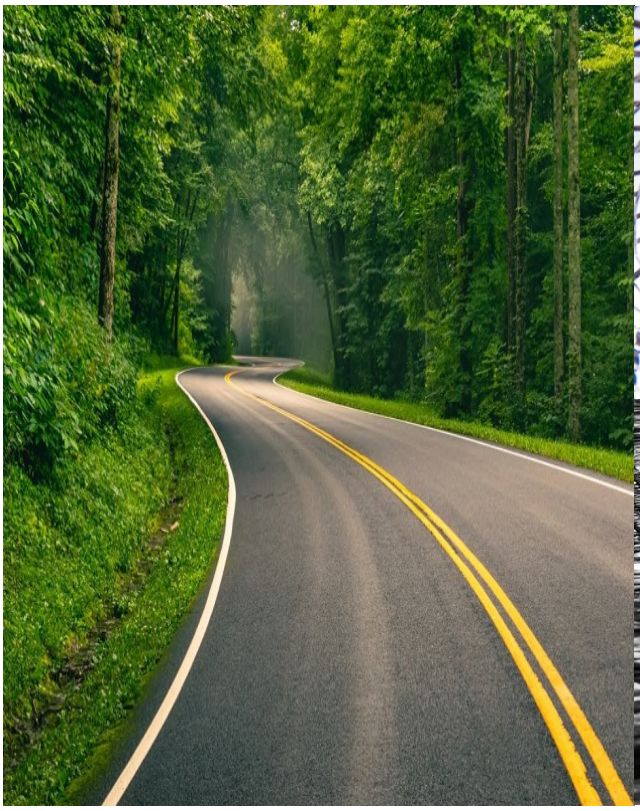
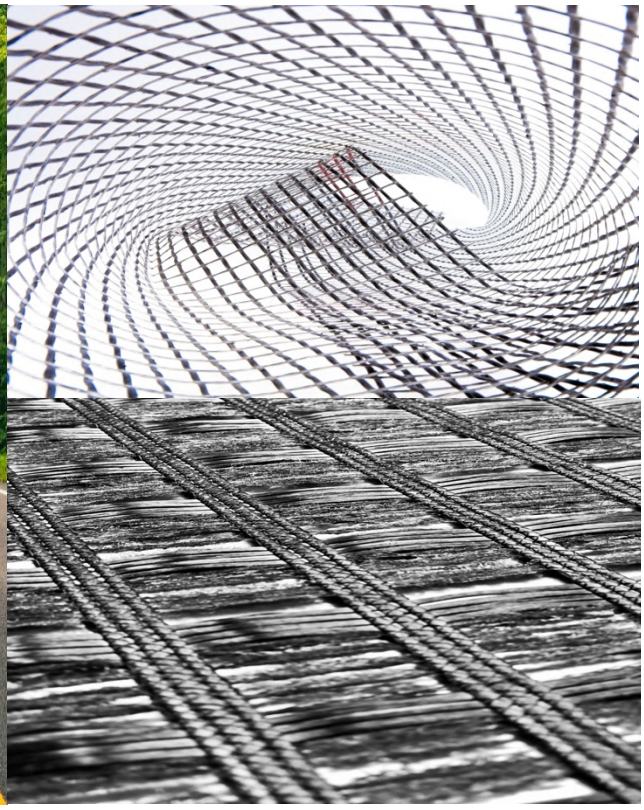
Program EPD Polska
Operator: MULTICERT Sp. z o.o.

# ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

## Product name:
## Drog-Glass and Drog-Glass-Carbon reinforcement grids





## Manufacturer:
## BauTex Sp. z o.o.

BauTex

Published on 19 March 2026
Valid until 19 March 2031

# GENERAL INFORMATION

## EPD OWNER

| | |
|---|---|
| **Manufacturer / EPD Holder** | BauTex Sp. z o.o. |
| **Address** | Partyzancka 94/106, 95-200 Pabianice, Poland |
| **Contact details** | +48 42 215 22 23<br>markowski@bautex.pro |
| **Website** | https://www.bautex.pro/ |

## PRODUCT IDENTIFICATION

| | |
|---|---|
| **Product name** | Drog-Glass and Drog-Glass-Carbon reinforcement grids |
| **Place(s) of production** | POLAND |

## EPD INFORMATION

| | |
|---|---|
| **EPD Polska program operator** | Multicert Sp. z o.o.<br>Ul. Mydlarska 47, 04-690 Warszawa, Poland<br>www.epd.org.pl, epd@epd.org.pl |
| **EPD standards** | This EPD is in accordance with EN 15804:2012+A2:2019 and ISO 14025 standards. |
| **Product category rules** | The CEN standard EN 15804:2012+A2:2019 serves as the core PCR (Product Category Rules). |
| **EPD verification** | Independent verification of this EPD and data, according to ISO 14025:<br>☐ Internal certification<br>☒ External verification |
| **EPD verifier** | Izabela Sztamberek-Sochan, Ph.D. |
| **EPD number** | EPD-P 01.03.2026 |
| **Registration:** | EPD Polska www.epd.org.pl |
| **Publishing date** | 19 March 2026 |
| **EPD valid until** | 19 March 2031 |
| **Reasons for performing LCA** | B2B |
| **Accountability** | The EPD Holder is responsible for the information provided and evidence. Multicert Sp. z o.o. does not hold responsibility for the manufacturer information, life cycle assessment data nor supporting evidence. |

EPDs of construction products may not be comparable if they do not comply with EN 15804 and if they are not compared in a building context.

