Environmental Product Declaration Type III ITB No. 215/2021

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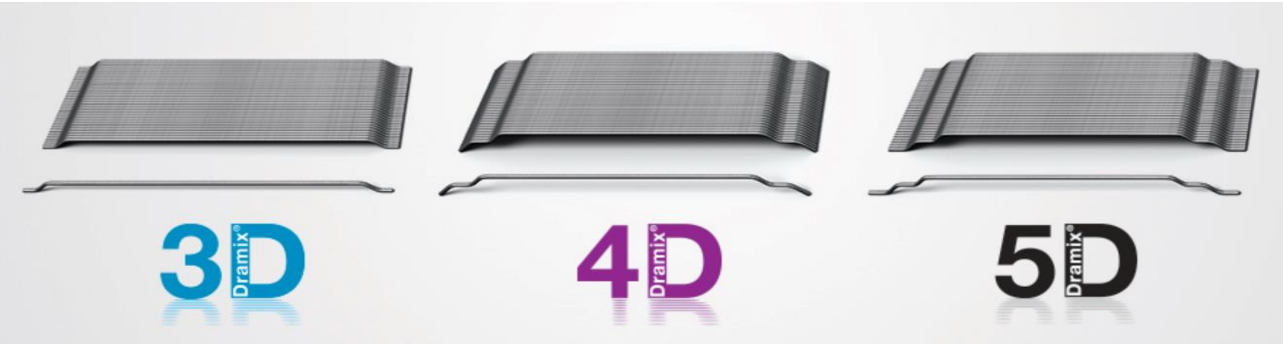
Dramix® Steel fibres for Concrete Reinforcement



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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-A4, C1-C4 and D modules in accordance with EN 15804+A2 (Cradle to Gate with options)

The year of EPD validation: 2023 (Issued first time in 2021)

Service Life: not declared by producer, specific calculation in accordance to EN 1990:2004

PCR: ITB-PCR A (PCR v 1.6. based on EN 15804+A2)

Declared unit: 1 kg of steel fibre

Product Standards: EN 14889-1 and ISO 13270–class A & conforms to ASTM A-820

Reasons for performing LCA: B2B

Representativeness: manufactured in Czech Republic

PRODUCT DESCRIPTION

Bekaert (www.bekaert.com) is a global technological and market leader in advanced solutions based on metal transformation and coatings, and the world's largest independent manufacturer of drawn steel wire products. Dramix® fibers for concrete reinforcement (3D, 4D and 5D) covered by this EPD are manufactured in the manufacturing plant, located at Petrovice u Karviné, Czech Republic. Dramix® is the company brand name of steel fibers for concrete reinforcement. Bekaert produces fibers in different variants according to the intended application. There are different product variants like glued or loose fibers. Gluing is applied for some of the variants to avoid fiber balling during mixing & to ensure homogeneous distribution of the fibers throughout the concrete mix. Figure 1 shows a basic fiber type 3D.

