



TYPE III ENVIRONMENTAL PRODUCT DECLARATION No. 505/2023

Issuance date: 16.08.2023
Validity date: 16.08.2028

EUROFAST FASTENERS FOR FIXING FLAT ROOFS

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, modules in accordance with EN 15804 (Cradle-to-Gate)

The year of preparing the EPD: 2023

Product standard: EAD 030351-00-0402

Service Life: 10 years - general assumption of EAD. For fasteners, it depends on the corrosive environment. The life expectancy of fasteners made of a different material or with a protective coating can be found in table 6

PCR: ITB-PCR A

Declared unit: 1 kg

Reasons for performing LCA: B2B

Representativeness: Global, 2021

Owner of the EPD:

VAN ROIJ FASTENERS EUROPE B.V.

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



Figure 1: The view of VAN ROIJ FASTENERS EUROPE B.V. manufactory

MANUFACTURER

Despite the fact that fasteners are a relatively small part of the overall Flat roof and Cladding construction, they play a critical role in the overall quality and safety of the system.

Eurofast is **manufacturer** of the leading fastener brand Eurofast® and a **full-service technical consultancy firm**, for mechanically fastening the building envelope. So that every building envelope can be fastened to a high quality. At Eurofast they strive to unburden their customers as much as possible in their process of finding the best suitable mechanical fastening solution, for their specific situation. This ensures that every building envelope is fastened to the highest possible standard.

PRODUCTS DESCRIPTION

Eurofast offers a wide range of fastening products for mechanically fastening flat roof and cladding constructions of industrial and commercial buildings. Complemented with a full-service package, installation equipment and necessities to support their customer at every step of the fastening process.

The Eurofast Flat roof solutions are applicable for fastening flexible roof, waterproofing membranes and insulation.

All of the fastening solutions of Eurofast meet the highest international requirements and standards. To guarantee these requirements and standards and to ensure that their customers always receive high quality products, they perform nonstop quality control on their production products in their Quality Control Centre.

The quality of the production processes and the Eurofast® products is constantly monitored, assessed and guaranteed. From material input to end product output. Based on a comprehensive series of carefully performed tests.

Each Eurofast fastener can be supplied with technical documentation.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

UNIT

The declared unit is 1 kg of product of Eurofast fasteners for fixing flat roofs (divided for 3 joint elements: tubes, screws, termination bars and pressure plates).

SYSTEM BOUNDARY

Modules A1-A3, are taken into consideration in the LCA: A1 Production of preliminary products, A2 Transport to plant, A3 Production (incl. provision of energy, production of packaging as well as auxiliaries and consumables, waste treatment). Energy and water consumption, emissions as well as information on generated wastes were inventoried in European plants 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. The product is understood as an element of other systems and complex construction products.

ALLOCATION

The allocation rules used for this EPD are based on general ITB's document PCR A (EN 15804+A2). Input and output data from the production is inventoried and allocated to the production on the mass basis. The declared product recipe was used for the calculations, based on specific substances included in the production and energy consumption divided for 3 elements: tubes, screws, termination bars and pressure plates.

SYSTEM LIMITS

All raw materials submitted for the formulations and production data were taken into consideration. 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. Machines and facilities required during production are neglected. The production of etiquettes/printing was not considered.

MODULES A1 & A2: RAW MATERIALS SUPPLY AND TRANSPORT

Raw materials come from different manufacturers. PA/PP Tubes comes from own production (at Van Roij Fasteners Europe B.V.) but all screws are manufactured in Taiwan. Data on transport of the different products to the manufacturing plants is collected and modelled. Means of transport include ships from Taiwan, trucks and European fuel averages are applied. More detailed information is available in the respective manufacturer's documentation (e.g. product data sheets).

MODULE A3: PRODUCTION

VAN ROIJ FASTENERS EUROPE B.V. produces Eurofast fasteners for fixing flat roofs. Van Roij Fasteners Europe BV produces PA/PP tubes (see figure 2). Process: Material PA6(25kg bags) → go to small silos → drying PA6 → ADD MASTERBATCH → injection → PA (conditioning) → 1 week → box goes to assembly or customer. Material PP(25kg bags) → go to small silos → ADD MASTERBATCH → INJECTION → box goes to assembly or customer.

