Łukasiewicz
Institute of Ceramics
and Building Materials

RAWLPLUG®

ENVIRONMENTAL PRODUCT DECLARATION

NR 04-10/2025

Hammer-in
facade fixings

R-TFIX-8M

OWNER OF THE DECLARATION:	Rawlplug S.A.
PROGRAM OWNER:	Łukasiewicz Research Network – Institute of Ceramics and Building Materials
PROGRAM NAME:	Environmental product declaration – B2B
DATE OF ISSUE:	**31.10.2025**
DECLARATION VALID UNTIL:	**31.10.2030**

1. GENERAL INFORMATION

Product of declaration:	Hammer-in facade fixings R-TFIX-8M
Program owner: Łukasiewicz Research Network– Institute of Ceramics and Building Materials Environmental Engineering Center in Opole. **http://www.icimb.pl/opole/**	**Declaration owner:** Rawlplug S.A. 6 Kwidzyńska st., 51-416 Wrocław Telephone: +48 695 223 116 Adress: info@rawlplug.com **www.rawlplug.com**
Declared unit:	**1 kg**
Date of issue:	31.10.2025
Declaration valid until:	31.10.2030
Life Cycle Analysis (LCA):	A1-A3, C1-C4 and D according to PN-EN 15804+A2 (Cradle-to-Gate with options)
Product Categorization (PCR) Rules	PN-EN 15804+A2:2020-03 Sustainability of construction works. Environmental Product Declarations. Basic principles of categorization of construction products, ICIMB-PCR A.
Representatives:	Polish product, year 2024
Declared durability:	25 years
Reasons for performing LCA:	B2B
Standard of product	EAD 330196-01-0604, ETA-17/0592
Declarations that are the result of different programs or are not performed in accordance with the standard may not be comparable.	
The Łukasiewicz – Institute of Ceramics and Building Materials Environmental Engineering Center provides access to the Type III environmental declaration for hammer-in facade fixings R-TFIX-8M to interested parties.	
The declaration owner is responsible for the information and the base evidence. Łukasiewicz Research Network - Institute of Ceramics and Building Materials Center for Environmental Engineering is not responsible for the manufacturer's information and data and evidence regarding the life cycle assessment.	
Authors' team: Katarzyna Kiprian, M.Sc. Ewa Głodek-Bucyk, Ph.D. Patryk Okoń, M.Sc. Kamil Ryfiak, Eng. **Approved:** Joanna Poluszyńska Joanna Poluszyńska, PhD Director of the Environmental Engineering Center Ewa Głodek-Bucyk Ewa Głodek-Bucyk, Ph.D. Leader of the Process Engineering Research Group	**Review:** CEN standard PN-EN 15804+A2 serves as the main PCR document. Independent verification of declarations and data according to EN ISO 14025:2010 ☐ internal ☑ external Katarzyna Grzesik Katarzyna Grzesik, PhD, DSc

2. INFORMATION ABOUT THE MANUFACTURER AND PRODUCTS

Rawlplug is a leading global supplier of innovative fastening systems, fasteners and tools for the construction and industrial sectors, as well as for individual customers. The company, whose history dates back over 100 years to the invention of the first expansion plug, has four modern production plants. Two in Poland (Wrocław and Łańcut) and in Vietnam and Thailand, as well as a modern R5PL logistics centre in Kożuchów, Poland. Rawlplug consistently pursues an ambitious ESG strategy, with the overarching goal of achieving climate neutrality by 2030. Thanks to a global network of 42 sales companies, the company delivers high-quality products and services in over 100 countries. With over 2,000 employees, the Rawlplug Group supports the most demanding engineering projects in the world – from Burj Khalifa to space missions to Mars. For more information, visit: **www.rawlplug.com.**

Figure 1.
Production plant in Wrocław

R-TFIX-8M is universal hammer-in facade fixing with steel pin recommended for ETICS thermal insulation systems. The fixing consists of an anchoring sleeve, an insulating plate made of polypropylene and metal nail with overmolding for sizes 95 mm and 115 mm and metal nail with polyamide pin for the rest size from 135 mm to 295 mm. The metal pin is available in galvanized or zinc flake coating carbon steel and stainless steel. The fixings can also be used with KWL and R-KWL washers – these are additional accessories. The design of the fixing ensures easy and quick installation in all types of substrates (concrete, ceramic brick, silicate brick, concrete block, aerated concrete), while ensuring the highest load-bearing capacity. The high rigidity of the plate (1.0 kN/mm) ensures the stability of the insulation system, counteracting vibrations caused by wind suction forces. Reduced point thermal transmittance to 0.001 W/K for sizes 135-295 mm and to 0.002 W/K for sizes 95-115 mm reduces heat loss on the facade thanks to the use of a high-quality steel pin.