# COMPANY INFORMATION

## HOLDER OF THE EPD

BauTex Sp. z o.o.
ul. Partyzancka 94/106
95-200 Pabianice
Poland

## COMPANY PROFILE

BauTex Sp. z o.o. is a Polish manufacturer specialising in reinforcement solutions for road and civil engineering applications. The company focuses on the development and production of technical fabrics and reinforcement grids used in asphalt pavements and other infrastructure systems. BauTex products are applied in transportation infrastructure projects including highways, municipal roads, industrial pavements and airport surfaces.

The company has developed expertise in the design and production of glass-fiber and hybrid reinforcement grids intended to improve the mechanical performance and durability of asphalt layers. These solutions are used primarily for the reinforcement of asphalt overlays, crack control and stress distribution in road structures. By integrating advanced materials such as fiberglass and carbon fibers, BauTex aims to provide durable reinforcement systems that extend pavement service life and reduce maintenance requirements.

BauTex supplies its products to road construction contractors, infrastructure developers and engineering companies operating in Poland and international markets. The company supports customers with technical consulting related to pavement reinforcement design, material selection and installation methods.

Through continuous product development and cooperation with the road construction sector, BauTex contributes to improving the durability and performance of asphalt pavements and other infrastructure elements exposed to heavy traffic loads and demanding environmental conditions.

# PRODUCT INFORMATION

## PRODUCT DESCRIPTION

Drog-Glass and Drog-Glass-Carbon are reinforcement grids designed for use in asphalt pavements in road construction. The products are used as reinforcement layers placed between asphalt courses in order to improve the mechanical performance and durability of pavement structures.

The reinforcement grids are manufactured using high-strength fibers arranged in a regular grid structure that provides tensile reinforcement in both longitudinal and transverse directions. The grids are designed to distribute stresses within asphalt layers and limit the propagation of reflective cracks originating from underlying pavement layers.

Drog-Glass grids are produced from glass fiber yarns, while Drog-Glass-Carbon grids combine glass fibers with carbon fibers in order to increase stiffness and tensile performance. Both products are designed to provide high tensile strength with minimal elongation.

The reinforcement grids are typically supplied in roll form and installed during road construction or rehabilitation works. After installation, the grid becomes embedded within the asphalt layer and forms part of the pavement reinforcement system.

## PRODUCT APPLICATION

Drog-Glass and Drog-Glass-Carbon reinforcement grids are used in road construction and pavement rehabilitation projects where increased structural performance and crack resistance are required.

Typical applications include:

- reinforcement of asphalt overlays in road rehabilitation projects
- limitation of reflective cracking caused by joints or cracks in underlying pavement layers
- reinforcement of asphalt layers in roads exposed to heavy traffic loads
- improvement of stress distribution within pavement structures
- extension of pavement service life and reduction of maintenance frequency

The reinforcement grid is installed between asphalt layers during paving operations. Once covered with asphalt mixture, the grid forms an integrated reinforcement layer within the pavement structure.

The use of reinforcement grids can improve the durability of road surfaces by reducing crack propagation and by enhancing the structural behaviour of asphalt layers under traffic loads.

## PRODUCT STANDARDS

Drog-Glass and Drog-Glass-Carbon reinforcement grids are manufactured and tested in accordance with the relevant European standard for geosynthetics used in asphalt reinforcement applications: EN 15381:2008 – Geosynthetics – Characteristics required for use in pavements and asphalt overlays.

## PRODUCT RAW MATERIAL COMPOSITION

The main raw materials used for the production of Drog-Glass and Drog-Glass-Carbon reinforcement grids are glass fibres and polymer-modified asphalt coating. In the Drog-Glass-Carbon variant, carbon fibres are additionally incorporated to enhance the mechanical performance of the grid. The approximate material composition of the products is presented in the table below.

| Material | Drog-Glass | Drog-Glass-Carbon |
|---|---|---|
| Glass fibre | ~81.7 % | ~77.8 % |
| Carbon fibre | – | ~5.6 % |
| Polymer-modified asphalt coating | ~6.7 % | ~6.6 % |
| Cardboard core (roll tube) | ~5.9 % | ~4.3 % |
| Packaging film (PE / stretch) | ~1.0 % | ~0.8 % |
| Production losses (fibres) | ~4.1 % | ~4.2 % |
| Bitumen losses | ~0.6 % | ~0.7 % |

*Table 1. Approximate material inputs and process losses related to 1 kg of Drog-Glass and Drog-Glass-Carbon reinforcement grids (% by mass).*

## ADDITIONAL TECHNICAL INFORMATION

The products covered by this declaration are organised into two main product groups: Drog-Glass and Drog-Glass-Carbon.

Within these groups, the product families include the standard variants and the corresponding L variants, i.e. Drog-Glass / Drog-Glass-L and Drog-Glass-Carbon / Drog-Glass-Carbon-L.

Individual product variants are identified by their tensile strength classes, such as 50/50, 80/70, 100/100, 120/120, 120/200 and 120/250.

The main technical characteristics of the product groups and their variants are presented in Table 2.

| Parameter | Unit | Direction | Drog-Glass<br>Drog-Glass-L | Drog-Glass-Carbon<br>Drog-Glass-Carbon-L |
|---|---|---|---|---|
| Product variants | – | – | 50/50, 80/70, 100/100, 120/120, 120/200 | 120/200, 120/250 |
| Typical product codes | – | – | DG | DGC |
| Reinforcement yarn | – | MD | Glass fibre roving | Glass fibre roving |
| | – | CMD | Glass fibre roving | Carbon fibre |
| Coating | – | – | Polymer-modified asphalt | Polymer-modified asphalt |
| Colour | – | – | Black | Black |
| Tensile strength | kN/m | MD | ≥50 – ≥120 | ≥120 |
| | kN/m | CMD | ≥50 – ≥200 | ≥200 – ≥250 |
| Elongation | % | MD | 2.5 (±0.5) | 2.5 (±0.5) |
| | % | CMD | 2.5 (±0.5) | 1.4 (±0.1) |
| Width | m | – | 1–5.4 | 1–5.4 |
| Roll length | m | – | 50–100 | 50 |

*Table 2. Technical characteristics of Drog-Glass and Drog-Glass-Carbon product variants.*

Drog-Glass and Drog-Glass-Carbon reinforcement grids are supplied in roll form and used for reinforcement of asphalt pavement layers. The products are designed to improve stress distribution and limit reflective and fatigue cracking in asphalt pavements. They are manufactured in accordance with EN 15381.

