JRS Fibers for Life.

Environmental Product Declaration

In accordance with ISO14025:2006 and
EN15804:2012+A2:2019

VIATOP premium

Drainage Inhibitor

ECO PLATFORM EPD VERIFIED

Declaration Number	652/2024
Issue Date	19.07.2024
Valid to	19.07.2029
Validated:	09.08.2024
Product Category Rule	Construction Products 2019:14 v. 1.3.4, PCR A 1.6.
Program Holder	Instytut Techniki Budowlanej (ITB)

VIATOP® premium
Das Pellet.

General information

Fibers for Life.

Product:
VIATOP premium

Program operator:
Instytut Techniki Budowlanej (ITB)
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Declaration number:
652/2024

This declaration is based on Product Category Rules:
Construction Products 2019:14 v. 1.3.4

Statement of liability:
The owner of the declaration shall be liable for the underlying information and evidence. ITB shall not be liable with respect to manufacturer, life cycle assessment data and evidences.

Declared unit:
1 kg VIATOP premium

Declared unit with option:
A1-A3, A5, C1, C2, C3, C4, D

Functional unit:
-

Owner of the declaration:
J. RETTENMAIER & Söhne GmbH + Co. KG
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Holzmühle 1, D-73494 Rosenberg, Germany
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Place of production:
Germany, Great Britain

Management system:
ISO 50001, ISO 14001, ISO 9001

Issue date:
19.07.2024

Valid to:
19.07.2029

Year of study:
2024

Comparability:
EPD of products may not be able to compare if they do not comply with EN 15804+A2.

Verification:
Independent verification of the declaration and data, according to ISO14025:2010

internal ☐ external ☒

Sign

Signature Not Verified
Dokument podpisany przez Michał Piasecki, ITB
Data: 2024.08.09 09:23:42 CEST

Michał Piasecki
Independent verifier approved by ITB

The EPD has been worked out by:
Marvin Gornik

EurA

Approved

Manufacturer

J. RETTENMAIER & Söhne GmbH + Co. KG (JRS) is a manufacturer, solution provider and reliable system/ technology partner for a wide range of industries. As an owner-operated family company JRS has had strong roots in Southern Germany since 1878. As a corporate group, JRS is now globally active, with around 4000 employees at over 90 locations worldwide. A spirit of inventiveness, courage and close customer relations has shaped what began as a classic oil and grain mill into global market and knowledge leader in the sustainable, functional plant fiber technology segment.

Product

Product description:

The asphalt industry offers asphalt mixes for all kinds of roads. To ensure a long service life it is essential that those mixes contain a high volume of binder (bitumen). Cellulose fibers (preferably pelletized) are acting as drainage inhibitors to enable the increase of binder without any negative effects like drain down from the aggregates whilst hot/warm during mixing, storage, hauling / transport, paving compacting and cooling down to the final temperature. An addition rate of x ≥ 0.3% is recommended and can be seen in several specifications of asphalt mixes in many European countries.

Pelletized cellulose fibers like VIATOP premium enable the industry to add these products automatically via a dosing system to the mixing plant whilst producing asphalt mixes.

Product specification:

VIATOP premium is a pelletized blend of approx. 90 % by weight cellulose fiber ARBOCEL ZZ 8-1 and approx. 10 % by weight bitumen.

Materials	kg / kg product	% of product	Post-consumer recycled material, weight-% of product	Biogenic material, kg C / kg product
ARBOCEL ZZ 8-1 (Cellulose fibers)	0.90	90	90	0.32
Bitumen	0.10	10	0	0
Total	1.00	100	90	0.32
Packaging	4.08E-03	-	-	-

Technical data:

Parameter	Amount
Average pellet length	2 mm – 8 mm
Average pellet thickness	3 mm – 5 mm
Bulk density (in accordance with DIN EN ISO 60)	440 g/L – 510 g/L

The type and the amount of product packaging depends on the specific customer requirements. The results are based on a representative mix of packaging materials per sold product per year. The packaging amounts to 0.00408 kg per kg of product.

Packaging Materials	kg / kg product	Post-consumer recycled material, weight-% of packaging material	Biogenic material, weight-% of packaging material	Biogenic material, kg C / kg packaging material
Big Bags	1.37E-03	0	0	0
LDPE-Foil	2.81E-04	3	0	0
LDPE Stretch Wrap	5.15E-04	7	0	0
LDPE Covers	1.92E-03	8	0	0
others (LDPE)	2.05E-06	30	0	0
total	4.08E-03	5	0	0

Manufacturing:
VIATOP premium is manufactured in Germany and Great Britain, accounting for 78% and 22% of the total annual production, respectively.

