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Fasteners for flat roof thermal insulation and waterproofing system



Owner of the EPD:

Wkręt-met Sp. z o. o.
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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: 2026

Service Life: 10 years

PCR: ITB-PCR A

Declared unit: 1 kg

Reasons for performing LCA: B2B

Representativeness: Polish, European, 2023

MANUFACTURER



Figure 1 View from the Wkręt-met Sp. z o.o. manufacturing plant no. 1 in Kuźnica Kiedrzyńska



Figure 2 View from the Wkręt-met Sp. z o.o. manufacturing plants no. 2, 3, and 4 in Wanaty near Częstochowa

Wkręt-met Sp. z o.o. is a Polish manufacturer of fastening products for the construction sector. It operates 2 production locations in Poland (Manufacturing plant no.1 in Kuźnica Kiedrzyńska, Manufacturing plant no. 2, 3 and 4 in Wanaty) equipped with injection molding machines, presses, rolling equipment, CNC machining centers, high-bay storage, and quality control systems. The company provides comprehensive customer support throughout the fastening process.

PRODUCTS DESCRIPTION AND APPLICATION

Fasteners for flat roof thermal insulation and waterproofing systems are mechanical fixing elements used to secure roofing components. The product group includes screws (with or without expansion sleeves) and washers, or washers with integrated sleeves. Screws and washers without sleeves are made of carbon steel, hardened, and protected with a galvanic or lamellar coating. Products differ in length, diameter, head type and coating, depending on the specific variant and application requirements. Products are assessed in accordance with ETA-15/0578 and CE-marked according to Regulation (EU) No. 305/2011 (CPR), designed to transfer structural loads in roofing systems, with a declared service life of 10 years. Associated Approvals / Certificate Numbers:

- ETA-15/0578

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 products.

Note: Mass conversion factor per unit area m^2 , assumed 4 pcs/ m^2 , insulation thickness 170mm 200mm long fasteners – factor 0.09.

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 2% 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. Production of the Fasteners for flat roof thermal insulation and waterproofing system is a line process (as presented in Figure 2) conducted in the two manufacturing plant located in Kuźnica Kiedrzyńska or Wanaty near Częstochowa. Input and output data from the production is inventoried and allocated to the production on the mass basis. The declaration covers all Fasteners for flat roof thermal insulation and waterproofing system products manufactured in the plant. Their production resources and processing stages are basically similar, so it is possible to average the production by product weight.

System limits

Minimum 99.0% input materials and 100% energy consumption (electricity, gas, LPG, other) were inventoried in a processing plant and were included in the calculation. In the assessment, all available data from production have been considered, i.e. all raw materials/elements used as per formulation process, utilized thermal energy for heating , and electric power consumption. Thus, material and energy flows contributing less than 1 % of mass or energy have been considered. It can be assumed that the total sum of neglected processes does not exceed 1 % of energy usage and mass per modules A or D. Machines and facilities required during production are neglected.

Modules A1 and A2: Raw materials supply and transport

Modules A1 and A2 represent the extraction and processing of raw materials (mainly steel or plastic material) and transport to the production site. Steel and plastic elements are commonly used semi-finished products for the production of any parts. Module A2 (transport) includes truck transport and uses Polish and European averages for fuel data.

Module A3: Production

Production, consisting of preparing metal and plastic parts and finishing, takes place in two plant. The following processes are used in production: cutting, perforating, forming, molding and applying an anti-corrosion coating. After passing quality control, the finished products are initially stored, then packed and sent to the recipient. The block diagram of the production process is shown in Figure 3.

