

ENVIRONMENTAL PRODUCT DECLARATION

EPD Ref. No. 2024-0066

BUILDING ELEMENTS MADE OF RECYCLED PLASTICS



In accordance with EN 15804+A2

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Declared unit (DU): 1 kg

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1. GENERAL INFORMATION

This Environmental Product Declaration (EPD) is developed in accordance with the European standard EN 15804 and ISO 14025. It contains the information on the impacts of the declared construction materials on the environment.

EPDs may not be comparable if they do not comply with the EN 15804 standard and if the core systems are not based on the same database.

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Declared product(s)	Building elements made of recycled plastics: • Coping elements for sewage manholes made of recycled plastics • Road safety elements made of recycled plastics
Declaration reference number	EPD Ref. No. 2024-0066
PCR	PCR in accordance with EN 15804+A2:2019
Date of issue	12-11-2024
Validity date	12-11-2029
Declared unit	1 kg
Life cycle analysis (LCA)	A1-A3, C1-C4, D modules
Service Life	Depending on the application, no more than 50 years
Reason for performing LCA	Bussines-to-bussines
Representativeness	Polish product, 2023

2. VERIFICATION

This Environmental Product Declaration (EPD) has been verified in accordance with ISO 14025 and is valid for 5 years from the date of issue if the underlying data have not changed significantly.

CEN EN 15804 standard serves as the main PCR document.
Independent verification corresponding to ISO 14025:2010 ☐ Internal ☒ External
Third party verifier:  Monika Kotkiewicz, CERTBUD Sp. z o.o.
External verification of EPD: Monika Kotkiewicz, CERTBUD Sp. z o. o. Input data verification, LCA: Damian Bulski, CEexpert Verification of LCA: Monika Kotkiewicz, CERTBUD Sp. z o. o.

Note: CERTBUD Sp. z o. o. is a notified body (No. 2310) of the European Commission and Member States designated for the tasks specified in the Regulation (EU) No 305/2011 of the European Parliament and of the Council laying down harmonised conditions for the marketing of construction products. In addition, CERTBUD Sp. z o.o. is a unit accredited by the Polish Centre for Accreditation - in the field of certification of construction products (accreditation number AC 158). CERTBUD Sp. z o.o. acts as an independent, third-party verification organization (17065/17025 certified).



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3. MANUFACTURER

The core business of **EW INVEST Eryk Wiśniewski** is the production of construction elements from recycled plastics for the construction and renovation of surface caps of sanitary and storm sewer wells, as well as the production of road infrastructure equipment. The production plant is located at ul. Warszawska 95 in Pyrzyce (West Pomeranian Voivodeship).



Figure 3.1: View of EW INVEST production plant

The manufactured elements of surface copings for sewage manholes form the innovative TVR T System, which includes, among others, compensation rings, cones and relief rings, adapters for manholes and sewage inlets, as well as supporting and protective elements of infrastructure equipment made of thermoplastic compositions of recyclates in the process of extrusion and high-pressure molding.

All manufactured elements of the TVR T System are subject to current control of the Company's Quality Management System, meet the quality and technical requirements specified in the standards for building materials and in the National Technical Assessment No. IBDiM-KOT-2017/0047. The products have the construction mark "B" based on the issued National Declarations of Performance, where the manufacturer declares the strength class D 400 in accordance with the PN-EN 124-1:07-2015 standard.

The plant's equipment, infrastructure and organization enable the processing of plastics at a level of over 8,300 tons per year, which can result in finished products in the amount of approx. 628,000 pieces.

4. DESCRIPTION AND CLASSIFICATION OF PRODUCTS

The technology basis' production of construction and infrastructure products from plastics is extrusion of thermoplastic polymer compositions into polymer extrudate granulate for pressure molding. The basic material for the production of construction and infrastructure elements are ready-made polymer compositions based on recycled polyvinyl chloride (PVC) plasticized and unplasticized, polyolefins (LD-PE, MD-PE, HD-PE, PP, PEX) and admixtures of other polymers and fillers in the amount of up to 20% intended for extrusion on extruders.

