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## PERT, PERTAL and PE-X pipes



### Owner of the EPD:

KAN Sp. z o.o.

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### Basic information

This declaration is the Type III Environmental Product Declaration (EPD) based on EN 15804+A2 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of the declared construction materials on the environment and their aspects verified by the independent body according to ISO 14025. Basically, comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804+A2.

**Life cycle analysis (LCA):** A1-A3, A4-A5, C1-C4 and D modules in accordance with EN 15804+A2 (Cradle-to-Gate with options)

**The year of preparing the EPD:** 2026

**Product standards:** EN ISO 21003-2, EN ISO 15875-2, EN ISO 22391-2

**Service Life:** 50 years

**PCR:** ITB-PCR A

**Declared unit:** 1 kg

**Reasons for performing LCA:** B2B

**Representativeness:** Poland, Europe, 2025

## **MANUFACTURER**

KAN Group, headquartered in Kleosin (Poland), is an experienced European manufacturer and supplier of KAN-therm installation systems. Since opening its business activity in 1990, KAN has built its position on strong pillars: professionalism, innovativeness, quality and development. KAN-therm is an optimal, complete installation multisystem which comprises the modern, complementing one another, solutions in the scope of pipe



*Figure 1 The view of KAN Sp. z o.o. manufacturing plant located in Kleosin*

water and heating installations and also the technological ones. It is an excellent realization of the vision concerning the universal system thanks to the long-term experience of the KAN constructors, rigorous control of raw materials and final products quality and at last the efficient recognition of the installation market needs consistent with the requirements of the balanced building industry.

Nowadays, KAN employs more than 1200 people. Company has a branch network in Poland, subsidiaries in Germany, Hungary, Ukraine, the United Arab Emirates, India, China and the CIS countries. The products with the label KAN-therm are exported to 68 countries around the world. The distribution chain covers Europe and a significant part of Asia, Africa and America.

Company bases present activity and future on strong foundations: experience, quality and innovative solutions. At the same time constantly adapt the offer to their needs and improving the level of service. That is why KAN have won the confidence both of a trade partners and users of offered technical solutions. Company is perceived as a reliable and trustworthy partner.

Company goal is to provide the users with products, which guarantee comfort and perfect operation of the installation as well as a feeling of a complete safety. Company strive for a simple design and quick assembly of our systems. For the sake of the users' health, KAN provide the highest quality products, manufactured and used in harmony with the natural human environment.

## **PRODUCTS DESCRIPTION**

A system of PERT, PERTAL and PE-X pipes used in KAN-therm installation systems, especially in the UltraLine. Material characterized by high resistance to temperature and pressure, which makes it ideal for water and heating installations.

All additional technical information about the product is available on the manufacturer's website and catalogues.

## **LIFE CYCLE ASSESSMENT (LCA) – general rules applied**

### **Unit**

The declared unit is 1 kg of PERT, PERT-AL, and PE-X pipes. The declared unit applies to different product types, each comprising products with varying dimensions and weights. However, due to the use of the same manufacturing process and the similarities between the products, a mass-based declared unit was considered appropriate.

### **System boundary**

The life cycle analysis of the declared products covers “Product Stage” A1-A3, A4-A5, C1-C4+D modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options). Energy and water consumption, emissions as well as information on generated wastes were inventoried and were included in the calculation. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804+A2, machines and facilities (capital goods) required for the production as well as transportation of employees were not included in LCA.

### **Allocation**

The allocation rules used for this EPD are based on general ITB 's document PCR A. In the modules A1-A3, material losses in the assembly of the products in the factory are defined on the averaged specific values for the site. Input and output data from the production is inventoried and allocated to the production on the mass basis. The declaration covers a wide range of products (averaged). Their production resources and processing stages are basically similar, so it is possible to average the production by product volume.