## SUBSTANCES AND REACH DECLARATION

Drog-Glass and Drog-Glass-Carbon reinforcement grids do not contain substances of very high concern (SVHC) listed under Regulation (EC) No 1907/2006 (REACH) in concentrations exceeding 0.1% (1000 ppm). The products are not classified as hazardous to human health or the environment under applicable EU legislation.

## Declared Unit

The declared unit of this Environmental Product Declaration is 1 kg of Drog-Glass and Drog-Glass-Carbon reinforcement grids.

For information purposes, results may be converted to a surface-related unit (1 m²) using the mass per unit area values provided in Table 3.

The conversion is performed by multiplying the results per declared unit (1 kg) by the corresponding mass per unit area (g/m²) divided by 1000.

Environmental impacts are assumed to scale proportionally with mass per unit area within each product group. Separate LCA models were developed for Drog-Glass and Drog-Glass-Carbon products to reflect differences in material composition.

| Product | Variant | Mass per unit area (g/m²) |
|---|---|---|
| Drog-Glass<br>Drog-Glass-L | 50/50 | 220 ±20 |
| | 80/70 | 300 ±25 |
| | 100/100 | 410 ±30 |
| | 120/120 | 450 ±35 |
| | 120/200 | 520 ±40 |
| Drog-Glass-Carbon<br>Drog-Glass-Carbon-L | 120/200 | 320 ±30 |
| | 120/250 | 350 ±30 |

*Table 3. Mass per unit area of product variants (for conversion of declared unit).*

# PRODUCT LIFE-CYCLE

## RAW MATERIALS ACQUISITION AND TRANSPORT (A1, A2)

Module A1 covers the supply of raw materials used for the production of Drog-Glass and Drog-Glass-Carbon reinforcement grids. The main input materials are glass fibre rovings used as the primary reinforcement component and polymer-modified asphalt used as the coating material. In the Drog-Glass-Carbon variant, carbon fibres are additionally incorporated to enhance the mechanical performance of the grid. Auxiliary materials include cardboard tubes used as roll cores and polyethylene packaging film. The raw materials are sourced from European suppliers and delivered to the BauTex production facility in Pabianice, Poland.

Module A2 includes the transport of raw materials from suppliers to the manufacturing site. Transport is carried out primarily by road using diesel trucks (>16 t, EURO 6). The model reflects representative transport distances based on supplier locations and typical logistics routes for the supply of reinforcement fibres, coating materials and packaging components.

## MANUFACTURING (A3)

Module A3 comprises the production of Drog-Glass and Drog-Glass-Carbon reinforcement grids at the BauTex manufacturing facility in Pabianice, Poland. The process begins with the preparation of reinforcement fibres supplied in the form of glass fibre rovings and, in the case of Drog-Glass-Carbon products, additional carbon fibres. The rovings are fed into weaving machines where they are arranged in longitudinal and transverse directions to form a bidirectional grid structure.

The produced grid is subsequently stabilised by applying a polymer-modified asphalt coating which ensures mechanical integrity of the structure and improves adhesion to asphalt layers during installation. After coating, the material passes through a controlled drying and cooling stage to achieve dimensional stability and the required mechanical properties.

The finished grid is then cut to the required width and wound into rolls of specified length. Cardboard cores are used as roll tubes to support the product during storage and transport. The rolls are labelled for traceability and subjected to routine quality control checks, including verification of tensile strength, elongation and dimensional parameters.

Energy consumption for this module is based on site-specific data and includes electricity used for weaving, coating and finishing operations. Finished rolls are wrapped with protective packaging film, palletised and prepared for distribution.

## END OF LIFE (C1, C2, C3, C4, D)

Drog-Glass and Drog-Glass-Carbon reinforcement grids are installed within asphalt pavement layers where they function as structural reinforcement. During pavement construction the grids become fully embedded in the asphalt mixture and bonded with bitumen and mineral aggregates. As a result, the reinforcement grids become permanently integrated into the asphalt structure and cannot be technically separated or recovered as an individual product during the end-of-life stage.

At the end of the pavement service life, road surfaces are typically removed through milling or demolition processes. During these operations the reinforcement grids remain physically bound to the asphalt matrix and are collected together with reclaimed asphalt pavement (RAP). Consequently, the grids follow the same end-of-life pathway as the asphalt material into which they are incorporated.

The end-of-life modelling is therefore based on typical European practices for asphalt pavement management. This includes milling and removal of asphalt layers (C1), transport of reclaimed asphalt pavement to asphalt plants or processing facilities (C2), mechanical processing and reuse of reclaimed asphalt pavement in new asphalt mixtures or other civil engineering applications (C3), and final disposal of the small non-recycled fraction (C4).

Since the reinforcement grids cannot be separated from the asphalt material, modules C1–C4 and D are modelled using representative processes for asphalt pavement recycling rather than for the reinforcement grid alone.

Due to their minor mass share and inert behaviour within reclaimed asphalt pavement, the reinforcement grids are conservatively treated as part of the reclaimed asphalt pavement stream and assumed to follow the standard RAP recycling pathway. Module D reflects the net benefits associated with the recycling of reclaimed asphalt pavement (RAP) into new asphalt mixtures or other civil engineering applications. As the reinforcement grids remain embedded in the asphalt matrix and cannot be separated, they are modelled as part of the recycled RAP stream.