Table 1.
Composition of hammer-in facade fixings R-TFIX-8M

Component	Percentage [%]
Plastic	54-56
Steel	34-36
Additives	8-12

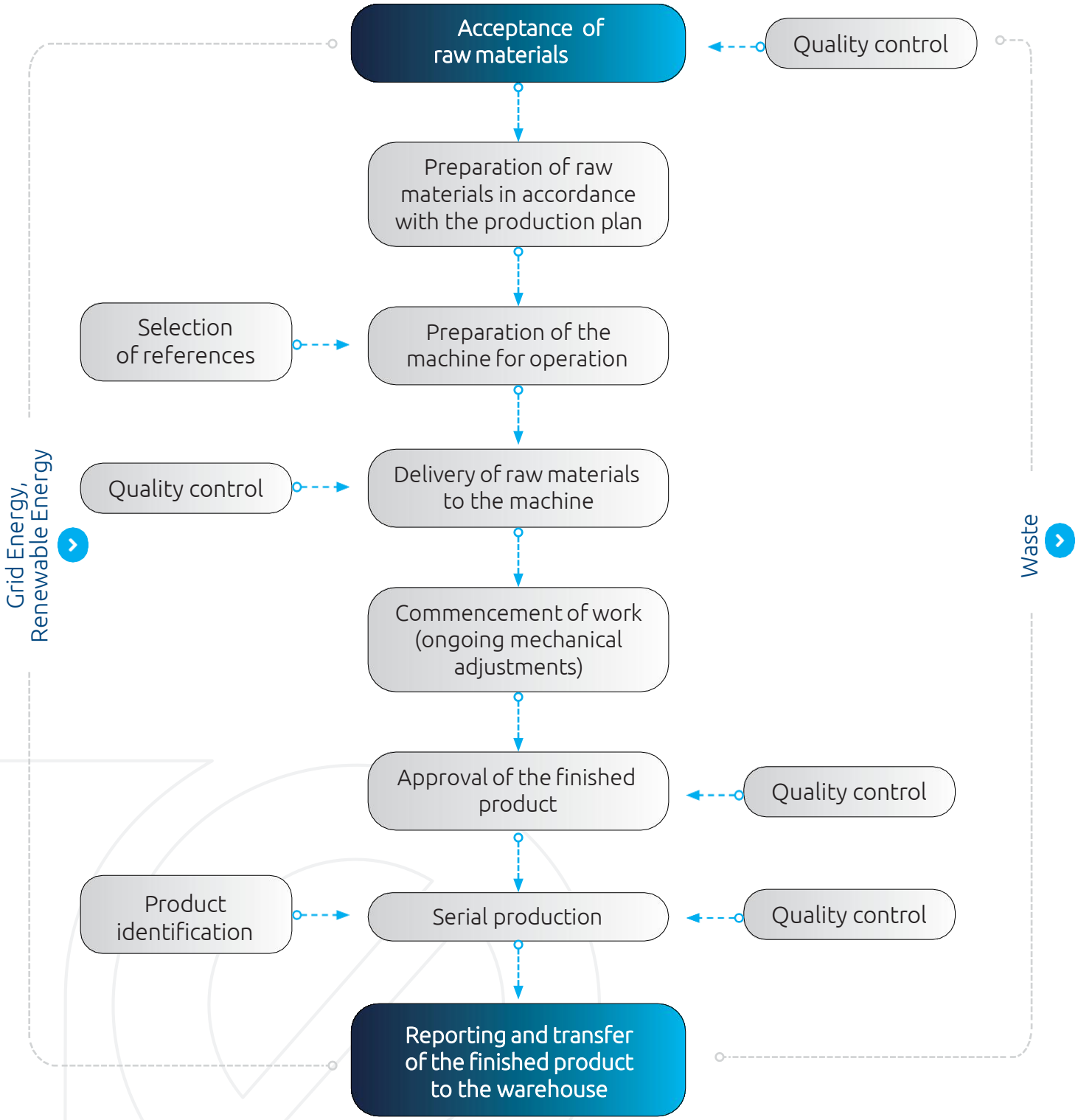


Figure 2.
Flow process for a hammer-in facade fixing

The manufacturing process of the R-TFIX-8M hammer-in facade fixing begins with the acceptance of raw materials to the plant. At this stage, a quality control check is performed to verify that the delivered material complies with the technical requirements and delivery documentation. The raw material is then placed in accordance with the current production plan and prepared for further processing.

The next stage is to prepare the machine for operation. The operator selects the appropriate product reference, sets the operating parameters, installs the required tools and checks the technical readiness of the device. Once the preparations are complete, the raw material is delivered to the machine. Before production begins, a quality control check is carried out to verify that the workstation has been prepared correctly and that the parameters comply with the technological plan.