Market:
Global

Reference service life, product:
Not relevant

Reference service life, building:
Not relevant

Additional technical information
-

LCA: Calculation rules

Declared unit:
The declared unit is 1 kg of VIATOP premium including packaging impacts.

Cut-off criteria:
For VIATOP premium, all available data was considered in the LCA and no materials were cut-off. For the packaging, singular-use wooden pallets were cut-off due to a high uncertainty in the environmental impacts of the pallets and their unknown average treatment at the end-of-life phase.

Allocation:

No allocation applied in this study. All data (i.e. energy and material consumption) was collected product specific at the manufacturing sites via measurements, which obviates the need for allocation.

Data quality:

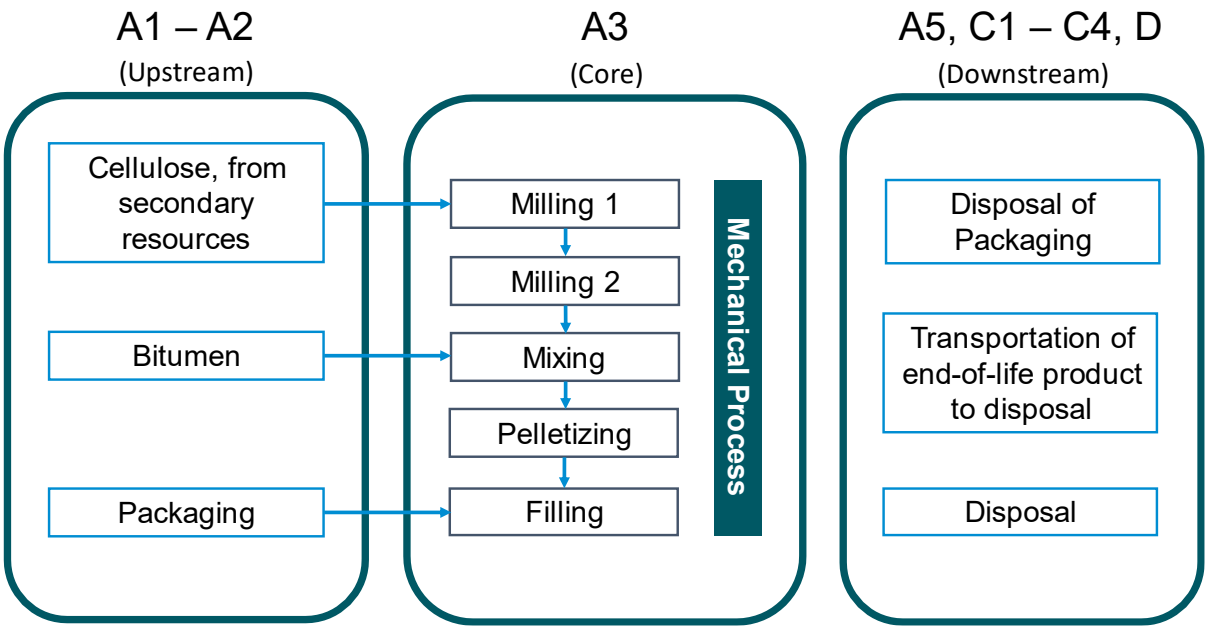
The performed LCA complies with the data quality requirements described in PCR 2019:14 Construction Products. Specific data was implemented wherever possible. If not available, generic data from the ecoinvent database was used and missing data was modelled with literature data. No proxies were used. Data on consumption of natural resources, energy carriers, and chemicals, emissions and transport modes are site specific from J. RETTENMAIER & Söhne GmbH + Co. KG. Foreground data refers to the year 2023 and to four European production sites. As far as possible, the supply of materials in the countries of origin as specified by J. RETTENMAIER & Söhne GmbH + Co. KG, including corresponding transport processes to the next processing step, was considered. Thus, data from the area under study was used. If not available, data from a larger area than the area under study were included, e.g., Europe (RER) or Global (GLO), the latter representing activities that are considered as average and valid for all the countries in the world. To ensure temporal relevance, the newest currently available ecoinvent database 3.9.1 from 2023 was used. The LCA was prepared in the software Umberto 11.11.1. Supplier specific data is not older than the year 2022.

System boundaries according to PCR 2019:14 Construction Products in accordance with EN15804+A2 (X=included, ND=module not declared)

	Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
	Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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
Modules declared	X	X	X	ND	ND	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geo-graphy	RER, GLO	RER	DE/ GB	-	-	-	-	-	-	-	-	-	-	RER	-	CH	-
Specific data	>90 %	>90 %	>90 %	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GWP-GHG Variation (Sites)	+39/-34%																

System boundary:

The system boundary is defined as cradle-to-gate with options and includes stages A1-A3 as well as end-of-life stages C1-C4 and D as illustrated by the flowchart.



