kg CO_2 eq. /MJ	0.1 kg CO_2eq. / MJ

26.Additional technical information, transport to the construction site

Parameter	Value	Data source and quality
Specific emissions from transport	0.11 kg CO_2 eq. /tkm	Transport, freight, lorry >32 metric tons, EURO5. Ecoinvent 3.10.
Average transport distance for A4	170 km	Average product transport distance

27.End of life process description

Process description	Unit	Value kg/tonne
Demolition process for the product and the amount of construction waste generated, broken down as follows:	kg collected as sorted	500
	kg collected as mixed construction waste	500
The construction waste recovery process and the construction waste generated, broken down as follows:	kg components for reuse (same purpose)	250
	kg for material recycling	250
	kg energy recovery	0
Construction waste disposal process and amount of waste to be disposed of	kg of product or material for final disposal	500
Waste transportation	km	The estimated transportation distance is 113 kilometers.

28. Review of producer-specific results

To ensure the transparency required by the program operator, it is important to indicate when presenting average results if the total global warming potential (GWP total A1-A3) of an individual product differs by more than 10 percent from the GWP result of the average product. To meet this requirement and to ensure the reliability of the results, a comprehensive sensitivity analysis has been carried out in the work. For the sensitivity analysis, a separate version of the LCA model has been created for each producer in the One Click LCA software, in which the flows of the A1-A3 stages have been adjusted to correspond to the producer-specific values.

It should be noted that since the average output data has been calculated by weighting the production volumes reported by different producers, the output data reported by individual producers for their products and thus the GWP results may differ significantly from the average of the main model. An individual producer may also not utilize all the material or resource flows used in the manufacturing of the average product.

The following table presents the producer-specific GWP values of the participating producers in relation to the average value, as well as a brief explanation of the differences in the producer-specific models.

Producer:	GWP total (kg CO2eq./ 1 t of stone)	Difference from average (%)	Reason for difference:
Average value:	2,98E+02		
Loimaan Kivi Oy	3,52E+02	18 %	Most significant difference: More natural stone usage compared to average

29. References

Ecoinvent Database version 3.10.1 (allocation, Cut-off, EN 15804+A2) 2024.

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

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.

LCA background report for stone products 5.8.2025.