ENVIRONMENTAL PRODUCT DECLARATION

No. 02-04/2024

Sand and Gravel

P.P.H.U Eurokrusz Sp. z o.o.

Declaration owner:	*P.P.H.U Eurokrusz Sp. z o.o.*
Program Owner:	*Łukasiewicz Research Network – Institute of Ceramics and Building Materials* *Environmental Engineering Center*
Program Name	*Environmental Product Declarations – B2B*
Release Date:	***19.04.2024***
Declaration valid until	***19.04.2029***

Łukasiewicz
Institute of Ceramics
and Building Materials

ENVIRONMENTAL PRODUCT DECLARATION
No. 02-04/2024

EUROKRUSZ

1. OVERVIEW

Declaration owner: P.P.H.U Eurokrusz Sp. z o.o.	**Products covered by the declaration:** Washed sand and gravel Dried sand and gravel
Program Owner: *Łukasiewicz Research Network – Institute of Ceramics and Building Materials* *Environmental Engineering Center*in Opole. **http://www.icimb.pl/opole/**	**Declaration owner:** P.P.H.U Eurokrusz Sp. z o.o. Dąbrowa 26A 26-420 Nowe Miasto nad Pilicą Phone: +48 678 39 84; 510 034 425 Address: Email: eurokrusz@eurokrusz.pl **https:** eurokrusz.pl/
Date of issue: 19.04.2024	**Declared Product/Declared Unit:** The declared unit (DU) for the products in question is **1 kg** of washed and dried sand and gravel
Declaration valid until: 19.04.2029	**Scope:** The declaration covers the following products: **Washed sand and gravel** **Dried sand and gravel** manufactured at P.P.H.U Eurokrusz Sp. z o.o. Dąbrowa 26A 26-420 Nowe Miasto nad Pilicą It contains information on the environmental impact of the declared products. All data on the production cycle were collected by P.P.H.U Eurokrusz Sp. z o.o. from 01.01.2022 to 31.12.2022 (12 months) and correspond to the production technology of the time. These are average data for the total production of sand and gravel produced at the production plant of P.P.H.U Eurokrusz Sp. z o.o. Dąbrowa 26A, 26-420 Nowe Miasto nad Pilicą. The Life Cycle Assessment has been developed in accordance with the requirements of PN-EN ISO 15804+A2:2020, PN-EN ISO 14025 and PN-EN ISO 14040. The rules for product categorization have been adopted in accordance with the PN-EN 15804 standard. The owner of the declaration is responsible for the underlying information and evidence. The Łukasiewicz Research Network - Institute of Ceramics and Building Materials of the Centre for Environmental Engineering in Opole is not responsible for the manufacturer's information as well as data and evidence regarding the life cycle assessment. Declarations that are the result of different programs or that are not made in accordance with the standard may not be comparable.

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Product Categorization (PCR) Rules	According to the standard: PN-EN 15804+A2:2020-03 Sustainability of construction works. Environmental Product Declarations. Basic principles of categorization of construction products.
Representativeness:	Polish product, year 2022
Declared durability:	Lifetime service life
Reasons for performing LCA:	B2B
Life Cycle Analysis (LCA):	The LCA analysis includes modules A1-A3, C1-C4 and D according to PN-EN 15804+A2 (Cradle-to-Gate with options)

The Łukasiewicz Research Network – Institute of Ceramics and Building Materials Environmental Engineering Center provides access to the Type III environmental declaration for sand and gravel of P.P.H.U Eurokrusz Sp. z o.o. to interested parties.

Authors' team:

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Director of the Center for Environmental Engineering

Ewa Głodek-Bucyk, Ph.D.

Leader of the Process Engineering Research Group

Review:

CEN standard PN-EN 15804+A2 serves as the main PCR document.
Independent verification of declarations and data according to EN ISO 14025:2010

☐ Internal ☒ External

Katarzyna Grzesik, PhD, DSc

2. MANUFACTURER & PRODUCT INFORMATION

Our company is a mine of natural aggregates with a long tradition. We have been present on the mining market since 2000. For years, the unit has been operating in the extraction and production of natural aggregates used in the construction sector. Our quartz litters are also used as drainage filters.
Our greatest asset is our excellent knowledge of the industry, as well as excellent technical facilities, thanks to which we efficiently and quickly carry out mining works and ensure the transport of our products throughout the country.