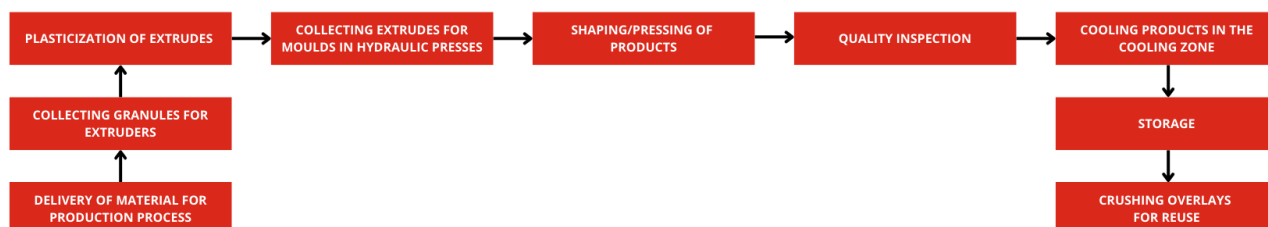


Figure 4.1: Production scheme of building elements made of recycled plastics

Extrusion is a continuous process in which polymer granulate is applied to the plasticizing system of the extruder, where thermal and material homogenization and plasticization of polymer compositions occur in a thermo-mechanical process. The product of extrusion is a plastic polymer extrudate, which after leaving the extruder head is portioned and then pressed under pressure to shape the product in a mold located on a hydraulic press. The product is demolded and removed after preliminary cooling and shaping in the mold. Product quality inspection includes: dimensional control, hardness control, surface structure control, etc. Qualified products go to the warehouse and await expedition.

Construction and infrastructure products are made of 100% recycled plastics - secondary materials created as a result of the material recycling process of polymer raw materials. The parameters of the raw material, characteristics of recyclates used in the processing and production process are specified, among others, by the standards PN-EN 15343:2010, PN-EN 15344:2010, PN-EN 15345 and PN-EN 15346:2010.

Table 4.1: Basic requirements and technical parameters for the raw material (PVC/PE granulate from recyclate)

Requirements/parameters	Research method	Parameter/result
Relative bulk density	PN-EN 15346:2010	0.360 – 0.615 g/l
Shore hardness	PN-EN ISO 868:2005	approx. ≥ 40 Sh' (D)
Compressive strength	PN-EN ISO 604	approx. ≥ 4 MPa
Tensile strength	PN-EN ISO 604	approx. ≥ 3.5 MPa
Particle size	PN-EN 15346:2010	6mm 75% ($\pm 10\%$)
Pollution	PN-EN 15346:2010	approx. 3 - 7%
Particle shape	Visual assessment	Granules: 2 - 8 mm
Water absorption	PN-EN 62:2008	approx. $\leq 1\%$
Suitability for extrusion	PN-EN 15346:2010	Temp. 130 - 185°C

The production of products is waste-free and does not burden the natural environment. All technological overflows, material scraps, extrudates, defectively pressed products that did not pass quality inspection are separated and sent for crushing and granulation in order to reuse the material in the production process. The raw material used for the extrusion process and the material obtained in the internal recirculation cycle is dust-free, emission-free, self-extinguishing (hard to burn), and also inert to the environment during storage, processing and use. All products made from recycled plastics are 100% materially recyclable.

4.1. COPING ELEMENTS FOR SEWAGE MANHOLES MADE OF RECYCLED PLASTICS

The group of construction elements made of recycled plastics used for the construction and renovation of near-surface sanitary and storm sewerage wells "TVR T System" includes the following products:

- **Compensation rings** – prefabricates for the construction of surface finials of manholes and drains with DN/ID internal diameter between 150mm and 180mm and height from 10mm to 150mm (in class D400). The broad dimensional scope of compensation rings allows to adjust the total height of manhole or sewage drain based only on the prefabricated elements. Compensation rings are elements placed on choke, cover plate, relief cone and ring, ring, or upper element of manholes. Their task is to provide technological access to working chambers of the manholes and to ensure the correct support of installed manhole finials. They enable to correct and precisely refer the upper surface of manhole or drain finial to the road surface ordinate.

Product groups: T1, T1R, T1C, T1K, T2



Figure 4.2: Compensation ring for height adjustment of manholes

- **Adapters and leading rings** – prefabricated elements in class D400 constituting as the upper element of a manhole surface finial that allows to install and assemble a manhole or floating drain (based on the asphalt road surface). The internal diameters of the TXS adapters are adapted to the insertion of the manhole guide pipe and the necessary connection, structural integration with the manhole. They are located centrally in the top structure on the balancing rings, below the external structural elements of the hatch body, such as hinge pockets, baskets, trusses and supports stiffening the body.

Product groups: TXS



Figure 4.3: Leading ring for self-leveling manholes

- **Relief cones, slabs and rings** – elements used to construct surface finials of manholes and non-manholes installed in areas of vehicle traffic, as well as outside of it, and in class A15, B125 and D400. Elements relieving shafts of ascending pipes of plastic wells and concrete rings simultaneously allow to adjust the height of a well and constitute as a protective element and element allowing to support/install well finial. They also constitute as a support for telescopes of plastic wells and foundation for installing compensation rings and adapters.