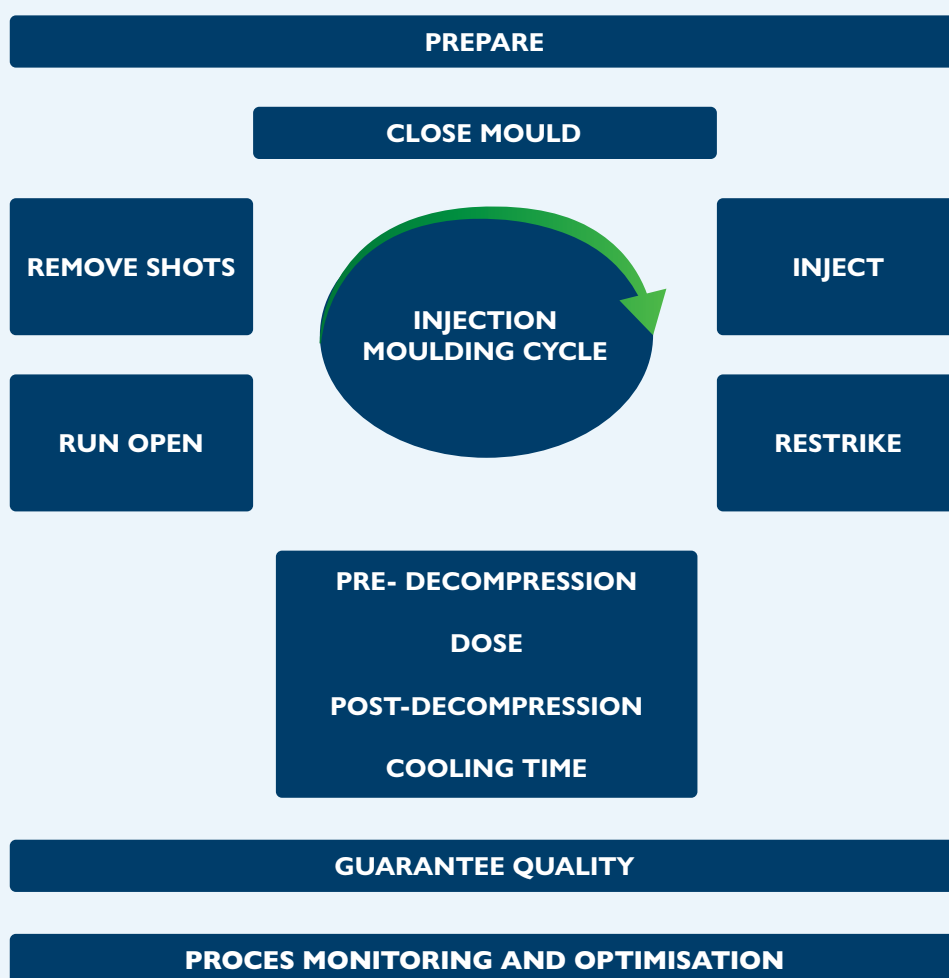


Figure 2: Tubes- Manufacturing process scheme

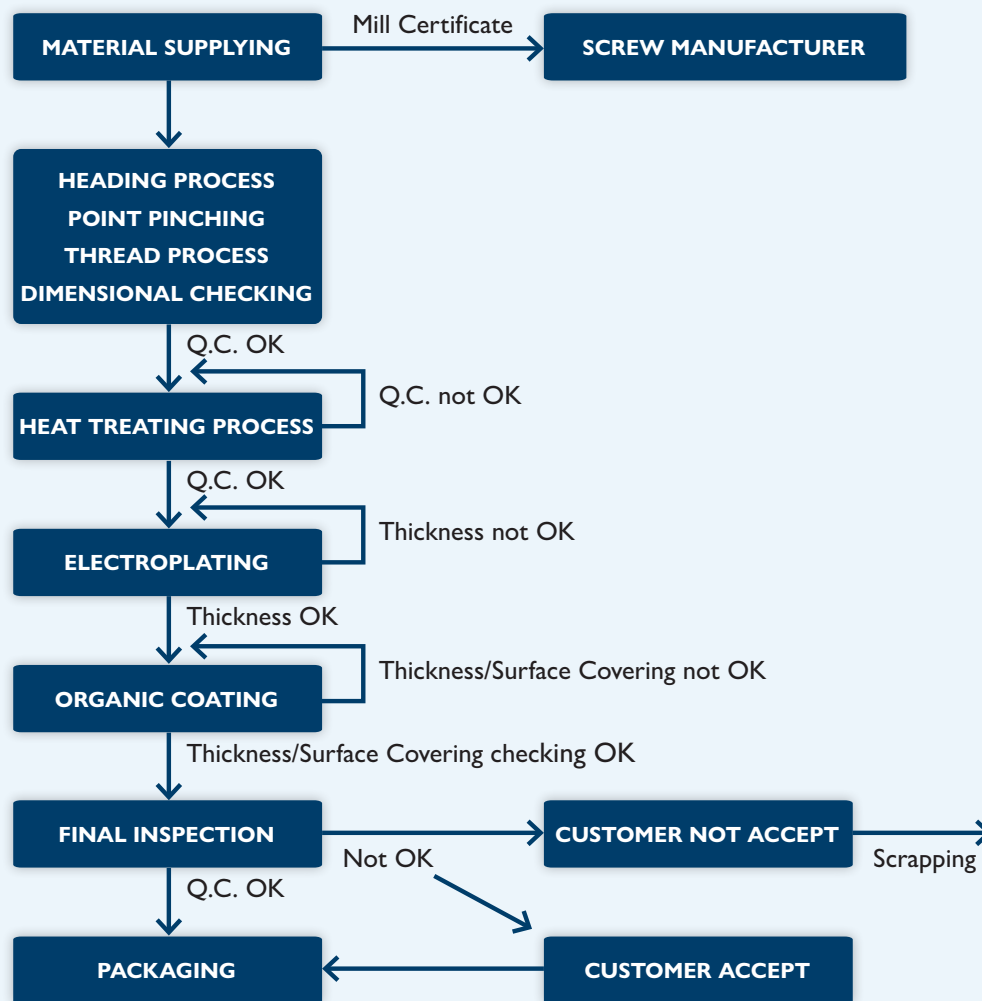


Figure 3.Screws- Manufacturing process scheme

DATA COLLECTION PERIOD

The data for manufacture of the declared products refer to period between 01.01.2021 – 01.12.2021 (1 year). The life cycle assessments were prepared for Europe as reference area.

DATA QUALITY

The data selected for LCA originate from ITB-LCI questionnaires completed by VAN ROIJ FASTENERS EUROPE B.V. 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.3.9.1 (polypropylene, polyamide, oil, wax, chromium steel, foil, folding boxboard carton, plastic film, packing film LDPE, EUR-flat pallet). Specific (LCI) data quality analysis was a part of the input data verification. Where no background data was available, data gaps were complemented by manufacturer information and literature research.

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 2013 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 CML-IA baseline method

ADDITIONAL INFORMATION

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

HEALTH ASPECTS

Product does not contain CFC, HCFC, does not emit TVOC, MDI, ammonia, formaldehyde; does not affect the ozone layer.

LIFE CYCLE ASSESSMENT (LCA) – results

DECLARED UNIT

The declaration refers to declared unit (DU) – 1 kg of Eurofast fasteners for fixing flat roofs produced in Europe. The following life cycle modules (Table 1) were included in the analysis. The following tables 2-5 show the environmental impacts of the life cycle of selected modules (A1-A3)