In 2007, we built and launched a technological line for drying and sorting quartz sands - used mainly in the production of construction chemicals, as well as in the renovation of bridge structures, cleaning of bricks and old buildings.
The quality of the deposit and our products has been confirmed by tests carried out every year at the Łukasiewicz Research Network – Institute of Ceramics and Building Materials in Krakow.
All products comply with the applicable standards:

- PN-EN 12620+A1:2010 – Aggregates for concrete
- PN-EN 13139:2003 – Aggregates for mortars
- PN-EN 13043:2004 – Aggregates for bituminous mixtures and surface curations used on roads, airports and other surfaces intended for traffic
- PN-EN 13242+A1:2010 – Aggregates for hydraulically bound and non-hydraulically bound materials used in construction and road construction.

In addition, the typical sand we produce with a granulation of 0/2 mm can be used as sand for sandpits, playgrounds and as a filling for outdoor sports surfaces – IT HAS A HYGIENIC CERTIFICATE (B-BK-60211-0285/21).
In addition, in order to maintain the stable quality of our products, we conduct laboratory control at the plant.

The group of products covered by the declaration is:

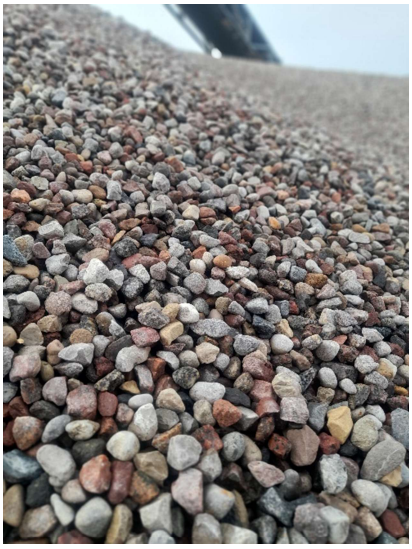
- Washed sand and gravel
- Dried sand and gravel

Table 1. Classification of sand and gravel fractions according to the assortment of P.P.H.U Eurokrusz Sp. z o.o.

Material	Fraction size [mm]	
Aggregate	-	

Dried sand	**1,4-2,0**	
Dried sand	**0,5-1,4**	
Dried sand	**0,1-0,5**	
Washed sand	**0,0-0,5**	

Washed sand	0,0-2	
Washed gravel	1-3	
Washed gravel	2-8	

Washed gravel	**8-16**	

The technology of obtaining sand and gravel consists in collecting the excavated material (after the excavation) from the deposit with the use of mechanical equipment – excavators, which load the obtained raw material onto a hopper. Then, by means of conveyor belts, the material goes to the outgoing basket for water treatment, where the raw material is rinsed and sieved in order to separate it into individual fractions defined by gradation. 50% of the separated product is a ready-to-be transported product to the customer by trucks. The remaining 50% is loaded and transported to the dryer, where it is dumped onto the hopper and the material is dried. After the drying process, the product is sieved to separate it into individual fractions defined by gradation, and then stored in silos.

The technological diagram of the sand and gravel production process is shown below:

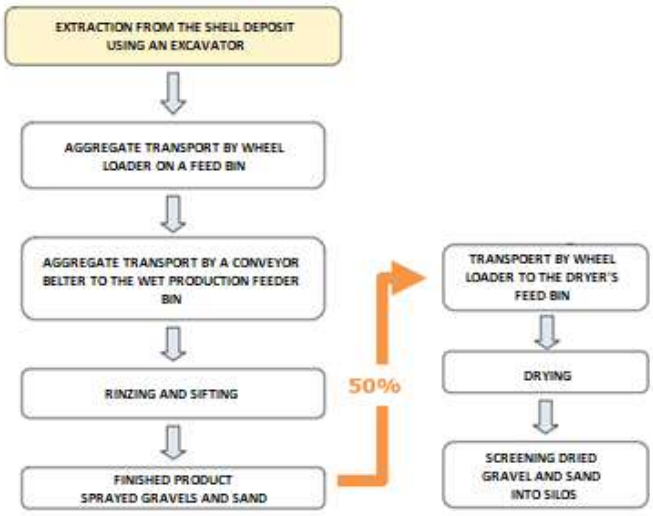
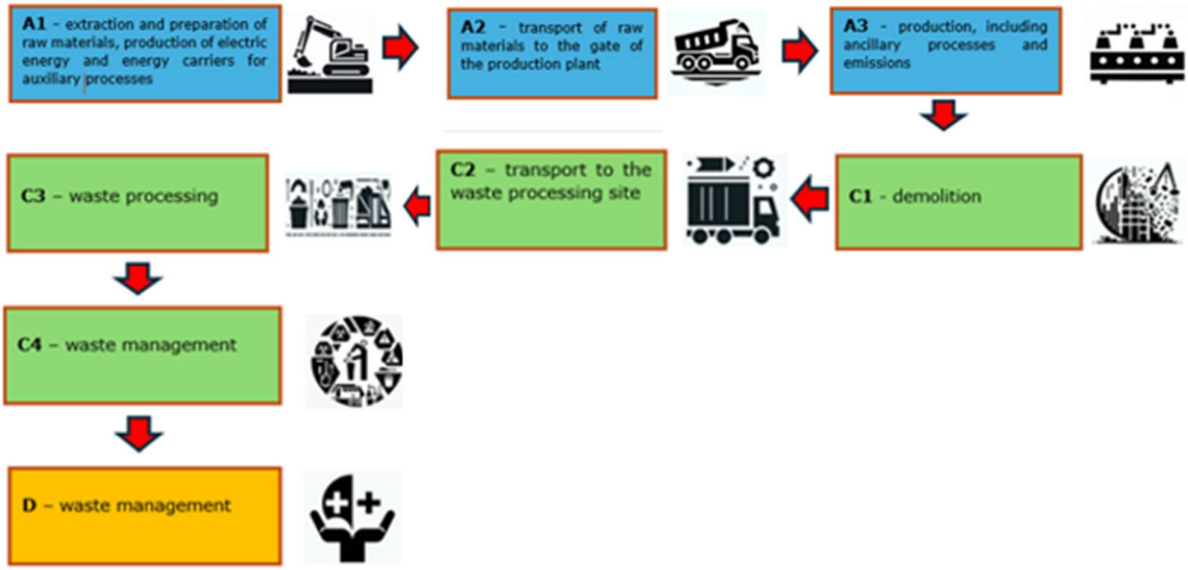


Figure 1: Sand and gravel production diagram at P.P.H.U. Eurokrusz Sp. z o.o.

3. LCA: SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

System Limitations

The life cycle analysis of the tested products includes modules A1-A3, C1-C4 and D (Cradle to Gate with options) in accordance with PN-EN 15804. It includes the following modules:



Duration of data collection

The data on the production process is from 2022 (period from 01.01.22 to 31.12.22).

Declared Unit (DU)

1 kg of product

Assumptions

A1 – extraction and consumption of raw materials,

A2 – transport to production,

A3 – CO_2, NO_x, SO_2 and other gases and dust emission values from the production process obtained as a result of estimation based on fuel consumption.

C1 – disassembly/demolition of the material. The data is collected based on the developed scenario.

C2 – it is assumed that pre-sorted demolition waste (construction rubble) is always transported to a waste recovery or disposal facility. The data is collected based on the developed scenario.

C3 – takes into account the environmental impact of the treatment of construction and demolition waste containing sands and gravels in a waste recovery facility. The data is collected based on the developed scenario.
C4 – takes into account the impact of stored construction debris containing sands and gravels. The data is collected based on the developed scenario.
D – refers to the impact and effects of the use of secondary material. It was assumed that the final product of the crushing process (crushed construction rubble) could be used as a building material for various purposes. The calculations are made based on the developed scenario.

Cut-off criteria

99% of all bulk streams involved in the production process were taken into account. All the energy used in the process was taken into account in the environmental declaration.

General data

The data for the calculations come from Ecoinvent v. 3.9.2 and KOBiZE. The emission factors for electricity were determined using the actual KOBiZE data. The applied emission factor of Polish electricity (Ecoinvent supplemented with current national data KOBiZE) is 0.685 kg CO2/kWh. A detailed analysis of data quality was part of an external audit.