### **System limits**

99.0% materials and 100% energy consumption were inventoried in a factory and were included in calculation. In the assessment, all significant parameters from gathered production data are considered, utilized energy, and electric power consumption, direct production waste, and available emission measurements. The total of neglected input flows per module A1-A3 does not exceed the permitted maximum of 1 % of energy usage and product mass. Tires consumption for transport was not considered. The components like: foils, papers, labels, tapes with a percentage share of less than 0.1% were not included in the calculations. It is assumed that the total sum of omitted processes does not exceed 1% of all impact categories. In accordance with EN 15804 machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

### **Modules A1 and A2: Raw materials supply and transport**

The modules A1 and A2 represent the extraction and processing of raw materials (plastic, aluminum and EVOH) and transport to the production site. The process starts with the manufacturing of raw plastic for products obtained followed by extrusion and cooling into the desired shape; For A2 module (transport- inventoried) European averages for fuel data are applied. Production of plastic elements were inventoried and assessed.

### **Module A3: Production**

The product specific manufacturing process is presented in Figure 2. The production process is partially automated and is based on receiving plastic materials for production and then extruding it into a specific shape.

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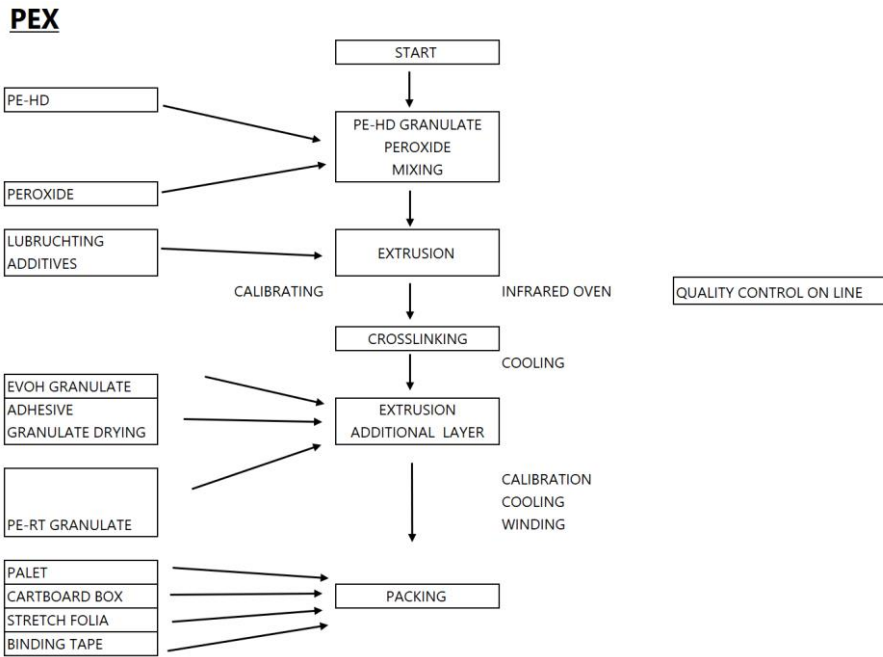


Figure 2 Manufacturing process scheme for PEX (A1-A3), with forming (A3)