All processes from raw material sourcing (all utilized materials as well as the diverse packaging solutions), transport to the production sites in Germany and Great Britain, the mechanical manufacturing until the end-of-life stage are evaluated and included. Infrastructure was excluded, except for upstream datasets as proposed in PCR 2019:14 Construction Products. The use-phase was excluded from the analysis, because VIATOP premium as an asphalt additive is always incorporated in asphalt roads and hence, environmental impacts of the use-phase should be taken from the respective EPDs of asphalt roads. Furthermore, environmental impacts of the demolition phase (C1) should rather be allocated to the final asphalt road, rather than to VIATOP premium. Therefore, the module C1 is set to zero. For module C2 a generic transportation mode of 50 km from demolition to the disposal site was assumed. Asphalt roads, that incorporate VIATOP premium may be processed for recycling or down- / upcycling. However, VIATOP premium itself is fully incorporated into these asphalt systems and cannot be separated from other materials inside the product. Hence, waste treatment efforts should not be allocated to VIATOP premium, but rather to the final product. Therefore, C3 was set to zero and information regarding module C3 should be taken from EPDs of the materials that incorporate VIATOP premium. For the final disposal, landfilling at end-of-life as waste asphalt (ecoinvent dataset) was assumed. Biogenic CO_2-uptake from atmosphere through cellulose and the respective release to the atmosphere at end-of-life was included according to EN15804+A2. The modelling was done by calculating the biogenic carbon share of VIATOP premium to CO_2 (biogenic C*44/12).

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD. In general, the environmental impacts were calculated for each production site and then averaged based on their specific production volumes in tons of VIATOP premium per year to obtain the average results presented in this EPD.

Assembly (A5)

	Unit	Value
Waste treatment of packaging	kg	4.08E-03

In total, 0.00408 kg of packaging per kg VIATOP premium is necessary. Waste treatment of the packaging material is modelled with a generic waste treatment dataset for waste plastic, mixture from ecoinvent. In this dataset, most of the packaging material is incinerated.

End of Life (C1, C3, C4)

	Unit	Value
To landfill	kg	1

Landfilled material is modelled with an ecoinvent dataset for landfill of waste asphalt.

Transport to waste processing (C2)

Transport from production place to assembly/user (C2)	Capacity utilisation (incl. return) %	Type	Distance (km)	Diesel consumption	Unit	Value
Truck	72	market for transport, freight, lorry, unspecified, RER	50	3.11E-02	kg/t*km	1.55E+00

Benefits and loads beyond the system boundaries (D)

VIATOP premium is used in road construction as an additive for asphalt mixtures. Hence, it is always incorporated into the final asphalt mixture. Recycling / Re-use of road asphalt that incorporates VIATOP premium is possible, but these potentials should be allocated to the final product. Therefore, module D is set to 0.

LCA: Results

The manufacturing stage (A3) dominates the environmental footprint for most impact categories by approx. 24 % up to 99 %, depending on the impact category, followed by raw material supply (A1), which contribute by approx. – 50 % up to 53 %. The negative impact stems from cellulose, from secondary resources, that enters the system burden free but with negative global warming potential (biogenic) due to the uptake of atmospheric carbon dioxide. The biogenic carbon dioxide is released in the disposal phase (C4), which therefore contributes by + 50 % in GWP-biogenic and + 45 % in GWP-total. In other impact categories, besides GWP-biogenic and GWP-total, the disposal phase (C4) has an impact between 0 – 30 %. Transportation by lorry to the manufacturing sites (A2) contributes by 0 % to 27 %, while the installation phase (A5 – disposal of packaging), only has a minor impact below 3 % in all impact categories.