Allocation

All data provided by the manufacturer have been referenced to the product's declared unit (DU) – 1 kg. The allocation rules used in this EPD are based on the general principles of ICIMB-PCR A.

4. LCA: SCENARIOS AND ADDITIONAL TECHNICAL INFORMATION

For the life cycle analysis of the products covered by the environmental statement in the field of "Cradle to gate with options", scenarios were developed for modules C1-C4 and D:

Module C1 - *Demolition/demolition* – according to the current state of the art, the dismantling of concrete structures that contain dried sand and gravel (aggregate constitutes 70% of the total weight of concrete) is carried out with the use of excavators equipped with a hammer.
Demolition works are carried out using an excavator with a hammer (30 l of fuel/m^3 of reinforced concrete) and a crusher (15 l of fuel/m^3 of reinforced concrete)
For washed sand and gravel, which is mainly used as a foundation for roads and for hardening the area, demolition/demolition is negligible.

Module C2 – *Transport* – transport of waste containing sand and gravel dried from demolition is directed to the recovery plant (recycling plant).
The following assumptions were made to calculate the impact of this module:

- 100% of the mass of waste is transported to the recovery plant as part of waste 17 01 01 or 17 01 02 (construction rubble),
- transport is carried out by means of self-unloading trucks with a load capacity of 16 – 32 tons, meeting the EURO 6 emission standards
- The material is transported to a waste treatment site located 50 km from the demolition site.

Module C3 - *Waste treatment*, e.g. collection of waste fractions from demolition and treatment of material streams for reuse, recycling and energy recovery. On the basis of national experience, it is assumed that construction rubble is valuable waste and can be recycled.
Therefore, the following processes were assumed for the calculations: unloading (loader), crushing (crusher).

The following were used for the calculations:

energy consumption	0,03	kWh/kg
Fuel	0,315	MJ/kg

Module C4 - It should take into account the impact of stored construction debris. In the developed scenario, mixed construction rubble waste containing dried and washed sand and gravel that has not been separated in the waste treatment process is landfilled. In the developed scenario, the amount of stored product was assumed to be at the level of 10%. The fraction of construction debris code 17 01 01 or 17 01 02 is not subject to landfill.

Module D - Reuse Potential- Benefits and burdens beyond system boundaries are taken into account. It was assumed that the final product of the crushing process (crushed construction rubble) could be used as a building material for various purposes. Processed sand and gravel can be used to create foundations, pavement substrates or used as asphalt additives. It can also be used as a filling for road construction or the creation of new areas

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5. LCA: RESULTS

The table below shows the LCA modules taken into account in the calculation of the environmental impact categories for the products covered by the declaration.

DESCRIPTION OF SYSTEM BOUNDARIES (X – INCLUDED IN LCA, MND – UNDECLARED MODULE)																
Production Stage			**Construction phase**		**Stage of use**							**End of Life Stage**				**Benefits and flows beyond system boundaries**
Mining & Sourcing in raw materials	Transport	Production	Transport	Construction Process	Usufruct	Maintenance	Repair	Exchange	Renovation	Energy consumption	Water consumption	Demolition	Transport	Waste Treatment	Waste management	Potential for reuse
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	**X**	**X**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**X**	**X**	**X**	**X**	**X**

The following tables present the results of the LCA analysis for washed sand and gravel as well as dried sand and gravel. Explanations of the abbreviations used to describe the impact categories are given below:

GWP-total	Total Global Warming Potential
GWP-fossil	Greenhouse Potential: Fossil Fuels
GWP-biogenic	Global Warming Potential: Biogenic
GWP-luluc	Global Warming Potential: Land Use and Conversion
A:	Stratospheric ozone depletion potential
AP	Acidification potential
EP-freshwater	Eutrophication potential of freshwater environments
EP-marine	Eutrophication potential of saltwater environments
EP-terrestial	Potential for eutrophication of terrestrial environments
POCP	Tropospheric ozone formation potential
ADP-minerals&metals	Potential for abiotic depletion of non-fossil fuels
ADP-fossil	Potential for abiotic depletion of fossil fuel feedstocks
WDP	Water deprivation potential (user),
PM	Potential incidence of diseases caused by particulate emissions
IRP	Ionising radiation (potential human exposure efficacy to U235)
ETP-fw	Potential Comparison Unit of Ecosystem Toxicity
HTP-c	Potential comparative unit toxic to humans, neoplastic diseases
HTP-nc	Potential comparative human toxic unit, non-cancer diseases

