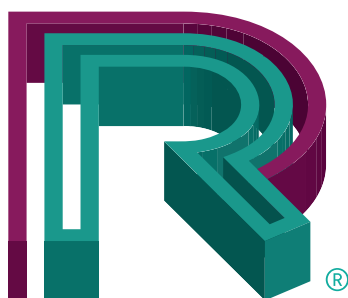


ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025:2006 and
EN 15804:2012+A2:2019/AC:2021 for:



RE.Stone | LINEA
RECUPERO
INERTI
RECOVERED STONE

RE.Stone 1
from
RMB S.p.A.

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-11680
Publication date:	2024-01-23
Review date:	2025-03-24
Valid until:	2029-01-22

*An EPD should provide current information and may be updated if conditions change.
The stated validity is therefore subject to the continued registration and publication at
www.environdec.com*

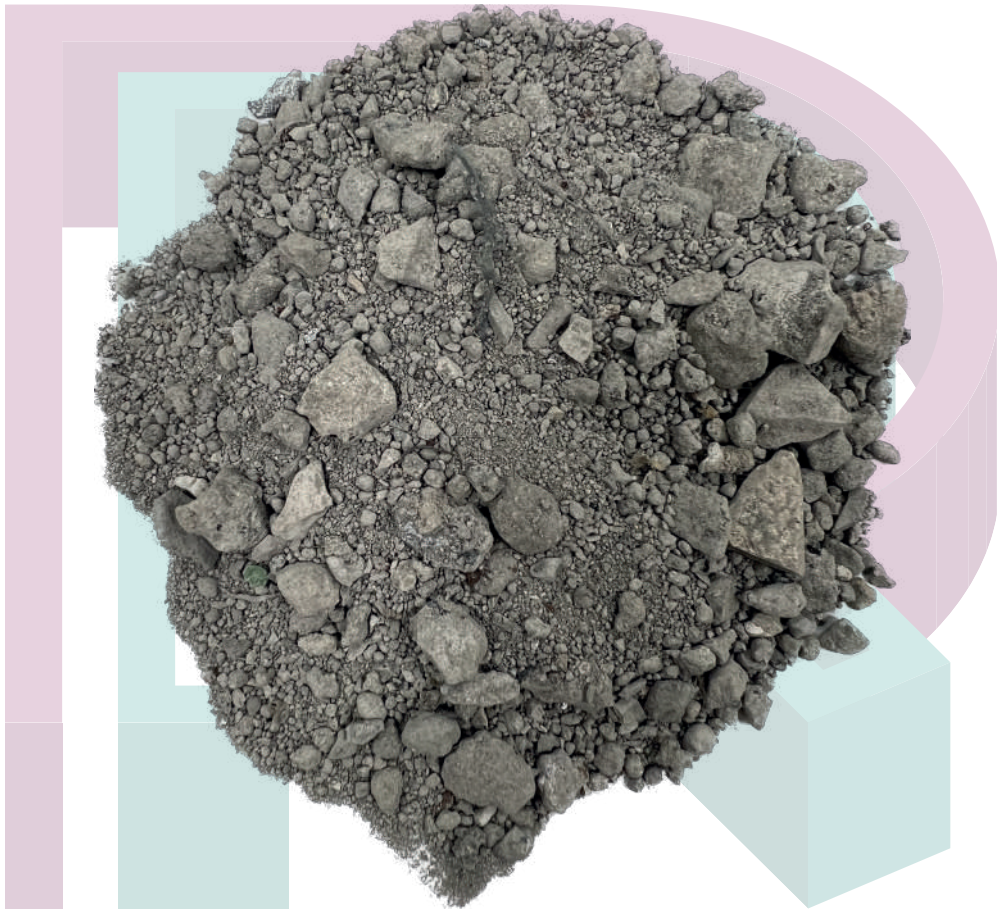


RMB



EPD®

RE.Stone



GENERAL INFORMATION

PROGRAMME INFORMATION

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): PCR 2019:14 Construction products (EN 15804:A2), version 1.3.1 prepared by IVL Swedish Environmental Research Institute, EPD International Secretariat
UN CPC 3756 Other articles of cement, concrete or artificial stone
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact .
Life Cycle Assessment (LCA)
LCA accountability: Paride Romano p.romano@greenwichsrl.it , Lorenzo Calisse l.calisse@greenwichsrl.it - Greenwich S.r.l. Via Presolana 2/4 24030 Medolago (BG) Italy https://greenwichsrl.it
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
<input checked="" type="checkbox"/> EPD verification by accredited certification body
Third-party verification: DNV GL Business Assurance Italia S.r.l. is an approved certification body accountable for the third-party verification
The certification body is accredited by: Accredia, certification number 008H rev.01
Procedure for follow-up of data during EPD validity involves third party verifier:
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
[Procedure for follow-up the validity of the EPD is at minimum required once a year with the aim of confirming whether the information in the EPD remains valid or if the EPD needs to be updated during its validity period. The follow-up can be organized entirely by the EPD owner or together with the original verifier via an agreement between the two parties. In both approaches, the EPD owner is responsible for the procedure being carried out. If a change that requires an update is identified, the EPD shall be re-verified by a verifier]