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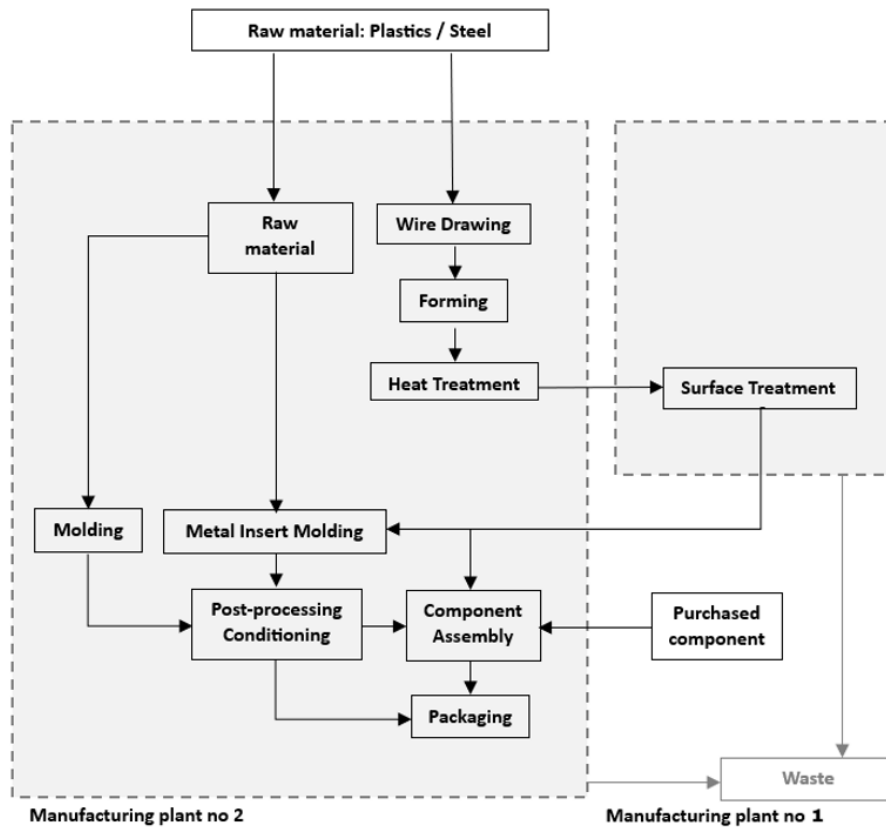


Figure 3. A basic scheme of the specific product manufacturing process

Module A4-A5: Transport to consumer

Transport of the steel and plastic parts from the Factory to the construction site is carried out using vehicles at customer's request, depending on the terms of the contract. Loads on trucks are secured with belts with tensioners or chains. Vehicle transport at distance 100 km is considered (emission standard: Euro 5) with 100% load capacity.

Modules C1-C4 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 products are transported to a recycling plant by 100 km on > 16t lorry EURO 5 where are used as scrap to produce a new steel or plastic products. 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 2). Module D presents credits resulting from the recycling of the steel scrap and plastic waste (used for a new production), calculated in accordance with the approach developed by World Steel Association and Plastic Europe. The situation is similar with plastic components, except that they are sent to appropriate recipients involved in recycling and storage of plastics.

Table 1. End-of-life scenario for the product components

Material	Material recovery %	Recycling %	Landfilling %
Steel scrap	100	98	2
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.

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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 producer. No specific 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 Ecoinvent v.3.11 and KOBIZE (Polish electricity mix and combustion factors for fuels). KOBIZE data is supplemented with Ecoinvent data on the national electricity mix impact where no specific indicator data is provided. Specific (LCI) data quality analysis was a part of the input data verification. The time related quality of the data used is valid (5 years).

Assumptions and estimates

The impacts of the representative of the 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. No mass balance approach was used. Biogenic content less than 5%.

Additional information

Polish electricity mix used is 0.533 kg CO₂/kWh (KOBiZE 2024). European electricity mix used is 0.43 kg CO₂/kWh (Ecoinvent v3.11, RER). As a general rule, no particular environmental or health protection measures other than those specified by law are necessary.

Databases

The data for the processes come from the following databases: Ecoinvent v.3.11, specific EPDs, ITB-Database. Specific data quality analysis was a part of external audit.