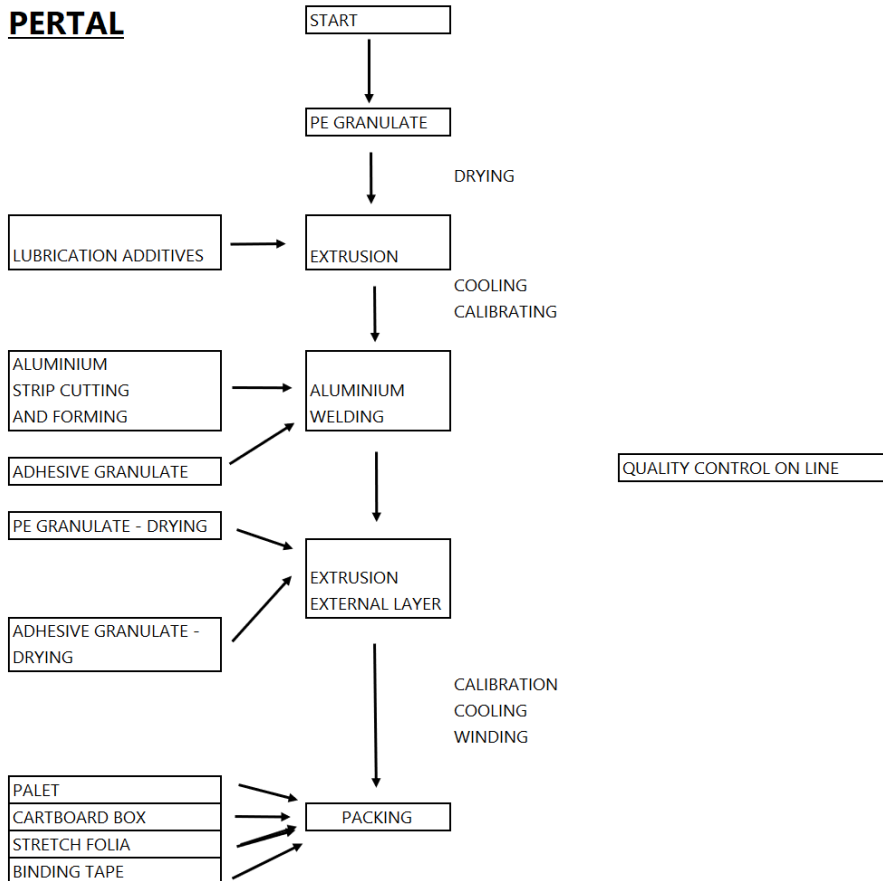


Figure 3 Manufacturing process scheme for PERTAL (A1-A3), with forming (A3)

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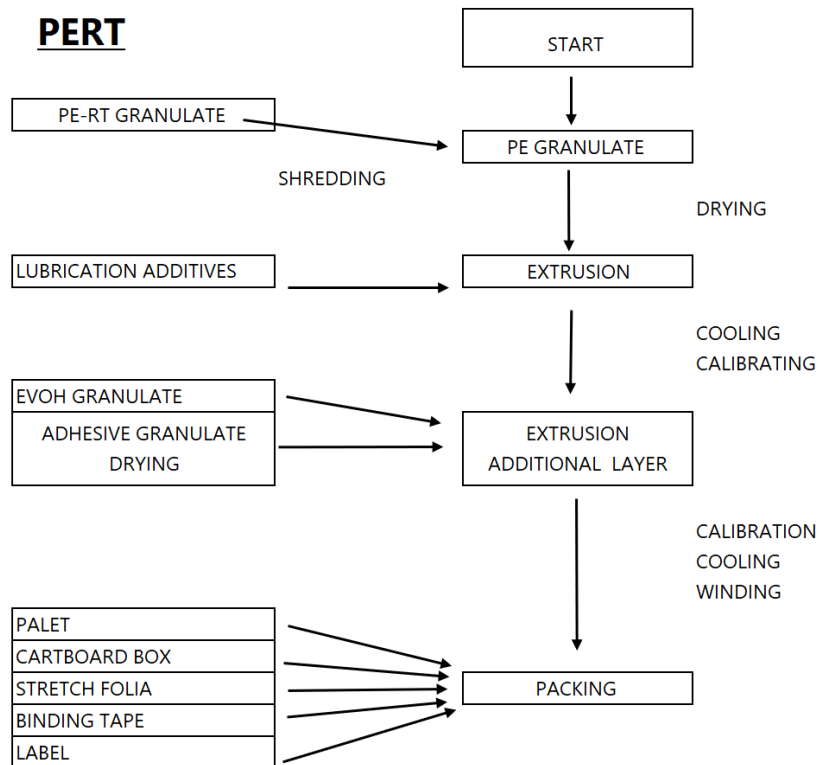


Figure 4 Manufacturing process scheme for PERT (A1-A3), with forming (A3)

### Module A4 and A5: transport to consumer and installation

Vehicle transport at distance 100 km is considered (emission standard: Euro 5) with 100% load capacity. Energy consumption during installation comes primarily from: power tools (electric crimpers), pipe cutting and calibration, transportation, and assembly organization. Assumed installation energy value is 0.005 kWh/kg of pipe.

### Modules C and D: End-of-life (EOL)

Due to the fact that the declaration covers a wide range of products for various purposes and usage scenarios, it is not possible to directly specify the de-construction technology and the amount of energy for disassembly in C1 module (so this module is generic based on literature). In the adapted end-of-life scenario, the de-constructed plastic products are transported to a plastic mill distant by 100 km on > 16t lorry EURO 5 where they are used as scrap to produce a new product. The recycling potential of C3 module is 98% and it is assumed that only 2% of the products will end up in a landfill – C4 module (Table 1). Module D presents credits resulting from the recycling of the plastic scrap (used for plastic production).

