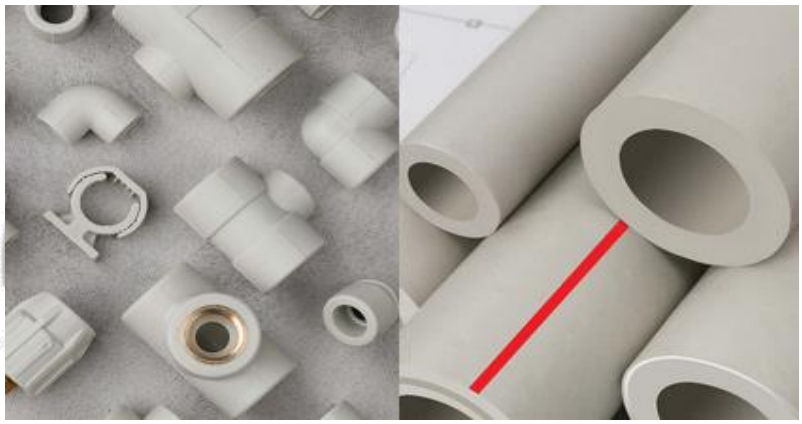
Type III Environmental Product Declaration No. 829/2025

Issuance date: 22.08.2025
Validation: 01.10.2025
Validity date: 22.08.2030

KAN-therm system
(PP pipes, fittings and connectors)



Owner of the EPD:

KAN Sp. z o.o.
Address: Zdrojowa 51
16-001 Kleosin, Poland
Tel.: +48 85 74 99 200
Website: www.kan-therm.com
Contact: kan@kan-therm.com

EPD Program Operator:

Instytut Techniki Budowlanej (ITB)
Address: Filtrowa 1,
00-611 Warsaw, Poland
Website: www.itb.pl
Contact: energia@itb.pl

ITB is the verified member of The European Platform for EPD program operators and LCA practitioner www.eco-platform.org

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: 2025
Product standards: EN ISO 21003-2, EN ISO 15874-2, EN ISO 15874-3
Service Life: 50 years
PCR: ITB-PCR A
Declared unit: 1 kg
Reasons for performing LCA: B2B
Representativeness: Poland, Europe, 2023

MANUFACTURER

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

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 most modern, complementing one another, solutions in the scope of pipe 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 and passion 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 have employed more than 1200 people. Company have 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 base our present activity and future on strong foundations: experience, quality and innovative solutions. At the same time, listen to the customer voice, constantly adapting the offer to their needs and improving the level of service. That is why KAN have won the confidence both of our trade partners and users of offered technical solutions and our 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 an absolutely simple design and quick assembly of our systems. For the sake of our users' health, KAN provide the highest quality products, manufactured and used in harmony with the natural human environment.

PRODUCTS DESCRIPTION

The KAN-therm PP system is a complete installation system consisting of pipes and fittings made of thermoplastic polypropylene PP-R. The system is designed for internal water supply systems (hot and cold water) as well as heating and cooling systems and industrial process systems.

The KAN-therm PP system is an installation system consisting of polypropylene (PP-R) pipes and fittings joined using a socket welding method (thermal polyfusion). It is a durable, corrosion-resistant, and biologically inert solution designed for indoor hot and cold water, central heating, and process installations. The system is easy to install, and its tightness and durability ensure a long service life.

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 KAN-therm system (PP pipes, fittings and connectors). Declared unit refer to different types of PP products; every products typology contains products with different dimensions and weights. However, the same manufacturing process and the similarities of PP products allow a declared unit based on mass unit of products. To convert the results from kilograms to a product unit/piece, use the conversion factor equal to the ratio of the unit weight to 1 kg.

System boundary

The life cycle analysis of the declared products covers “Product Stage” A1-A3, A4-A5, C2-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 and transport to the production site. The process starts with the manufacturing of PP granules. For A2 module (transport- inventoried) European averages for fuel data are applied.

Module A3: *Production*

The product specific manufacturing process is presented in Figure 2.The production process is partially automated and is based on receiving PP material (granulates) for production. Material go into extrusion/injection process. Components previously made are assembled into one final product.