Once the preparations are complete, work begins. The manufacturing process is started and the operator monitors the machine's operation, making any necessary mechanical adjustments to maintain the appropriate quality parameters. After a trial batch of the product has been produced, another quality control check is carried out, the positive result of which allows the finished product to be approved for further production.

Then, serial production begins, which runs continuously and in accordance with the established technological parameters. During production, constant supervision and periodic quality checks are carried out to ensure the repeatability and compliance of the products with the requirements. Each manufactured product is labelled for identification purposes. A batch number or production series designation is assigned, which allows the origin and manufacturing history of the product to be traced.

The final stage of the process is reporting and transferring the finished product to the warehouse. A production report is prepared containing data on quantity, quality and any deviations in the process. The finished products are then transferred to the warehouse for storage or shipment to the recipient.

3. LCA: CALCULATION RULES

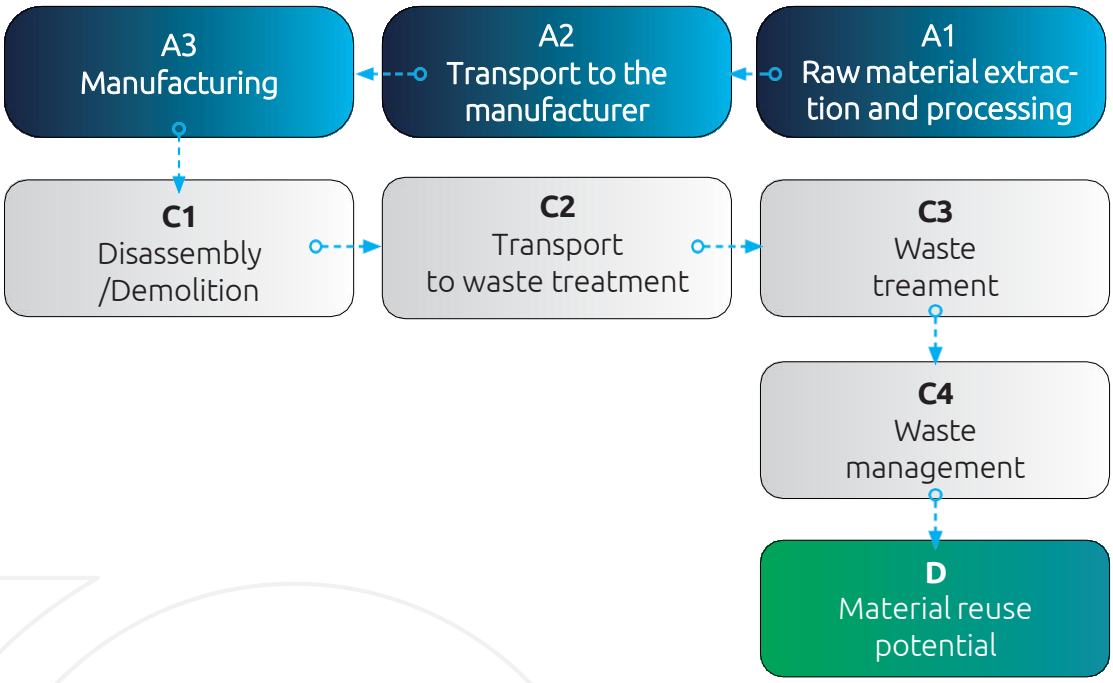
The environmental declaration is based on data provided by the declaration owner, Rawlplug S.A., for the plant where the product is manufactured:

- Rawlplug S.A. ul. Kwidzyńska 6, 51-416 Wrocław.

