



PIAVE

EPD®

THE INTERNATIONAL EPD® SYSTEM

AUSTRALASIA EPD®

ENVIRONMENTAL PRODUCT DECLARATION

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH ISO 14025:2006,
EN 15804:2012+A2:2019/AC:2021

PREMIX CONCRETE - 65MPA POST TENSION

Piave Premix Concrete Pty Ltd

Programme operator: The international EPD® system, www.environdec.com

Regional operator: EPD Australasia Ltd

EPD registration number: EPD-IES-24231

Publication date: 2025-03-31

Valid until: 2030-03-31

Geographical scope: Victoria

Product-specific EPD of one product manufactured at one site.



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 INFORMATION AND VERTIFICATION

Declaration Owner:	Owner	Piave Premix Concrete Pty Ltd
	Address	262 Salmon Street Port Melbourne VIC 3207
	Contact details	info@piave.com.au
	Website	https://www.piave.com.au/
EPD Programme Operator:	EPD International AB	Box 210 60, SE-100 31 Stockholm, Sweden, Email: info@environdec.com
Regional Programme:	EPD Australasia Ltd	Address: 315a Hardy Street Nelson 7010, New Zealand Web: www.epd-australasia.com Email: info@epd-australasia.com Phone: +61 2 8005 8206 (AU)
EPD Produced By:	Crema Constructions	Address: 262 Salmon Street Port Melbourne, VIC 3207, Australia Web: www.crema.com.au Email: info@epd-australasia.com Phone: +61 3 9644 1101 (AU)
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Geographical Scope:		Victoria

PCR:	PCR 2019:14 Construction Products, Version 1.3.4, 2024-04-30 (valid until 2025-06-20), C-PCR-003 (to 2019:14) Concrete and concrete elements, version 2024-04-30
PCR Review was Conducted by:	The Technical Committee of the International EPD® System. See www.environdec.com for a list of members. Most recent review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact .
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 1.3.4 is used. c-PCR 003 Concrete and elements
EPD Verifier	<div> <div> <p>Andrew D. Moore Life Cycle Logic Pty Ltd www.lifecyclelogic.com.au +61424320057 Andrew@lifecyclelogic.com.au</p> </div> <div>  </div> </div> <p>(External, Third party verifier approved by EPD Australasia and The International EPD System)</p>
EPD verification	<p>Independent verification of this EPD and data, according to ISO 14025:</p> <p><input type="checkbox"/> Internal verification <input checked="" type="checkbox"/> External verification</p>
Procedure for follow-up of data during the EPD validity involves third-party verifier	<p><input type="checkbox"/> No <input checked="" type="checkbox"/> Yes</p>

The manufacturer has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but registered in different EPD programmes 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.

EPDs of construction products may not be comparable if they do not comply with EN 15804.

PRODUCT IDENTIFICATION

Product name Premix Concrete – 65MPa Post Tension

Additional label(s)

Product number / reference 65MPa Post Tension

Production Site: 262 Salmon Street Port Melbourne VIC 3207

CPC code UN CPC 375 (Articles of concrete, cement and plaster)
ANZSIC 20330 (Concrete – ready mixed – except dry mix)



INTRODUCTION

ABOUT PIAVE

Piave was founded in 1993 by Anthony Schieven and Louis Crema, with a name coined by Loui's father Bepi, inspired by the Piave river in Northern Italy.

Originally existing predominantly as a means to supply their construction company's jobs, they built a plant in Port Melbourne, with Anthony managing the plant and Louis looking after finance and administration.

Piave now supplies a wide range of cementitious products used by the building and construction industry within Victoria.

Since its commencement we've set solid foundations for thousands of Melbourne buildings and homes. Now, still family-owned and run, a passionate new generation is propelling Piave into the future.

OUR COMMITMENT

We understand the crucial role the construction industry has to play in addressing our global carbon crisis, and are committed to playing our part in this journey, to ensure a brighter outlook for future generations.

SCOPE

This EPD covers premix concrete products for the Victorian metropolitan region. This EPD covers life cycle stages Cradle to gate with modules C1–C4 and module D (A1–A3 + C + D).



PRODUCT INFORMATION

PRODUCT DESCRIPTION

Concrete is prepared by mixing cement, coarse and fine aggregates, and water, with or without the addition of auxiliary agents and additives. The fresh concrete is placed on the building site or prefabricated in factory moulds, compacted, and hardened in the desired shape by the hydration of cement to form concrete.

