ENVIRONMENTAL PRODUCT DECLARATION

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

Mapelastic Zero (Malaysia Production)

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."

Programme:	**The International EPD® System; www.environdec.com**
EPD registered though the fully aligned regional hub:	**EPD Southeast Asia; www.epd-southeastasia.com**
Programme operator:	**EPD International AB**
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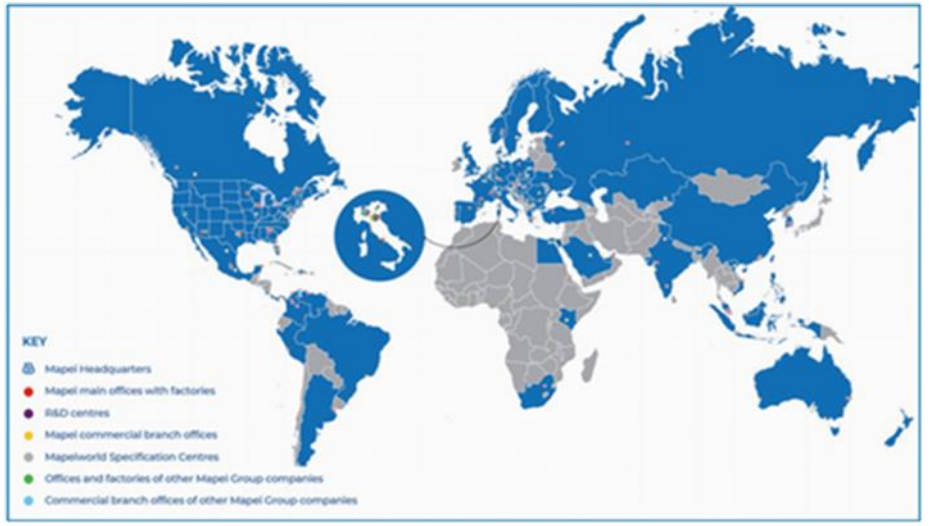
Revision Date	**2024-12-17**
Geographical scope:	**Malaysia**

1. COMPANY DESCRIPTION / GOAL & SCOPE



Founded in 1937 in Milan, Italy, Mapei produces adhesives and complementary products for laying all types of floor, wall and coating materials, and also specializes in other chemical products used in the building industry, such as waterproofing products, specialty mortars, admixtures for concrete, cement additives, products for underground constructions and for the restoration of concrete and historical buildings. There are currently 102 subsidiaries in the Mapei Group, with a total of 90 production facilities located around the world in 36 different countries and in 5 different continents. Mapei also has 32 central laboratories. Most locations are ISO 9001 and ISO 14001.

Mapei invests 12% in its company's total work-force and 5% of its turnover in Research & Development; in particular, 70% of its R&D efforts are directed to develop eco-sustainable and environmentally friendly products, which give important contribution to all major green rating systems for eco-sustainable buildings such as LEED and BREEAM. Furthermore, Mapei has developed a sales and technical service network with offices all over the world and offers an efficient Technical Assistance Service that is valued by architects, engineers, contractors and owners.

The goal of the study is to provide necessary data and documentation to produce an EPD according to the requirements of PCR Environdec (Version 1.3.4, 2024-04-30) under EN 15804:2012+A2:2019/AC:2021 and to have more comprehension about the environmental impacts related to **Mapelastic Zero** manufactured in Mapei Malaysia located in Nilai, including packaging of the finished products.

Target audiences of the study are customers and other parties with an interest in the environmental impacts of **Mapelastic Zero**. This analysis shall not support comparative assertions intended to be disclosed to the public.

2. PRODUCT DESCRIPTION

Mapelastic Zero is a two-component mortar based on cementitious binders, fine-grained selected aggregates, special admixtures and synthetic polymers dispersed in water, blended according to a formula developed in MAPEI's research laboratories. When the two components are mixed together, a free-flowing mix is obtained which may be easily applied, even on vertical surfaces, at a thickness of up to 2 mm in one single coat.
Mapelastic Zero is available in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan)

UN CPC code: 375

For more information see the TDS (Technical Data Sheet) on Mapei website (www.mapei.com).