The input and output flow values were calculated based on data provided by the manufacturer from the production plant for the period January 1, 2024 - December 31, 2024 (12 months).

System limitations

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



Data correlation period

Data regarding the production process were provided in 2025 for the period 01/01/2024 - 31/12/2024 (12 months) and correspond to the production technology at that time.

Declared unit

1 kg

Assumptions

A1 – Raw material extraction refers to specific mass shares in the production process per declared unit of product.

A2 – Transport to the production plant gate, with means of transport varying depending on delivery method.

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

C1 - includes processes related to the end of operation of the hammer-in facade fixings created during disassembly/demolition. The calculations are made on the basis of a developed scenario,

C2 – refers to the transport of the used product as part of the waste treatment to the recycling point and the transport of the waste, e.g. to the final disposal site. The calculations are made on the basis of a developed scenario,

C3 – takes into account the environmental impact during the treatment of demolition waste containing elements of the hammer-in facade fixings driven in the waste recovery plant. The calculations are performed on the basis of the developed scenario,

C4 – covers the final processes of management of used hammer-in facade fixings. The calculations are performed on the basis of the developed scenario,

D – takes into account the environmental benefits and burdens beyond the system boundaries resulting from the recovery of materials and energy at the end of the product's use. The calculations are performed based on the developed scenario.

Cut-off-criteria	The life cycle analysis takes into account 99% of all mass streams involved in the production process, allowing the main environmental impacts of the product to be fully mapped. All the energy used in the production process has been fully taken into account. The data on raw materials, energy and utilities comes directly from the manufacturer or has been obtained from recognized LCA databases.
General data	The data for the calculations come from Ecoinvent v. 3.10 and have been supplemented with KOBiZE CO_2, SO_2, NO_x, CO and total particulate matter emission factors for electricity, December 2024. Emission factors for electricity were determined using the actual KOBiZE data. The Polish electricity emission factor used (Ecoinvent supplemented with current national data from KOBiZE) is 0.597 kg CO_2/kWh. A detailed analysis of data quality was part of an external audit.
Allocation	All data regarding unit processes from a single production plant were obtained via Data Acquisition Questionnaires, completed and verified by the declaration owner – Rawlplug S.A. The original data was referenced to the declared product unit, i.e., 1 kilogram. The allocation principles used are consistent with the requirements of the EN 15804+A2 standard and the ICIMB-PCR Part A guidelines. All data were normalized to the declared unit level and recalculated in accordance with the principle of representativeness of the technological process at the analyzed plant.

4. LCA: SCENARIOS AND ADDITTIONAL TECHNICAL INFORMATION

The life cycle assessment was carried out in accordance with the requirements of PN-EN ISO 15804+A2:2020, PN-EN ISO 14025 and PN-EN ISO 14040. The rules for categorizing the product were adopted on the basis of the guidelines of the PN-EN 15804 standard. The data used in the Life Cycle Analysis (LCA) comes from the Data Acquisition Questionnaires, which were filled in by the owner of the declaration – Rawlplug S.A. and verified during the data audit. This data is no more than five years old, and none of the generic datasets used are more than ten years old. The complete, representativeness and consistency of the data were assessed as good. The quality of the specific data (LCI) was assessed as part of the verification process. In line with the scope of „cradle to gate with options", this environmental declaration also covers scenarios for the end-of-life phase of the product (modules C1 to C4) and potential benefits and burdens beyond the system boundaries (module D).

C1 – includes processes related to the end of operation of hammer-in facade fixings R-TFIX-8M, After the end of use, the hammer-in facade fixings R-TFIX-8M is dismantled during the demolition of the façade system or insulation of the building. The connectors can be mechanically separated from the ground together with polystyrene boards.

C2 – in order to calculate the impact of this module, the following assumptions were made:

- 100% of the weight of the waste is transported to the recovery plant,
- transport is carried out with the use of vehicles with a load capacity of 16 – 32 tons, meeting EURO 6 emission standards
- the material is transported to a waste treatment site located 100 km from the demolition site.