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	xReuse-recovery-recycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
MD	MD	MD	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND

Table 1: System boundaries for the environmental characteristic of the product.

Indicator	Unit	A1-A3 Screws	A1-A3 Tubes	A1-A3 Bars & plates
Global Warming Potential	eq. kg CO ₂	2.46E+00	3.43E+00	2.44E+00
Greenhouse potential - fossil	eq. kg CO ₂	2.44E+00	3.40E+00	2.43E+00
Greenhouse potential - biogenic	eq. kg CO ₂	1.37E-02	4.82E-02	1.24E-02
Global warming potential - land use and land use change	eq. kg CO ₂	5.70E-03	9.57E-04	1.09E-03
Stratospheric ozone depletion potential	eq. kg CFC 11	1.48E-07	6.76E-08	5.03E-09
Soil and water acidification potential	eq. mol H+	4.80E+01	2.14E-02	1.02E-02
Eutrophication potential - freshwater	eq. kg P	1.07E-03	2.65E-03	1.16E-03
Eutrophication potential - seawater	eq. kg N	3.37E-03	3.36E-03	2.21E-03
Eutrophication potential - terrestrial	eq. mol N	3.48E-02	3.13E-02	2.36E-02
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.36E-02	1.16E-02	1.08E-02
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.24E-05	1.51E-05	1.86E-06
Abiotic depletion potential - fossil fuels	MJ	2.59E+01	9.85E+01	5.92E-01
Water deprivation potential	eq. m ³	1.32E+00	1.19E+00	6.72E-01