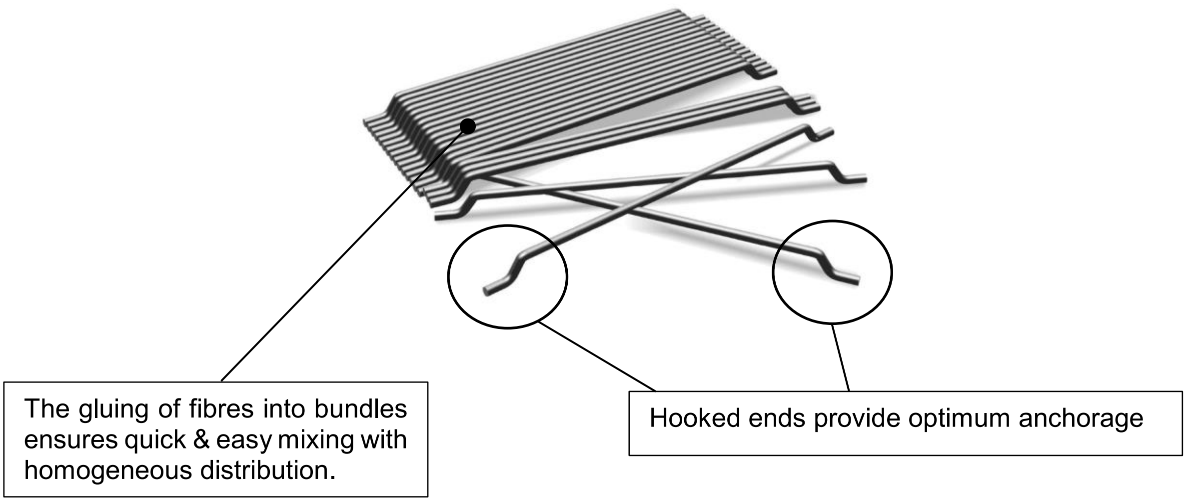


Figure 1. Technical concept of the Dramix® 3D fibre.

A specific product technical data is available at [Dramix® steel fiber concrete reinforcement solutions - Bekaert.com]

Bekaert Petrovice produce fibers from nominal diameter 0,380 mm up to 1,050 mm & indicative length from 30 mm up to 60 mm with nominal tensile strength as mentioned in Table 1, 2 & 3. Mainly according to the hooks, steel fibres are grouped into 3D, 4D and 5D types. As per the surface coating, steel fibers are grouped into Bright (uncoated or brass/bronze coated) and Galvanized (zinc coated) types. There are also steel fibers made from stainless steel. Bekaert offers different types of packaging; two main types are paper bags on pallets or big bags on pallets.

Table 1: Specification of 5D & 4D fibre types

Fibre type	Nominal Tensile Strength N/mm²	Nominal Length mm	Nominal Diameter mm
5D 65/60BG	2300	62	0.90
5D 65/60GG	2300	62	0.90
4D 55/50BG	1600	51	0.90
4D 55/60BG; BL	1450	61	1.05
4D 65/35BG	1850	36	0.55
4D 65/50BG; BL	1800	51	0.75
4D 65/60BG; BL	1600	61	0.90
4D 80/60BG	1800	61	0.75
4D 80/60BGP	2200	61	0.75

Table 2: Specification of 3D fibre types

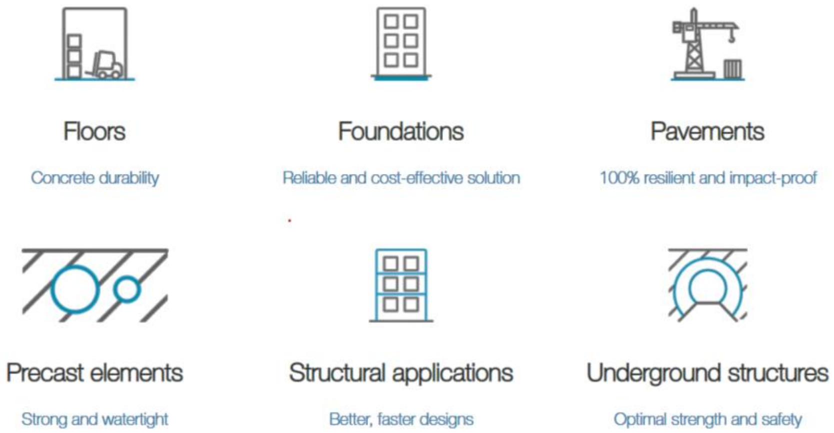
Fibre type	Nominal Tensile Strength N/mm²	Nominal Length mm	Nominal Diameter mm
3D 100/60BG	1270	60	0.62
3D 45/30BG; BL	1270	30	0.62
3D 45/30GG	1440	30	0.62
3D 45/35BG; BL	1225	35	0.75
3D 45/50BL	1115	50	1.05
3D 55/30BG	1345	30	0.55
3D 55/60BG; BL	1115	60	1.05
3D 65/35BG	1345	35	0.55
3D 65/35GG	1550	35	0.55
3D 65/40GG	1440	41	0.62
3D 65/50BG; BL	1225	50	0.75
3D 65/60BG; BL	1160	60	0.90
3D 65/60GG	1240	60	0.90
3D 80/30BGP	3070	30	0.38
3D 80/30GGP	3070	30	0.38
3D 80/30SL	2000	30	0.38
3D 80/50BG	1270	50	0.62
3D 80/60BG; BL	1225	60	0.75
3D 80/60BGP	1800	60	0.75
3D 80/60GG	1350	60	0.75

