ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Aggregates from Zakłady Produkcji Kruszyw Rupińscy Spółka Jawna

Programme operator	The Building Information Foundation RTS sr
EPD number	RTS_331_24
Publishing date	30.10.2024
EPD valid until	30.10.2029

GENERAL INFORMATION

MANUFACTURER INFORMATION

Manufacturer	Zakłady Produkcji Kruszyw Rupińscy Spółka Jawna
Address	ZG Osowa, Osowa, Suwałki, Poland
Contact details	biuro@zpkszumowo.pl
Website	https://zpkszumowo.pl/

PRODUCT IDENTIFICATION

Product name	Product 1 – crushed aggregate of post-glacial origin with continuous grain size 0-32 mm C 90/3 Product 2 – natural aggregate of post-glacial origin with continuous grain size 0-16 mm
Place(s) of production	ZG Osowa, Osowa, Suwałki, Poland
CPC code	15310, 15320

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EPD INFORMATION

EPD program operator	The Building Information Foundation RTS sr
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
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.
EPD author	Urtė Misiūnaitė, UAB Vesta Consulting
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐ Internal verification ☒ External verification
Verification date	
EPD verifier	Mari Kirss, Rangi Maja OÜ
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PRODUCT INFORMATION

PRODUCT DESCRIPTION

This study covers aggregates of post-glacial origin, excavated from quarry ZG Osowa located in Suwalki, Poland.

- Product 1 – crushed aggregate with continuous grain size 0-32 mm C 90/3

  Simplified process description: the product is extracted from the ground or wall using a loader, then poured into a screener for sorting the material in order to obtain coarse & medium stone, which is crushed in two stages in the further part of the process, after crushing the semi-finished product is mixed with sand to the established parameters of final product (detailed description of the process can be found in the section MANUFACTURING PROCESS).

- Product 2 – natural aggregate with continuous grain size 0-16 mm

  Simplified process description: the product is extracted from the ground or wall using a loader, then poured into a screener for sorting the material according to the established parameters of final product (detailed description of the process can be found in the section MANUFACTURING PROCESS).

PRODUCT APPLICATION

Aggregates can be used for different purposes, however aggregates included in this study are used in projects involving the construction of roads as structural layers of the road body.

PRODUCT STANDARDS

Products have CE and DWU marking and are compliant with the EU New Approach Directives. Aggregates are produced in accordance with European standards, which define all requirements for the product: EN 13242, LST EN13285.

ADDITIONAL TECHNICAL INFORMATION

Further information can be found at https://zpkszumowo.pl/

ABOUT MANUFACTURER

The company Zakłady Produkcji Kruszyw Rupińscy Spółka Jawna was established in 1995 in Poland. The basic scope of the company's activity is the extraction, production and sale of natural aggregates, which are used in production of concrete, prefabricated elements, production of mineral-asphalt mixtures and in the implementation of infrastructure investments, mainly road construction/reconstruction. Through its subsidiaries, the company is dynamically developing in the market of concrete production, precast concrete products and road construction services.

PRODUCT RAW MATERIAL COMPOSITION

Product and Packaging Material	Weight, kg		Post-consumer material, weight-%	Biogenic material, weight-%	Biogenic material, kg C/DU
	Product 1	Product 2			
Gravel and sand	1000	1000	0	0	0

PRODUCT RAW MATERIAL MAIN COMPOSITION

Raw material category	Amount, mass- %	Material origin
Metals	0	-
Minerals	100	PL
Fossil materials	0	-
Bio-based materials	0	-

SUBSTANCES, REACH - VERY HIGH CONCERN

The product does not contain any REACH SVHC substances in amounts greater than 0,1 % (1000 ppm).

BIOGENIC CARBON CONTENT

The product and do not have biogenic carbon content.

PRODUCT LIFE-CYCLE

MANUFACTURING AND PACKAGING (A1-A3)

A1: This module considers the extraction and processing of raw materials.

A2: The raw materials are transported to the production site. In this case the model includes transportation by wheel loaders or conveyor belts.

A3: This module includes the manufacture of products. It has considered all the energy consumption needed for production processes.

MANUFACTURING PROCESS

This EPD covers Product 1 and Product 2 operations of aggregate production.

The manufacturing process of **Product 1** follows:

- Excavation (using wheel loaders, excavators)
- Primary sorting (using feed hopper with grate, vibrating screener, conveyor belts)
- Preliminary crushing (using mobile crusher)
- Proper crushing (using impact crusher, feed hopper with grate, vibrating screener)
- Process of mixing semi-products (using a loader)
- Internal transport (using wheel loaders and trucks)

The manufacturing process of **Product 2** follows:

- Excavation (using wheel loaders, excavators)
- Primary sorting (using feed hopper with grate, vibrating screener, conveyor belts)
- Internal transport (using wheel loaders and trucks)

Overburden removal is excluded from the calculations, as this process was completed more than 20 years ago.