3. CONTENT DECLARATION

The main components and ancillary materials of the products included in this EPD are the following:

Table 1: Composition referred to 1 kg of product packaged in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan).

Materials	Percentage (%) by mass	Post-consumer recycled material weight-%	Biogenic Material, weight-%	Biogenic Material, weight-% and kgC/DU
Inorganic Binders	<30%	0	0	0
Organic Binders	<30%	0	0	0
Filler	<55%	0	0	0
Additives	<0,5%	0	0	0
Water	<5%	0	0	0
Packaging Materials	**Weight-% (versus the product)**		**Weight biogenic carbon, kg C/DU**	
HDPE	<10%		0	
LDPE	<1%		0	
Wood	<1%		0,00405	
Paper	<5%		0,00456	

The product does not contain a concentration higher than 0,1% (by unit weight) of either carcinogenic substances or substances of very high concern (SVHC) on the REACH Candidate List published by the European Chemicals Agency.

4. DECLARED UNIT AND REFERENCE SERVICE LIFE

The declared unit is 1 kg of product with its related packaging.

Due to the selected system boundary, the reference service life of the products is not specified.

5. SYSTEM BOUNDARIES AND ADDITIONAL TECHNICAL INFORMATION

The approach is “cradle to gate” (A1–A3) with modules C1-C4 and module D and optional modules (A1-A3 + A4-A5 +C + D):

- **A1, A2, A3** (Product stage): extraction and processing of raw materials (A1), transportation up to the factory gate (A2), manufacturing of the finished product and packaging (A3).
- **A4 – A5** (Construction process stage): transport distance of the finished product to final customers is assumed to be 1000km (A4). The installation phase includes the electricity consumption for the mixing of the product. The packaging is collected and sent to treatment.
- **C1, C2, C3, C4** (End of Life stage): the demolition phase (C1) includes the electricity for demolition. With a collection rate of 100% as C&D waste, the transports are carried out by lorry over 100 km (C2). A recycling ratio (C3) of 20% is considered in accordance with the local waste managing system. The remaining 80% is landfilled (C4).
- **D** (Resource recovery stage): contains credits from the recycling of the fraction of product in module C3, at the end of life, the product can be collected and recycled for use in substitution of virgin raw aggregates. This module contains also the credit from the incineration of a fraction of packaging waste (A5).

Table 2: System boundaries

	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	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	MY	MY	MY	MY	MY	-	-	-	-	-	-	-	MY	MY	MY	MY	MY
Specific data	22%			-		-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-			-		-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-			-		-	-	-	-	-	-	-	-	-	-	-	-

MND: Module Not Declared

A brief description of production process is the following:

The production process starts from raw materials, that are purchased from external and intercompany suppliers and stored in the plant. Bulk raw materials are stored in specific silos and added automatically in the production mixer, according to the formula of the product. Other raw materials, supplied in bags, big bags or tanks, are stored in the warehouse and added automatically or manually in the mixer. The production is a discontinuous process, in which all the components are mechanically mixed in batches. The semi-finished product is then packaged, put on wooden pallets and stored in the finished products warehouse. The quality of final products is controlled before the sale.

Table 3: Transport to the building site (A4)

Scenario information	Value	Unit
Means of transport: truck-trailer euro 5, gross weight 34-40 t, payload capacity 27 t		
Litres of fuel (diesel for truck)	0,0166	l/100km
Transport distance - truck	1E003	km
Capacity utilisation (including empty runs) - truck	85	%
Gross density of products transported	1100	kg/m^3
Capacity utilisation volume factor	85	%

Table 4: Installation into the building site (A5)

Scenario information	Value	Unit
Ancillary materials for installation	0	kg
Water use	0	m^3
Other resources use	0	kg/m^2
Electricity and other energy consumption for the installation	0,00234	kWh
Waste materials on building site before waste processing, generated by the product's installation (specified by type)	0,0184(HDPE) 0,000344 (LDPE) 0,0088 (Wood) 0,00734 (Paper) 0,01 (C&D waste)	kg
Output materials (specified by type) as result of waste processing at the building site e.g. of collection for recycling, for energy recovery, disposal (specified by route)	0,0431 (Landfill) 0,00174 (Recycling)	kg

Table 5: End of Life (C1-C4) per DU

Scenario information	Value	Unit
Collected separately	0	kg
Collected with mixed construction waste	0,99	kg
Reuse	0	kg
Recycling	0,198	kg
Energy recovery	0	kg
Landfill	0,792	kg
Transport to waste treatment	100	km

6. CUT-OFF RULES AND ALLOCATION

Criteria for the exclusion of inputs and outputs (cut-off rules) in the LCA, information modules and any additional information are intended to support an efficient calculation procedure. They are not applied in order to hide data. Cut-off criteria, where applied, are described in Table 6.