Core environmental impact indicators

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP – total	kg CO2 eq	-8.83E-01	5.67E-03	0.00E+00	7.44E-03	0.00E+00	1.19E+00	0.00E+00
GWP – fossil	kg CO2 eq	2.78E-01	5.67E-03	0.00E+00	7.43E-03	0.00E+00	1.62E-02	0.00E+00
GWP - biogenic	kg CO2 eq	-1.16E+00	4.98E-07	0.00E+00	5.89E-06	0.00E+00	1.17E+00	0.00E+00
GWP – luluc	kg CO2 eq	1.38E-04	7.26E-08	0.00E+00	3.63E-06	0.00E+00	2.26E-06	0.00E+00
ODP	kg CFC11 eq	5.41E-09	6.77E-12	0.00E+00	1.63E-10	0.00E+00	2.94E-10	0.00E+00
AP	mol H+ eq	7.92E-04	1.94E-06	0.00E+00	3.47E-05	0.00E+00	6.83E-05	0.00E+00
EP- freshwater	kg P eq	3.58E-04	2.09E-08	0.00E+00	5.36E-07	0.00E+00	6.82E-07	0.00E+00
EP -marine	kg N eq	2.57E-04	4.76E-06	0.00E+00	1.38E-05	0.00E+00	1.19E-04	0.00E+00
EP - terrestrial	molc N eq	2.04E-03	9.30E-06	0.00E+00	1.47E-04	0.00E+00	2.96E-04	0.00E+00
POCP	kg NMVOC eq	6.70E-04	2.72E-06	0.00E+00	5.15E-05	0.00E+00	1.13E-04	0.00E+00
ADP-M&M[2]	kg Sb-Eq	4.74E-07	5.30E-10	0.00E+00	2.37E-08	0.00E+00	1.97E-08	0.00E+00
ADP-fossil[2]	MJ	8.36E+00	1.96E-03	0.00E+00	1.08E-01	0.00E+00	2.34E-01	0.00E+00
WDP[2]	m3	4.82E-02	2.20E-04	0.00E+00	5.47E-04	0.00E+00	1.86E-03	0.00E+00

GWP-total: *Global Warming Potential;* ***GWP-fossil:*** *Global Warming Potential fossil fuels;* ***GWP-biogenic:*** *Global Warming Potential biogenic;* ***GWP-LULUC:*** *Global Warming Potential land use and land use change;* ***ODP:*** *Depletion potential of the stratospheric ozone layer;* ***AP:*** *Acidification potential, Accumulated Exceedance;* ***EP-freshwater:*** *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* ***EP-marine:*** *Eutrophication potential, fraction of nutrients reaching freshwater end compartment;* ***EP-terrestrial:*** *Eutrophication potential, Accumulated Exceedance;* ***POCP****: Formation potential of tropospheric ozone;* ***ADP-M&M****: Abiotic depletion potential for non-fossil resources (minerals and metals);* ***ADP-fossil:*** *Abiotic depletion potential for fossil resources;* ***WDP:*** *Water deprivation potential, deprivation weighted water consumption*

Reading example: 9,0 E-03 = 9,0*10-3 = 0,009. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Additional environmental impact indicators

Indicator	Unit	A1-A3	A5	C1	C2	C3	C4	D
PM	Disease incidence	5.76E-09	1.59E-10	0.00E+00	7.32E-10	0.00E+00	1.62E-09	0.00E+00
IRP[1]	kBq U235 eq.	4.58E-02	3.33E-06	0.00E+00	1.48E-04	0.00E+00	5.41E-04	0.00E+00
ETP-fw[2]	CTUe	2.28E+00	1.36E-02	0.00E+00	5.28E-02	0.00E+00	1.01E-01	0.00E+00
HTP-c[2]	CTUh	7.55E-11	2.59E-12	0.00E+00	4.01E-12	0.00E+00	5.14E-12	0.00E+00
HTP-nc[2]	CTUh	2.13E-09	2.30E-11	0.00E+00	8.37E-11	0.00E+00	6.23E-11	0.00E+00
SQP[2]	Dimensionless	1.56E+00	1.62E-03	0.00E+00	8.06E-02	0.00E+00	5.70E-01	0.00E+00

PM: *Particulate matter emissions;* ***IRP:*** *Ionising radiation, human health;* ***ETP-fw:*** *Ecotoxicity (freshwater);* ***ETP-c:*** *Human toxicity, cancer effects;* ***HTP-nc:*** *Human toxicity, non-cancer effects;* ***SQP:*** *Land use related impacts / soil quality*

[2] The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Resource use

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
RPEE	MJ	3.09E-01	5.64E-05	0.00E+00	1.70E-03	0.00E+00	9.36E-03	0.00E+00
RPEM	MJ	1.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	-1.28E-02	0.00E+00
TPE	MJ	3.22E-01	5.64E-05	0.00E+00	1.70E-03	0.00E+00	-3.48E-03	0.00E+00
NRPE	MJ	8.36E+00	1.96E-03	0.00E+00	1.08E-01	0.00E+00	2.34E-01	0.00E+00
NRPM	MJ	3.95E+00	-1.82E-01	0.00E+00	0.00E+00	0.00E+00	-3.77E+00	0.00E+00
TRPE	MJ	1.23E+01	-1.80E-01	0.00E+00	1.08E-01	0.00E+00	-3.53E+00	0.00E+00
SM	kg	9.96E-01	1.33E-06	0.00E+00	4.81E-05	0.00E+00	9.11E-05	0.00E+00
RSF	MJ	9.82E-05	3.81E-08	0.00E+00	5.94E-07	0.00E+00	3.82E-06	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
W	m^3	1.46E-03	7.88E-06	0.00E+00	1.38E-05	0.00E+00	2.77E-04	0.00E+00