Product groups: T3, T3-BR, T3-BB, T04, T06

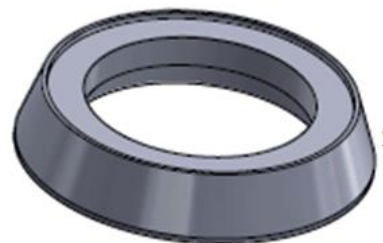


Figure 4.4: Relief cone for manholes

ENVIRONMENTAL PRODUCT DECLARATION BUILDING ELEMENTS MADE OF RECYCLED PLASTICS



- **Adapters and support elements** – prefabricated elements in class D400 used to construct tight surface finials of sewage drains, rain water wells, and other devices used to receive surface water. Adapters are the direct supporting/load-bearing element of sewage drain finial that simultaneously ensures support on the whole load-bearing surface of device's body. It is placed directly on: DN500 or DN450 concrete sewage drain rings, cones, rings, relief and self-levelling elements made from concrete or plastics, telescopes.

Product groups: TX, TXP, TXO

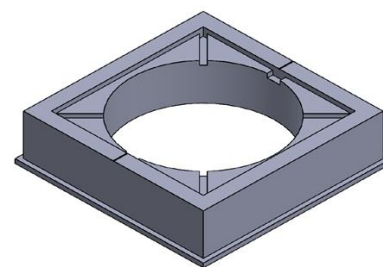


Figure 4.5: Support element for manholes and telescopic inlets

- **Protective coverings** – temporary protection of manholes, wells, inlets and the sewage system against contamination by unauthorized access, accidents during construction and assembly works before the installation of the target operational top. Used outside the area exposed to pedestrian and vehicular traffic.

Product groups: T4, T4-P, T4-BB, T4-IT, T5

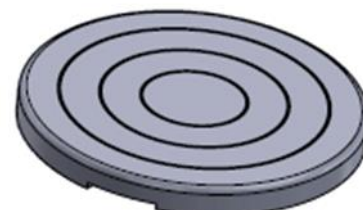


Figure 4.6: Protective covering

The scope of application of the above products includes:

- Public and internal roads
- Road engineering structures (bridges, viaducts, overpasses, tunnels)
- Railway engineering structures (bridges, viaducts, linear tunnels) and subway construction structures

4.2. ROAD SAFETY ELEMENTS MADE OF RECYCLED PLASTICS

Road safety elements, such as road bases and prefabricated refuge elements are manufactured from a mixture of recycled plastics, which includes: plasticized polyvinyl chloride (PVC), polyethylene (PE). The refuges are mounted to the substrate using expansion bolts. Road safety elements meet the requirements specified in the table below.

Table 4.2: Basic functional and technical properties of road safety elements

Road safety element type designation	Essential Characteristics for Intended Use	Performance characteristics/ requirements	Unit	Research and calculation method
Road bases	Tensile strength	≥ 2.0	MPa	PN-EN ISO 527-1 PN-EN ISO 868 PN-EN ISO 62
	Hardness	46 ± 4	Shore (D)	
	Water absorption	≤ 2.0	%	
Refuge elements	Tensile strength	≥ 3.0	MPa	
	Hardness	46 ± 4	Shore (D)	
	Water absorption	≤ 1.0	%	

The group of road safety elements made of recycled plastics used, among others, to secure vehicle and pedestrian traffic and works carried out in the road area includes:

- **Road bases** – essential elements of equipment and security in road traffic organization enabling correct installation of signs, road barriers and fences, directional boards, etc. Bases are an ideal solution for temporary road works, modernizations or other situations requiring variable traffic organization where quickness of action is required. They are characterized by high durability, impact resistance and resistance to weather conditions. Different models of bases are available in different weights: 7 kg, 15 kg, 20 kg and 22 kg, which allows to match the appropriate product to the conditions and requirements of traffic organization on construction sites. Mounting holes in the bases enable universal use and installation of temporary road markings, barriers, warning and fencing tapes. Product groups: KP, MF, DANFOD

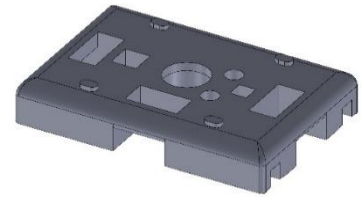


Figure 4.7: Road base 22 kg weight version

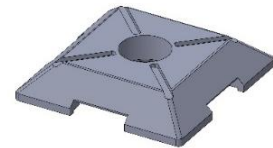


Figure 4.8: Road base 7 kg weight version

- **Refuge elements** – modular elements from the group of road safety devices designed to build areas separated on the roadway that allow pedestrians to cross it in two stages. They can also be used to build islands, public transport stops, and are also used in road engineering as elements to slow down and secure road traffic. Areas made of refuges can have permanent or temporary purposes.