Table 1 End-of-life scenario for the specific products

Material	Material recovery	Recycling	Landfilling
plastics	100%	98%	2%

Electricity at end-of-life (module C) has been modelled using an average Polish electricity mix as the location where the product reaches end-of-life is unknown.

### Data collection period

The data for manufacture of the declared products refer to period between 01.01.2025 – 31.12.2025 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

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### Data quality

The data selected for LCA originate from ITB-LCI questionnaires completed by KAN Sp. z o. o. and verified during data audit. No data collected is older than five years and no generic datasets used are older than ten years. The representativeness, completeness, reliability, and consistency are judged as good. The background data for the processes come from the following resources database Eco invent v.3.11. No mass balance approach was used. Biogenic carbon with packing in product less than 5%.

### Assumptions and estimates

The impacts of the representative products were aggregated using weighted average.

### Calculation rules

LCA was performed using ITB-LCA tool developed in accordance with EN15804+A2. Emission of greenhouse gases were calculated using the IPCC 2016 GWP method with a 100-year horizon. Emission of acidifying substances, emission of substances to water contributing to oxygen depletion, emission of gases that contribute to the creation of ground-level ozone, abiotic depletion, and ozone depletion emissions where all calculated with the EF 3.1. method

### Additional information

Polish electricity mix used is 0.553 kg CO<sub>2</sub>/kWh (December 2025). As a general rule, no particular environmental or health protection measures other than those specified by law are necessary.

## LIFE CYCLE ASSESSMENT (LCA) – Results

### Declared unit

The declaration refers to declared unit (DU) – 1 kg of PERT, PERTAL and PE-X pipes produced in Poland. The following life cycle modules (Table 2) were included in the analysis. The following tables 3-6 show the environmental impacts of the life cycle of selected modules (A1-A5+C1-C4+D).

Table 2 System boundaries for the environmental characteristic of the product.

Environmental assessment information (MD – Module Declared, MND – Module Not Declared, INA – Indicator Not Assessed)																
Product stage			Construction process		Use stage							End of life				Benefits and loads beyond the system boundary
Raw material supply	Transport	Manufacturing	Transport to construction site	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction demolition	Transport	Waste processing	Disposal	Reuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MD	MD	MD	MD	MD

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*Table 3 Life cycle assessment (LCA) results for specific product – environmental impacts of (DU: 1 kg)*

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO <sub>2</sub>	2.88E+00	1.50E-01	5.90E-01	3.62E+00	1.67E-02	3.43E-03	6.87E-03	1.67E-02	4.43E-01	2.64E-04	-4.22E-01
Greenhouse potential - fossil	eq. kg CO <sub>2</sub>	2.92E+00	1.50E-01	5.81E-01	3.65E+00	1.66E-02	3.43E-03	6.85E-03	1.66E-02	3.42E-01	2.63E-04	-3.65E-01
Greenhouse potential - biogenic	eq. kg CO <sub>2</sub>	-4.38E-02	-5.67E-06	8.64E-03	-3.51E-02	5.68E-05	9.23E-06	1.85E-05	5.68E-05	1.00E-01	6.71E-07	-5.66E-02
Global warming potential - land use and land use change	eq. kg CO <sub>2</sub>	2.60E-03	7.01E-05	6.44E-05	2.74E-03	6.52E-06	5.36E-07	1.07E-06	6.52E-06	5.28E-04	2.49E-07	-5.49E-04
Stratospheric ozone depletion potential	eq. kg CFC 11	8.56E-08	2.50E-09	4.09E-09	9.22E-08	3.85E-09	1.88E-11	3.77E-11	3.85E-09	7.56E-08	1.07E-10	-6.72E-09
Soil and water acidification potential	eq. mol H <sup>+</sup>	1.01E-02	3.22E-03	7.25E-03	2.06E-02	6.75E-05	3.62E-05	7.25E-05	6.75E-05	1.95E-03	2.48E-06	-1.80E-03
Eutrophication potential - freshwater	eq. kg P	6.54E-04	6.43E-06	1.12E-03	1.78E-03	1.12E-06	5.90E-06	1.18E-05	1.12E-06	1.61E-04	2.45E-08	-2.02E-04
Eutrophication potential - seawater	eq. kg N	2.19E-03	8.15E-04	9.48E-04	3.96E-03	2.04E-05	5.13E-06	1.03E-05	2.04E-05	2.12E-03	8.62E-07	-4.52E-04
Eutrophication potential - terrestrial	eq. mol N	2.26E-02	9.04E-03	8.04E-03	3.97E-02	2.22E-04	4.47E-05	8.95E-05	2.22E-04	6.61E-03	9.43E-06	-4.17E-03
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.63E-02	2.53E-03	2.36E-03	2.12E-02	6.80E-05	1.29E-05	2.57E-05	6.80E-05	7.23E-04	2.74E-06	-4.07E-04
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.51E-05	2.59E-07	2.61E-07	1.56E-05	5.89E-08	1.29E-09	2.58E-09	5.89E-08	2.83E-06	6.04E-10	-3.64E-06
Abiotic depletion potential - fossil fuels	MJ	8.01E+01	1.93E+00	1.10E+01	9.30E+01	2.47E-01	5.41E-02	1.08E-01	2.47E-01	5.15E+00	7.22E-03	-5.93E+00
Water deprivation potential	eq. m <sup>3</sup>	9.83E-01	6.89E-03	2.48E-01	1.24E+00	1.14E-03	1.03E-03	2.07E-03	1.14E-03	1.15E-01	2.29E-05	-1.21E-01