PRODUCT APPLICATION

Normal-class - designed for residential applications, low rise buildings, paving and driveways etc. Its specification and ordering have been simplified as far as practicable.
Special-class - allows the purchaser to incorporate into the project specification any special requirements for the project.

PRODUCT STANDARDS

The concrete products within the EPD conform to AS 1379:2007 Specification and Supply of Concrete. General Australian Standard AS 1379 sets down a number of ways of specifying and ordering concrete to promote uniformity, efficiency and economy in production and delivery. It refers to two classes of concrete: normal-class and special-class.

Further information can be found at <https://www.piave.com.au/>.

PRODUCT RAW MATERIAL COMPOSITION

Material	Proportion (% m/m)	Post-consumer material, weight (%)	Renewable material, weight (%)
Sand	0-85%	0%	0%
Aggregate	0-91%	0%	0%
GP Cement	2-18%	0%	0%
Ground Blast Furnace Slag	0-11%	0%	0%
Silica Fume	0-1%	0%	0%
Water	3-11%	0%	0%
Admixtures	<0.4%	0%	0%

The product mass and design mix details are provided in “Piave Premix Concrete Mix Designs-Final.xlsx” (2025-03-21).

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain substances in the Candidate List of Substances of Very High Concern (SVHC) which exceeds the limits for registration with the European Chemicals Agency (i.e., if the substance constitute more than 0.1% of the weight of the product).

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.

Concrete production is the process of combining water, aggregates, cementitious binders and additives. These different 'ingredients' are transported from our suppliers to our specialised batching plant. Our batching plant stores the ingredients in cement silos, aggregate bins and admixture tanks. The plants use weigh scales and flow meters to accurately weigh the ingredients which are then mixed in an agitator truck.

PRODUCT END OF LIFE (C1-C4, D)

BS EN 16757:2017 presents four end of life scenarios for concrete:

1. Disposal of concrete at a landfill site,
2. Reuse of recovered concrete elements in new construction works,
3. Use of concrete debris, e.g. In land restoration, or
4. Crushing/recycling of concrete:
 - a. Crushed concrete substitutes primary material without further processing, or

Scenarios 2, 3 and 4 can all result in benefits and loads outside the system boundary and thus should be considered in a whole-of-life

building study or when comparing concrete products on a functional basis in line with BS EN 16757:2017.