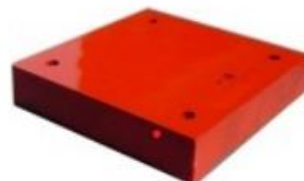
Azyl dla pieszych
ELEMENT NAROŻNY

Figure 4.9: Refuge element – corner element



Azyl dla pieszych
ELEMENT SKRAJNY

Figure 4.10: Refuge element – outer element



Azyl dla pieszych
ELEMENT WEWNĘTRZNY

Figure 4.11: Refuge element – inner element

Detailed technical data sheets of individual products can be found on the manufacturer's official website:
<https://ew-invest.com/en/products/>

5. LIFE CYCLE ASSESSMENT (LCA) - RULES

5.1. DECLARED UNIT (DU)

The declaration refers to declared unit – 1 kg of building element made of recycled plastics manufactured by EW INVEST Eryk Wiśniewski.

5.2. ALLOCATION

The allocation rules used for this EPD are based on EN 15804+A2. The production of building elements made of recycled plastics is a process carried out in one production plant of EW INVEST Eryk Wiśniewski located in Pyrzyce, Poland. For the life cycle assessment (LCA) calculation purpose – mass basis allocation was done.

5.3. SYSTEM BOUNDARIES

The system limits for the environmental characteristics of building elements made of recycled plastics are shown in figure 5.1. Data used in LCA calculation were declared by manufacturer and reflected the actual status for the period 01.07.2023 – 01.07.2024.

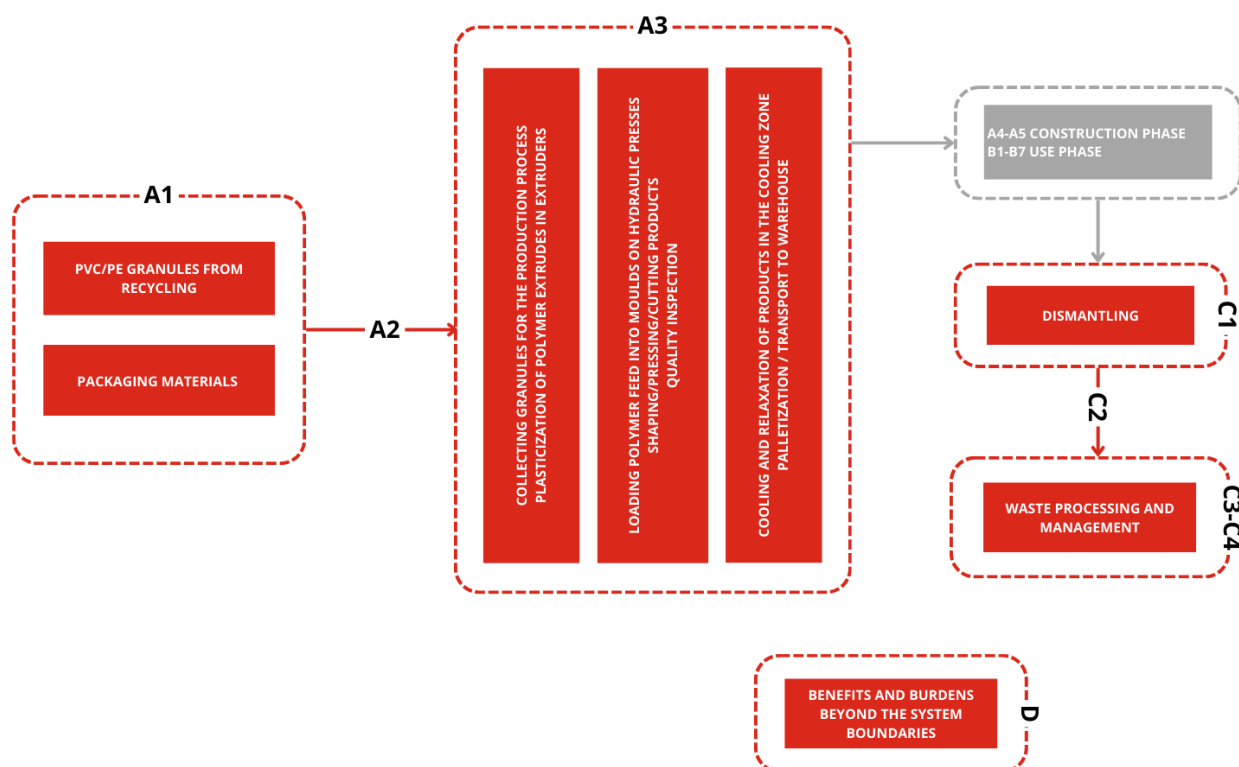


Figure 5.1: System boundaries used for environmental characterization

Legend:

----- defined modules

----- undefined modules

This Environmental Product Declaration includes a life cycle assessment (LCA) for the Cradle-to-Gate (A1- A3), with C1-C4 and D according to EN 15804+A2. Modules A4-A5 and B1-B7 are not included. Impacts from the global line production at EW INVEST were inventoried and 100% were allocated to the production of building elements made of recycled plastics in terms of annual production volume expressed in unit of mass.

