Type III Environmental Product Declaration No. 780/2025

Issuance date: 18.03.2025
Validation: 02.04.2025
Validity date: 18.03.2030

Hydraulic binders

Owner of the EPD:

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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, EN 15804+A2 (Cradle-to-Gate)
The year of preparing the EPD: 2025
Product standard: EN 13282-1:2013, PN-EN 13282-2:2025-06
Service Life: Up to 60 days (the product itself, stored in air-dry conditions, remains ready for use for 60 days without losing its declared performance properties). The product used as a component for soil stabilization and binder and aggregate mixtures with the soil remains bound for many years.
PCR: ITB-PCR A
Declared unit: 1 ton
Reasons for performing LCA: B2B
Representativeness: Poland, Europe, 2023

MANUFACTURER

Spoiwex Sp. z o.o. is a manufacturer and supplier of modern hydraulic binders for use in transportation engineering (road, rail, airport), through hydroengineering and civil engineering, to underground mining. It also supports the energy sector by offering services for the collection and management of combustion by-products from power plants. It also offers research and technical advice on the selection of suitable materials and technologies.

Figure 1 The view of Spoiwex Sp. z o.o. manufacturing plant located in Rogowiec

SPOIWEX Sp. z o.o. has been operating continuously since 2008, consistently strengthening its position in the industry. For more than a decade, the company has gained valuable experience, implementing more than 700 investments both in Poland and abroad.

Two production facilities located in central (Rogowiec Plant) and southern Poland (Zory Plant) allow the company to efficiently supply binders throughout the country.

PRODUCTS DESCRIPTION

Hydraulic Binder is mainly intended for traffic engineering and earthworks, in particular for:

- Soil stabilisation
- Reinforcement and improvement of the pavement base
- Improving soil in embankment layers

Table 1 Products covered by EPD

Hydraulic binder	Product
DROHART	HRB N 4 DROHART 32,5 HRB E 4 DROHART EXPERT 32,5 HSD DROHART 22,5 HRB E 3 DROHART PLUS 22,5 HRB E 2 DROHART 12,5
STABIFEN	HSD STABIFEN 5 HSD STABIFEN 12,5

All additional technical information about the product is available on the https://spoiwex.pl/ and catalogues.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

Declared unit is 1 ton of hydraulic binders products, two groups: DROHART and STABIFEN. The reference period is the year 2023.

System boundary

The life cycle analysis of the declared products covers “Product Stage” A1-A3 modules in accordance with EN 15804 and ITB PCR A (cradle to gate with options). The product is an intermediate component and is used for the production of roads. 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 PCR A. Production of hydraulic binders is a line process executed by of Spoiwex Sp. z o.o. in plant located in Rogowiec and Żory (Poland). Allocation was done on product mass basis. All impacts from raw materials extraction and processing are allocated in module A1 of the LCA . Impacts from the global line production of Spoiwex Sp. z o.o. Water and energy consumption, associated emissions and generated wastes are allocated to module A3. Packaging materials were taken into consideration..

System limits

100% materials and 100% energy consumption were inventoried in a factories 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 taken into account. It is 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 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/elements (mainly Portland clinker and production dusts) and transport to the production site. For A2 module (transport) European averages for fuel data are applied. All input material transport’s distances from supplier were considered and included into calculation.

Module A3: *Production*

The production of hydraulic binders starts with the extraction of Portland clinker and production dust as the main production raw materials. First, the contents of the cement trucks are pneumatically transshipped into silos. The next stage is dosing with volumetric dosing machines of the main production raw materials. Weighing according to the adopted recipe, followed by thorough mixing of the raw materials in the mixer and obtaining the hydraulic binder. Once the final product is obtained, the hydraulic binder is loaded into a cement truck trailer and collected by the clients. A diagram of the production process is shown in Figure 2.