Table 3: Specification of BSF & other fibre types

Fibre type	Nominal Tensile Strength N/mm²	Nominal Length mm	Nominal Diameter mm
BSF 65/35BG	1300	35	0.55
BSF 65/60BG	1150	60	0.90
BSF 80/60BG	1200	60	0.75
BSF 45/35BL	1200	35	0.75
BSF 45/50BL	1100	50	1.05
BSF 55/60BL	1100	60	1.05
Dramix® Duo 100	1225	60	0.75
Dramix® Ready	1225	60	0.75
Dramix® MallaEnBolsa	1115	50	1.05
Agilia Sols C Métal	1345	30	0.55
SikaFibre Metal Chapes	1270	30	0.62
Twinplate 4D	1450	61	1.05
ROCfibre TR 50/50	1115	50	1.05
DE 50/1.0 N	1100	50	1.00
DE 60/1.0 N	1100	60	1.00
LU 50/1.0	1100	48	1.02
LU 50/1.25	1000	48	1.25

PRODUCT APPLICATION

Dramix® steel fibers are used for concrete reinforcement and are an alternative to steel mesh and bars. They are discontinuous, three-dimensional and isotropic reinforcement. The steel fibers bridge cracks at their small widths, distribute stresses and increase the strength of the concrete in the cracked state. Adding the adequate number of fibers to the concrete plasticizes the concrete, increasing its tensile and shear strength, impact strength and fatigue resistance. Steel fibers for structural use are used for concrete & mortar reinforcement for below applications: over ground applications (flooring, building & civil engineering work, etc.), underground applications (segmental linings for tunneling, etc.) & precast.



The hooked ends of Dramix® 3D ensure the desired fiber pullout. This is the mechanism, which actually generates the renowned concrete ductility and post-crack strength. The improved anchorage of Dramix® 4D utilizes the same principle but translates it into greater steel strengths (Figure 2). Dramix® 5D, in contrast, is shaped to form the perfect anchor; the pullout mechanism is replaced by fibre elongation. The tensile strength of a steel fiber has to increase in parallel with the strength of its anchorage. Dramix® 3D, 4D, and 5D are each designed to capitalize on the wire strength to the maximum degree. Dramix® 3D and 4D create concrete ductility by the slow deformation of the hook during the pullout process, and not by the ductility of the wire itself. This is different for the Dramix® 5D. Due to the anchor design, the fiber cannot be pulled out and does not move in the concrete. Instead, the wire is elongated, providing the ductility on the same principle as classic reinforcement steel. The tensile strength level of Dramix® product series is shown in Figure 2.