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LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to declared unit (DU) – 1 kg of the Fasteners for flat roof thermal insulation and waterproofing system. The following life cycle modules (Table 3) were included in the analysis. The evaluation results for the specific products are given in Tables 4-7.

Table 3. System boundaries for the environmental characteristic of the specific products.

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 4. Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO ₂	2.98E+00	1.06E-01	4.44E-01	3.53E+00	1.67E-02	6.87E-03	2.75E-03	8.34E-03	1.16E+00	1.20E-02	-1.49E+00
Greenhouse potential - fossil	eq. kg CO ₂	3.07E+00	1.06E-01	4.44E-01	3.62E+00	1.66E-02	6.85E-03	2.74E-03	8.31E-03	1.06E+00	1.20E-02	-1.47E+00
Greenhouse potential - biogenic	eq. kg CO ₂	-1.00E-01	2.71E-05	6.67E-04	-9.98E-02	5.68E-05	1.85E-05	7.39E-06	2.84E-05	1.00E-01	8.54E-06	-6.76E-03
Global warming potential - land use and land use change	eq. kg CO ₂	2.87E-03	5.57E-05	4.81E-05	2.98E-03	6.52E-06	1.07E-06	4.28E-07	3.26E-06	9.50E-06	6.41E-07	-1.15E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	4.30E-08	2.00E-09	5.21E-09	5.02E-08	3.85E-09	3.77E-11	1.51E-11	1.92E-09	3.18E-01	2.89E-11	-7.57E-09
Soil and water acidification potential	eq. mol H ⁺	9.52E-03	1.58E-03	5.21E-03	1.63E-02	6.75E-05	7.25E-05	2.90E-05	3.37E-05	3.90E-04	7.97E-06	-3.83E-04
Eutrophication potential - freshwater	eq. kg P	4.13E-04	5.59E-06	8.01E-04	1.22E-03	1.12E-06	1.18E-05	4.72E-06	5.59E-07	2.07E-06	1.19E-07	-4.11E-05
Eutrophication potential - seawater	eq. kg N	2.21E-03	4.12E-04	6.82E-04	3.30E-03	2.04E-05	1.03E-05	4.10E-06	1.02E-05	8.61E-04	2.65E-05	-2.20E-04
Eutrophication potential - terrestrial	eq. mol N	2.27E-02	4.54E-03	5.80E-03	3.30E-02	2.22E-04	8.95E-05	3.58E-05	1.11E-04	2.25E-03	3.25E-05	-2.22E-03
Potential for photochemical ozone synthesis	eq. kg NMVOC	9.28E-03	1.33E-03	1.73E-03	1.23E-02	6.80E-05	2.57E-05	1.03E-05	3.40E-05	5.68E-04	1.41E-05	-3.39E-04
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.01E-05	2.49E-07	1.94E-07	1.05E-05	5.89E-08	2.58E-09	1.03E-09	2.95E-08	5.27E-08	2.52E-09	-1.28E-04
Abiotic depletion potential - fossil fuels	MJ	5.65E+01	1.42E+00	8.36E+00	6.63E+01	2.47E-01	1.08E-01	4.33E-02	1.23E-01	2.35E-01	2.49E-02	-2.92E+00
Water deprivation potential	eq. m ³	4.72E-01	6.02E-03	1.77E-01	6.55E-01	1.14E-03	2.07E-03	8.27E-04	5.70E-04	2.83E-02	1.18E-04	-1.82E+00

Table 5. Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 kg)

Indicator	Unit	A1-A5	B1-B7	C1	C2	C3	C4	D
Particulate matter	disease incidence	INA	INA	INA	INA	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA	INA	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA	INA	INA	INA	INA