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

COMPANY INFORMATION

Owner of the EPD: RMB S.p.A. Via Monte Canale, 25080 Polpenazze del Garda (BS) Italy

Contact: Francesco Fiorini, Technical Manager francesco.fiorini@rmbspa.com

Description of the organisation:

COMPANY

Since 1981 RMB S.p.a. has been involved in the recovery of new raw materials from waste, managing the complete cycle in total respect for the environment. The company has an overall plant potential of 680.000 tons/year, establishing itself as one of the main multi-purpose platforms in Europe for the treatment aimed at recovering special, hazardous and non-hazardous waste.

MISSION

The main objective of RMB is the separation of all exploitable fractions, especially metals, in order to obtain MPS and/or "end of waste" to be marketed. All the operations carried out within the production platforms are oriented towards recovery and tend towards the maximum valorisation of the materials, in both economic and environmental terms.

VISION

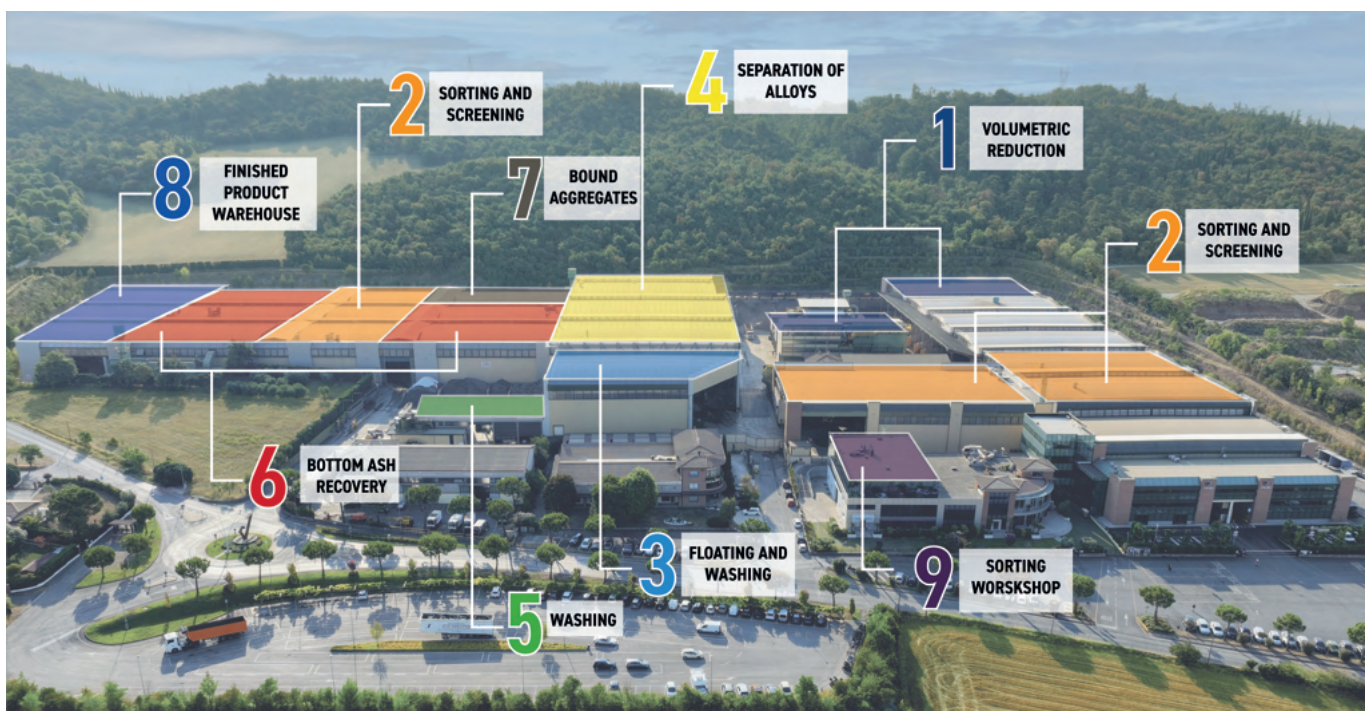
The company focuses on the "CIRCULAR ECONOMY" model based on the application of the concepts of reuse, recycling, recovery of materials and energy, reducing the transfer of waste to landfills as much as possible.