Detailed assumptions regarding recycling rates of reclaimed asphalt pavement and the corresponding modelling approach are provided in the Estimates and Assumptions section.

# LIFE-CYCLE ASSESSMENT

## LIFE-CYCLE ASSESSMENT INFORMATION

| | |
|---|---|
| **Reference year for primary data** | 2025 |

## DECLARED UNIT

| | |
|---|---|
| **Declared unit** | 1 kg |
| **Mass per declared unit** | 1 kg |

Scope: LCA results are reported for a declared unit of 1 kg of Drog-Glass and Drog-Glass-Carbon reinforcement grids manufactured in 2025. No functional unit (FU) or reference service life (RSL) is declared, as use-stage modules (B1–B7) are not declared.

Results per 1 m² can be calculated by multiplying the results per 1 kg by the basis weight of the selected product variant [kg/m$^2$], as indicated in the product specification table.

## BIOGENIC CARBON CONTENT

| Product | Drog-Glass | Drog-Glass-Carbon |
|---|---|---|
| Biogenic carbon content in product, kg C | 0 | 0 |
| Biogenic carbon content in packaging, kg C | 0,0266 | 0,0194 |

*Table 4. Biogenic carbon content at the factory gate.*

## SYSTEM BOUNDARY

The scope of the EPD is cradle-to-gate with modules C1–C4 and module D. The product stage modules A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing) are included in the study together with the end-of-life modules C1 (Deconstruction), C2 (Waste transport), C3 (Waste processing) and C4 (Waste disposal), as well as module D (Benefits and loads beyond the system boundary).

Modules A4 (Transport to the construction site) and A5 (Construction / installation process) are not declared because transport distances to construction sites and installation conditions depend on project-specific factors. Use stage modules B1–B7 are not relevant for this product.

| Product stage | | | Assembly stage | | Use stage | | | | | | | End of life stage | | | | Beyond the system boundaries |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| X | X | X | MND | MND | MNR | MNR | MNR | MNR | MNR | MNR | MNR | X | X | X | X | X |
| Raw materials | Transport | Manufacturing | Transport to the construction site | Assembly | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction | Waste transport | Waste processing | Disposal | Benefits beyond system boundary |

*Modules not declared = MND. Modules not relevant = MNR.*

## CUT-OFF CRITERIA

The study does not exclude any modules or processes which are stated mandatory in the EN 15804+A2. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All available data for relevant unit processes have been included in the calculation. There is no neglected unit process more than 1% of total mass and energy flows. The total neglected input and output flows do also not exceed 5% of energy usage or mass. The life cycle analysis includes all industrial processes from raw material acquisition to production.

The production of capital equipment, construction activities, and infrastructure, maintenance and operation of capital equipment, personnel-related activities, energy, and water use related to company management and sales activities are excluded.

## ESTIMATES AND ASSUMPTIONS

This LCA study has been conducted in accordance with the applicable methodological principles, including performance metrics, system boundaries, data quality requirements, allocation procedures, and rules for data inclusion and exclusion. The key assumptions and estimates applied in the modelling are outlined below.

Module A1:

Raw materials used for the production of Drog-Glass and Drog-Glass-Carbon reinforcement grids include glass fibre rovings used as the main reinforcement component, polymer-modified asphalt used as coating material, and auxiliary materials such as cardboard roll cores and polyethylene packaging film. In the case of Drog-Glass-Carbon products, carbon fibres are additionally incorporated to enhance the mechanical properties of the grid. Upstream environmental impacts associated with these materials are modelled using datasets from the ecoinvent 3.9.1 (cut-off) database.

Module A2:

Transport of raw materials to the BauTex manufacturing facility in Pabianice is modelled using road transport based on representative supplier distances. Glass fibre rovings are transported by heavy-duty trucks (>16 t), while bitumen, polymer modifiers and auxiliary materials are transported mainly by medium-duty trucks. Packaging materials are transported over shorter regional distances using light-duty vehicles.

Module A3:

Energy consumption for manufacturing is based on site-specific production data for the year 2025 and includes electricity used in weaving, impregnation, finishing and internal logistics operations. Minor production losses of fibres and polymer-modified asphalt coating occurring during the manufacturing process are included in the material balance of the system.

Module C1:

At the end of pavement service life, asphalt layers containing reinforcement grids are typically removed by milling operations. The energy consumption associated with asphalt milling is modelled as diesel consumption corresponding to 11.46 kJ per kg of removed asphalt pavement.

Module C2:

Transport of reclaimed asphalt pavement (RAP) from the demolition site to a RAP processing or asphalt mixing facility is assumed to occur by road transport over a representative distance of 50 km using EURO 6 trucks.

Module C3:

Reclaimed asphalt pavement undergoes mechanical processing prior to reuse in new asphalt mixtures or other civil engineering applications. This stage includes operations such as crushing, screening and preparation of the reclaimed material. The electricity consumption associated with RAP processing is assumed to be 9.5 Wh per kg of processed asphalt material.

Because the reinforcement grids remain embedded within the asphalt matrix and cannot be separated from reclaimed asphalt pavement, the processing energy is allocated to the declared unit proportionally to the mass of material entering the RAP stream.

Module C4:

Based on typical European asphalt management practice, it is assumed that 95 % of reclaimed asphalt pavement is reused or recycled, while the remaining 5 % is assumed to be disposed of via landfill.

Module D:

Environmental benefits beyond the system boundary are associated with the substitution of virgin mineral aggregates by reclaimed asphalt pavement used in new asphalt mixtures or other infrastructure applications. Due to their minor mass share and inert behaviour within reclaimed asphalt pavement, the reinforcement grids are conservatively treated as part of the RAP stream and assumed to follow the standard RAP recycling pathway.