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Table 6. Life cycle assessment (LCA) results for specific product – environmental impacts (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	5.41E+00	1.77E-02	6.39E-01	6.06E+00	3.54E-03	8.90E-03	3.56E-03	1.77E-03	4.89E-03	3.73E-04	-1.57E+00
Consumption of renewable primary energy resources used as raw materials	MJ	1.05E+00	0.00E+00	0.00E+00	1.05E+00	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	6.46E+00	1.77E-02	6.39E-01	7.11E+00	3.54E-03	8.90E-03	3.56E-03	1.77E-03	4.89E-03	3.73E-04	-1.57E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.53E+01	1.42E+00	8.07E+00	5.48E+01	2.47E-01	1.08E-01	4.33E-02	1.23E-01	2.35E-01	2.49E-02	-4.07E+00
Consumption of non-renewable primary energy resources used as raw materials	MJ	1.58E+01	0.00E+00	3.05E-01	1.61E+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 non-renewable primary energy resources	MJ	6.11E+01	1.42E+00	8.38E+00	7.09E+01	2.47E-01	1.08E-01	4.33E-02	1.23E-01	2.35E-01	2.49E-02	-4.07E+00
Consumption of secondary materials	kg	3.58E-01	6.46E-04	5.90E-04	3.59E-01	8.27E-05	9.40E-06	3.76E-06	4.14E-05	2.20E-04	8.99E-06	-5.43E-03
Consumption of renew. secondary fuels	MJ	1.90E-02	5.51E-06	2.61E-06	1.90E-02	9.11E-07	4.75E-08	1.90E-08	4.56E-07	1.65E-06	1.69E-07	-5.08E-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	0.00E+00
Net consumption of freshwater	m3	1.31E-02	1.33E-04	5.82E-03	1.90E-02	3.10E-05	3.11E-04	1.24E-04	1.55E-05	-2.90E-04	-3.70E-04	-1.79E-02

Table 7. Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste	kg	7.85E-02	1.51E-03	1.24E-01	2.04E-01	2.77E-04	8.38E-04	3.35E-04	1.38E-04	7.52E-03	4.40E-05	-4.71E-02
Non-hazardous waste	kg	3.28E+00	3.20E-02	3.93E+00	7.25E+00	4.92E-03	5.65E-02	2.26E-02	2.46E-03	8.53E-01	4.97E-01	-1.44E+00
Radioactive waste	kg	1.47E-04	3.09E-07	1.15E-06	1.48E-04	1.84E-08	1.62E-08	6.49E-09	9.21E-09	1.97E-07	6.15E-09	-3.14E-01
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	3.82E-02	7.27E-05	4.92E-02	8.75E-02	7.64E-07	7.26E-07	2.90E-07	3.82E-07	1.69E-04	4.21E-07	-1.69E-04
Materials for energy recovery	kg	9.91E-03	6.31E-08	6.23E-08	9.91E-03	6.18E-09	1.17E-09	4.67E-10	3.09E-09	1.86E-08	1.72E-09	-1.65E-08
Exported Energy	MJ	2.05E-02	4.09E-04	2.56E-03	2.35E-02	0.00E+00	3.46E-04	1.38E-04	0.00E+00	2.53E-02	5.24E-06	-1.29E-04

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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+A2 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 data, 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
- KOBiZE Wskaźniki emisyjności CO₂, SO₂, NO_x, CO i pyłu całkowitego dla energii elektrycznej. Grudzień 2024
- World Steel Association 2023 Life Cycle inventory methodology report for steel products
- Ecoinvent.org

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

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CERTIFICATE № 919/2026 of TYPE III ENVIRONMENTAL DECLARATION

Products:

Fasteners for flat roof thermal insulation and waterproofing system

Manufacturer:

Wkręt-met Sp. z o. o.

Kuźnica Kiedrzyńska, ul. W. Witosa 170/176, 42-233 Mykanów, 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.

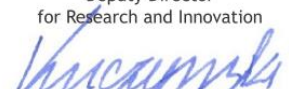
This certificate, issued on 27th February 2026 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics
and Environment Department


Agnieszka Winkler-Skalna, PhD



Deputy Director
for Research and Innovation


Krzysztof Kućzyński, PhD

Warsaw, February 2026