Product-related or management system-related certifications:

UNI EN ISO 9001:2015, UNI EN ISO 14001:2015, UNI EN ISO 45001:2018.

Name and location of production site(s):

Via Monte Canale 3, 25080 Polpenazze del Garda (BS) Italy



PRODUCT INFORMATION

Product name: RE.Stone 1

Product identification: Pluri-inert industrial aggregate CE marked EN 12620:2002+A1:2008, EN 13043:2002/AC:2004, EN 13242:2022+A1:2007

Product description: Pluri-inert industrial aggregate made by inert matrix material deriving from industrial processes of thermal and mechanical treatment of wastes. RE.Stone 1 has technical characteristics with a particle size of 0-20 mm and is used for the production of cement conglomerates, mixed cemented and/or loose aggregates.

UN CPC code: UN CPC 3756 Other articles of cement, concrete or artificial stone.

Geographical scope: Global; manufacturing site is located in Italy.

LCA INFORMATION

Declared unit (DU): 1 Ton

Reference service life: Not applicable

Time representativeness: solar year 2023

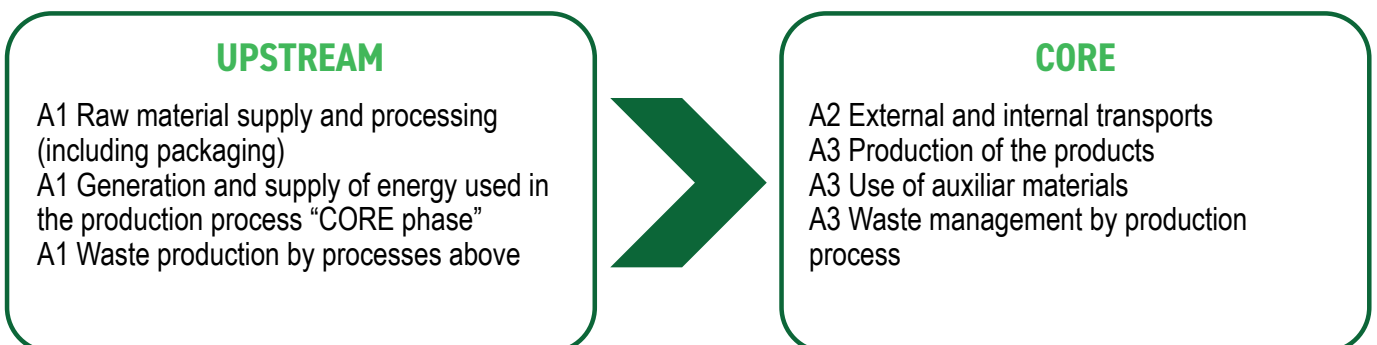
Database(s) and LCA software used: Ecoinvent 3.9.1, SimaPro 9.5.0.1

Description of system boundaries: Cradle to gate (A1-A3).

Modules C1–C4 and module D are not considered based on the criteria at paragraph 5.2 of EN 15804+A2 as well as paragraph 2.2.2 of PCR 2019:14 Construction products (EN 15804:A2) and ANNEX A3 of GPI 4.0:

- RE.Stone 1 is physically integrated with other products (e.g. concrete) so it cannot be physically separated from them at end of life;
- RE.Stone 1 is no longer identifiable at end of life as a result of a physical or chemical transformation process;
- RE.Stone 1 does not contain biogenic carbon.