5.3.1. A1 – RAW MATERIALS SUPPLY

This module takes into account the extraction and processing of all raw materials, as well as Energy consumption. The extraction and consumption of raw materials refers to specific mass shares in the production process per unit of declared product. Raw materials for the production of components of building elements made of recycled plastics come from Polish and foreign suppliers.

5.3.2. A2 – TRANSPORT TO THE PRODUCTION SITE

Raw materials are transported to the production plant from Polish and foreign suppliers. Distances from the place of obtaining raw materials to the production plant are individual for each raw material. The means of transport were diversified depending on the method of delivery of raw materials. The adopted model includes road transport (average values) for each raw material. For calculation purposes European fuel averages are applied in module A2.

5.3.3. A3 – PRODUCTION

Module A3 covers all production-related process – including the production of building elements made of recycled plastics, their packaging and internal transport.

A schematic of the production line for building elements made of recycled plastics at EW INVEST Eryk Wiśniewski is shown in Fig. 4.1 .

This module takes into account energy consumption (including approximately 95% of electricity generated from renewable energy sources) and wastages generated in the production plant, as well as losses generated in the production process.

5.3.4. C1-C2 – DEMOLITION AND TRANSPORT

The end of life stage commence with demolition. C1 module covers object's deconstruction within selective waste collection at deconstruction location (tab. 5.1)

C2 module is the beginning of waste treatment and describe waste transport. It was assumed that waste transport carried out to waste management plant and landfill (tab. 5.1). For calculation purposes European fuel averages are applied.

5.3.5. C3-C4 – WASTE PROCESSING AND MANAGEMENT

For the purpose of life cycle analysis, scenarios were developed for modules C3 and C4. In C3 module it was assumed that 37% of plastic waste is used in energy recovery and 18% is recycled. The remaining 45% of plastic waste will undergo landfilling (tab. 5.1).

Table 5.1: End of life scenario for building elements made of recycled plastics

Module	Assumption
C1	• 42.8 MJ/kg – caloric value of diesel • 0.5 l/kg – consumption of diesel per declared unit
C2	• 50 km – landfilling • 50 km – waste management plant
C3	• 18% - recycling • 37% - incineration (energy recovery)
C4	• 45% - landfilling

5.3.6. D – BENEFITS AND LOADS BEYOND THE SYTEM BOUNDARY

Module D describes the environmental benefits and loads of reuse, recycling and energy recovery of waste materials at the end of life.

In the adapted scenario, benefits were calculated for 37% of plastic waste going to incineration – energy recovery.

DATA COLLECTION PERIOD	The data regarding the production of products refer to period from 01.07.2023 to 01.07.2024.
DATA QUALITY	The values determined to calculate the LCA originate from verified EW INVEST Eryk Wiśniewski inventory data. The LCA analysis uses data prepared based on actual consumption at the production site. The details collected are no more than two years old.
CALCULATION RULES	The impacts of the representative EW INVEST Eryk Wiśniewski products were aggregated using weighted average. The weighted average method was used according to the percentage of each product in building elements made of recycled plastics based on the relations to whole production quantity. Impacts were calculated for all building elements made of recycled plastics and are shown in Tables 6.3 and 6.4 . The LCA analysis was conducted in accordance with the EN 15804+A2.
CUT-OFF CRITERIA	All-important parameters from collected production data, i.e. all materials used by recipe, electricity consumed, internal fuel consumption and thermal energy, direct production waste, and the results of all available emission measurements were included in the calculations. In accordance with EN 15804, machinery and equipment (capital assets) needed for and during production, as well as the transportation of production facility employees, were not included. The sum of the omitted total mass flows does not exceed 1% and excluded consumption of renewable and non-renewable primary energy is no more than 1% according to EN 15804+A2.
BACKGROUND DATA	The main source of general and auxiliary data is the Ecoinvent 3.9 database.

6. LIFE CYCLE ASSESSMENT (LCA) - RESULTS

Life cycle assessment (LCA) of this environmental declaration covers A1-A3, C1-C4, D modules („cradle to gate” with C1-C4 and D). Table 6.1 shows the LCA modules considered in calculating the environmental impact categories for the products covered by this declaration.