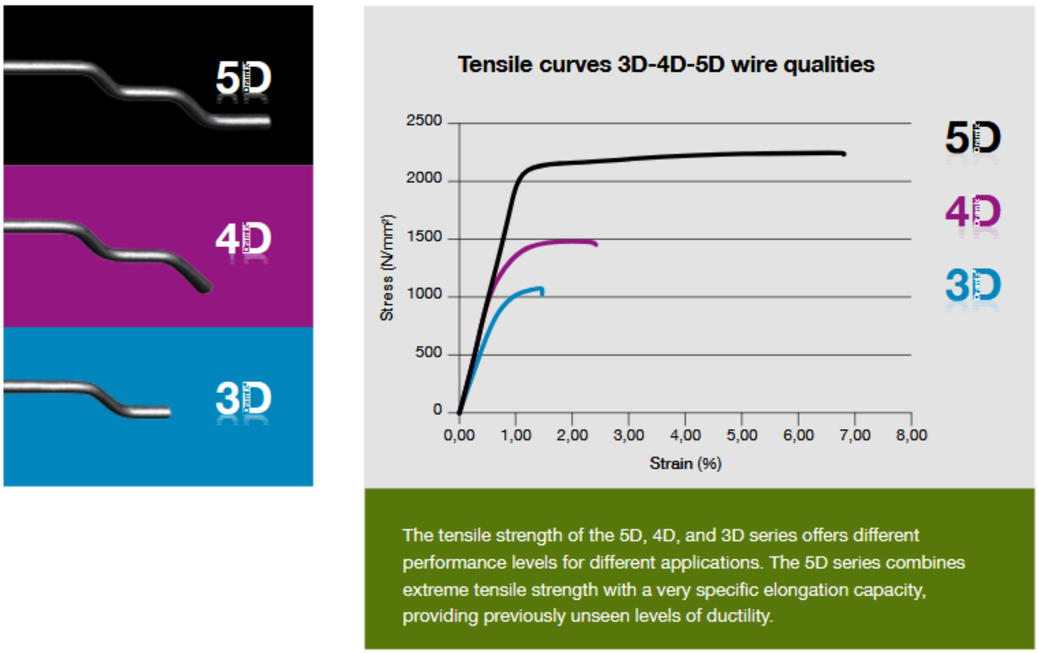


Figure 2. The tensile strength of Dramix® product series.

LIFE CYCLE ASSESSMENT (LCA) – general rules applied

Unit

The declared unit is 1 kg of Dramix® steel fiber.

System boundary

The life cycle analysis of the declared product covers “Product Stage” A1-A4 modules, “End of Life stage” C1, C2, C3, C4 modules and gains and loads beyond system in D module (Cradle to Gate with options) in accordance with EN 15804+A2 and ITB PCR A (2023).

Allocation

The allocation rules used for this EPD are based on general ITB PCR A. Production of steel fibers is a line process in a manufacturing plant located at Petrovice, Czech Republic (see Figure 3). Allocation of impacts is done on a product mass basis. All impacts from raw materials production (wire rod, galvanized half product, bead wires, hose wires, stainless steel, widia dies, PCD dies, soaps, emulsion, inhibitors, glue, bags, paper and pallets) are allocated in the A1 module of the LCA. 99% of the impacts from a line production were allocated to product covered by this declaration. Module A2 includes transport of raw materials such as steel from supplier to manufacturing plant (Petrovice). Municipal wastes of the factory were allocated to module A3. Energy supply (gas Lama Energy) and electricity (Veolia) were inventoried and 100% was allocated to the product assessed.

System limits

99% materials and 100% energy consumption (electricity, gas) were inventoried in the factory and were included in the calculation. In the assessment, all significant parameters from gathered production data are considered, i.e., all material used per formulation (main input is steel Wire Rod), utilized thermal energy, and electric power consumption, direct production waste, and available emission measurements. Tires consumption for transport was not taken into account. Precomponents like labels, tapes with a percentage share of less than 0.2% 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.

A1 and A2 Modules: Raw materials supply and transport

The steel input materials are produced according to the valid Ecoinvent data 3.10. Data on transport of the different input products to the manufacturing plants were inventoried in detail and modelled by the assessor. For calculation purposes European fuel averages are applied in module A2.

A3: Production

The production process (Petrovice plant) is presented in Figure 3.

A4: Transport to construction site

The following transport scenario to the place of use was assumed based on the manufacturer's declaration: large vehicle over an average distance of 500 km. For calculation purposes, European fuel averages are applied in module A4.