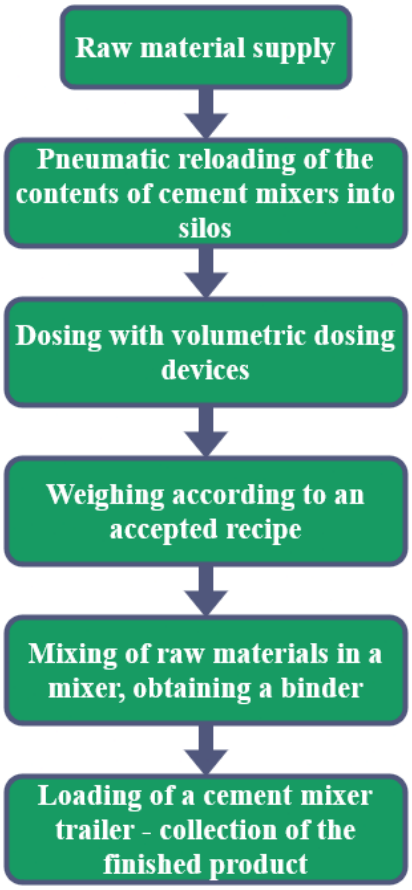

Figure 2 Manufacturing process scheme (A3)

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 Spoiwex Sp. z o.o. and verified during LCI 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.3.10. Specific (LCI) data quality analysis was a part of the input data verification. Where no background data is 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 EN 15804+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

Polish electricity (Ecoinvent v 3.10 supplemented by actual national KOBiZE data) emission factor used is 0.685 kg CO_2/kWh. 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 ton of Hydraulic binders following life cycle modules (Table 2) were included in the analysis. The following tables 3-10 show the environmental impacts of the life cycle of selected modules (A1-A3).

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**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**	**MND**

Table 3 Life cycle assessment (LCA) results for STABIFEN products – environmental impacts (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3
Global Warming Potential	eq. kg CO_2	1.77E+02	1.17E+01	2.85E+00	1.92E+02
Greenhouse potential - fossil	eq. kg CO_2	1.73E+02	1.17E+01	2.85E+00	1.88E+02
Greenhouse potential - biogenic	eq. kg CO_2	3.71E+00	7.64E-03	6.52E-03	3.73E+00
Global warming potential - land use and land use change	eq. kg CO_2	2.73E-02	3.84E-03	2.69E-04	3.14E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	8.88E-07	2.33E-07	1.08E-08	1.13E-06
Soil and water acidification potential	eq. mol H+	3.93E-01	3.67E-02	2.10E-02	4.51E-01
Eutrophication potential - freshwater	eq. kg P	2.19E-02	7.82E-04	3.38E-03	2.61E-02
Eutrophication potential - seawater	eq. kg N	1.25E-01	1.24E-02	2.98E-03	1.40E-01
Eutrophication potential - terrestrial	eq. mol N	1.39E+00	1.35E-01	2.61E-02	1.56E+00
Potential for photochemical ozone synthesis	eq. kg NMVOC	4.20E-01	5.75E-02	7.46E-03	4.84E-01
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	4.60E-04	3.83E-05	7.99E-07	4.99E-04
Abiotic depletion potential - fossil fuels	MJ	8.35E+02	1.65E+02	3.15E+01	1.03E+03
Water deprivation potential	eq. m^3	1.54E+01	7.96E-01	5.94E-01	1.68E+01

Table 4 Life cycle assessment (LCA) results for STAIFEN product – additional impacts indicators (DU: 1 ton)

Indicator	Unit	A1-A3
Particulate matter	disease incidence	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA
Potential comparative toxic unit for ecosystems	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 5 Life cycle assessment (LCA) results for STABIFEN product - the resource use (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	4.27E+01	2.79E+00	2.96E+00	4.85E+01
Consumption of renewable primary energy resources used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	4.27E+01	2.79E+00	2.96E+00	4.85E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	8.35E+02	1.65E+02	3.15E+01	1.03E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	8.35E+02	1.65E+02	3.15E+01	1.03E+03
Consumption of secondary materials	kg	8.00E+02	7.54E-02	2.84E-03	8.00E+02
Consumption of renew. secondary fuels	MJ	8.75E-03	9.52E-04	1.43E-05	9.72E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater	m^3	5.33E-01	2.19E-02	8.90E-02	6.44E-01

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

Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste	kg	2.87E+00	2.37E-01	3.57E-01	3.46E+00
Non-hazardous waste	kg	1.24E+03	5.01E+00	1.64E+01	1.26E+03
Radioactive waste	kg	1.07E-03	5.25E-05	4.62E-06	1.13E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	1.61E-02	1.24E-03	2.46E-04	1.75E-02
Materials for energy recovery	kg	2.27E-05	1.04E-05	3.50E-07	3.35E-05
Exported Energy	MJ	7.60E+01	6.86E-02	2.40E-02	7.61E+01