C3 - waste treatment, e.g. collection of waste fractions from demolition and processing of material streams intended for reuse, recycling and energy recovery. The module was considered zero due to the lack of technological operations generating significant emissions or energy consumption in the processing process. All waste is transferred for further management in modules C4 (utilization) and module D (energy recovery and benefits outside the system):

- 90 % for combustion with energy recovery,
- 10 % for landfill site.

The generated waste is an integral part of the insulation system and is processed together with it. Therefore, there are no separate technological operations for connectors only, which could cause additional environmental burdens.
The benefits of using these secondary materials are covered in Module D.

C4 – The developed scenario assumes the storage of 10% of waste containing elements of the hammer-in facade fixings R-TFIX-8M. The process takes into account the management of the storage site in accordance with the applicable national regulations.

D – includes the potential environmental benefits of recovery and reuse. The calculations take into account the environmental benefits and burdens beyond the system boundaries resulting from energy recovery at the end of the product's life. Energy recovery: 90% of the waste containing the hammer-in facade fixings R-TFIX-8M is incinerated with energy recovery, replacing fossil fuel energy production and reducing greenhouse gas emissions.

4. LCA: RESULTS

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

SYSTEM BOUNDARIES (X –MODULE INCLUDED IN LCA, MND – MODULE NOT DECLARED)																
Products stage			**Construction process stage**		**Use stage**							**End-of-life stage**				**Benefits and loads beyond the system boundary**
Raw material supply	Transport	Production	Transport	Construction process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction	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
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X

The following tables present the results of the LCA analysis hammer-in facade fixings R-TFIX-8M. Explanations of the abbreviations used to describe the impact category are provided below:

GWP-total	Global warming potential
GWP-fossil	Global warming potential fossil fuel
GWP-biogenic	Global warming potential biogenic
GWP-luluc	Global warming potential land use and land change
ODP	Depletion potential of the stratospheric ozone layer
AP	Acidification potential of land and water
EP-freshwater	Eutrophication potential, fraction of nutrients reaching freshwater end compartment
EP-marine	Eutrophication potential, fraction of nutrients reaching marine end compartment
EP-terrestial	Eutrophication potential, Accumulated Exceedance
POCP	Formation potential of tropospheric ozone photochemical oxidants
ADP-minerals &metals	Abiotic depletion potential for nonfossil resources
ADP-fossil	Abiotic depletion potential for fossil resources
WDP	Water (user) deprivation potential
PM	Potential incidence of disease due to PM emissions
IRP	Potential Human exposure efficiency relative to U235
ETP-fw	Potential comparative Toxic Unit for ecosystems
HTP-c	Potential comparative Toxic Unit for humans (cancerogenic)
HTP-nc	Potential comparative Toxic Unit for humans (non-cancerogenic)
SQP	Potential soil quality index
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 resources excluding non-re- newable 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 fuels
NRSF	Use of non-renewable secondary fuels
FW	Use of net fresh water

MAIN IMPACT INDICATORS: 1 kilogram hammer-in facade fixings R-TFIX-8M

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
GWP-total	kg CO_2 eq.	3,14E+00	1,51E-01	2,07E-01	0,00E+00	3,80E-02	0,00E+00	2,79E-04	-1,99E+00
GWP-fossil	kg CO_2 eq.	3,17E+00	1,51E-01	2,06E-01	0,00E+00	3,80E-02	0,00E+00	2,78E-04	-1,99E+00
GWP-biogenic	kg CO_2 eq.	-3,78E-02	1,04E-04	7,07E-04	0,00E+00	2,63E-05	0,00E+00	7,37E-07	4,88E-03
GWP-luluc	kg CO_2 eq.	4,80E-03	5,02E-05	2,93E-04	0,00E+00	1,26E-05	0,00E+00	2,90E-08	-8,07E-04
ODP	kg CFC11 eq.	6,10E-08	3,00E-09	5,26E-10	0,00E+00	7,55E-10	0,00E+00	4,29E-12	-2,72E-09
AP	mol H+ eq.	1,13E-02	3,14E-04	8,87E-04	0,00E+00	7,91E-05	0,00E+00	2,46E-06	-1,08E-02
EP-freshwater	kg PO4 eq.	7,10E-04	1,02E-05	2,37E-04	0,00E+00	2,57E-06	0,00E+00	8,22E-09	-8,94E-04
EP-marine	kg N eq.	3,06E-03	7,54E-05	1,61E-04	0,00E+00	1,90E-05	0,00E+00	1,14E-06	-1,02E-03
EP-terrestrial	mol N eq.	2,32E-02	8,13E-04	1,29E-03	0,00E+00	2,05E-04	0,00E+00	1,25E-05	-9,65E-03
POCP	kg NMVOC eq.	1,17E-02	5,22E-04	3,64E-04	0,00E+00	1,31E-04	0,00E+00	3,73E-06	-5,52E-03
ADP-minerals & metals	kg Sb eq.	1,35E-05	4,93E-07	4,77E-07	0,00E+00	1,24E-07	0,00E+00	1,14E-10	-8,87E-07
ADP-fossil	MJ	6,16E+01	2,12E+00	2,23E+00	0,00E+00	5,34E-01	0,00E+00	3,64E-03	-1,65E+01
WDP	WDP (m^3) world eq.	1,94E+00	8,81E-03	1,31E-02	0,00E+00	2,22E-03	0,00E+00	7,87E-06	-8,70E-02