## ALLOCATION

Allocation follows the rules defined in EN 15804+A2. Foreground inputs and outputs were inventoried separately for the two main product groups (Drog-Glass and Drog-Glass-Carbon) and allocated to the declared unit (1 kg of product) on a mass basis within each group. This approach reflects the different material composition of glass fibre and glass-carbon variants while using a common manufacturing logic across variants within each group.

Internal production losses generated during weaving and coating operations are included in the material balance of the manufacturing process (A3). Production waste (glass fibre offcuts and coating losses) leaving the system boundary is reported as an output flow in Module A3 (MFR). This material is supplied to third parties for use as reinforcement material in composites and similar applications. No environmental credits associated with this use are claimed in Module D.

## DATA QUALITY

For foreground data, the LCA study relies on primary data collected by BauTex Sp. z o.o. for the year 2025, including energy consumption, raw material use, transport distances and production volumes.

Background data are taken from the ecoinvent 3.9.1 (cut-off) database and implemented in openLCA.

For electricity consumption in module A3, the background dataset was adapted for climate change modelling to reflect the Polish national electricity mix based on KOBiZE 2024 data.

The adaptation consists of replacing the default climate change (GWP) factor of electricity with a national factor based on KOBiZE 2024 operational emission data, complemented by upstream emissions (fuel supply and methane emissions from coal extraction) and additional life-cycle components relevant to the Polish energy system.

All other environmental impact indicators were modelled using the original ecoinvent datasets, ensuring consistency and completeness across the full set of EN 15804+A2 indicators.

## GEOGRAPHIC REPRESENTATIVENESS

The specified land or region where the product system is manufactured and managed is Poland, Europe.

# ENVIRONMENTAL IMPACT DATA: Drog-Glass reinforcement grid

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP-Total | kg CO2 eq. | 2,06E+00 | 9,60E-02 | 4,70E-01 | MND | MNR | 1,14E-03 | 9,25E-03 | 5,69E-03 | 1,40E-04 | -1,65E-02 |
| GWP-fossil | kg CO2 eq. | 2,10E+00 | 9,59E-02 | 4,67E-01 | MND | MNR | 1,14E-03 | 9,24E-03 | 5,66E-03 | 1,40E-04 | -1,64E-02 |
| GWP-biogenic | kg CO2 eq. | -3,81E-02 | 7,66E-05 | 2,60E-03 | MND | MNR | 2,61E-07 | 8,46E-06 | 3,15E-05 | 3,21E-08 | -2,82E-05 |
| GWP-luluc | kg CO2 eq. | 3,44E-03 | 4,69E-05 | 1,40E-04 | MND | MNR | 1,28E-07 | 4,56E-06 | 1,69E-06 | 1,70E-08 | -1,36E-05 |
| ODP | kg CFC-11 eq. | 5,22E-08 | 2,17E-09 | 2,14E-09 | MND | MNR | 1,81E-11 | 2,01E-10 | 2,59E-11 | 2,15E-12 | -2,01E-10 |
| AP | mol H+ eq. | 1,55E-02 | 2,30E-04 | 3,35E-03 | MND | MNR | 1,05E-05 | 2,02E-05 | 4,06E-05 | 1,29E-06 | -1,10E-04 |
| EP-freshwater | kg P eq. | 7,10E-04 | 7,09E-06 | 5,60E-04 | MND | MNR | 3,49E-08 | 6,57E-07 | 6,79E-06 | 7,26E-09 | -3,70E-06 |
| EP-marine | kg N eq. | 3,23E-03 | 6,35E-05 | 4,80E-04 | MND | MNR | 4,89E-06 | 5,09E-06 | 5,85E-06 | 5,80E-07 | -3,05E-05 |
| EP-terrestrial | mol N eq. | 3,37E-02 | 6,50E-04 | 4,21E-03 | MND | MNR | 5,31E-05 | 5,18E-05 | 5,10E-05 | 6,30E-06 | -3,40E-04 |
| POCP | kg NMVOC eq. | 1,05E-02 | 3,80E-04 | 1,21E-03 | MND | MNR | 1,57E-05 | 3,13E-05 | 1,47E-05 | 1,90E-06 | -1,10E-04 |
| ADPE (disc.2) | kg Sb eq. | 2,50E-04 | 1,91E-07 | 1,43E-07 | MND | MNR | 2,20E-10 | 2,15E-08 | 1,74E-09 | 2,79E-11 | -4,43E-08 |
| ADPF (disc.2) | MJ, (NCV) | 3,41E+01 | 1,46E+00 | 5,34E+00 | MND | MNR | 1,50E-02 | 1,32E-01 | 6,47E-02 | 1,84E-03 | -2,16E-01 |
| WDP (disc.2) | m3 World eq. | 8,57E-01 | 7,49E-03 | 1,00E-01 | MND | MNR | 3,71E-05 | 6,60E-04 | 1,22E-03 | 4,76E-06 | -1,32E-02 |
| Acronyms | GWP-total – Climate change, total global warming potential; GWP-fossil – Climate change, fossil fuels; GWP-biogenic – Climate change, biogenic carbon; GWP-luluc – Climate change, land use and land use change; ODP – Ozone layer depletion; AP – Acidification of terrestrial and freshwater environments; EP-freshwater – Eutrophication, freshwater; EP-marine – Eutrophication, marine; EP-terrestrial – Eutrophication, terrestrial; POCP – Photochemical ozone formation (smog formation); ADPE – Abiotic depletion, minerals and metals; ADPF – Abiotic depletion, fossil fuels; WDP – Water scarcity (water use deprivation potential); NCV - net calorific value. | | | | | | | | | | |
| Disclaimer 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 experience with the indicator. | | | | | | | | | | |

## ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | Disease Incidence | 1,01E-07 | 7,02E-09 | 5,46E-09 | MND | MNR | 2,91E-10 | 5,50E-10 | 6,60E-11 | 3,50E-11 | -1,45E-09 |
| IRP (disc.1) | kBq U235 eq. | 3,74E-01 | 1,88E-03 | 1,53E-02 | MND | MNR | 7,07E-06 | 1,80E-04 | 1,90E-04 | 9,31E-07 | -1,01E-03 |
| ETP-fw (disc.2) | CTUe | 7,96E+00 | 6,98E-01 | 1,38E+00 | MND | MNR | 7,11E-03 | 6,47E-02 | 1,68E-02 | 8,60E-04 | -9,34E-02 |
| HTP-c (disc.2) | CTUh | 1,06E-09 | 4,19E-11 | 1,42E-10 | MND | MNR | 3,46E-13 | 4,14E-12 | 1,72E-12 | 4,47E-14 | -1,30E-11 |
| HTP-nc (disc.2) | CTUh | 6,98E-08 | 8,89E-10 | 5,21E-09 | MND | MNR | 2,18E-12 | 8,10E-11 | 6,32E-11 | 3,21E-13 | -1,51E-10 |
| SQP (disc.2) | Dimensionless | 1,14E+01 | 1,42E+00 | 1,14E+00 | MND | MNR | 1,00E-03 | 7,93E-02 | 1,38E-02 | 2,19E-03 | -2,48E-01 |
| Acronyms | PM – Particulate matter emissions (potential incidence of disease);IRP – Ionising radiation, human health exposure potential; ETP-fw – Ecotoxicity, freshwater; HTP-c – Human toxicity, cancer effects; HTP-nc – Human toxicity, non-cancer effects; SQP – Land use related impacts, soil quality. | | | | | | | | | | |
| Disclaimer 1 | This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator | | | | | | | | | | |
| Disclaimer 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 experience with the indicator. | | | | | | | | | | |

## USE OF NATURAL RESOURCES

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ, (NCV) | 4,02E+00 | 2,16E-02 | 4,93E-01 | MND | MNR | 8,47E-05 | 2,06E-03 | 5,98E-03 | 1,51E-05 | -1,13E-02 |
| PERM | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ, (NCV) | 4,02E+00 | 2,16E-02 | 4,93E-01 | MND | MNR | 8,47E-05 | 2,06E-03 | 5,98E-03 | 1,51E-05 | -1,13E-02 |
| PENRE | MJ, (NCV) | 3,41E+01 | 1,46E+00 | 5,34E+00 | MND | MNR | 1,50E-02 | 1,32E-01 | 6,47E-02 | 1,84E-03 | -2,16E-01 |
| PENRM | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ, (NCV) | 3,41E+01 | 1,46E+00 | 5,34E+00 | MND | MNR | 1,50E-02 | 1,32E-01 | 6,47E-02 | 1,84E-03 | -2,16E-01 |
| SM | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 3,29E-02 | 2,60E-04 | 1,43E-02 | MND | MNR | 1,33E-06 | 2,17E-05 | 1,70E-04 | 1,68E-07 | -4,60E-04 |
| Acronyms | PERE – Use of renewable primary energy as energy carriers; PERM – Use of renewable primary energy resources as raw materials; PERT – Total use of renewable primary energy resources (PERE + PERM); PENRE – Use of non-renewable primary energy as energy carriers; PENRM – Use of non-renewable primary energy resources as raw materials; PENRT – Total use of non-renewable primary energy resources (PENRE + PENRM); SM – Use of secondary material; RSF – Use of renewable secondary fuels; NRSF – Use of non-renewable secondary fuels; FW – Net use of fresh water; NCV - net calorific value. | | | | | | | | | | |

## OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CRU | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | kg | 0,00E+00 | 0,00E+00 | 4,76E-02 | MND | MNR | 0,00E+00 | 0,00E+00 | 9,50E-01 | 0,00E+00 | 0,00E+00 |
| MER | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EET | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Acronyms | CRU – Components for re-use; MFR – Materials for recycling; MER – Materials for energy recovery; EEE – Exported electrical energy; EET – Exported thermal energy. | | | | | | | | | | |

## WASTE

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 1,20E-04 | 9,02E-06 | 3,19E-06 | MND | MNR | 1,00E-07 | 8,36E-07 | 3,87E-08 | 1,19E-08 | -1,48E-06 |
| NHWD | kg | 6,49E-03 | 3,51E-05 | 7,56E-03 | MND | MNR | 2,80E-07 | 3,72E-06 | 9,65E-07 | 5,00E-02 | -1,01E-05 |
| RWD | kg | 9,55E-05 | 4,54E-07 | 3,76E-06 | MND | MNR | 1,63E-09 | 4,31E-08 | 4,56E-08 | 2,16E-10 | -2,46E-07 |
| Acronyms | HWD – Hazardous waste disposed; NHWD – Non-hazardous waste disposed; RWD – Radioactive waste disposed. | | | | | | | | | | |