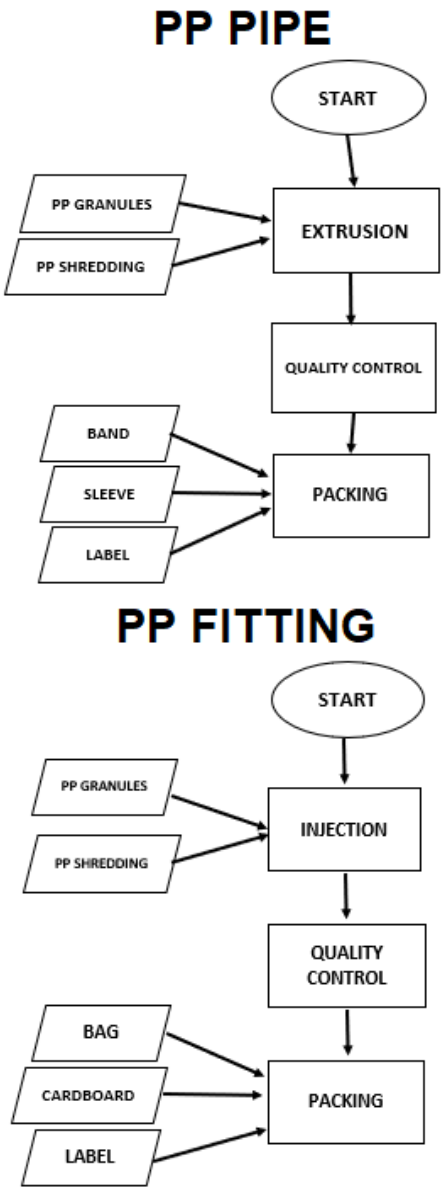


Figure 2 Manufacturing process scheme (A1-A3), with forming/assembly process in Kleosin (A3)

Module A4: transport to consumer

Vehicle transport at distance 100 km is considered (emission standard: Euro 5) with 100% load capacity.

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 very generic based on literature). In the adapted end-of-life scenario, the de-constructed steel products are transported to a metal mill distant by 100 km on > 16t lorry EURO 5 where are used as scrap to produce a new metals. The recycling potential of C3 module is 98% for metal elements and 90% of polymer parts, will end up in a landfill – C4 module (Table 1). Module D includes benefits from the use of steel components for the production of new steel, the production of recycled plastic granules and the incineration of plastic with energy recovery.

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

Material	Material recovery	Recycling	Incineration	Landfilling
metals	100%	98%	0%	2%
polymers	100%	45%	45%	10%

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 01.01.2023 – 31.12.2023 (1 year). The life cycle assessments were prepared for Poland and Europe as reference area.

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 is judged as good. The background data for the processes come from the following resources database Ecoinvent v.3.11.

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 was calculated using the IPCC 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 (Ecoinvent v 3.11 supplemented by actual national KOBiZE data) emission factor used is 0.597kg CO_2/kWh (National for 2023). As a general rule, no particular environmental or health protection measures other than those specified by law are necessary. The product may contain dangerous substances (lead), more then 0,1% by weight, given by the REACH Candidate List.

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 kg of KAN-therm system (PP pipes, fittings and connectors) 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**

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_2	2.90E+00	2.24E-01	1.64E-01	3.29E+00	1.67E-02	3.43E-03	6.87E-03	1.67E-02	1.23E+00	5.28E-04	-1.17E+00
Greenhouse potential - fossil	eq. kg CO_2	2.90E+00	2.24E-01	1.62E-01	3.28E+00	1.66E-02	3.43E-03	6.85E-03	1.66E-02	1.23E+00	5.27E-04	-1.10E+00
Greenhouse potential - biogenic	eq. kg CO_2	3.67E-03	1.40E-04	2.27E-03	6.07E-03	5.68E-05	9.23E-06	1.85E-05	5.68E-05	8.74E-04	1.34E-06	-1.81E-02
Global warming potential - land use and land use change	eq. kg CO_2	2.35E-03	7.49E-05	1.73E-05	2.44E-03	6.52E-06	5.36E-07	1.07E-06	6.52E-06	2.34E-05	4.97E-07	-1.94E-04
Stratospheric ozone depletion potential	eq. kg CFC 11	8.68E-08	4.85E-09	1.59E-09	9.32E-08	3.85E-09	1.88E-11	3.77E-11	3.85E-09	2.35E-01	2.13E-10	-5.62E-08
Soil and water acidification potential	eq. mol H+	9.81E-03	8.02E-04	1.83E-03	1.24E-02	6.75E-05	3.62E-05	7.25E-05	6.75E-05	2.47E-02	4.95E-06	-1.12E-03
Eutrophication potential - freshwater	eq. kg P	6.31E-04	1.52E-05	2.84E-04	9.30E-04	1.12E-06	5.90E-06	1.18E-05	1.12E-06	4.24E-06	4.91E-08	-6.64E-05
Eutrophication potential - seawater	eq. kg N	2.15E-03	2.62E-04	2.41E-04	2.65E-03	2.04E-05	5.13E-06	1.03E-05	2.04E-05	1.34E-02	1.72E-06	-2.41E-04
Eutrophication potential - terrestrial	eq. mol N	2.22E-02	2.85E-03	2.05E-03	2.71E-02	2.22E-04	4.47E-05	8.95E-05	2.22E-04	1.42E-01	1.89E-05	-2.38E-03
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.60E-02	1.14E-03	6.32E-04	1.78E-02	6.80E-05	1.29E-05	2.57E-05	6.80E-05	3.50E-02	5.48E-06	-6.32E-04
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.38E-05	7.63E-07	6.86E-08	1.47E-05	5.89E-08	1.29E-09	2.58E-09	5.89E-08	3.01E-07	1.21E-09	-1.45E-06
Abiotic depletion potential - fossil fuels	MJ	7.94E+01	3.17E+00	2.99E+00	8.55E+01	2.47E-01	5.41E-02	1.08E-01	2.47E-01	1.57E-01	1.44E-02	-9.39E+00
Water deprivation potential	eq. m^3	9.12E-01	1.65E-02	6.28E-02	9.92E-01	1.14E-03	1.03E-03	2.07E-03	1.14E-03	2.61E-02	4.58E-05	-4.23E-02