RPEE *Renewable primary energy resources used as energy carrier;* ***RPEM*** *Renewable primary energy resources used as raw materials;* ***TPE*** *Total use of renewable primary energy resources;* ***NRPE*** *Nonrenewable primary energy resources used as energy carrier;* ***NRPM*** *Nonrenewable primary energy resources used as materials;* ***TRPE*** *Total use of non-renewable primary energy resources;* ***SM*** *Use of secondary materials;* ***RSF*** *Use of renewable secondary fuels;* ***NRSF*** *Use of non-renewable secondary fuels;* ***W*** *Use of net fresh water.*

The resource use impact categories were calculated according to option A in Annex 3 of PCR 2019:14 Construction Products.

End of life – Waste

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
HW	kg	9.24E-03	2.58E-05	0.00E+00	7.26E-05	0.00E+00	1.31E-04	0.00E+00
NHW	kg	1.71E+00	1.64E-04	0.00E+00	2.26E-03	0.00E+00	1.00E+00	0.00E+00
RW	kg	1.17E-05	8.30E-10	0.00E+00	3.61E-08	0.00E+00	1.23E-07	0.00E+00

HW *Hazardous waste disposed;* ***NHW*** *Non-hazardous waste disposed;* ***RW*** *Radioactive waste disposed.*

All waste treatment processes are included within the system boundaries.

Information describing the biogenic carbon content at the factory gate

Biogenic carbon content	Unit	Value
Biogenic carbon content in product	kg C/kg product	0.32
Biogenic carbon content in the accompanying packaging	kg C/kg Packaging	0.00

In VIATOP premium, the overall carbon content (biogenic + fossil) amounts to 40,3 wt.% carbon. Consequently, as the biogenic fraction is 32 wt.% carbon, the biogenic carbon equals 79.4% of the product's carbon in VIATOP premium.

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

National electricity grid	Data source	value	unit
market for electricity, medium voltage	Ecoinvent 3.9.1 / energy supplier	0.618	kg CO2-eq/kWh

The regional electricity supplier conveyed information on the carbon footprint and composition of the electricity mixes used at the European production sites. For the most realistic modelling of electricity, the ecoinvent datasets «market for electricity, medium voltage (DE)» and «market for electricity, medium voltage, GB» were used and adjusted towards the electricity mix specifications conveyed by the electricity supplier. Additionally, the global warming potential results of the modelled electricity mixes were adjusted towards the supplier specific carbon footprint through adding or subtracting the elementary flow «carbon dioxide, fossil» on the output side. The emission factor stated above is the average electricity emission factor of all European production sites, weighted over production volumes.

Additional environmental impact indicators required for construction products

To increase the transparency of biogenic carbon contribution to climate impact, the indicator GWP-IOBC (also called GWP-GHG) is required as it declares climate impacts calculated according to the principle of instantaneous oxidation.

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-IOBC	kg CO2 eq.	2.78E-01	5.67E-03	0.00E+00	7.43E-03	0.00E+00	1.62E-02	0.00E+00

GWP-IOBC / GWP-GHG *Global warming potential calculated according to the principle of instantaneous oxidation.*

The variation in GWP-IOBC / GWP-GHG results between sites of +39/-34% occurs due to differences in emission factors of electricity between production sites.

Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

X The product contains no substances given by the REACH Candidate list.

☐ The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.
☐ The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List, see table.
☐ The product contains no substances given by the REACH Candidate list.
☐ The product is classified as hazardous waste, see table.

Indoor environment

No tests have been carried out on the product concerning indoor environment.

Bibliography

ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
PCR 2019:14	IVL Swedish Environmental Research Institute, the Secretariat of the International EPD System, 'PCR 2019:14 Construction products Version 1.3.4'. Apr. 30, 2024. Available: https://environdec.com/pcr-library/with-documents

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CERTIFICATE № 652/2024
of TYPE III ENVIRONMENTAL DECLARATION

Products:

VIATOP premium- Drainage Inhibitor

Manufacturer:

J. RETTENMAIER & Söhne GmbH + Co. KG

Holzmühle 1, D-73494 Rosenberg, Germany

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 19th July 2024 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
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Warsaw, July 2024