Input flows are covered for the whole formula.

Table 6: Cut-off criteria

Process excluded from study	Cut-off criteria	Quantified contribution from process
A3: production (auxiliary materials)	Less than 10^{-5} kg/kg of finished product	Sensitivity study demonstrates a relative contribution lower than 0,5%

For the allocation procedure and principles consider the following table (Table):

Table 7: Allocation procedure and principles

Module	Allocation Principle
A1	All data are referred to 1 kg of product A1: electricity is allocated to the specific production line
A3	All data are referred to 1 kg of packaged product A3-wastes: all data are allocated to the whole production plant

7. ENVIRONMENTAL PERFORMANCE AND INTERPRETATION

GWP

Climate change

GWPtotal - Global Warming Potential refers to the emission/presence of GHGs (greenhouse gases) in the atmosphere (mainly CO_2, N_2O, CH_4) which contribute to the increase in the temperature of the planet. GWP-total considers:
- GWP-fossil
- GWP-biogenic
- GWP-luluc (land use and land use change)

ODP

Ozone Depletion

Ozone Depletion Potential refers to the degradation of the stratospheric layer of the ozone involved in blocking the UV component of sunrays. Depletion is due to particularly reactive components that originate from chlorofluorocarbon (CFC) or (CFM).

AP

Acidification

Acidification Potential refers to the emission of specific acidifying substances (i.e. NOx, SOx) in the air. These substances decrease the pH of the rainfall with predictable damages to the ecosystem.

EP

Eutrophication

Eutrophication Potential refers to the nutrient enrichment, which determines unbalance in ecosystems and causes the death of the fauna and decreased biodiversity in flora. It considers:
- EP-freshwater: acquatic freshwater
- EP-marine: acquatic marine
- EP-terrestrial

POCP

Photochemical ozone formation

The Photochemical Ozone Creation Potential is the ozone formation in low atmosphere. This is quite common in the cities where a great amount of pollutants (like VOC and NOx) are emitted every day (industrial emissions and vehicles). It is mainly diffused during the summertime.

ADP minerals&metals

Depletion of abiotic resources – minerals and metals

Abiotic Depletion Potential elements refers to the depletion of the mineral resources.

ADP-fossil

Depletion of abiotic resources – fossil fuel

Abiotic Depletion Potential fossil fuel refers to the depletion of the fossil fuel resources.

WDP

Water use

It expresses the potential deprivation of water, that consists in not having the water needs satisfied.

The following tables show the environmental impacts for the products considered according to the requirements of EN15804:2012+A2:2019/AC:2021. The Characterization Factors are based on EF 3.1 package. The results are referred to the declared unit (see § 4). The additional environmental indicators are not declared. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.
We discourage the use of the outcomes from modules A1-A3 without considering the results obtained from modules C.

Mapelastic Zero

(1 kg of product in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan))

Table 8: Mapelastic Zero: Potential environmental impact – mandatory indicators according to EN 15804 referred to 1 kg of product in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan).