SQP	Indicator of potential soil quality
PERE	Consumption of renewable energy resources, excluding renewable energy resources used as raw material
PERMIAN	Consumption of renewable energy resources used as raw material
PERT	Total consumption of renewable, primary energy resources
PEN-RE	Consumption of non-renewable primary energy resources, excluding non-renewable primary energy resources used as feedstock
RE	Consumption of non-renewable energy resources used as raw material
PENRT	Total consumption of non-renewable, primary energy resources
SM	Consumption of secondary materials
RSF	Consumption of renewable alternative fuels
NRSF	Consumption of non-renewable alternative fuels
FW	Fresh water consumption

MAIN IMPACT INDICATORS: 1 kg of washed sand and gravel									
	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO2 eq.	0,00E+00	0,00E+00	6.69E-03	0,00E+00	0,00E+00	0,00E+00	2.83E-04	-2.11E-03
GWP-fossil	kg CO2 eq.	0,00E+00	0,00E+00	6.49E-03	0,00E+00	0,00E+00	0,00E+00	2.82E-04	-2.04E-03
GWP-biogenic	kg CO2 eq.	0,00E+00	0,00E+00	1.95E-04	0,00E+00	0,00E+00	0,00E+00	7.88E-07	-6.59E-05
GWP-luluc	kg CO2 eq.	0,00E+00	0,00E+00	4.22E-06	0,00E+00	0,00E+00	0,00E+00	3.73E-08	-1.06E-06
A:	kg CFC11 eq.	0,00E+00	0,00E+00	4.23E-11	0,00E+00	0,00E+00	0,00E+00	4.41E-12	-3.35E-11
AP	mol H+ eq.	0,00E+00	0,00E+00	3.99E-05	0,00E+00	0,00E+00	0,00E+00	2.51E-06	-1.69E-05
EP-freshwater	kg PO4 eq.	0,00E+00	0,00E+00	5.37E-06	0,00E+00	0,00E+00	0,00E+00	8.55E-09	-3.00E-07
EP-marine	kg N eq.	0,00E+00	0,00E+00	1.31E-05	0,00E+00	0,00E+00	0,00E+00	1.16E-06	-6.44E-06
EP-terrestrial	mol N eq.	0,00E+00	0,00E+00	1.32E-04	0,00E+00	0,00E+00	0,00E+00	1.26E-05	-7.42E-05
POCP	kg NMVOC eq.	0,00E+00	0,00E+00	3.87E-05	0,00E+00	0,00E+00	0,00E+00	3.74E-06	-2.14E-05
ADP-minerals & metals	kg Sb eq.	0,00E+00	0,00E+00	4.69E-09	0,00E+00	0,00E+00	0,00E+00	1.10E-10	-1.85E-08
ADP-fossil	MJ	0,00E+00	0,00E+00	7.30E-02	0,00E+00	0,00E+00	0,00E+00	3.61E-03	-3.18E-02
WDP	WDP (m3) world. EKW	0,00E+00	0,00E+00	2.60E-04	0,00E+00	0,00E+00	0,00E+00	7.96E-06	-1.88E-03
ADDITIONAL IMPACT INDICATORS: 1 kg washed sand and gravel									
	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidency	0,00E+00	0,00E+00	6.24E-10	0,00E+00	0,00E+00	0,00E+00	7.11E-11	-4.26E-10
IRP	kBq U235 eq.	0,00E+00	0,00E+00	5.04E-05	0,00E+00	0,00E+00	0,00E+00	2.14E-06	-5.14E-04
ETP-fw	CTUe	0,00E+00	0,00E+00	5.37E-06	0,00E+00	0,00E+00	0,00E+00	8.55E-09	-3.00E-07
HTP-c	CTUh	0,00E+00	0,00E+00	5.31E-13	0,00E+00	0,00E+00	0,00E+00	4.64E-14	-1.18E-12
HTP-nc	CTUh	0,00E+00	0,00E+00	1.51E-11	0,00E+00	0,00E+00	0,00E+00	1.42E-12	-1.74E-11
SQP	-	0,00E+00	0,00E+00	9.45E-03	0,00E+00	0,00E+00	0,00E+00	4.46E-03	-5.77E-02