*Table 4 Life cycle assessment (LCA) results for specific product – additional impacts indicators (DU: 1 kg)*

Indicator	Unit	A1-A3	A4-A5	C1-C4	D
Particulate matter	disease incidence	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA

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Table 5 Life cycle assessment (LCA) results for specific product - the resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.61E+00	2.00E-02	8.98E-01	3.53E+00	3.54E-03	4.45E-03	8.90E-03	3.54E-03	1.03E+00	6.27E-05	-1.03E+00
Consumption of renewable primary energy resources used as raw materials	MJ	4.16E-01	0.00E+00	0.00E+00	4.16E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	3.03E+00	2.00E-02	8.98E-01	3.95E+00	3.54E-03	4.45E-03	8.90E-03	3.54E-03	1.03E+00	6.27E-05	-1.12E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.87E+01	1.93E+00	1.09E+01	5.16E+01	2.47E-01	5.41E-02	1.08E-01	2.47E-01	3.75E+01	7.22E-03	-5.93E+00
Consumption of non-renewable primary energy resources used as raw materials	MJ	4.13E+01	0.00E+00	2.84E-02	4.14E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-3.23E+01	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	7.95E+01	1.93E+00	1.10E+01	9.24E+01	2.47E-01	5.41E-02	1.08E-01	2.47E-01	5.15E+00	7.22E-03	-5.93E+00
Consumption of secondary materials	kg	1.65E-02	9.00E-04	7.80E-04	1.82E-02	8.27E-05	4.70E-06	9.40E-06	8.27E-05	1.01E+00	1.52E-06	-1.02E+00
Consumption of renew. secondary fuels	MJ	1.20E-03	5.11E-06	4.22E-06	1.21E-03	9.11E-07	2.37E-08	4.75E-08	9.11E-07	3.60E-07	3.96E-08	-1.13E-05
Consumption of non-renewable secondary fuels	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	3.48E-05	0.00E+00	-3.48E-05
Net consumption of freshwater	m <sup>3</sup>	2.34E-02	1.64E-04	6.57E-03	3.01E-02	3.10E-05	1.55E-04	3.11E-04	3.10E-05	3.46E-03	7.90E-06	-3.56E-03