Table 6.1: Modules defined and not declared in system boundaries

Product stage			Construction process stage		Use stage							End of life stage				
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use stage	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction/demolition	Transport	Waste processing	Disposal	Reuse, recovery, recycling potential
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

X – modules defined

MND – modules not declared

Indicators describing environmental impact of product can be categorized as general environmental impacts, additional impacts and environmental aspects related to resources. The abbreviations and its explanations used to describe the environmental impact of building elements made of recycled plastics are shown below (tab. 6.2).

The tables 6.3 and 6.4 present the results of the LCA analysis for mentioned above products.

Table 6.2: Abbreviations and its explanations used in LCA analysis

ENVIRONMENTAL IMPACT INDICATORS	
GWP-total	Global Warming Potential – total
GWP-fossil	Global Warming Potential - fossil
GWP-biogenic	Global Warming Potential - biogenic
GWP-luluc	Global Warming Potential - land use and land use change
ODP	Stratospheric ozone depletion potential
AP	Soil and water acidification potential
EP-freshwater	Eutrophication potential - freshwater
EP-marine	Eutrophication potential - seawater
EP-terrestrial	Eutrophication potential - terrestrial
POCP	Potential for photochemical ozone synthesis

ADP-minerals & metals*	Potential for depletion of abiotic resources - non-fossil resources
ADP-fossil*	Abiotic depletion potential – fossil fuels
WDP*	Water deprivation potential

ENVIRONMENTAL ASPECTS RELATED TO RESOURCE INDICATORS

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
PEN-RE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials
RE	Use of non-renewable primary energy resources used as raw materials
PENRT	Total use of non-renewable primary energy resources
SM	Use of secondary material
RSF	Use of renewable secondary fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water

ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES INDICATORS

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

*The results should be used with caution because there is high uncertainty or limited experience with these indicators.

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Table 6.3: LCA analysis results for 1 kg of coping elements for sewage manholes made of recycled plastics

Results per 1 kg : coping elements for sewage manholes made of recycled plastics										
ENVIRONMENTAL IMPACTS										
PARAMETER	UNIT	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	eq. kg CO2	5.12E-02	5.00E-02	6.43E-02	1.66E-01	1.78E+00	5.01E-03	9.35E-01	4.61E-02	-3.07E+00