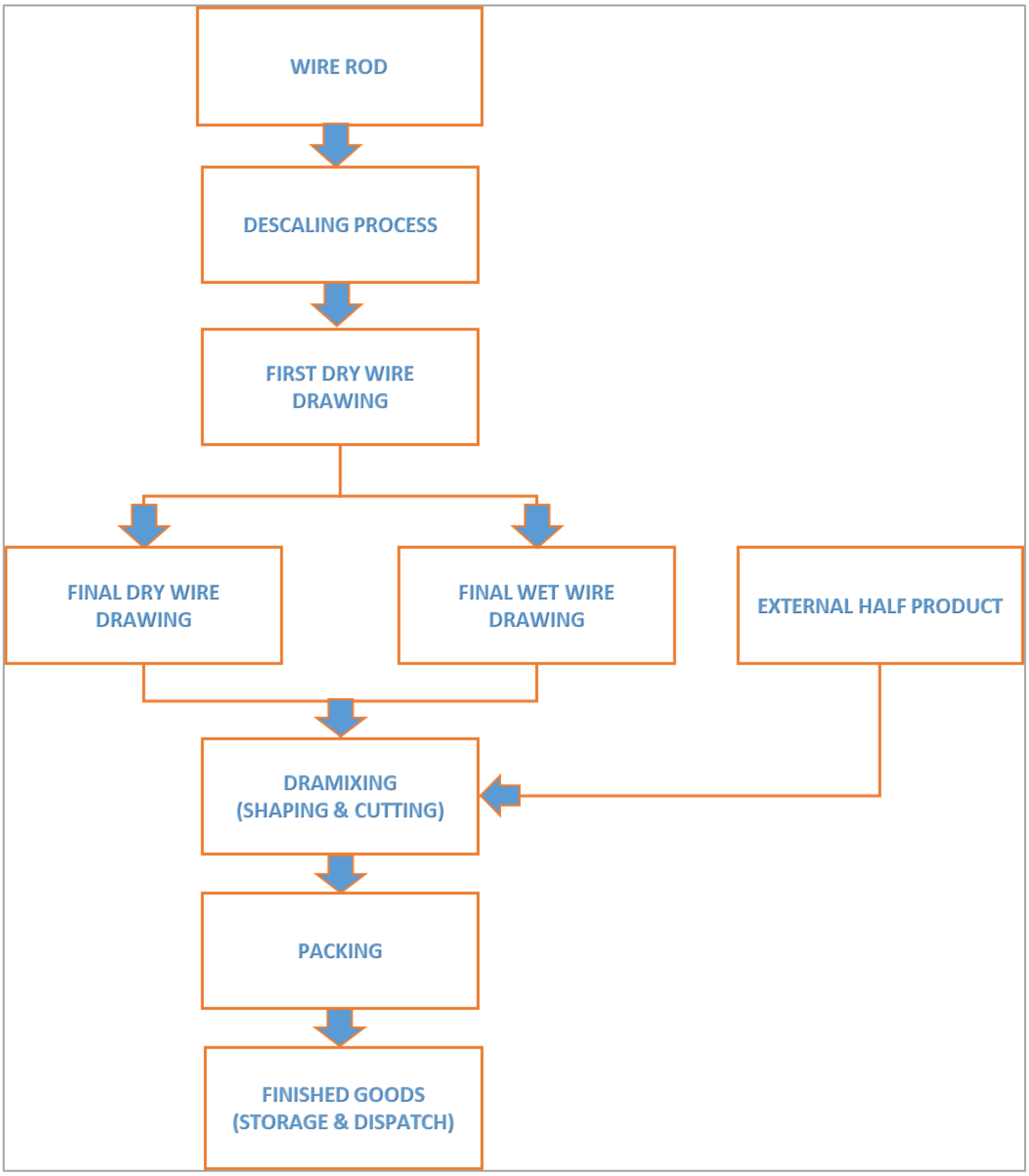


Figure 3. A schematic diagram of the industrial process (A3 module)

End of life scenarios (C and D modules)

The end-of-life scenario has been generalized. The concrete with the steel fibers are disassembled (C1 module) by crane, power tools, hammers, breakers, and grappling hooks mounted onto heavy equipment. 100% material recovery during demolishing is assumed. The manufacturer declares the technology and the scenario in which the steel fibers can be separated (in a close future) from waste concrete up to 95% by heavy crusher with a magnetic separator. 5% goes to landfill. 10% of recovered steel waste product can be reused or adapted to new applications (concrete reinforcement). 90% of recovered steel can be used for new steel production (EAF process). It is assumed that at the end of life the transport distance from the product deconstruction place to waste processing (C2) is 50 km on > 16 t loaded lorry with 75% capacity utilization and fuel consumption of 35 l per 100 km. Materials recovered from dismantled products are recycled according to the BAT treatment practice. The reuse, recovery and recycling potential for a new product system is considered beyond the system boundaries (module D) based on World Steel recommendations and national practice (see references).