END OF LIFE SCENARIO DETAILS

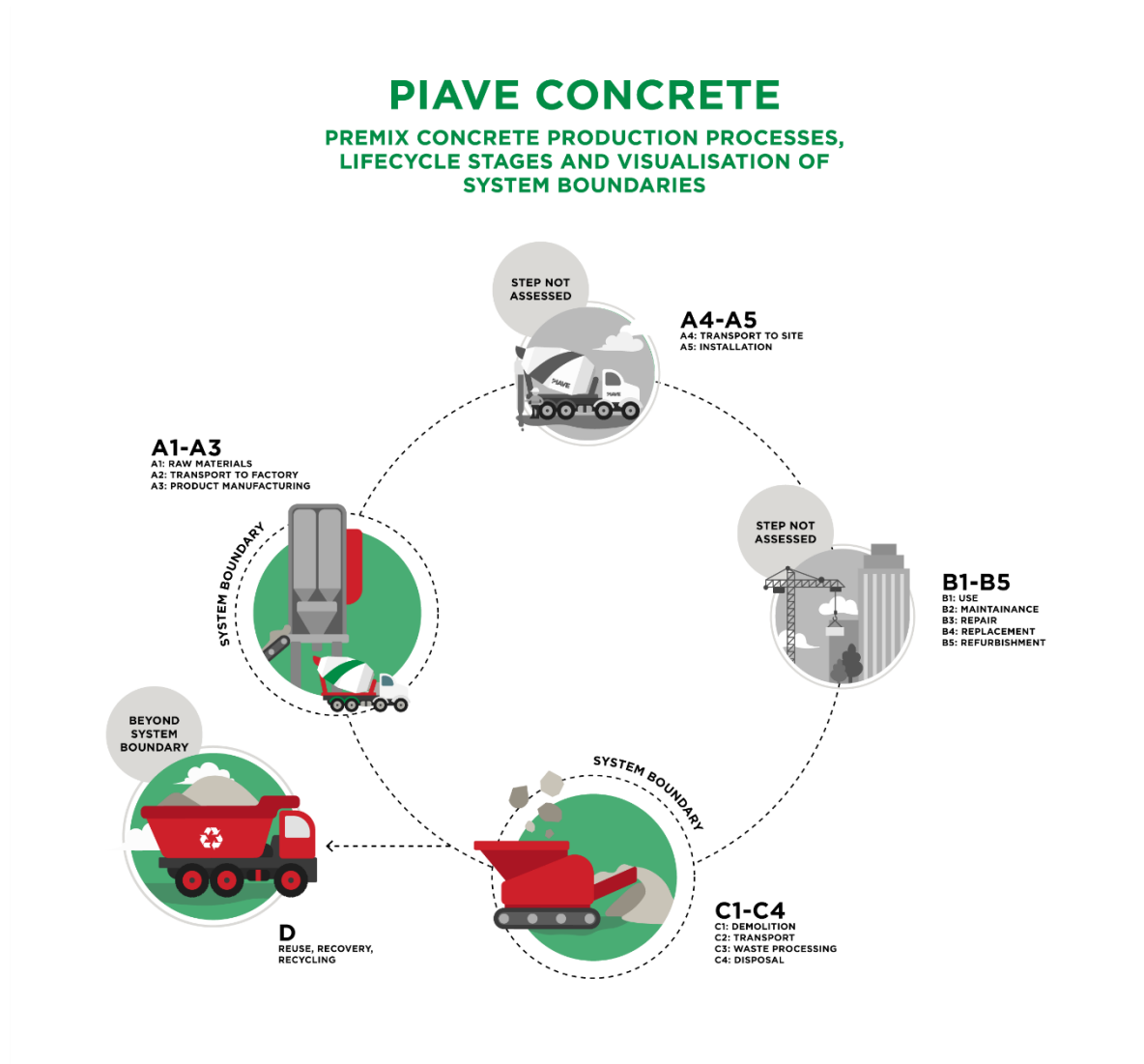
Scenario parameter	Value
Collection process – kg collected separately	2400kg
Collection process – kg collected with mixed waste	0kg
Recovery process – kg for re-use	0kg
Recovery process – kg for recycling	2033kg
Recovery process – kg for energy recovery	0kg
Disposal (total) – kg for final deposition	367kg
Scenario assumptions e.g. transportation	50km

For concrete produced in Victoria, we have used the end-of-life scenario representative for Victorian building & demolition materials products based on the National Waste Report 2022 (NWR 2022). This scenario implies that 84.7% of the concrete is recycled and the remaining 15.3% of the concrete is sent to landfill.

We have modelled a single scenario for concrete with a density of 2 400 kg/m³. This is a conservative value for the concrete mixes covered by our EPDs. The impact of this simplification is much smaller than the impact of the scenario and data assumptions applied to the end-of-life modules.

The concrete collected for recycling reaches end-of-waste status when it is crushed and stockpiled as "recycled crushed concrete" (RCC) aggregates. Crushed concrete is assumed to substitute primary (quarried) material without needing further processing.

MANUFACTURING PROCESS



LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2022-01-01 to 2022-12-31
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DECLARED AND FUNCTIONAL UNIT

Declared unit	1m3 of Premix Concrete supplied to the client
Mass per declared unit	2385 kg

BIOGENIC CARBON CONTENT

The product contains no biogenic carbon and is delivered in bulk without packaging.

SYSTEM BOUNDARY

	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	ND	ND	ND	ND	ND	ND	ND	ND	ND	x	x	x	x	x	x	x
	Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction /demolition	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling
Geography	AU	AU	AU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Share of Specific Data	>90%																		
Variation - products	NR																		
Variation - Sites	NR																		

Included in this study = X. Modules not declared = ND. Modules not relevant = NR

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.

The contribution of capital goods (production equipment and infrastructure) and personnel is excluded, as these processes are non-attributable and they contribute less than 10% to GWP-GHG.

The contribution of the back ground processes have been included.

No flows were excluded on the basis of cut-off criteria.

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.