INDICATORS DESCRIBING RESOURCE CONSUMPTION: 1 kg of washed sand and gravel									
	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	0,00E+00	0,00E+00	4.14E-03	0,00E+00	0,00E+00	0,00E+00	1.06E-04	-9.42E-03
PERMIAN	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
PERT	MJ	0,00E+00	0,00E+00	4.14E-03	0,00E+00	0,00E+00	0,00E+00	1.06E-04	-9.42E-03
PEN-RE	MJ	0,00E+00	0,00E+00	8.95E-02	0,00E+00	0,00E+00	0,00E+00	3.78E-03	-2.63E-02
RE	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
PENRT	MJ	0,00E+00	0,00E+00	8.95E-02	0,00E+00	0,00E+00	0,00E+00	3.78E-03	-2.63E-02
SM	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
RSF	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
NRSF	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
FW	m3	0,00E+00	0,00E+00	2.31E-03	0,00E+00	0,00E+00	0,00E+00	3.70E-04	2.48E-03

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 kg washed sand and gravel									
	Life Cycle Stage								
Indicator	**Unit (referenced to DU)**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Amount of hazardous waste	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of non-hazardous waste	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of radioactive waste	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Reusable components	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Recyclable Materials	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy Recovery Materials	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ/energy carrier	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

MAIN IMPACT INDICATORS: 1 kg dried sand and gravel									
	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO2 eq.	0,00E+00	0,00E+00	2.93E-02	4.98E-02	1.36E-02	5.67E-02	2.83E-04	-2.11E-03
GWP-fossil	kg CO2 eq.	0,00E+00	0,00E+00	2.92E-02	4.98E-02	1.35E-02	5.55E-02	2.82E-04	-2.04E-03
GWP-biogenic	kg CO2 eq.	0,00E+00	0,00E+00	1.20E-04	1.21E-05	1.27E-05	1.11E-03	7.88E-07	-6.59E-05
GWP-luluc	kg CO2 eq.	0,00E+00	0,00E+00	7.79E-06	5.50E-06	6.57E-06	2.59E-05	3.73E-08	-1.06E-06
A:	kg CFC11 eq.	0,00E+00	0,00E+00	5.30E-10	7.73E-10	2.87E-10	5.31E-10	4.41E-12	-3.35E-11
AP	mol H+ eq.	0,00E+00	0,00E+00	3.02E-02	4.51E-04	2.88E-05	3.96E-04	2.51E-06	-1.69E-05
EP-freshwater	kg PO4 eq.	0,00E+00	0,00E+00	3.89E-06	1.49E-06	9.38E-07	3.09E-05	8.55E-09	-3.00E-07
EP-marine	kg N eq.	0,00E+00	0,00E+00	1.69E-05	2.09E-04	7.28E-06	1.53E-04	1.16E-06	-6.44E-06
EP-terrestrial	mol N eq.	0,00E+00	0,00E+00	1.69E-04	2.27E-03	7.40E-05	1.60E-03	1.26E-05	-7.42E-05
POCP	kg NMVOC eq.	0,00E+00	0,00E+00	1.48E-03	6.73E-04	4.48E-05	4.73E-04	3.74E-06	-2.14E-05
ADP-minerals & metals	kg Sb eq.	0,00E+00	0,00E+00	5.79E-08	1.70E-08	4.31E-08	3.30E-08	1.10E-10	-1.85E-08
ADP-fossil	MJ	0,00E+00	0,00E+00	3.81E-01	6.37E-01	1.87E-01	6.53E-01	3.61E-03	-3.18E-02
WDP	WDP (m3) world. EKW	0,00E+00	0,00E+00	8.49E-04	1.41E-03	7.84E-04	2.03E-03	7.96E-06	-1.88E-03