GWP-fossil	eq. kg CO2	5.11E-02	5.00E-02	3.81E-02	1.39E-01	1.78E+00	5.01E-03	9.35E-01	4.60E-02	-3.06E+00
GWP-biogenic	eq. kg CO2	-2.04E-05	4.43E-05	2.62E-02	2.62E-02	3.86E-04	3.84E-06	-1.08E-04	3.23E-05	-1.65E-02
GWP-luluc	eq. kg CO2	1.03E-04	2.47E-05	2.68E-05	1.54E-04	2.01E-04	2.44E-06	5.17E-05	4.48E-06	-9.33E-04
ODP	eq. kg CFC 11	3.61E-10	1.09E-09	5.61E-10	2.01E-09	2.84E-08	1.14E-10	1.55E-09	1.27E-10	-1.46E-08
AP	mol H+	2.81E-04	1.09E-04	3.19E-04	7.09E-04	1.65E-02	1.24E-05	3.79E-04	4.12E-05	-2.26E-02
EP-freshwater	eq. kg P	2.42E-05	3.55E-06	3.74E-05	6.52E-05	5.48E-05	3.70E-07	1.15E-05	8.08E-07	-3.70E-03
EP-marine	eq. kg N	5.17E-05	2.76E-05	4.39E-05	1.23E-04	7.66E-03	3.38E-06	1.86E-04	9.71E-04	-3.19E-03
EP-terrestrial	eq. mol N	5.56E-04	2.80E-04	5.14E-04	1.35E-03	8.33E-02	3.47E-05	1.54E-03	1.58E-04	-2.80E-02
POCP	eq. kg NMVOC	1.58E-04	1.70E-04	1.35E-04	4.63E-04	2.47E-02	2.02E-05	4.60E-04	6.40E-05	-8.08E-03
ADP-minerals & metals	eq. kg Sb.	4.69E-07	1.67E-07	6.36E-07	1.27E-06	6.39E-07	1.43E-08	3.05E-07	1.27E-08	-1.25E-05
ADP-fossil	MJ	6.83E-01	7.15E-01	4.89E-01	1.89E+00	2.35E+01	7.66E-02	8.53E-01	1.20E-01	-3.50E+01
WDP	eq. m3	1.34E-02	3.55E-03	1.21E-02	2.91E-02	5.82E-02	3.93E-04	4.81E-02	7.17E-04	-6.66E-01
ADDITIONAL IMPACTS										
PERE	MJ	8.64E-02	1.12E-02	5.76E-01	6.73E-01	1.33E-01	1.11E-03	4.08E-02	2.47E-03	-3.34E+00
PERM	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	0.00E+00
PERT	MJ	8.64E-02	1.12E-02	5.76E-01	6.73E-01	1.33E-01	1.11E-03	4.08E-02	2.47E-03	-3.34E+00
PEN-RE	MJ	6.66E-01	6.53E-01	4.76E-01	1.80E+00	2.14E+01	6.99E-02	7.90E-01	1.10E-01	-3.47E+01
PENRM	MJ	1.61E-02	6.20E-02	1.31E-02	9.11E-02	2.15E+00	6.64E-03	6.27E-02	1.00E-02	-2.49E-01
PENRT	MJ	6.83E-01	7.15E-01	4.89E-01	1.89E+00	2.35E+01	7.66E-02	8.53E-01	1.20E-01	-3.50E+01
SM	MJ	1.70E-03	7.84E-04	2.16E-01	2.19E-01	1.36E-02	7.66E-05	2.04E-01	1.08E-04	-1.89E-01
RSF	MJ	8.26E-04	2.11E-04	1.27E-01	1.29E-01	1.50E-03	1.87E-05	6.22E-04	2.37E-05	-1.08E-01
NRSF	MJ	2.13E-03	4.16E-04	3.37E-03	5.92E-03	4.05E-03	3.88E-05	1.15E-03	6.41E-05	-3.72E-01
FW	m3	3.67E-04	8.64E-05	8.78E-04	1.33E-03	1.26E-03	1.02E-05	1.47E-03	1.19E-04	-9.26E-02
ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES										
HWD	kg	2.27E-03	6.71E-04	1.78E-03	4.73E-03	1.96E-02	7.18E-05	1.65E-02	1.66E-04	-1.05E-01
NHWD	kg	4.03E-03	3.46E-02	5.88E-03	4.45E-02	1.45E-02	6.59E-03	4.15E-02	4.55E-01	-1.17E-01
RWD	kg	1.68E-06	2.33E-07	3.75E-07	2.28E-06	2.56E-06	2.32E-08	7.15E-07	4.53E-08	-2.48E-05
CRU	kg	-3.55E-22	-6.27E-28	8.54E-24	-3.47E-22	-1.79E-22	-1.45E-24	-6.54E-23	3.16E-23	-3.07E-21
MFR	kg	1.64E-03	7.11E-04	2.10E-01	2.13E-01	1.12E-02	6.60E-05	2.58E-03	7.78E-05	-1.84E-01
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	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	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	0.00E+00