The key processes that require allocation are:

- Production of concrete mixes: All shared processes are attributed to concrete products based on their volume.
- Silica fume is a co-product from silicon metal production and has been allocated based on economic value in the silica fume EPD (Quanzhou Winitoor Import and Export Co., Ltd. 2024).
- Ground granulated blast furnace slag from steel blast furnace production was allocated economically.
- Electricity and diesel use at the plant are allocated to concrete on Volume (1m³) basis.

Electricity

Electricity has been modelled for processes that Piave Premix controls using adjusted data to represent the estimated residual electricity grid mix in Victoria. This is done by removing renewables from the Australian Energy Statistics 2022 data (Table O3.2). The residual grid mix is made up of Coal (92.1%), natural gas (7.3%) and oil products (0.6%).

The reference year for the electricity dataset documented is 2022.

The allocations in the Ecoinvent 3.10 datasets used in this study follow the Ecoinvent system model 'Allocation, cut-off, EN15804'.

AVERAGES AND VARIABILITY

The results of the LCA are based on data from a single plant based in port Melbourne Victoria. There are no other plants that the environmental profiles of the concrete in this report relate to. Therefore the mandatory indicators stay well within the $\pm 10\%$ range as required by the PCR as they only relate to this one plant.



ENVIRONMENTAL IMPACT DATA

Please consider the following mandatory statements when interpreting the results:

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. EN 15804 reference package based on EF 3.1 version has been used.

The use of the results of modules A1-A3 (A1-A5 for services) without considering the results of module C is discouraged.

Note: The results of the impact categories abiotic depletion of minerals and metals, land use, human toxicity (cancer), human toxicity, non-cancer and ecotoxicity (freshwater) may be highly uncertain in LCAs that include capital goods/infrastructure in generic datasets, in case infrastructure/capital goods contribute greatly to the total results. This is because the LCI data of infrastructure/capital goods used to quantify these indicators in currently available generic datasets sometimes lack temporal, technological and geographical representativeness. Caution should be exercised when using the results of these indicators for decision-making purposes.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	C1	C2	C3	C4	D
GWP – total ¹⁾	kg CO ₂ eq	3.39E+02	5.67E+00	2.16E+01	1.25E+01	2.29E+00	-1.61E+00
GWP – fossil	kg CO ₂ eq	3.39E+02	5.67E+00	2.16E+01	1.25E+01	2.29E+00	-1.61E+00
GWP – biogenic	kg CO ₂ eq	0.00E+00	0.00E+00	4.34E-19	0.00E+00	0.00E+00	0.00E+00
GWP – LULUC	kg CO ₂ eq	1.97E-02	5.65E-04	7.69E-03	1.28E-03	1.31E-03	-1.72E-04
Ozone depletion pot.	kg CFC ₁₁ eq	2.26E-05	1.21E-06	4.31E-07	1.91E-07	6.64E-08	-7.58E-16
Acidification potential	mol H ⁺ eq	3.40E+00	5.89E-02	6.78E-02	1.12E-01	1.62E-02	-2.87E-03
EP-freshwater ²⁾	kg P eq	1.24E-02	1.88E-05	1.44E-03	3.60E-04	1.88E-04	-5.33E-05
EP-marine	kg N eq	1.23E+00	2.61E-02	2.29E-02	5.22E-02	6.19E-03	-1.38E-03
EP-terrestrial	mol N eq	1.37E+01	2.86E-01	2.49E-01	5.71E-01	6.76E-02	-1.29E-02
POCP (“smog”) ³⁾	kg NMVOC eq	3.56E+00	7.87E-02	1.07E-01	1.70E-01	2.42E-02	-3.80E-03
ADP-minerals & metals ⁴⁾	kg Sb eq	9.04E-04	2.88E-06	6.97E-05	4.47E-06	3.64E-06	-3.92E-08
ADP-fossil resources	MJ	4.01E+03	7.63E+01	3.05E+02	1.63E+02	5.62E+01	-2.15E+01
Water use ⁵⁾	m ³ eq depr.	2.21E+03	2.05E-01	1.50E+00	4.07E-01	1.62E-01	-2.66E+00

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.

2) The OneClickLCA tool uses global characterisation factors for WDP and does not use the regionalised Australian catchment level data.