# ENVIRONMENTAL IMPACT DATA: Drog-Glass-Carbon reinforcement grid

## CORE ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| GWP-Total | kg CO2 eq. | 4,32E+00 | 1,72E-01 | 4,45E-01 | MND | MNR | 1,14E-03 | 9,25E-03 | 5,69E-03 | 1,40E-04 | -1,65E-02 |
| GWP-fossil | kg CO2 eq. | 4,35E+00 | 1,72E-01 | 4,42E-01 | MND | MNR | 1,14E-03 | 9,24E-03 | 5,66E-03 | 1,40E-04 | -1,64E-02 |
| GWP-biogenic | kg CO2 eq. | -2,69E-02 | 1,40E-04 | 2,46E-03 | MND | MNR | 2,61E-07 | 8,46E-06 | 3,15E-05 | 3,21E-08 | -2,82E-05 |
| GWP-luluc | kg CO2 eq. | 3,37E-03 | 9,17E-05 | 1,30E-04 | MND | MNR | 1,28E-07 | 4,56E-06 | 1,69E-06 | 1,70E-08 | -1,36E-05 |
| ODP | kg CFC-11 eq. | 1,05E-07 | 3,81E-09 | 2,02E-09 | MND | MNR | 1,81E-11 | 2,01E-10 | 2,59E-11 | 2,15E-12 | -2,01E-10 |
| AP | mol H+ eq. | 2,46E-02 | 3,90E-04 | 3,18E-03 | MND | MNR | 1,05E-05 | 2,02E-05 | 4,06E-05 | 1,29E-06 | -1,10E-04 |
| EP-freshwater | kg P eq. | 1,84E-03 | 1,35E-05 | 5,30E-04 | MND | MNR | 3,49E-08 | 6,57E-07 | 6,79E-06 | 7,26E-09 | -3,70E-06 |
| EP-marine | kg N eq. | 5,89E-03 | 1,00E-04 | 4,60E-04 | MND | MNR | 4,89E-06 | 5,09E-06 | 5,85E-06 | 5,80E-07 | -3,05E-05 |
| EP-terrestrial | mol N eq. | 5,12E-02 | 1,02E-03 | 3,99E-03 | MND | MNR | 5,31E-05 | 5,18E-05 | 5,10E-05 | 6,30E-06 | -3,40E-04 |
| POCP | kg NMVOC eq. | 1,52E-02 | 6,20E-04 | 1,15E-03 | MND | MNR | 1,57E-05 | 3,13E-05 | 1,47E-05 | 1,90E-06 | -1,10E-04 |
| ADPE (disc.2) | kg Sb eq. | 2,40E-04 | 4,40E-07 | 1,36E-07 | MND | MNR | 2,20E-10 | 2,15E-08 | 1,74E-09 | 2,79E-11 | -4,43E-08 |
| ADPF (disc.2) | MJ, (NCV) | 6,85E+01 | 2,53E+00 | 5,06E+00 | MND | MNR | 1,50E-02 | 1,32E-01 | 6,47E-02 | 1,84E-03 | -2,16E-01 |
| WDP (disc.2) | m3 World eq. | 1,28E+00 | 1,36E-02 | 9,52E-02 | MND | MNR | 3,71E-05 | 6,60E-04 | 1,22E-03 | 4,76E-06 | -1,32E-02 |
| Acronyms | GWP-total – Climate change, total global warming potential; GWP-fossil – Climate change, fossil fuels; GWP-biogenic – Climate change, biogenic carbon; GWP-luluc – Climate change, land use and land use change; ODP – Ozone layer depletion; AP – Acidification of terrestrial and freshwater environments; EP-freshwater – Eutrophication, freshwater; EP-marine – Eutrophication, marine; EP-terrestrial – Eutrophication, terrestrial; POCP – Photochemical ozone formation (smog formation); ADPE – Abiotic depletion, minerals and metals; ADPF – Abiotic depletion, fossil fuels; WDP – Water scarcity (water use deprivation potential); NCV - net calorific value. | | | | | | | | | | |
| Disclaimer 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 experience with the indicator. | | | | | | | | | | |

## ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS – EN 15804+A2, PEF

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PM | Disease Incidence | 1,26E-07 | 1,02E-08 | 5,17E-09 | MND | MNR | 2,91E-10 | 5,50E-10 | 6,60E-11 | 3,50E-11 | -1,45E-09 |
| IRP (disc.1) | kBq U235 eq. | 4,11E-01 | 4,03E-03 | 1,45E-02 | MND | MNR | 7,07E-06 | 1,80E-04 | 1,90E-04 | 9,31E-07 | -1,01E-03 |
| ETP-fw (disc.2) | CTUe | 1,61E+01 | 1,26E+00 | 1,31E+00 | MND | MNR | 7,11E-03 | 6,47E-02 | 1,68E-02 | 8,60E-04 | -9,34E-02 |
| HTP-c (disc.2) | CTUh | 1,51E-09 | 7,99E-11 | 1,35E-10 | MND | MNR | 3,46E-13 | 4,14E-12 | 1,72E-12 | 4,47E-14 | -1,30E-11 |
| HTP-nc (disc.2) | CTUh | 7,96E-08 | 1,54E-09 | 4,94E-09 | MND | MNR | 2,18E-12 | 8,10E-11 | 6,32E-11 | 3,21E-13 | -1,51E-10 |
| SQP (disc.2) | Dimensionless | 1,33E+01 | 1,82E+00 | 1,08E+00 | MND | MNR | 1,00E-03 | 7,93E-02 | 1,38E-02 | 2,19E-03 | -2,48E-01 |
| Acronyms | PM – Particulate matter emissions (potential incidence of disease);IRP – Ionising radiation, human health exposure potential; ETP-fw – Ecotoxicity, freshwater; HTP-c – Human toxicity, cancer effects; HTP-nc – Human toxicity, non-cancer effects; SQP – Land use related impacts, soil quality. | | | | | | | | | | |
| Disclaimer 1 | This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator | | | | | | | | | | |
| Disclaimer 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 experience with the indicator. | | | | | | | | | | |