	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total [kg CO2 eq.]	6,66E-01	6,44E-02	2,45E-02	4,86E-03	8,09E-03	5,40E-04	1,20E-02	-3,32E-03
GWP-fossil [kg CO2 eq.]	6,78E-01	6,17E-02	3,10E-03	4,86E-03	7,75E-03	5,31E-04	1,19E-02	-3,30E-03
GWP-biogenic [kg CO2 eq.]	-1,95E-02	2,69E-03	2,14E-02	-2,74E-06	3,38E-04	1,80E-06	6,01E-05	-1,74E-05
GWP-luluc [kg CO2 eq.]	7,57E-03	2,94E-06	5,73E-06	4,81E-06	3,69E-07	7,18E-06	7,11E-05	-1,14E-06
AP [Mole of H+ eq.]	3,36E-08	3,99E-15	1,09E-14	2,41E-14	5,00E-16	9,59E-16	3,20E-14	-4,26E-15
ODP [kg CFC-11 eq.]	3,81E-03	6,48E-05	1,18E-05	1,72E-05	8,38E-06	2,66E-06	8,42E-05	-6,91E-06
EP freshwater [kg P eq.]	1,78E-04	7,82E-09	2,49E-09	2,48E-09	9,81E-10	2,07E-09	2,69E-08	-6,48E-10
EP marine [kg N eq.]	8,20E-04	2,49E-05	2,86E-06	3,73E-06	3,23E-06	1,22E-06	2,17E-05	-2,50E-06
EP terrestrial [Mole of N eq.]	9,94E-03	2,80E-04	3,14E-05	4,06E-05	3,66E-05	1,35E-05	2,39E-04	-2,77E-05
POCP [kg NMVOC eq.]	1,61E-03	7,05E-05	8,54E-06	1,10E-05	9,05E-06	3,38E-06	6,63E-05	-6,86E-06
ADP-element* [kg Sb eq.]	8,64E+00	9,86E-10	1,40E-10	2,33E-10	1,24E-10	5,57E-10	7,68E-10	-1,49E-10
ADP-fossil* [MJ]	3,77E+00	8,59E-01	3,67E-02	5,19E-02	1,08E-01	9,93E-03	1,56E-01	-4,58E-02
WDP* [m^3 world equiv.]	1,17E-01	2,72E-04	6,69E-04	1,56E-03	3,41E-05	1,02E-04	1,36E-03	-4,83E-04

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**: Depletion Potential of the stratospheric Ozone layer; **AP**: Acidification Potential; **$EP_{FRESHWATER}$**: Eutrophication Potential, freshwater; **EP_{MARINE}**: Eutrophication Potential, marine; **$EP_{TERRESTRIAL}$**: Eutrophication Potential, terrestrial; **POCP**: Formation potential of tropospheric ozone; **$ADP_{MINERALS\&METALS}$**: Abiotic Depletion Potential for non-fossil resources; **ADP_{FOSSIL}**: Abiotic Depletion Potential for fossil resources; **WDP**: Water Deprivation Potential.

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

Table 9: Mapelastic Zero: Potential environmental impact – additional mandatory and voluntary indicators referred to 1 kg of product in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan)

	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG [kg CO2 eq.]	6,87E-01	6,18E-02	3,11E-03	4,86E-03	7,76E-03	5,40E-04	1,20E-02	-3,30E-03

GWP-GHG: 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 CO_2 is set to zero. This new indicator cannot be compared with the GWP-GHG of the EPD according to the old PCR 1.2 (and earlier versions).

Table 10: Mapelastic Zero: Use of resources referred to 1 kg of product in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan).

	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE* [MJ]	5,31E-01	4,14E-03	2,19E-02	1,52E-02	5,19E-04	1,09E-03	2,73E-02	-2,74E-03
PERM* [MJ]	1,76E-04	0,00E+00	-1,46E-02	0,00E+00	0,00E+00	-3,28E-05	0,00E+00	0,00E+00
PERT* [MJ]	5,31E-01	4,14E-03	7,30E-03	1,52E-02	5,19E-04	1,06E-03	2,73E-02	-2,74E-03
PENRE* [MJ]	3,28E+00	8,59E-01	7,98E-02	5,19E-02	1,08E-01	1,16E-02	1,56E-01	-4,58E-02
PENRM* [MJ]	8,71E-01	0,00E+00	-4,31E-02	0,00E+00	0,00E+00	-1,62E-03	0,00E+00	0,00E+00
PENRT* [MJ]	3,85E+00	8,59E-01	3,67E-02	5,19E-02	1,08E-01	9,93E-03	1,56E-01	-4,58E-02
SM [kg]	6,75E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF [MJ]	9,90E-03	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF [MJ]	9,00E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW [m3]	1,48E-02	7,28E-06	1,65E-05	3,73E-05	9,12E-07	2,96E-06	4,14E-05	-1,14E-05

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 (primary energy and primary energy resources used as raw materials); **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 (primary energy and primary energy resources used as raw materials); **SM**: Use of secondary material; **RSF**: Use of renewable secondary fuels; **NRSF**: Use of non-renewable secondary fuels; **FW**: Net use of fresh water.