Table 7 Life cycle assessment (LCA) results for DROHART products – environmental impacts (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3
Global Warming Potential	eq. kg CO_2	4.09E+02	1.61E+01	3.33E+00	4.29E+02
Greenhouse potential - fossil	eq. kg CO_2	4.02E+02	1.61E+01	3.32E+00	4.21E+02
Greenhouse potential - biogenic	eq. kg CO_2	7.37E+00	1.05E-02	7.61E-03	7.39E+00
Global warming potential - land use and land use change	eq. kg CO_2	5.52E-02	5.26E-03	3.14E-04	6.08E-02
Stratospheric ozone depletion potential	eq. kg CFC 11	1.54E-06	3.19E-07	1.25E-08	1.87E-06
Soil and water acidification potential	eq. mol H+	8.29E-01	5.03E-02	2.45E-02	9.04E-01
Eutrophication potential - freshwater	eq. kg P	4.07E-02	1.07E-03	3.94E-03	4.58E-02
Eutrophication potential - seawater	eq. kg N	2.53E-01	1.69E-02	3.48E-03	2.73E-01
Eutrophication potential - terrestrial	eq. mol N	2.86E+00	1.84E-01	3.05E-02	3.07E+00
Potential for photochemical ozone synthesis	eq. kg NMVOC	8.18E-01	7.87E-02	8.70E-03	9.06E-01
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	1.08E-03	5.25E-05	9.32E-07	1.13E-03
Abiotic depletion potential - fossil fuels	MJ	1.59E+03	2.26E+02	3.68E+01	1.85E+03
Water deprivation potential	eq. m^3	3.32E+01	1.09E+00	6.93E-01	3.50E+01

Table 8 Life cycle assessment (LCA) results for DROHART products – additional impacts indicators (DU: 1 ton)

Indicator	Unit	A1-A3
Particulate matter	disease incidence	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA
Potential comparative toxic unit for ecosystems	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 9 Life cycle assessment (LCA) results for DROHART products - the resource use (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	9.03E+01	3.82E+00	3.45E+00	9.75E+01
Consumption of renewable primary energy resources used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of renewable primary energy resources	MJ	9.03E+01	3.82E+00	3.45E+00	9.75E+01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.59E+03	2.26E+02	3.68E+01	1.85E+03
Consumption of non-renewable primary energy resources used as raw materials	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total consumption of non-renewable primary energy resources	MJ	1.59E+03	2.26E+02	3.68E+01	1.85E+03
Consumption of secondary materials	kg	5.40E+02	1.03E-01	3.31E-03	5.40E+02
Consumption of renew. secondary fuels	MJ	7.69E-03	1.30E-03	1.66E-05	9.01E-03
Consumption of non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater	m^3	9.57E-01	3.00E-02	1.04E-01	1.09E+00

Table 10 Life cycle assessment (LCA) results for DROHART products – waste categories (DU: 1 ton)

Indicator	Unit	A1	A2	A3	A1-A3
Hazardous waste	kg	6.51E+00	3.25E-01	4.17E-01	7.25E+00
Non-hazardous waste	kg	9.56E+02	6.86E+00	1.92E+01	9.82E+02
Radioactive waste	kg	2.38E-03	7.19E-05	5.39E-06	2.45E-03
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	2.41E-02	1.69E-03	2.88E-04	2.61E-02
Materials for energy recovery	kg	3.86E-05	1.43E-05	4.08E-07	5.33E-05
Exported Energy	MJ	5.50E+01	9.40E-02	2.80E-02	5.51E+01

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, V1.6 General Product Category Rules for Construction Products (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
- PN-EN 15942:2012 Sustainability of construction works – Environmental product declarations – Communication format business-to-business
- KOBiZE Wskaźniki emisyjności CO_2, SO_2, NO_x, CO i pyłu całkowitego dla energii elektrycznej, grudzień 2023
- https://ecoinvent.org/

LCA,LCI, input data verification
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CERTIFICATE № 780/2025
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Hydraulic binders

Manufacturer:

Spoiwex Sp. z o.o.
ul. Boczna 6, 44-240 Żory, 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 18th March 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, March 2025