Table 4. End of life scenarios for Dramix® products

Progress products	Material recovery from concrete	Reuse	Recycling	Landfilling
Steel products	95%	10%	90%	5%

Data collection period

The data for the manufacture of the declared products refer to the period between 01.01.2022 – 31.12.2022 (1 year). The life cycle assessments were done for Czech as reference area.

Data quality - production

The data selected for LCA originate from ITB-LCI questionnaires completed by producers using the inventoried data and Ecoinvent v.3.10. No data collected is older than five years and no generic datasets used are older than ten years. The criteria of representativeness, completeness, reliability, and consistency met the required standards. Allocation for steel production impacts is done in accordance with *LCI data for Steel products Report* compiled by Brayan Hughes and William Hare (2012 for World Steel Association).

Assumptions and estimates

The impacts of the representative products were aggregated using weighted average. Data regarding production per 1 kg of product was averaged for the analysed production of each product group. All production processes (A3) were assigned to different types of products in an equal way.

Calculation rules

LCA was done in accordance with ITB PCR A document (2023). Characterization factors are CML ver. 4.2 based. ITB-LCA algorithms were used for impact calculations. A1 was calculated based on data from the database and specific EPD for steel, A3 and A2 are calculated based on the LCI questionnaire provided by the manufacturer.

Databases

The background data for the processes come from the following databases: Ecoinvent v.3.10 (steel, ancillary items, packaging), specific production data (Czech electricity mix). Specific (LCI) data quality analysis was a part of the audit. The time-related quality of the data used is valid (5 years).

LIFE CYCLE ASSESSMENT (LCA) – Results

Declared unit

The declaration refers to the unit DU– 1 kg of the Dramix® & Steel fibres (tables 1, 2 & 3). The following life cycle modules are included in the declaration (Table 5).

Table 5. System boundaries (life stage modules included) in a product environmental assessment

Environmental assessment information (MA – Module assessed, MNA – Module not assessed, 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**
MA	**MA**	**MA**	**MA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MNA**	**MA**	**MA**	**MA**	**MA**	**MA**