**According to Annex 3 of PCR 1.3.4, the option B for the calculation of primary energy use indicators have been used.*

Table 11: Mapelastic Zero: Waste production and output flows referred to 1 kg of product in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan).

	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD [kg]	2,76E-03	1,71E-11	1,45E-11	3,23E-11	2,14E-12	1,44E-12	3,89E-11	-6,94E-12
NHWD [kg]	3,33E-03	3,47E-05	4,32E-02	2,42E-05	4,35E-06	2,73E-06	7,93E-01	-2,01E-03
RWD [kg]	3,11E-05	3,42E-07	5,71E-07	1,27E-06	4,29E-08	1,25E-07	1,64E-06	-2,29E-07
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]	0,00E+00	0,00E+00	5,00E+00	0,00E+00	0,00E+00	1,98E-01	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	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EET [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

HWD: Hazardous waste disposed; **NHWD**: Non-Hazardous waste disposed; **RWD**: Radioactive waste disposed; CRU: Components of reuse; MFR: Materials for recycling; **MER**: Materials for energy recovery; **EEE**: Exported electrical energy; **EET**: Exported thermal energy

Table 12: Mapelastic Zero: Information on biogenic carbon content at the factory gate referred to 1 kg of product in 32kg composite packaging (24kg multiply bag + 8kg plastic jerrycan).

Biogenic Carbon Content	Unit	Quantity
Biogenic carbon content in product	kg C	0,00E+00
Biogenic carbon content in packaging	kg C	6,72E-03

More details about electrical mix used in this EPD, is shown below:

	Data source	GWP-GHG	Unit
electricity grid mix (MY) – 2022	Ecoinvent 3.10	0,818	kg CO_2-eqv/kWh

8. DATA QUALITY

Table 13: Data quality

Dataset & Geographical reference	Database (source)	Temporary reference
A1; A3		
Inorganic Binder	Specific EPD from supplier	2022
Organic Binder	Ecoinvent 3.10	2023
Filler	Sphera Database	2023
Additives	Sphera Database; Ecoinvent 3.10	2023
Water	Sphera Database	2022
Electricity grid mix (MY)	Sphera Database	2022
Packaging components	Sphera Database; Ecoinvent 3.10	2023
A2		
Truck, Euro 5, 27t payload (GLO)	Sphera Database	2023
Light train, gross tonne weight 500t / 363t payload (GLO)	Sphera Database	2023
Oceanic ship (27500 DWT – GLO)	Sphera Database	2023
Diesel for transport (CN)	Sphera Database	2020
Heavy Fuel Oil (IN)	Sphera Database	2020
Electricity grid mix (CN)	Sphera Database	2020
A4		
Truck, Euro 6, 27t payload (GLO)	Sphera Database	2023
Diesel for transport (CN)	Sphera Database	2020
A5		
Tap water from surface water	Sphera Database	2023
Commercial waste in municipal waste incineration plant	Sphera Database	2023
Inert matter on landfill	Sphera Database	2023
Electricity grid mix (CN)	Sphera Database	2020
C1-C4		
Truck (EURO 6 - 9,3 ton payload – GLO)	Sphera Database	2023
Electricity grid mix (EU)	Sphera Database	2020
Diesel for transport (EU)	Sphera Database	2020
Construction waste dumping (EU)	Sphera Database	2023
Construction waste treatment (EU)	Sphera Database	2023

All data included in table above refer to a period between 2020-2023; the most relevant ones are specific from supplier, while the others (i.e. transport and minor contribution dataset), come from European and global databases. All datasets are not more than 10 years old according to EN 15804 §6.3.8.2 “Data quality requirements”.

The Quality level concerning datasets used in the EPD can be considered as “very good” or “good” according to Annex E of the EN 15804 (current version).

Primary data concern the year 2023 and represent the whole annual production.