ADDITIONAL IMPACT INDICATORS: 1 kg dried sand and gravel									
	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidency	0,00E+00	0,00E+00	1.39E-07	1.26E-08	9.83E-10	8.28E-09	7.11E-11	-4.26E-10
IRP	kBq U235 eq.	0,00E+00	0,00E+00	3.09E-04	3.02E-04	2.54E-04	3.99E-04	2.14E-06	-5.14E-04
ETP-fw	CTUe	0,00E+00	0,00E+00	3.89E-06	1.49E-06	9.38E-07	3.09E-05	8.55E-09	-3.00E-07
HTP-c	CTUh	0,00E+00	0,00E+00	3.10E-12	8.19E-12	3.15E-12	6.10E-12	4.64E-14	-1.18E-12
HTP-nc	CTUh	0,00E+00	0,00E+00	3.60E-11	2.42E-10	4.85E-11	1.77E-10	1.42E-12	-1.74E-11
SQP	-	0,00E+00	0,00E+00	2.53E-02	4.25E-02	1.13E-01	6.95E-02	4.46E-03	-5.77E-02
INDICATORS DESCRIBING RESOURCE CONSUMPTION: 1 kg dried sand and gravel									
	Life Cycle Stage								
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	0,00E+00	0,00E+00	6.56E-03	3.63E-03	2.95E-03	2.48E-02	1.06E-04	-9.42E-03
PERMIAN	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
PERT	MJ	0,00E+00	0,00E+00	6.56E-03	3.63E-03	2.95E-03	2.48E-02	1.06E-04	-9.42E-03
PEN-RE	MJ	0,00E+00	0,00E+00	4.18E-01	7.77E-02	1.96E-01	3.48E-01	3.78E-03	-2.63E-02
RE	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
PENRT	MJ	0,00E+00	0,00E+00	4.18E-01	0,00E+00	1.96E-01	3.48E-01	3.78E-03	-2.63E-02
SM	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
RSF	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
NRSF	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
FW	m3	0,00E+00	0,00E+00	5.68E-05	2.16E-05	2.97E-05	4.95E-04	1.26E-07	-4.58E-06
INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 kg dried sand and gravel									
	Life Cycle Stage								
Indicator	**Unit (referenced to DU)**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Amount of hazardous waste	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of non-hazardous waste	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Amount of radioactive waste	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Reusable components	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Recyclable Materials	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Energy Recovery Materials	Kg	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ/energy carrier	HV	HV	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

6. INTERPRETATION OF RESULTS

Figures 2 and 3 show graphs of the contributions of the individual life cycle modules to the basic impact categories for the product: *washed sand and gravel* and *dried sand and gravel.*

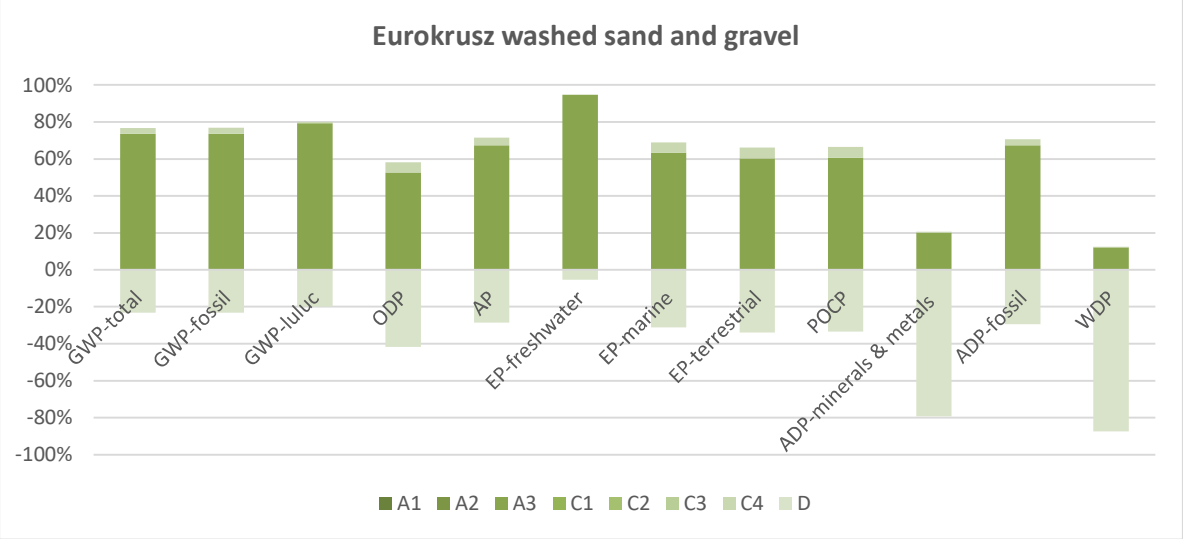

Figure. 2 Shares of life cycle modules on the main categories of influences – sand and washed gravel.