Table 2: Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 kg of Tube, 1 kg of screw and 1 kg of termination bars and pressure plates)

Indicator	Unit	A1-A3 All elements
Particulate matter	disease incidence	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA
Potential comparative toxic unit for eco-systems	CTUe	INA
Potential comparative toxic unit for humans (cancer effects)	CTUh	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA
Potential soil quality index	dimensionless	INA

Table 3: Life cycle assessment (LCA) results for specific product – additional impacts indicators (DU: 1 kg)

Indicator	Unit	A1-A3 Screws	A1-A3 Tubes	A1-A3 Bars and plates
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.60E+00	2.67E+00	2.48E+00
Consumption of renewable primary energy resources used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	1.60E+00	2.68E+00	2.48E+00
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	2.41E+01	6.36E+01	2.45E+01
Consumption of non-renewable primary energy resources used as raw materials	MJ	4.25E-01	3.32E+01	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	2.60E+01	9.87E+01	2.45E+01
Consumption of secondary materials	kg	2.96E-01	5.36E-03	1.00E+00
Consumption of renew. secondary fuels	MJ	1.49E-04	8.44E-05	2.82E-04
Consumption of non-renewable secondary fuels	MJ	0.00E+00	1.76E-02	0.00E+00
Net consumption of freshwater	m³	1.97E-02	2.45E-02	5.33E-04

Table 4: Life cycle assessment (LCA) results for specific product - the resource use (DU: 1 kg)

Indicator	Unit	A1-A3 Screws	A1-A3 Tubes	A1-A3 Bars and plates
Hazardous waste	kg	5.71E-01	2.58E-02	6.39E-02
Non-hazardous waste	kg	3.67E+00	9.48E-01	8.34E-02
Radioactive waste	kg	5.34E-05	4.27E-05	4.77E-05
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	3.83E-04	2.76E-04	1.74E-04
Materials for energy recovery	kg	3.09E-06	8.26E-07	1.08E-05
Exported Energy	MJ	3.24E-02	8.62E-02	3.04E-02

Table 5: Life cycle assessment (LCA) results for specific product – waste categories (DU: 1 kg)

Fastener material / Coating type	Environment corrosivity category according to EN ISO 12944-1:2017 and EN ISO 12944-2:2017
Carbon steel / zinc coating with additional Eurofast Coat 15C or Eurofast Coat 30C coating	C1, C2 VH, C3 H
Fastener type / fastener material	Environment corrosivity category according to EN ISO 9223:2012
Bimetallic fastener made of stainless steel grade AISI 316 or AISI 316Cu	C1, C2, C3, C4, C5
Fastener made of stainless steel grade AISI 305	C1, C2, C3, C4

Designations:

H – high (15 years to 25 years)

VH – Very high (over 25 years)

Table 6: Fasteners expected service life

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 basics for LCA analysis was EN 15804+A2 and ITB PCR A

Independent verification corresponding to ISO 14025 (sub clause 8.1.3.)



external



internal

External verification of EPD: Halina Prejzner, PhD. 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 within the same product category but from different programmes may not be comparable. 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. Depending on the application, a corresponding conversion factor such as the specific weight per surface area must be taken into consideration.

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. 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
- EAD 030351-00-0402: Systems of mechanically fastened flexible roof waterproofing sheets
- 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 2021

<https://ecoinvent.org/>

Signature valid

Dokument podpisany przez
Michał Piasecki / ITB
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CERTIFICATE № 505/2023 of TYPE III ENVIRONMENTAL DECLARATION

Products:

Eurofast fasteners for fixing flat roofs

Manufacturer:

VAN ROIJ FASTENERS EUROPE B.V.

ul. Jan Tooropstraat 16, 5753 DK Deurne, Netherlands

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 16th August 2023 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics
and Environment Department

Agnieszka Winkler-Skalna
Agnieszka Winkler-Skalna, PhD



Deputy Director
for Research and Innovation

Krzysztof Kuczyński
Krzysztof Kuczyński, PhD

Warsaw, August 2023