Table 6. Life cycle assessment (LCA) results for specific product – environmental impacts (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Global Warming Potential	eq. kg CO_2	5.26E-01	1.45E-02	1.49E-01	6.90E-01	8.34E-02	2.14E-03	6.21E-03	4.17E-03	1.06E-04	-2.09E-01
Greenhouse potential - fossil	eq. kg CO_2	5.44E-01	1.44E-02	1.48E-01	7.07E-01	8.31E-02	2.14E-03	6.19E-03	4.16E-03	1.05E-04	-2.11E-01
Greenhouse potential - biogenic	eq. kg CO_2	-1.90E-02	9.08E-05	5.91E-04	-1.83E-02	2.84E-04	8.70E-06	2.12E-05	1.42E-05	2.68E-07	1.60E-03
Global warming potential - land use and land use change	eq. kg CO_2	9.06E-04	1.04E-05	2.19E-06	9.19E-04	3.26E-05	3.10E-08	2.43E-06	1.63E-06	9.94E-08	2.23E-05
Stratospheric ozone depletion potential	eq. kg CFC 11	1.06E-08	6.15E-09	1.43E-09	1.82E-08	1.92E-08	1.82E-11	1.43E-09	9.62E-10	4.26E-11	-6.39E-09
Soil and water acidification potential	eq. mol H+	3.83E-03	1.08E-04	8.80E-04	4.82E-03	3.37E-04	1.30E-05	2.51E-05	1.69E-05	9.90E-07	-8.43E-04
Eutrophication potential - freshwater	eq. kg P	2.90E-04	1.79E-06	3.49E-04	6.41E-04	5.59E-06	5.15E-06	4.16E-07	2.79E-07	9.81E-09	-8.42E-05
Eutrophication potential - seawater	eq. kg N	5.63E-04	3.26E-05	2.14E-04	8.09E-04	1.02E-04	3.15E-06	7.58E-06	5.09E-06	3.45E-07	-1.82E-04
Eutrophication potential - terrestrial	eq. mol N	1.16E-02	3.55E-04	1.52E-03	1.34E-02	1.11E-03	2.23E-05	8.27E-05	5.55E-05	3.77E-06	-2.02E-03
Potential for photochemical ozone synthesis	eq. kg NMVOC	1.64E-03	1.09E-04	4.43E-04	2.19E-03	3.40E-04	6.50E-06	2.53E-05	1.70E-05	1.10E-06	-1.10E-03
Potential for depletion of abiotic resources - non-fossil resources	eq. kg Sb	6.26E-06	9.42E-08	8.38E-08	6.44E-06	2.95E-07	1.22E-09	2.19E-08	1.47E-08	2.42E-10	-5.01E-06
Abiotic depletion potential - fossil fuels	MJ	7.92E+00	3.94E-01	3.81E+00	1.21E+01	1.23E+00	5.58E-02	9.19E-02	6.17E-02	2.89E-03	-1.53E+00
Water deprivation potential	eq. m^3	3.34E-01	1.82E-03	6.07E-02	3.96E-01	5.70E-03	8.95E-04	4.25E-04	2.85E-04	9.16E-06	-2.42E-03

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

Indicator	Unit	A1-A4	C1-C4	D
Particulate matter	disease incidence	INA	INA	INA
Potential human exposure efficiency relative to U235	eg. kBq U235	INA	INA	INA
Potential comparative toxic unit for ecosystems	CTUe	INA	INA	INA
Potential comparative toxic unit for humans (non-cancer effects)	CTUh	INA	INA	INA
Potential soil quality index	dimensionless	INA	INA	INA

Table 8. Life cycle assessment (LCA) results for specific product - the resource use (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Consumption of renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	1.43E+00	5.66E-03	1.10E-01	1.55E+00	1.77E-02	1.63E-03	1.32E-03	8.85E-04	2.51E-05	-1.38E-01
Consumption of renewable primary energy resources used as raw materials	MJ	2.83E-01	0.00E+00	0.00E+00	2.83E-01	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	1.72E+00	5.66E-03	1.10E-01	1.93E+00	1.77E-02	1.63E-03	1.32E-03	8.85E-04	2.51E-05	-1.38E-01
Consumption of non-renewable primary energy - excluding renewable primary energy sources used as raw materials	MJ	7.30E+00	3.94E-01	3.91E+00	1.17E+01	1.23E+00	5.76E-02	9.19E-02	6.17E-02	2.89E-03	-1.42E+00
Consumption of non-renewable primary energy resources used as raw materials	MJ	9.24E-02	0.00E+00	0.00E+00	9.24E-02	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	7.39E+00	3.94E-01	3.93E+00	1.23E+01	1.23E+00	5.76E-02	9.19E-02	6.17E-02	2.89E-03	-1.42E+00
Consumption of secondary materials	kg	1.14E+00	1.32E-04	1.61E-04	1.14E+00	4.14E-04	2.35E-06	3.08E-05	2.07E-05	6.07E-07	-3.07E-02
Consumption of renew. secondary fuels	MJ	9.03E-03	1.46E-06	5.00E-07	9.03E-03	4.56E-06	7.30E-09	3.39E-07	2.28E-07	1.59E-08	-4.78E-05
Consumption of non-renewable secondary fuels	MJ	1.59E-05	0.00E+00	0.00E+00	1.59E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Net consumption of freshwater	m^3	9.07E-03	4.96E-05	1.80E-04	9.30E-03	1.55E-04	2.57E-06	1.16E-05	7.76E-06	3.16E-06	-1.65E-03

Table 9 Life cycle assessment (LCA) results for specific product – waste categories (DU: 1 kg)