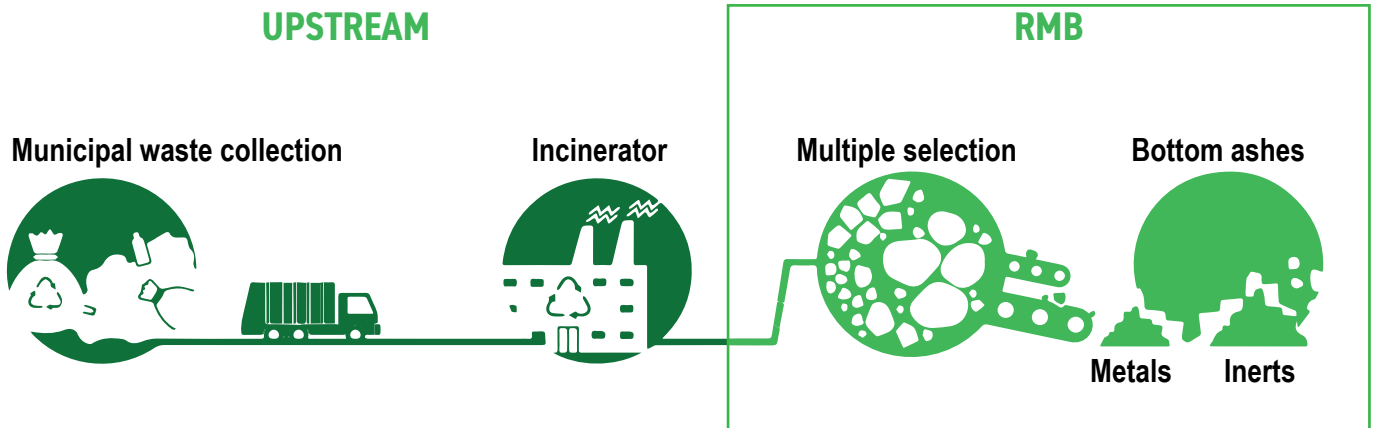
System diagram:



More information: Paride Romano p.romano@greenwichsrl.it
 Lorenzo Calisse l.calisse@greenwichsrl.it
 Greenwich S.r.l.

PROCESS DESCRIPTION

Bottom ash and slag from the waste-to-energy plant, taken from RMB, are subjected to a first phase of storage necessary for the maturation/carbonation process to take place with simultaneous loss of water and reduction of pH (15-20 days). Subsequently, by means of a wheel loader, the stored ashes are transferred to the dedicated production sections, where sieving, volumetric reduction and separation of the metal fractions from the mineral/aggregate fraction takes place. The product, loose and with a particle of various selected size, is conveyed by a conveyor belt into the storage box.



ALLOCATION

RE.Stone 1 is a by-product of the production process; allocation was made on an economic basis.

DATA QUALITY

About generic data, throughout the analysis, criteria of geographic and technological equivalence, and equivalence with respect to system boundaries were considered.

Information between 2010 and 2020 was considered for generic data; site-specific data refer to the year 2023.

The electricity used by RMB for the production of RE.Stone 1 is taken from the national energy system and from the photovoltaic plant on the roof of the facility, which were modelled with the following Ecoinvent modules, respectively: Electricity, medium voltage {IT} electricity, medium voltage, residual mix | Cut-off, U (GWP-GHG 0,615 kg CO₂ eq/kWh) and Electricity, low voltage {IT} electricity production, photovoltaic, kWp slanted-roof installation, single-Si, panel, mounted | Cut-off, U (GWP-GHG 0, 083 kg CO₂ eq/kWh).

PROXY DATA

No proxy data was used.

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Geography	ITA	ITA	ITA	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Specific data used	>90%			ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
Variation - products	-			ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-
Variation - sites	-			ND	ND	ND	ND	ND	ND	ND	ND	ND	-	-	-	-	-

CONTENT INFORMATION

Incoming quantity per DU [ton]	Product components	Weight for declared unit [ton]	Post-consumer material, weight-%	Biogenic material, weight-% and kg C/kg
5,44	Bottom ash	1	100%	0 kg

RE.Stone 1 is sold without packaging.

RESULTS OF THE ENVIRONMENTAL PERFORMANCE INDICATORS

MANDATORY IMPACT CATEGORY INDICATORS ACCORDING TO EN 15804

Indicator	Unit	A1	A2	A3	A1-A3
GWP-total	kg CO ₂ eq.	1,36E-01	1,10E+00	4,53E-01	1,69E+00
GWP-fossil	kg CO ₂ eq.	1,34E-01	1,10E+00	4,52E-01	1,69E+00
GWP- biogenic	kg CO ₂ eq.	2,11E-03	1,28E-03	5,14E-04	3,91E-03
GWP- luluc	kg CO ₂ eq.	1,70E-05	5,55E-04	2,68E-04	8,40E-04
ODP	kg CFC 11 eq.	3,16E-09	2,36E-08	9,87E-09	3,66E-08
AP	mol H ⁺ eq.	3,96E-04	6,30E-03	1,47E-03	8,16E-03
EP-freshwater	kg P eq.	2,03E-05	7,60E-05	4,20E-05	1,38E-04
EP- marine	kg N eq.	7,73E-05	2,14E-03	4,80E-04	2,70E-03
EP-terrestrial	mol N eq.	8,28E-04	2,31E-02	5,06E-03	2,89E-02
POCP	kg NMVOC eq.	3,67E-04	7,77E-03	2,11E-03	1,02E-02
ADP-minerals&metals*	kg Sb eq.	2,01E+00	1,56E+01	6,51E+00	2,41E+01
ADP-fossil*	MJ	1,97E-07	3,40E-06	1,92E-06	5,52E-06
WDP*	m ³	3,65E-02	6,44E-02	7,42E-02	1,75E-01