TRANSPORT AND INSTALLATION (A4-A5)

This EPD does not cover the transport and installation stage. The GWP (global warming potential) of A4 stage is less than 20% of the GWP of modules A1–A3 and less than 1000 km, so it is not mandatory to declare.

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)

This EPD does not cover the end of life phase. The examples of end of life procedures could be found in EPD for precast concrete elements where aggregates has been used as raw material.

MANUFACTURING PROCESS

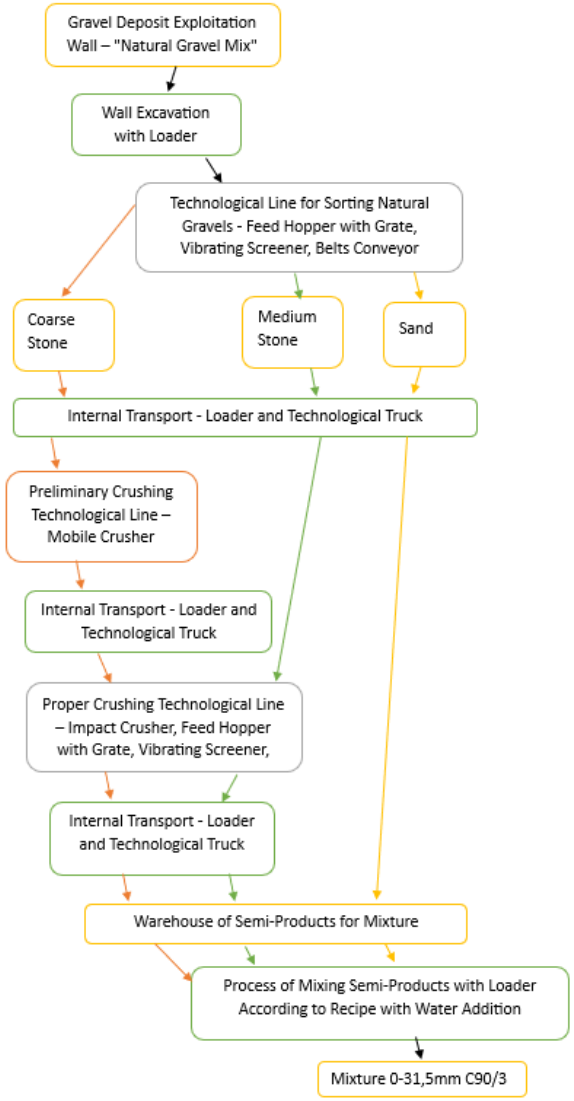

Figure 1. The manufacturing process diagram of Product 1.

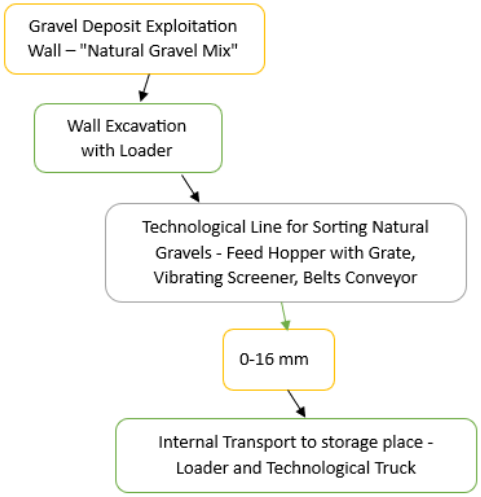

Figure 2. The manufacturing process diagram of Product 2.

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2023

DECLARED AND FUNCTIONAL UNIT

Declared unit	1 tonne of product
Mass per declared unit	1000 kg

SYSTEM BOUNDARY

This EPD covers the cradle to gate scope with following modules: A1 (Raw material supply), A2 (Transport), and A3 (Manufacturing). No modules C1 (Deconstruction), C2 (Transport at end-of-life), C3 (Waste processing), C4 (Disposal) and D - benefits and loads beyond the system boundary are declared as product falls under exemption of 5.2 statement of EN 15804.

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	MND	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	Deconstr./demol.	Transport	Waste processing	Disposal	Reuse	Recovery	Recycling

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

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.

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 allocations in the Ecoinvent 3.8 datasets used in this study follow the Ecoinvent system model ‘Allocation, cut-off, EN15804’.

ENVIRONMENTAL IMPACT DATA

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.

CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

Impact category	Unit	A1-A3	
		Product 1	Product 2
GWP – total[1)]	kg CO_2e	3,44E+00	9,86E-01
GWP – fossil	kg CO_2e	3,44E+00	9,86E-01
GWP – biogenic	kg CO_2e	0,00E+00	0,00E+00
GWP – LULUC	kg CO_2e	3,54E-04	9,81E-05
Ozone depletion pot.	kg CFC_{-11}e	5,00E-07	2,11E-07
Acidification potential	mol H^+e	3,51E-02	1,02E-02
EP-freshwater[2)]	kg Pe	9,43E-06	3,26E-06
EP-marine	kg Ne	1,18E-02	4,53E-03
EP-terrestrial	mol Ne	1,30E-01	4,97E-02
POCP (“smog”)	kg NMVOCe	3,57E-02	1,37E-02
ADP-minerals & metals	kg Sbe	3,06E-06	5,00E-07
ADP-fossil resources	MJ	3,07E+01	1,33E+01
Water use[3)]	m^3e depr.	2,22E-01	3,56E-02

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.

Reading example: 9.00e-03 = 9.0*10-3 = 0.009

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

Impact category	Unit	A1-A3	
		Product 1	Product 2
Particulate matter	Incidence	6,43E-07	2,74E-07
Ionizing radiation[4)]	kBq U235e	1,49E-01	6,09E-02
Ecotoxicity (freshwater)	CTUe	3,11E+01	7,97E+00
Human toxicity, cancer	CTUh	8,57E-10	3,05E-10
Human tox. non-cancer	CTUh	2,10E-08	5,76E-09
SQP[5)]	-	1,08E+01	1,72E+00

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	
		Product 1	Product 2
Renew. PER as energy[6)]	MJ	2,61E+00	7,58E-02
Renew. PER as material	MJ	0,00E+00	0,00E+00
Total use of renew. PER	MJ	2,61E+00	7,58E-02
Non-re. PER as energy	MJ	4,25E+01	1,33E+01
Non-re. PER as material	MJ	0,00E+00	0,00E+00
Total use of non-re. PER	MJ	4,25E+01	1,33E+01
Secondary materials	kg	1,26E-02	5,19E-03
Renew. secondary fuels	MJ	5,79E-05	1,70E-05
Non-ren. secondary fuels	MJ	0,00E+00	0,00E+00
Use of net fresh water	m3	6,79E-03	8,05E-04

8) PER = Primary energy resources

END OF LIFE – WASTE

Impact category	Unit	A1-A3	
		Product 1	Product 2
Hazardous waste	kg	1,08E-01	1,77E-02
Non-hazardous waste	kg	3,19E+00	1,25E-01
Radioactive waste	kg	2,19E-04	9,33E-05

END OF LIFE – OUTPUT FLOWS

Impact category	Unit	A1-A3	
		Product 1	Product 2
Components for re-use	kg	0,00E+00	0,00E+00
Materials for recycling	kg	0,00E+00	0,00E+00
Materials for energy rec	kg	0,00E+00	0,00E+00
Exported energy	MJ	0,00E+00	0,00E+00

KEY INFORMATION TABLE (RTS) – KEY INFORMATION PER KG OF PRODUCT

Impact category	Unit	A1-A3	
		Product 1	Product 2
GWP – total	kg CO_2e	3,43E-03	9,86E-04
ADP-minerals & metals	kg Sbe	4,98E-09	4,92E-10
ADP-fossil	MJ	4,25E-02	1,33E-02
Water use	m^3e depr.	2,22E-04	3,56E-05
Secondary materials	kg	1,26E-05	5,19E-06
Biog. C in product[7)]	kg C	0,00E+00	0,00E+00
Biog. C in packaging	kg C	0,00E+00	0,00E+00

9) Biog. C in product = Biogenic carbon content in product

SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

Scenario parameter	Energy type	Data source	Value, kg CO2e / kWh
Electricity, Poland (specific electricity mixes based on AIB)	Residual mix	LCA study for country specific residual electricity mixes based on AIB 2022 and calculated by One Click LCA, OneClickLCA 2023	0.95
Electricity production, photovoltaic, 570kWp open ground installation, multi-Si	Consumption of electricity produced by own solar panels	Ecoinvent 3.8 Year 2021	0.0789

Fuel scenario documentation

Scenario parameter	Comment	Data source	Value, kg CO2e / kWh
Market for diesel, burned in building machine	Used for extraction of aggregates, aggregate sorting, crushing stones, mixing semi-products, internal transportation	Ecoinvent 3.8 Year 2021	0.0919

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.

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

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

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

RTS PCR (English version, 26.8.2020)

EPD AUTHOR AND CONTRIBUTORS

Manufacturer	Zakłady Produkcji Kruszyw Rupińscy Spółka Jawna
EPD author	Urtė Misiūnaitė, UAB Vesta Consulting
EPD verifier	Mari Kirss, Rangi Maja OÜ
EPD program operator	The Building Information Foundation RTS sr
Background data	This EPD is based on Zakłady Produkcji Kruszyw Rupińscy Spółka Jawna LCA background report, Ecoinvent 3.8 (Allocation, cut-off, EN15804) and One Click LCA databases.
LCA software	The LCA and EPD have been created using One Click LCA tool. EF 3.0