Table 6 Life cycle assessment (LCA) results for specific product – waste categories (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	1.64E-01	2.63E-03	1.09E-01	2.76E-01	2.77E-04	4.19E-04	8.38E-04	2.77E-04	1.50E-02	7.67E-06	-3.01E-02
Non-hazardous waste	kg	1.96E+01	4.29E-02	5.49E+00	2.51E+01	4.92E-03	2.82E-02	5.65E-02	4.92E-03	1.29E+00	1.08E-04	-1.44E+00
Radioactive waste	kg	3.88E-05	3.32E-07	1.13E-06	4.02E-05	1.84E-08	8.12E-09	1.62E-08	1.84E-08	2.05E-05	4.79E-08	-2.05E-05
Components for re-use	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	0.00E+00	0.00E+00
Materials for recycling	kg	1.87E-03	1.61E-04	2.65E-02	2.85E-02	7.64E-07	3.63E-07	7.26E-07	7.64E-07	7.95E-04	1.44E-08	-7.95E-04
Materials for energy recovery	kg	2.21E-06	6.47E-08	8.26E-08	2.35E-06	6.18E-09	5.83E-10	1.17E-09	6.18E-09	1.71E-07	1.71E-10	-1.66E-07
Exported Energy	MJ	3.01E-02	3.83E-04	3.43E-03	3.39E-02	0.00E+00	1.73E-04	3.46E-04	0.00E+00	7.59E-02	0.00E+00	-1.61E-02

## Type III Environmental Product Declaration No. 963/2026

### Verification

The process of verification of this EPD is in accordance with ISO 14025. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

The basis for LCA analysis was EN 15804 and ITB PCR A
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.) <input checked="" type="checkbox"/> external <input type="checkbox"/> internal
External verification of EPD: Halina Prejzner, PhD. Eng. LCI audit and verification: Michał Chwedaczuk, M.Sc. Eng. LCA, LCI audit and input data verification: Michał Piasecki, PhD., D.Sc., eng.

Note 1: The declaration owner has the sole ownership, liability, and responsibility for the information provided and contained in EPD. Declarations of construction products may not be comparable if they do not comply with EN 15804+A2. For further information about comparability, see EN 15804+A2 and ISO 14025.

Note 2: ITB is a public Research Organization and Notified Body (EC Reg. no 1488) to the European Commission and to other Member States of the European Union designated for the tasks concerning the assessment of building products' performance. ITB acts as the independent, third-party verification organization (see ISO 17025/17065/17029). ITB-EPD program is recognized and registered member of The European Platform - Association of EPD program operators and ITB-EPD declarations are registered and stored in the international ECO-PORTAL.

### Normative references

- ITB PCR A General Product Category Rules for Construction Products
- ISO 14025:2006, Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 21930:2017 Sustainability in buildings and civil engineering works – Core rules for environmental product declarations of construction products and services
- ISO 14044:2006 Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2011 Buildings and constructed assets – Service life planning – Part 1: General principles and framework
- ISO 15686-8:2008 Buildings and constructed assets – Service life planning – Part 8: Reference service life and service-life estimation
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- ISO 14067:2018 Greenhouse gases – Carbon footprint of products – Requirements and guidelines for quantification
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- ISO 20915:2018 Life cycle inventory calculation methodology for steel products
- EN ISO 21003-2 Multilayer piping systems for hot and cold water installations inside buildings Part 3: Pipes
- EN ISO 15875-2 Systemy przewodów rurowych z tworzyw sztucznych do instalacji wody ciepłej i zimnej. Usieciowany polietylen (PE-X) Część 2: Rury
- EN ISO 22391-2 Systemy przewodów rurowych z tworzyw sztucznych do instalacji wody ciepłej i zimnej. PE-RT. Cz. 2: Rury.
- KOBiZE Wskaźniki emisyjności CO<sub>2</sub>, SO<sub>2</sub>, NO<sub>x</sub>, CO i pyłu całkowitego dla energii elektrycznej. December 2025
- Ecoinvent.org

LCA, LCI, input data verification  
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# CERTIFICATE № 963/2026 of TYPE III ENVIRONMENTAL DECLARATION

Product:

**PERT, PERTAL and PE-X pipes**

Manufacturer:

**KAN Sp. z o.o.**

Zdrojowa 51, 16-001 Kleosin, Poland

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

**EN 15804+A2**

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

This certificate, issued for the first time on  
04<sup>th</sup> May 2026  
is valid for 5 years or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics  
and Environment Department

Agnieszka Winkler-Skalna, PhD



Deputy Director  
for Research and Innovation

Krzysztof Kuczyński, PhD

Warsaw, May 2026