Acronyms. 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 = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

ADDITIONAL MANDATORY AND VOLUNTARY IMPACT CATEGORY INDICATORS

Indicator	Unit	A1	A2	A3	A1-A3
GWP-GHG ^[1]	kg CO ₂ eq.	1,34E-01	1,10E+00	4,52E-01	1,69E+00

Additional voluntary indicators e.g. the voluntary indicators from EN 15804 or the global indicators according to ISO 21930:20

[1] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

RESOURCE USE INDICATORS

Indicator	Unit	A1	A2	A3	A1-A3
PERE	MJ	1,08E-01	2,51E-01	1,40E-01	5,00E-01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	1,08E-01	2,51E-01	1,40E-01	5,00E-01
PENRE	MJ	1,90E+00	1,53E+01	6,37E+00	2,36E+01
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	2,01E+00	1,56E+01	6,51E+00	2,41E+01
SM	kg	1,00E+03	0,00E+00	0,00E+00	1,00E+03
RSF	MJ	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
FW*	m ³	1,07E-03	2,23E-03	2,16E-03	5,47E-03

Acronyms. 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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

* Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

WASTE INDICATORS

Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste disposed	kg	7,17E-06	9,77E-05	4,07E-05	7,17E-04
Non-hazardous waste disposed	kg	4,24E-03	7,18E-01	1,93E+00	4,24E-03
Radioactive waste disposed	kg	3,11E-06	5,02E-06	3,15E-06	3,11E-06

OUTPUT FLOW INDICATORS

Indicator	Unit	A1	A2	A3	A1-A3
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	0,00E+00	8,47E-03	8,47E-03
Materials for energy recovery	kg	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
Exported energy, thermal	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00

VARIATION COMPARED TO THE PREVIOUS VERSION

Compared to the 2022 version, environmental impacts have decreased in 2023. This was due to minor changes in the industrial operations and the allocation of common impacts to three products (RE.Stone1, 2 and 3) as opposed to complete allocation to RE.Stone 1 in 2022. Additionally, an increased photovoltaic production in 2023 contributed to the lowering of environmental impacts.

ADDITIONAL ENVIRONMENTAL INFORMATION

RECYCLED MATERIAL CONTENT

PRODUCT	DESCRIPTION	RECYCLED MATERIAL CONTENT
RE.Stone 1	Industrial recovery aggregate PRE-CONSUMER	100%

The product described in this Environmental Product Declaration (EPD) contains 100% recycled materials. The determination of the recycled content has been carried out according to the procedures established by the CP DOC 262 certification scheme, version 2.2, accredited by Accredia, in accordance with ISO/IEC 17065 requirements. The calculation was performed using a mass balance approach, considering only pre-consumer and post-consumer materials as defined by relevant standards. This certification ensures the product's compliance with the criteria outlined in the Minimum Environmental Criteria (CAM) for the construction sector. Complete documentation supporting the verification is maintained and available upon request.

As provided for in paragraph 1 of article 184-ter of Legislative Decree 152/2006 and subsequent amendments, R.M.B. undertakes to comply with the limits of the ecotoxicological tests established by the CLP Regulation (Reg. 1272/2008/CE and subsequent amendments) to verify the ecotoxicity of the materials.

Specifically, the company is committed to carrying out ecotoxicity tests in compliance with EU Regulation 440/2008 and subsequent amendments, evaluating the dangers to the environment and carrying out corrosion and irritation tests for dangers to human health.

REFERENCES

General Programme Instructions of the International EPD® System-Version 4.0.

EN 15804:2012+A2:2019/AC:2021, Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

PCR 2019:14 Costruction products version 1.3.1.

GreenMan 2019. Impianti di incenerimento rifiuti non pericolosi. Progetto di variante "Revamping per adeguamento tecnologico" Relazione di progetto preliminare. Manzano, 11/04/2019

Background report. Analisi del ciclo di vita di RE.Stone 1. RMB S.p.A. - Luglio 2023. By F. Gilardelli & M. Caimi Greenwich S.r.l.

Revisione 02 Analisi ciclo di vita di RE.Stone 1, con specifica contenuto di riciclato. RMB S.p.A. - Dicembre 2024 by P. Romano & L. Calisse.



RMB



www.environdec.com