Indicator	Unit	A1	A2	A3	A1-A3	A4	C1	C2	C3	C4	D
Hazardous waste	kg	3.97E-01	4.43E-04	6.12E-03	4.04E-01	1.38E-03	3.67E-05	1.03E-04	6.92E-05	3.07E-06	-2.32E-05
Non-hazardous waste	kg	1.19E+00	7.86E-03	1.68E+00	2.88E+00	2.46E-02	2.48E-02	1.83E-03	1.23E-03	4.32E-05	-6.03E-02
Radioactive waste	kg	1.15E-05	2.94E-08	5.23E-06	1.67E-05	9.21E-08	7.70E-08	6.86E-09	4.60E-09	1.92E-08	-6.91E-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
Materials for recycling	kg	5.35E-04	1.22E-06	2.22E-02	2.28E-02	3.82E-06	7.40E-08	2.84E-07	1.91E-07	5.78E-09	0.00E+00
Materials for energy recovery	kg	5.40E-07	9.88E-09	6.13E-05	6.19E-05	3.09E-08	3.01E-10	2.30E-09	1.54E-09	6.85E-11	0.00E+00
Exported Energy	MJ	6.84E-02	0.00E+00	3.52E-04	6.87E-02	0.00E+00	5.00E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 10 Life cycle assessment (LCA) results for specific product – TRACI v 2.1. indicators for Dramix (DU: 1 kg)

		A1	A2	A3	A1-A3
Acidification potential (AP)	kg SO_2-Eq	1.81E-03	4.11E-05	7.50E-04	2.60E-03
Global warming potential (GWP100)	kg CO_2-Eq	5.72E-01	2.19E-02	1.48E-01	7.42E-01
Ecotoxicity: freshwater	CTU_e	4.94E+02	2.02E-01	2.51E+00	4.97E+02
Eutrophication potential	kg N-Eq	2.59E-03	1.60E-05	2.62E-03	5.23E-03
Human toxicity: carcinogenic	CTU_h	4.76E-05	1.62E-09	2.64E-08	4.77E-05
Human toxicity: non-carcinogenic	CTU_h	4.22E-07	5.11E-09	8.40E-08	5.11E-07
Ozone depletion potential (ODP)	kg CFC-11-Eq	6.47E-09	5.15E-10	1.38E-09	8.37E-09
Particulate matter formation potential (PMFP)	kg PM 2,5-Eq	5.21E-04	1.04E-05	5.85E-05	5.90E-04
Maximum incremental reactivity (MIR)	kg O_3-Eq	2.69E-02	8.56E-04	8.92E-03	3.67E-02

VERIFICATION

The process of verification of this EPD was 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 15804:2012+A1:2019 and ITB PCR A (2023)
Independent verification corresponding to ISO 14025 (sub clause 8.1.3.) [x] 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 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: Note: 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 (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 (v1.6,2023)
- 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
- EN 14889-1:2006 Fibers for concrete. Steel fibers. Definitions, specifications and conformity
- LCI DATA FOR STEEL PRODUCTS at https://www.worldsteel.org/en/dam/jcr:04f8a180-1406-4f5c-93ca-70f1ba7de5d4/LCI%2520study_2018%2520data%2520release.pdf
- https://ecoinvent.org/

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Instytut Techniki Budowlanej
00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department
02-656 Warsaw, Ksawerów 21

CERTIFICATE № 215/2021
of TYPE III ENVIRONMENTAL DECLARATION

Products:

Dramix® Steel fibres for Concrete Reinforcement

Manufacturer:

N.V. Bekaert S.A.

Bekaertstraat 2, 8550 Zwevegem, Belgium

Produced in the manufacturing plant,

Bekaert Petrovice s.r.o.

Petrovice 595, CZ-735 72 Petrovice u Karviné, Czech Republic

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

PN-EN 15804

Sustainability of construction works.
Environmental product declarations.
Core rules for the product category of construction products.

This certificate, issued for the first time on 1st June 2021 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Acting 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, June 2021