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ENVIRONMENTAL PRODUCT DECLARATION

BUILDING ELEMENTS MADE OF RECYCLED PLASTICS



Table 6.4 : LCA analysis results for 1 kg of road safety elements made of recycled plastics

Results per 1 kg : road safety elements made of recycled plastics										
ENVIRONMENTAL IMPACTS										
PARAMETER	UNIT	A1	A2	A3	A1-A3	C1	C2	C3	C4	D
GWP-total	eq. kg CO2	5.04E-02	5.00E-02	6.43E-02	1.66E-01	1.78E+00	5.01E-03	9.35E-01	4.61E-02	-3.07E+00
GWP-fossil	eq. kg CO2	5.04E-02	5.00E-02	3.81E-02	1.39E-01	1.78E+00	5.01E-03	9.35E-01	4.60E-02	-3.06E+00
GWP-biogenic	eq. kg CO2	-2.46E-05	4.43E-05	2.62E-02	2.62E-02	3.86E-04	3.84E-06	-1.08E-04	3.23E-05	-1.65E-02
GWP-luluc	eq. kg CO2	1.03E-04	2.47E-05	2.68E-05	1.54E-04	2.01E-04	2.44E-06	5.17E-05	4.48E-06	-9.33E-04
ODP	eq. kg CFC 11	3.54E-10	1.09E-09	5.61E-10	2.01E-09	2.84E-08	1.14E-10	1.55E-09	1.27E-10	-1.46E-08
AP	mol H+	2.78E-04	1.09E-04	3.19E-04	7.09E-04	1.65E-02	1.24E-05	3.79E-04	4.12E-05	-2.26E-02
EP-freshwater	eq. kg P	2.41E-05	3.55E-06	3.74E-05	6.52E-05	5.48E-05	3.70E-07	1.15E-05	8.08E-07	-3.70E-03
EP-marine	eq. kg N	5.12E-05	2.76E-05	4.39E-05	1.23E-04	7.66E-03	3.38E-06	1.86E-04	9.71E-04	-3.19E-03
EP-terrestrial	eq. mol N	5.51E-04	2.80E-04	5.14E-04	1.35E-03	8.33E-02	3.47E-05	1.54E-03	1.58E-04	-2.80E-02
POCP	eq. kg NMVOC	1.56E-04	1.70E-04	1.35E-04	4.63E-04	2.47E-02	2.02E-05	4.60E-04	6.40E-05	-8.08E-03
ADP-minerals & metals	eq. kg Sb.	4.65E-07	1.67E-07	6.36E-07	1.27E-06	6.39E-07	1.43E-08	3.05E-07	1.27E-08	-1.25E-05
ADP-fossil	MJ	6.55E-01	7.15E-01	4.89E-01	1.89E+00	2.35E+01	7.66E-02	8.53E-01	1.20E-01	-3.50E+01
WDP	eq. m3	1.28E-02	3.55E-03	1.21E-02	2.91E-02	5.82E-02	3.93E-04	4.81E-02	7.17E-04	-6.66E-01
ADDITIONAL IMPACTS										
PERE	MJ	8.60E-02	1.12E-02	5.76E-01	6.73E-01	1.33E-01	1.11E-03	4.08E-02	2.47E-03	-3.34E+00
PERM	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	0.00E+00
PERT	MJ	8.60E-02	1.12E-02	5.76E-01	6.73E-01	1.33E-01	1.11E-03	4.08E-02	2.47E-03	-3.34E+00
PEN-RE	MJ	6.42E-01	6.53E-01	4.76E-01	1.80E+00	2.14E+01	6.99E-02	7.90E-01	1.10E-01	-3.47E+01
PENRM	MJ	1.32E-02	6.20E-02	1.31E-02	9.11E-02	2.15E+00	6.64E-03	6.27E-02	1.00E-02	-2.49E-01
PENRT	MJ	6.55E-01	7.15E-01	4.89E-01	1.89E+00	2.35E+01	7.66E-02	8.53E-01	1.20E-01	-3.50E+01
SM	MJ	1.68E-03	7.84E-04	2.16E-01	2.19E-01	1.36E-02	7.66E-05	2.04E-01	1.08E-04	-1.89E-01
RSF	MJ	8.15E-04	2.11E-04	1.27E-01	1.29E-01	1.50E-03	1.87E-05	6.22E-04	2.37E-05	-1.08E-01
NRSF	MJ	2.12E-03	4.16E-04	3.37E-03	5.92E-03	4.05E-03	3.88E-05	1.15E-03	6.41E-05	-3.72E-01
FW	m3	3.52E-04	8.64E-05	8.78E-04	1.33E-03	1.26E-03	1.02E-05	1.47E-03	1.19E-04	-9.26E-02
ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES										
HWD	kg	2.26E-03	6.71E-04	1.78E-03	4.73E-03	1.96E-02	7.18E-05	1.65E-02	1.66E-04	-1.05E-01
NHWD	kg	4.02E-03	3.46E-02	5.88E-03	4.45E-02	1.45E-02	6.59E-03	4.15E-02	4.55E-01	-1.17E-01
RWD	kg	1.66E-06	2.33E-07	3.75E-07	2.28E-06	2.56E-06	2.32E-08	7.15E-07	4.53E-08	-2.48E-05
CRU	kg	-3.55E-22	-6.27E-28	8.54E-24	-3.47E-22	-1.79E-22	-1.45E-24	-6.54E-23	3.16E-23	-3.07E-21
MFR	kg	1.62E-03	7.11E-04	2.10E-01	2.13E-01	1.12E-02	6.60E-05	2.58E-03	7.78E-05	-1.84E-01
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	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	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	0.00E+00



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7. REFERENCES

- EN 15804+A2:2019 Sustainability of construction works -- Environmental product declarations -- Core rules for the product category of construction products;
- EN ISO 14025:2010 Environmental labels and declarations -- Type III environmental declarations -- Principles and procedures
- 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
- EN ISO 14067:2018 Greenhouse gases -- Carbon footprint of products -- Requirements and guidelines for quantification
- ISO 21930:2017 Sustainability in buildings and civil engineering works -- Core rules for environmental product declarations of construction products and services
- Ecoinvent 3.9 database



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CERTIFICATE No. EPD-2024-0066

of TYPE III ENVIRONMENTAL DECLARATION

Product:

Building elements made of recycled plastics

- Coving elements for sewage manholes made of recycled plastics
- Road safety elements made of recycled plastics

Manufacturer:

EW INVEST Eryk Wiśniewski
ul. Seledynowa 49/1
70-781 Szczecin
NIP: 955-147-72-92

confirms the correctness of the data included in the development of the Type III Environmental Declaration and accordance with the requirements of the standard:

EN 15804+A2:2019

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

This certificate, issued for the first time on 12/11/2024 and is valid for 5 years or until amendment of mentioned Environmental Declaration.



Director of the Certification
Department
CERTBUD Sp. z o.o.

Kamil PAWŁOWSKI

Warsaw, 12/11/2024