ADDITIONAL IMPACT INDICATORS: 1 kilogram hammer-in facade fixings R-TFIX-8M

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PM	Disease incidency	3,95E-07	1,11E-08	7,60E-09	2,14E-08	6,99E-10	8,35E-09	1,07E-10	-1,02E-07
IRP	kBq U235 eq.	4,35E-01	2,68E-03	1,51E-03	4,89E-04	1,73E-04	4,55E-04	3,01E-06	-1,77E-02
ETP-fw	CTUe	1,12E-03	6,51E-06	6,11E-05	1,52E-06	4,00E-07	2,13E-05	7,67E-09	-3,63E-04
HTP-c	CTUh	1,32E-07	1,14E-09	3,12E-10	3,26E-10	6,73E-11	1,53E-10	1,61E-12	-4,85E-07
HTP-nc	CTUh	9,95E-08	1,31E-09	1,22E-09	1,35E-10	8,38E-11	4,07E-10	7,36E-13	-5,15E-09
SQP	-	2,92E+01	1,16E+00	2,76E-01	7,68E-02	8,06E-02	1,09E-01	6,72E-03	-2,99E+00

INDICATORS DESCRIBING RESOURCE CONSUMPTION: 1 kilogram hammer-in facade fixings R-TFIX-8M

		Life Cycle Stage							
Indicator	**Unit**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
PERE	MJ	2,92E+00	3,66E-02	4,26E-01	0,00E+00	9,17E-03	0,00E+00	1,08E-04	-9,43E-01
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
PERT	MJ	2,92E+00	3,66E-02	4,26E-01	0,00E+00	9,17E-03	0,00E+00	1,08E-04	-9,43E-01
PEN-RE	MJ	6,62E+01	2,26E+00	2,36E+00	0,00E+00	5,68E-01	0,00E+00	3,87E-03	-1,75E+01
RE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ	6,62E+01	2,26E+00	2,36E+00	0,00E+00	5,68E-01	0,00E+00	3,87E-03	-1,75E+01
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m^3	2,65E-02	3,74E-04	3,32E-03	0,00E+00	1,43E-07	0,00E+00	1,43E-07	-8,57E-03

INDICATORS DESCRIBING OUTPUT STREAMS AND WASTE: 1 kilogram hammer-in facade fixings R-TFIX-8M									
		Life Cycle Stage							
Indicator	**Unit (expressed per DU)**	**A1**	**A2**	**A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste	kg	WN	WN	2,14E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Radioactive waste	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Components for re-use	kg	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling	kg	WN	WN	2,14E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for energy recovery	kg	WN	WN	9,54E-02	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy	MJ/energy carrier	WN	WN	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	7,06E-01

BIOGENIC CARBON	
Organic carbon content in product (kg C_{org})	**0,00E+00**
Organic carbon content in packaging (kg C_{org})	**3,96E-02**

Table 2.
Hammer-in facade fixings R-TFIX-8M converter per 1 m² of insulation system