## USE OF NATURAL RESOURCES

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PERE | MJ, (NCV) | 4,98E+00 | 4,51E-02 | 4,68E-01 | MND | MNR | 8,47E-05 | 2,06E-03 | 5,98E-03 | 1,51E-05 | -1,13E-02 |
| PERM | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PERT | MJ, (NCV) | 4,98E+00 | 4,51E-02 | 4,68E-01 | MND | MNR | 8,47E-05 | 2,06E-03 | 5,98E-03 | 1,51E-05 | -1,13E-02 |
| PENRE | MJ, (NCV) | 6,85E+01 | 2,53E+00 | 5,06E+00 | MND | MNR | 1,50E-02 | 1,32E-01 | 6,47E-02 | 1,84E-03 | -2,16E-01 |
| PENRM | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| PENRT | MJ, (NCV) | 6,85E+01 | 2,53E+00 | 5,06E+00 | MND | MNR | 1,50E-02 | 1,32E-01 | 6,47E-02 | 1,84E-03 | -2,16E-01 |
| SM | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| RSF | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| NRSF | MJ, (NCV) | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| FW | m3 | 7,07E-02 | 4,60E-04 | 1,35E-02 | MND | MNR | 1,33E-06 | 2,17E-05 | 1,70E-04 | 1,68E-07 | -4,60E-04 |
| Acronyms | PERE – Use of renewable primary energy as energy carriers; PERM – Use of renewable primary energy resources as raw materials; PERT – Total use of renewable primary energy resources (PERE + PERM); PENRE – Use of non-renewable primary energy as energy carriers; PENRM – Use of non-renewable primary energy resources as raw materials; PENRT – Total use of non-renewable primary energy resources (PENRE + PENRM); SM – Use of secondary material; RSF – Use of renewable secondary fuels; NRSF – Use of non-renewable secondary fuels; FW – Net use of fresh water; NCV - net calorific value. | | | | | | | | | | |

## OUTPUT FLOWS

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CRU | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| MFR | kg | 0,00E+00 | 0,00E+00 | 4,68E-02 | MND | MNR | 0,00E+00 | 0,00E+00 | 9,50E-01 | 0,00E+00 | 0,00E+00 |
| MER | kg | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EEE | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| EET | MJ | 0,00E+00 | 0,00E+00 | 0,00E+00 | MND | MNR | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 | 0,00E+00 |
| Acronyms | CRU – Components for re-use; MFR – Materials for recycling; MER – Materials for energy recovery; EEE – Exported electrical energy; EET – Exported thermal energy. | | | | | | | | | | |

## WASTE

| Impact category | Unit | A1 | A2 | A3 | A4-A5 | B1-B7 | C1 | C2 | C3 | C4 | D |
|---|---|---|---|---|---|---|---|---|---|---|---|
| HWD | kg | 1,90E-04 | 1,58E-05 | 3,03E-06 | MND | MNR | 1,00E-07 | 8,36E-07 | 3,87E-08 | 1,19E-08 | -1,48E-06 |
| NHWD | kg | 5,64E-03 | 7,48E-05 | 7,45E-03 | MND | MNR | 2,80E-07 | 3,72E-06 | 9,65E-07 | 5,00E-02 | -1,01E-05 |
| RWD | kg | 1,00E-04 | 9,87E-07 | 3,57E-06 | MND | MNR | 1,63E-09 | 4,31E-08 | 4,56E-08 | 2,16E-10 | -2,46E-07 |
| Acronyms | HWD – Hazardous waste disposed; NHWD – Non-hazardous waste disposed; RWD – Radioactive waste disposed. | | | | | | | | | | |

## SCENARIO DOCUMENTATION

Manufacturing energy scenario documentation

| Scenario parameter | Value |
|---|---|
| Electricity data source and quality | Electricity used in module A3 is based on the ecoinvent 3.9.1 dataset for the Polish electricity mix. For climate change modelling, the default GWP factor was replaced with a national electricity factor based on KOBiZE 2024 operational emission data and extended to include upstream emissions (fuel supply, methane emissions from coal extraction and infrastructure-related contributions). |
| Climate change emission factor (GWP) | 0,599 kg CO2e / kWh |

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Multicert Sp. z o.o. (2024). General Programme Instructions of the EPD Polska Programme, Warsaw, Poland.

## EPD VERIFICATION:

The verification procedure for this Environmental Product Declaration (EPD) has been carried out in accordance with the requirements of ISO 14025 standards. This EPD is valid for five years from the date of publication and may be updated earlier in the event of significant changes. Renewal requires a review and, where applicable, an update.

## EPD CONTRIBUTORS

| | |
|---|---|
| **Manufacturer representative** | Michał Markowski<br>Commercial Director |
| **EPD verifier** | Izabela Sztamberek-Sochan, PhD. |

**Note:** The owner of the declaration is solely responsible for its content. Construction product EPDs may not be comparable if they do not comply with EN 15804. For further information on comparability, see EN 15804 and ISO 14025.

## EPD Polska Certificate

Program EPD Polska
Operator: MULTICERT Sp. z o.o.

BauTex

# CERTIFICATE

### TYPE III EPD DECLARATION

(ENVIRONMENTAL PRODUCT DECLARATION)

**Reg. No. EPD-P 01.03.2026**

EPD Environmental Product Declaration
EPD VERIFIED
EPD POLAND

This document confirms that the Environmental Product Declaration developed by **BauTex Sp. z o.o.** for

**Drog-Glass and Drog-Glass-Carbon reinforcement grids**

manufactured in accordance with: **EN 15381:2008** standard
meets the requirements of standards **EN 15804:2012+A2:2019** and **ISO 14025**, and that the data contained therein has been prepared correctly.

The Declaration was published on March 19, 2026 and is valid until March 19, 2031, or until it is deregistered or its publication on the website www.epd.org.pl is discontinued.

Authenticity of this certificate can be confirmed in.
the public register at www.epd.org.pl

*Izabela Sztamberek-Sochan, Ph.D.*
EPD Polska Verifier

MULTICERT JEDNOSTKA CERTYFIKACYJNA

*Grzegorz Suwara*
CEO Multicert Sp. z o.o.

Warsaw, March 19, 2026