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

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	2.00E+00	5.12E-02	2.27E-01	2.27E+00	3.54E-03	4.45E-03	8.90E-03	3.54E-03	5.08E-02	1.25E-04	-3.25E-01
Consumption of renewable primary energy resources used as raw materials	MJ	1.28E-02	0.00E+00	0.00E+00	1.28E-02	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	2.01E+00	5.12E-02	2.27E-01	2.29E+00	3.54E-03	4.45E-03	8.90E-03	3.54E-03	5.08E-02	1.25E-04	-3.25E-01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	3.80E+01	3.17E+00	2.79E+00	4.39E+01	2.47E-01	5.41E-02	1.08E-01	2.47E-01	-2.70E+01	1.44E-02	-1.27E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	4.14E+01	0.00E+00	1.99E-01	4.16E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.71E+01	0.00E+00	-1.11E+01
Total consumption of non-renewable primary energy resources	MJ	7.94E+01	3.17E+00	2.99E+00	8.55E+01	2.47E-01	5.41E-02	1.08E-01	2.47E-01	1.57E-01	1.44E-02	-1.02E+01
Consumption of secondary materials	kg	1.29E-02	1.42E-03	2.28E-04	1.46E-02	8.27E-05	4.70E-06	9.40E-06	8.27E-05	7.56E-04	3.03E-06	-3.20E-01
Consumption of renew. secondary fuels	MJ	2.44E-04	1.84E-05	1.10E-06	2.64E-04	9.11E-07	2.37E-08	4.75E-08	9.11E-07	9.80E-06	7.93E-08	-3.64E-06
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	0.00E+00	0.00E+00	-1.10E-05
Net consumption of freshwater	m^3	2.17E-02	3.81E-04	1.79E-03	2.39E-02	3.10E-05	1.55E-04	3.11E-04	3.10E-05	2.73E-04	1.58E-05	-1.21E-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	1.61E-02	4.53E-03	2.76E-02	4.82E-02	2.77E-04	4.19E-04	8.38E-04	2.77E-04	2.85E-03	1.53E-05	-7.76E-03
Non-hazardous waste	kg	2.02E+00	9.69E-02	1.39E+00	3.50E+00	4.92E-03	2.82E-02	5.65E-02	4.92E-03	4.58E-02	2.16E-04	-4.40E-01
Radioactive waste	kg	3.64E-05	9.25E-07	2.98E-07	3.76E-05	1.84E-08	8.12E-09	1.62E-08	1.84E-08	1.04E-06	9.59E-08	-8.00E-06
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	1.42E-03	4.21E-05	2.61E-02	2.76E-02	7.64E-07	3.63E-07	7.26E-07	7.64E-07	2.72E-01	2.89E-08	-2.68E-04
Materials for energy recovery	kg	2.15E-06	1.99E-07	2.45E-08	2.38E-06	6.18E-09	5.83E-10	1.17E-09	6.18E-09	7.72E-08	3.42E-10	-1.09E-07
Exported Energy	MJ	2.47E-02	1.37E-03	8.73E-04	2.70E-02	0.00E+00	1.73E-04	3.46E-04	0.00E+00	3.49E-01	0.00E+00	-8.75E-03

Verification

The process of verification of this EPD is in accordance with ISO 14025 and ISO 21930. 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.) [x] external [ ] 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 (v.1.6.,2023)
- 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 2: Pipes
- EN ISO 15874-2 Plastics piping systems for hot and cold water installations — Polypropylene (PP) Part 2: Pipes
- EN ISO 15874-3 Plastics piping systems for hot and cold water installations — Polypropylene (PP) Part 3: Fittings
- KOBiZE Wskaźniki emisyjności CO_2, SO_2, NO_x, CO i pyłu całkowitego dla energii elektrycznej. December 2024
- World Steel Association 2024 Life Cycle inventory methodology report for steel products

LCA,LCI, input data verification
Michał Piasecki, PhD. D.Sc.

Qualified electronic signature

Head of Thermal Physic, Acoustic and Environment Department
Agnieszka Winkler-Skalna, PhD.

Qualified electronic signature

Instytut Techniki Budowlanej

Instytut Techniki Budowlanej

00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department

02-656 Warsaw, Ksawerów 21

CERTIFICATE № 829/2025
of TYPE III ENVIRONMENTAL DECLARATION

Products:

KAN-therm system (PP pipes, fittings and connectors)

Manufacturer:

KAN Sp. z o.o.

ul. 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 on 22nd August 2025 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

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, August 2025