9. ADDITIONAL INFORMATION

9.1 CO_2 offset

Total CO_2 emissions measured throughout the entire life cycle of the product have been offset through the acquisition of certified carbon credits in support of forestry protection projects. More information available at: www.mapei.it

9.2 Biogenic carbon content

For **Mapelastic Zero** the biogenic carbon content in packaging at the factory gate referred to 1 kg of product with packaging is 6,72E-03 kgC

9.3 VOC Emissions

Volatile Organic Compounds (VOC) special tests and evidence have been carried out on the two products, according to ISO 16000 parts 3, 6, 9 and 11 and EN 16516.
The products have been evaluated in emission chambers, in order to detect their VOC emissions after 3 and 28 days storage in the ventilated chambers, according to GEV (Gemeinschaft Emissionskontrollierte Verlegewerkstoffe, Klebstoffe und Bauprodukte e.V.) test method.

The following product meets the requirements for the emission class EMICODE® **EC1^{PLUS}**, as "very low emission", released by GEV:

- **Mapelastic Zero**: license number number 17042

Next table describes the limits for the EMICODE® EC1^{PLUS} class:

Table 3: EC1^{PLUS} VOC limits

	3 days µg/m³	**28 days µg/m³**
TVOC (C6-C16)	≤ 750 µg/m³	≤ 60 µg/m³
TSVOC (C16-C22)		≤ 40 µg/m³
C1A-C1B substances	Total ≤ 10 µg/m³	Single substance ≤ 1 µg/m³
Formaldehyde/ acetaldehyde	≤ 50 µg/m³	
Sum of formaldehyde/acetaldehyde	≤ 50 ppb	
sum of non-assessable VOCs		≤ 40
R value		≤ 1

9.4 Recycled content

Product	Recycled material content
Mapelastic Zero	6,75%

10. VERIFICATION AND REGISTRATION

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.

CEN standard EN15804 served as the Core Product Category Rules (PCR)	
PCR:	PCR 2019:14 Construction products (EN 15804:A2), Version 1.3.4, 2024-04-30 , UN CPC code: 375
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 Peña. The review panel may be contacted via the Secretariat www.environdec.com/contact.
Independent third-party verification of the declaration and data, according to ISO 14025:2006:	☒ EPD Process Certification ☐ EPD Verification
Third party verifier:	Certiquality S.r.l. Number of accreditations: 0013VV rev.000
Accredited or approved by:	Accredia
Procedure for follow-up of data during EPD validity involves third-party verifier	☒ Yes ☐ No

11. DIFFERENCES VERSOUS PREVIOUS VERSION

Environmental impact data reported in Ch. 7 and sharing of specific data in tab. 2 have been updated.

Editorial and front page layout changes

12. REFERENCES

- EN 15804: SUSTAINABILITY OF CONSTRUCTION WORKS - ENVIRONMENTAL PRODUCT DECLARATIONS - CORE RULES FOR THE PRODUCT CATEGORY OF CONSTRUCTION PRODUCTS
- GENERAL PROGRAMME INSTRUCTIONS OF THE INTERNATIONAL EPD® SYSTEM. VERSION 4.0
- ISO 14025 ENVIRONMENTAL LABELS AND DECLARATIONS - TYPE III ENVIRONMENTAL DECLARATIONS - PRINCIPLES AND PROCEDURES
- ISO 14044 ENVIRONMENTAL MANAGEMENT – LIFE CYCLE ASSESSMENT – REQUIREMENTS AND GUIDELINES
- PCR 2019:14 CONSTRUCTION PRODUCTS (EN 15804: A2); UN CPC code: 375; VERSION 1.3.4
- ENVIRONMENTAL IMPACTS OF CONSTRUCTION AND DEMOLITION WASTE MANAGEMENT ALTERNATIVES
- A CASE STUDY ON THE EFFECTIVE IMPLEMENTATION OF THE REUSE AND RECYCLING OF CONSTRUCTION & DEMOLITION WASTE MANAGEMENT PRACTICES IN MALAYSIA
- WASTE MANAGEMENT CHALLENGES IN MALAYSIA
- MUNICIPAL SOLID WASTE MANAGEMENT AND POTENTIAL REVENUE FROM RECYCLING IN MALAYSIA
- IMPLICATIONS OF MUNICIPAL SOLID WASTE MANAGEMENT ON GREENHOUSE GAS EMISSIONS IN MALAYSIA AND THE WAY FORWARD

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