Product	Unit	Conversion factor
R-TFIX-8M-095	kg/pcs	0,023
R-TFIX-8M-115	kg/pcs	0,026
R-TFIX-8M-135	kg/pcs	0,029
R-TFIX-8M-155	kg/pcs	0,032
R-TFIX-8M-175	kg/pcs	0,070
R-TFIX-8M-195	kg/pcs	0,076
R-TFIX-8M-215	kg/pcs	0,043
R-TFIX-8M-235	kg/pcs	0,047
R-TFIX-8M-255	kg/pcs	0,050
R-TFIX-8M-275	kg/pcs	0,053
R-TFIX-8M-295	kg/pcs	0,056

Conversion factor kg of product per m² of insulation system = number of facade fixings [pcs/m²]* × Conversion factor [kg/pcs] × index [kg]
*The recommended number of facade fixings per m² is 5 pcs.

6. INTERPRETATION

Figure 3 shows a graph of the proportions of the individual life cycle modules to the basic impact categories for hammer-in facade fixings R-TFIX-8M.

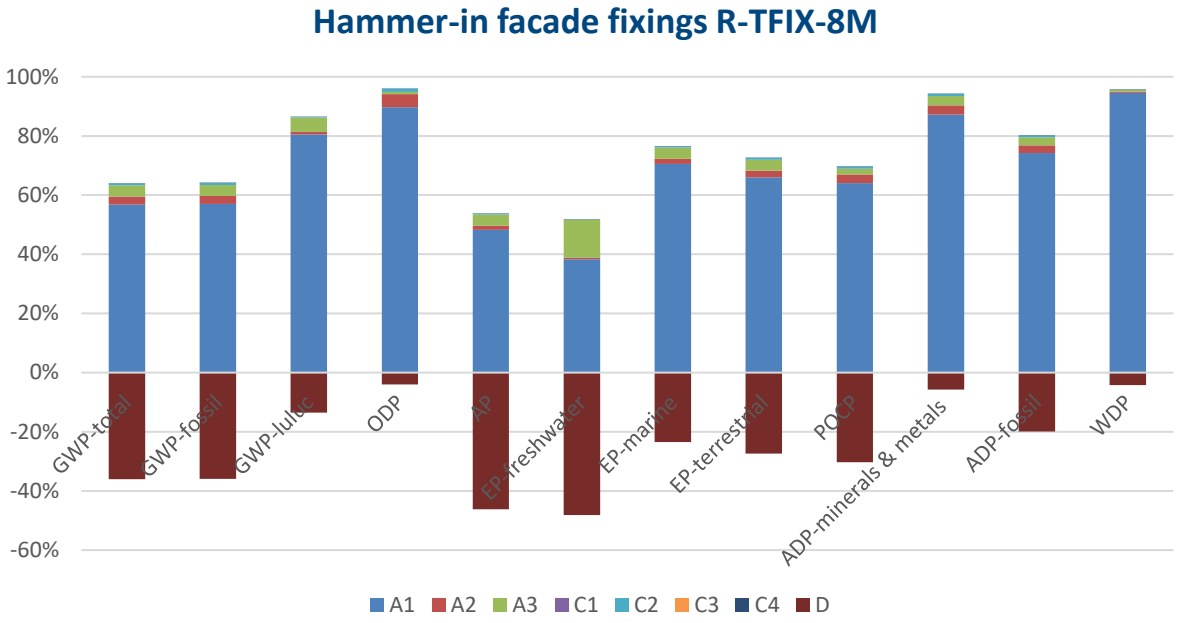


Figure 3.
Shares of life cycle modules in the main categories of impacts – hammer-in facade fixings R-TFIX-8M.

BIBLIOGRAPHY

- ICIMB-PCR A. General Product Category Rules for Construction Products.
- PN-EN ISO 14025:2014-04, Environmental labels and declarations – Type III environmental declarations – Rules and procedures.
- PN-EN 15804+A2:2020, Sustainability of building structures – Environmental product declarations -Basic principles of categorization of construction products.
- PN-EN ISO 14040:2009 Environmental management. Life Cycle Assessment. Principles and structure.
- PN-EN ISO 14044:2009, Environmental management. Life Cycle Assessment. Requirements and guidelines.
- EN 15942:2012, Sustainability of construction works – Environmental product declarations – Communication format business-to-business.
- Additional explanatory material can be obtained from the company page of the declaration owner: https://www.rawlplug.com//