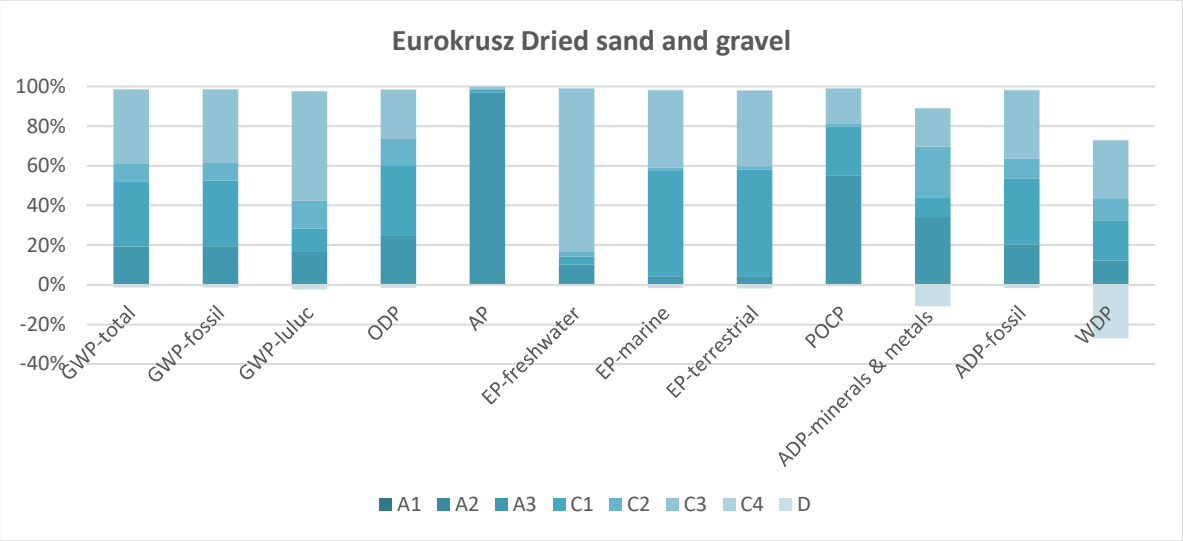

Figure. 3 Shares of life cycle modules for the main categories of impacts – sand and dried gravel.

LITERATURE

- ✓ PN-EN ISO 14025:2014-04, Environmental labels and declarations - Type III environmental declarations - Principles and procedures.
- ✓ PN-EN 15804+A2:2020, Sustainability of buildings - Environmental declarations of products - Basic principles of categorization of construction products.
- ✓ PN-EN ISO 14040:2009 Environmental Management. Life Cycle Assessment. Rules and structure.
- ✓ PN-EN ISO 14044:2009, Environmental management. Life Cycle Assessment. Requirements and guidelines.
- ✓ EN 15942:2012, Sustainability of construction works – Environmental product declarations – Communication format business-to-business.
- ✓ Explanatory materials can be used ; on the website of the owner of the declaration: www.eurokrusz.pl

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PROCESS ENGINEERING RESEARCH GROUP

TYPE III ENVIRONMENTAL DECLARATION CERTIFICATE

no. 02-04/2024

Products:

Sand and Gravel

Owner:

P.P.H.U. Eurokrusz Sp. z o.o.

Dąbrowa 26A
26-420 Nowe Miasto nad Pilicą

The declaration was developed in accordance with the requirements of the standard:

PN-EN 15804+A2: 2020-03

Sustainability of construction works
Environmental product declarations
Core rules for the product category of construction products

The declaration was verified in accordance with the requirements of the standard:

PN-EN ISO 14025:2010

Environmental labels and declarations
Type III environmental declarations. Principles and procedures

The certificate was issued for the first time on **April, 19 2024** and is valid for 5 years or until the said EPD is amended.

Process Engineering Research Group Leader

Ewa Głodek-Bucyk, PhD Eng.

Director of Center Of Environmental Engineering

Joanna Poluszyńska, PhD

Opole, April 2024