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

Impact category	Unit	A1-A3	C1	C2	C3	C4	D
Particulate matter	Incidence	1.62E-05	1.58E-06	1.74E-06	1.83E-05	3,70E-07	-1,77E-08
Ionizing radiation ⁶⁾	kBq U235	4.74E-01	3.51E-01	3.86E-01	7.22E-02	3,53E-02	0,00E+00
Ecotoxicity (freshwater)	CTUe	2.24E+03	4.59E+01	3.96E+01	8.97E+00	4,72E+00	-1,70E+01
Human toxicity, cancer	CTUh	9.51E-08	1.76E-09	3.67E-09	1.28E-09	4,22E-10	-2,44E-10
Human tox. non-cancer	CTUh	4.30E-06	3.32E-08	1.92E-07	2.03E-08	9,70E-09	-1,05E-08
SQP ⁷⁾	-	1.48E+03	9.92E+00	1.93E+02	1.14E+01	1,11E+02	-6,46E+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.

END OF LIFE – WASTE

Impact category	Unit	A1-A3	C1	C2	C3	C4	D
Renew. PER as energy ⁸⁾	MJ	1.28E+02	4.36E-01	5.24E+00	1.03E+00	5.43E-01	-2.87E+00
Renew. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renew. PER	MJ	1.28E+02	4.36E-01	5.24E+00	1.03E+00	5.43E-01	-2.87E+00
Non-re. PER as energy	MJ	4.11E+03	7.63E+01	3.05E+02	1.63E+02	5.62E+01	-2.15E+01
Non-re. PER as material	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-re. PER	MJ	4.11E+03	7.63E+01	3.05E+02	1.63E+02	5.62E+01	-2.15E+01
Secondary materials	kg	1.30E+02	2.99E-02	1.39E-01	6.77E-02	1.41E-02	-2.03E+00
Renew. secondary fuels	MJ	9.35E-04	9.76E-05	1.75E-03	1.77E-04	2.93E-04	0.00E+00
Non-ren. secondary fuels	MJ	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	2.87E+00	4.63E-03	4.14E-02	1.08E-02	5.85E-02	-6.65E-02

8) PER = Primary energy resources

ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Impact category	Unit	A1-A3	C1	C2	C3	C4	D
Hazardous waste	kg	1.07E+00	1.02E-01	4.37E-01	1.81E-01	6.21E-02	-3.66E-10
Non-hazardous waste	kg	9.60E+03	7.18E-01	9.18E+00	2.47E+00	3.67E+02	-1.16E-01
Radioactive waste	kg	3.84E-03	5.37E-04	9.60E-05	1.77E-05	8.62E-06	-1.73E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	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
Materials for recycling	kg	1.60E-02	0.00E+00	0.00E+00	2.03E+03	0.00E+00	0.00E+00
Materials for energy rec	kg	4.12E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy	MJ	1.95E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

ENVIRONMENTAL IMPACTS – GWP-GHG - THE INTERNATIONAL EPD SYSTEM

Impact category	Unit	A1-A3	C1	C2	C3	C4	D
GWP-GHG ¹⁰⁾	kg CO ₂ eq	3.39E+02	5.67E+00	2.16E+01	1.25E+01	2.29E+00	-1.61E+00

10) This indicator includes all greenhouse gases excluding biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product as defined by IPCC AR 5 (IPCC 2013). In addition, the characterisation factors for the flows - CH₄ fossil, CH₄ biogenic and Dinitrogen monoxide - were updated in line with the guidance of IES PCR 1.3.4 Annex 1. This indicator is identical to the GWP-total of EN 15804:2012+A2:2019 except that the characterization factor for biogenic CO₂ is set to zero.

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD Classification	Indicator	Disclaimer
ILCD Type 1	GWP	None
	ODP	None
	PM	None
ILCD Type 2	AP	None
	EP-Freshwater	None
	EP-Marine	None
	EP-Terrestrial	None
	POCP	None
	IRP	1

ILCD Type 3	ADP-Minerals&Metals	2
	ADP-Fossil	2
	WDP	2
	ETP-fw	2
	HTP-c	2
	HTP-nc	2
	SQP	2
Disclaimer 1 – 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.		
Disclaimer 2 – The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experience with this indicator.		

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Value
Electricity data source and quality	Sourced from retail bill and on site meter readings
Electricity CO _{2e} / kWh	1.08 kg CO _{2e} / kWh

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The LCA and EPD have been created using the One Click LCA Pre-verified EPD Generator, tool version 0.22.12, One Click LCA Ltd, approved 2024-01-05

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