

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025 / ISO 21930

Owner of declaration	Remei Baltica OÜ
Program operator	The Building Information Foundation RTS sr
Declaration number	RTS_254_23
Publishing date	20.09.2023
EPD valid until	20.09.2028

CONCRETE ADMIXTURES



LCA SUPPORT



GENERAL INFORMATION

The EPD owner has the sole ownership, liability, and responsibility for the EPD. Construction products EPDs may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

EPDs within the same product category but from different programmes may not be comparable.

EPD program operator

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Publishing date 20.09.2023

Valid until

20.09.2028

Product category rules

The CEN standard EN 15804 serves as the core PCR. In addition, the RTS PCR (English version, 26.8.2020) is used.

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Verification date

8 September 2023

Independent verification of this EPD and data, according to ISO 14025:2010:

Internal External

Manufacturer

Remei Baltica OÜ

Address

Golfitee 74, Vaida, Estonia

Contact details

info@remei.ee

Website

www.remei.com

Remei Baltica OÜ is supplying concrete industry with various products. For instance; Concrete colours, admixtures, surface protections, release agents and many others.

Place of production

Estonia

Products

Concrete admixtures

Declared unit

kg

Mass of declared unit

1 kg

Data period

2022

PRODUCT INFORMATION

Product name	Concrete admixtures (plasticizers, superplasticizer, water retaining admixtures, accelerator, air-entraining admixtures, water proofer, retarder)
Place of production	Estonia

PRODUCT DESCRIPTION AND APPLICATION

Concrete admixtures are natural or manufactured chemicals or additives added during concrete mixing to enhance specific properties of the fresh or hardened concrete, such as workability, durability, or early and final strength.

TECHNICAL SPECIFICATIONS AND PRODUCT STANDARDS

Density 1.00-1.60 g/ml

Product standards: EN 12878:2005+AG:2006 (concrete admixtures)

Further information can be found at www.remei.com

PRODUCT RAW MATERIAL COMPOSITION PER DECLARED UNIT

Raw material category	Amount, mass- % and material origin*
Metals	-
Minerals	0-60%, Europe
Fossil materials	0-40%, Europe
Bio-based materials	0-10%, Europe

Product components	Amount, mass-%*	Material origin	Post-consumer recycled material, mass-%
Chemical substances	5-60%	EU and non-EU	0%
Water	40-95%	EU	-

* Order of magnitude, not exact composition

The product or the packaging does not contain any biogenic carbon.

Biogenic carbon content in product	0 kg
Biogenic carbon content in packaging	0 kg

Note. 1 kg biogenic carbon is equivalent to 44/12 kg of biogenic CO₂.

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0.1 % (1000 ppm).

PRODUCT LIFE-CYCLE AND LIFE-CYCLE ASSESSMENT

Period for data	2022
Declared unit	kg
Mass per declared unit	1 kg
Mass of packaging	0.063 kg

The declared product is the worst-case scenario of several variations in all impact categories. The product is used in very small quantities in final concrete products and plays a minor role in the total impacts.

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 do not exceed 5% of energy usage or mass. Cut-off has been applied to raw material packaging waste and chemicals used for water softening and preservatives.

Co-product allocation has not been used.

The data sources for the study are Ecoinvent 3.8 (2021) and One Click LCA databases. The tools used for the study were One Click LCA and Open LCA.

SYSTEM BOUNDARY

The scope of the EPD is cradle to gate with options (A1-A4).

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	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND
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

Modules not declared = MND. Modules not relevant = MNR.

MANUFACTURING AND PACKAGING (A1-A3)

Concrete admixtures are manufactured by making different chemical mixtures in water solution.

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.

Vehicle capacity utilization volume factor is assumed to be 1, which means full load. In reality, it may vary but as role of transportation emission in total results is small and so the variety in load is assumed to be negligible. Empty returns are not taken into account as it is assumed that return trip is used by transportation company to serve the needs of other clients.

Fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. All fuel and energy use was allocated based on production volume. The electricity used in the plant is grid energy and this has been modelled based on Estonian residual mix for 2020-2022. The study also considers the material losses occurring during the manufacturing processes as well as losses during electricity transmission.

Concrete admixtures are packaged in 1000 L intermediate bulk containers, which are reused at least 10 times.

Electricity data source and quality	Modelled electricity based on Estonian residual mix for 2020-2022
Specific emissions	0.64 kg CO ₂ e/kWh

TRANSPORT AND INSTALLATION (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions.

The transportation distance is defined according to RTS PCR - from the place of manufacture to Helsinki, Finland. According to the manufacturer, transportation doesn't cause losses as products are packaged properly. The final product is transported 120 km (45 km by lorry and 75 km ferry). Vehicle capacity utilization volume factor is assumed to be 1.

Vehicle type used for transport and distance	120 km (45 km by lorry and 75 km ferry)
Specific transport emissions	0.13 kg CO2 per tkm
Capacity utilisation (including empty returns)	100%
Density	1.00-2.00 g/ml
Volume capacity utilisation factor	1

A5 has not been declared.

PRODUCT USE AND MAINTENANCE (B1-B7)

This EPD does not cover the use phase.

Air, soil, and water impacts during the use phase have not been studied.

PRODUCT END OF LIFE (C1-C4, D)

EOL has not been declared. The Products meet the criteria set out in 5.2 of EN 15804. The products are physically integrated with other products during installation so they cannot be physically separated from the at end of life.

End of life scenarios for the products can be found in EPD for concrete.

BIBLIOGRAPHY

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.

ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services

Ecoinvent database v3.8 (2021) and One Click LCA database.

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CONCRETE ADMIXTURES

ENVIRONMENTAL IMPACTS - CORE INDICATORS, EN 15804+A2, PEF

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global warming potential - total	kg CO ₂ e	2.61E+00	1.69E-02	MND	MND	MND	MND	MND
Global warming potential - fossil	kg CO ₂ e	2.58E+00	1.69E-02	MND	MND	MND	MND	MND
Global warming potential - biogenic	kg CO ₂ e	3.05E-02	6.27E-06	MND	MND	MND	MND	MND
Global warming potential - LULUC	kg CO ₂ e	1.77E-01	8.85E-06	MND	MND	MND	MND	MND
Ozone depletion pot.	kg CFC ₁₁ e	2.52E-04	3.57E-09	MND	MND	MND	MND	MND
Acidification potential	mol H ⁺ e	1.56E-02	3.19E-04	MND	MND	MND	MND	MND
Eutrophication potential - freshwater	kg Pe	5.19E-05	8.61E-08	MND	MND	MND	MND	MND
Eutrophication potential - marine	kg Ne	2.89E-03	8.13E-05	MND	MND	MND	MND	MND
Eutrophication potential - terrestrial	mol Ne	3.20E-02	9.03E-04	MND	MND	MND	MND	MND
Photochemical ozone formation ("smog")	kg NMVOCe	9.81E-03	2.40E-04	MND	MND	MND	MND	MND
Abiotic depletion potential - minerals & metals	kg Sbe	3.21E-05	3.94E-08	MND	MND	MND	MND	MND
Abiotic depletion potential - fossil resources	MJ	2.94E+01	2.28E-01	MND	MND	MND	MND	MND
Water use	m ³ e depr.	6.84E-01	8.29E-04	MND	MND	MND	MND	MND

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.

USE OF NATURAL RESOURCES

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Renewable PER as energy	MJ	3.95E+00	2.38E-03	MND	MND	MND	MND	MND
Renewable PER as material	MJ	1.66E+00	0.00E+00	MND	MND	MND	MND	MND
Total use of renewable PER	MJ	4.10E+00	2.38E-03	MND	MND	MND	MND	MND
Non-renewable PER as energy	MJ	2.44E+01	2.28E-01	MND	MND	MND	MND	MND
Non-renewable PER as material	MJ	6.20E+00	0.00E+00	MND	MND	MND	MND	MND
Total use of non-renewable PER	MJ	2.94E+01	2.28E-01	MND	MND	MND	MND	MND
Secondary materials	kg	6.97E-03	8.52E-05	MND	MND	MND	MND	MND
Renewable secondary fuels	MJ	3.80E-04	5.63E-07	MND	MND	MND	MND	MND
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	MND	MND	MND	MND	MND
Use of net fresh water	m ³	1.75E-02	2.14E-05	MND	MND	MND	MND	MND

PER = Primary energy resources

END OF LIFE - WASTE

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	1.00E-01	2.70E-04	MND	MND	MND	MND	MND
Non-hazardous waste	kg	2.21E+00	3.46E-03	MND	MND	MND	MND	MND
Radioactive waste	kg	4.54E-05	1.60E-06	MND	MND	MND	MND	MND

END OF LIFE - OUTPUT FLOWS

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	MND	MND	MND	MND	MND
Materials for recycling	kg	0.00E+00	0.00E+00	MND	MND	MND	MND	MND
Materials for energy rec	kg	0.00E+00	0.00E+00	MND	MND	MND	MND	MND
Exported energy	MJ	0.00E+00	0.00E+00	MND	MND	MND	MND	MND

ENVIRONMENTAL IMPACTS - EN 15804+A1, CML / ISO 21930

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
Global Warming Potential	kg CO ₂ e	2.45E+00	1.64E-02	MND	MND	MND	MND	MND
Ozone depletion Potential	kg CFC ₁₁ e	3.36E-04	2.79E-09	MND	MND	MND	MND	MND
Acidification	kg SO ₂ e	1.27E-02	2.56E-04	MND	MND	MND	MND	MND
Eutrophication	kg PO ₄ ³ e	5.76E-03	3.13E-05	MND	MND	MND	MND	MND
POCP ("smog")	kg C ₂ H ₄ e	7.37E-04	6.83E-06	MND	MND	MND	MND	MND
ADP-elements	kg Sbe	3.21E-05	3.81E-08	MND	MND	MND	MND	MND
ADP-fossil	MJ	2.94E+01	2.28E-01	MND	MND	MND	MND	MND

KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	A4	C1	C2	C3	C4	D
GWP - total	kg CO ₂ e	2.61E+00	1.69E-02	MND	MND	MND	MND	MND
GWP - fossil	kg CO ₂ e	2.58E+00	1.69E-02	MND	MND	MND	MND	MND
GWP - biogenic	kg CO ₂ e	3.05E-02	6.27E-06	MND	MND	MND	MND	MND
ADP-minerals & metals	kg Sbe	3.21E-05	3.94E-08	MND	MND	MND	MND	MND
ADP-fossil	MJ	2.94E+01	2.28E-01	MND	MND	MND	MND	MND
Water use	m ³ e depr.	6.84E-01	8.29E-04	MND	MND	MND	MND	MND
Secondary materials	kg	6.97E-03	8.52E-05	MND	MND	MND	MND	MND
Biogenic C in product (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A
Biogenic C in packaging (A3)	kg C	0.00E+00	N/A	N/A	N/A	N/A	N/A	N/A