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

ENVIRONMENTAL PRODUCT DECLARATION

IN ACCORDANCE WITH EN 15804+A2 & ISO 14025

Product name:
Composite drainage membrane GXP® DREN

Manufacturer:
GRILTEX POLSKA Sp. z o.o.

Published on 31 December 2025
Valid until 31 December 2030

GENERAL INFORMATION

EPD OWNER

Manufacturer / EPD Holder	GRILTEX POLSKA Sp. z o.o.
Address	Obornicka 7, Złotkowo, 62-002 Suchy Las, Poland
Contact details	+48 61 655 37 51 biuro@griltex.pl
Website	https://www.griltex.pl/

PRODUCT IDENTIFICATION

Product name	Composite drainage membrane GXP® DREN
Place(s) of production	POLAND

EPD INFORMATION

EPD Polska program operator	Multicert Sp. z o.o. Ul. Mydlarska 47, 04-690 Warszawa, Poland www.epd.org.pl, epd@epd.org.pl
EPD standards	This EPD is in accordance with EN 15804+A2 and ISO 14025 standards.
Product category rules	The CEN standard EN 15804+A2 serves as the core PCR (Product Category Rules).
EPD verification	Independent verification of this EPD and data, according to ISO 14025: ☐Internal certification ☒ External verification
EPD verifier	Izabela Sztamberek-Sochan, Ph.D.
EPD number	EPD-P 10.12.2025
Registration:	EPD Polska www.epd.org.pl
Publishing date	31 December 2025
EPD valid until	31 December 2030
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

GRILTEX POLSKA Sp. z o.o.
ul. Obornicka 7
Złotkowo, 62-002 Suchy Las
Poland

COMPANY PROFILE

GRILTEX POLSKA Sp. z o.o. is a Polish manufacturer of geosynthetic and waterproofing materials, headquartered in Złotkowo near Poznań and operating within the wider Griltex Group, which originated in Western Europe. The Griltex brand was established in the 1960s and has developed extensive expertise in plastics processing and geotechnical solutions. The company has been active in Poland since the 1990s and is regarded as one of the early domestic producers of geosynthetics. Over time, it has built its position on technical reliability, product development and cooperation with the civil engineering and environmental sectors.

The company specialises in the production of geomembranes, drainage and insulation membranes, geotextiles and customised sealing systems used in construction, infrastructure and environmental protection projects. Its products are applied in foundation protection, earthworks, water management and underground engineering. In addition to manufacturing, GRILTEX POLSKA provides technical support related to material selection, installation methods and performance requirements in geotechnical applications. The company operates a modern manufacturing facility equipped with extrusion, forming and testing capabilities, supported by internal laboratory control.

Quality management is maintained in accordance with ISO 9001, with documented procedures for process monitoring, product traceability and performance testing. Environmental responsibility forms part of the company's operational strategy, reflected in the use of recyclable materials, resource efficiency and the development of long-lasting geosynthetic solutions aimed at protecting soil and groundwater. GRILTEX POLSKA supplies both domestic and international markets, serving contractors, designers and public authorities involved in infrastructure, transportation and landscape engineering. Through continuous technical development and sector-specific expertise, the company supports the durable application of geosynthetics in demanding engineering conditions.

PRODUCT INFORMATION

PRODUCT DESCRIPTION

GXP® DREN is a composite drainage membrane consisting of an extruded dimpled sheet manufactured from high-density polyethylene (HDPE) combined with a filtration geotextile layer made from polypropylene (PP). The product is designed to provide subsurface drainage, filtration and mechanical protection of waterproofing systems in underground and foundation structures.

The HDPE membrane forms the structural core of the product and features a regular pattern of studs creating a three-dimensional drainage cavity. This profiled structure forms continuous flow channels that allow the collection and horizontal transport of groundwater or infiltrating water along the protected surface. The geometry of the dimples maintains the drainage space even under typical soil and backfill loads.

A nonwoven geotextile layer bonded to the membrane acts as a filtration interface. The geotextile allows water to enter the drainage layer while preventing fine soil particles from penetrating the drainage cavity, thereby reducing the risk of clogging and maintaining long-term drainage performance.

The composite structure separates soil from structural surfaces and reduces hydrostatic pressure acting on underground elements. At the same time, the membrane protects underlying waterproofing layers against mechanical damage during installation and backfilling operations.

Due to the chemical resistance and durability of HDPE and the filtration properties of the geotextile layer, the membrane maintains stable performance in contact with soil, groundwater and mineral construction materials. The product is designed for long-term service in underground construction applications.

PRODUCT APPLICATION

GXP® DREN membranes are used in civil engineering and building construction as drainage, filtration and protective layers in subsurface structures.
Typical applications include:

- Vertical foundation walls and basement structures – as a drainage layer protecting waterproofing systems and enabling controlled water flow towards drainage outlets,
- Retaining walls and underground structural elements – to reduce hydrostatic pressure and facilitate water discharge behind structural wall,
- Infrastructure construction – including bridge abutments, underground parking structures, tunnels and buried engineering structures requiring controlled subsurface drainage,
- Green roofs and landscaped structures – as a drainage and separation layer between soil substrates and waterproofing systems,
- Foundation slabs and underground floors – as a drainage and protective layer in contact with soil and backfill materials.

The membrane functions as a combined drainage, filtration and protection system, compatible with bituminous, polymeric and mineral waterproofing materials typically used in underground construction.

PRODUCT STANDARDS

GXP® DREN membranes are manufactured and tested in accordance with relevant European standards governing geosynthetics and waterproofing applications, including:

- EN 13252:2017 – Geotextiles and geotextile-related products - Characteristics required for use in drainage systems.

The product is suitable for use in contact with soil, concrete, and typical mineral backfill materials.

PRODUCT RAW MATERIAL COMPOSITION

Recycled HDPE drainage membrane	86 - 91%
Polypropylene geotextile filtration layer	9-14%
Minor additives and auxiliary materials	<1 %

ADDITIONAL TECHNICAL INFORMATION

GXP® DREN membranes are available in several basis weight variants depending on the thickness of the HDPE drainage layer. The filtration geotextile is bonded to the surface of the membrane forming a composite drainage system.:

	Product's variant				
Available basis weight [g/m²]	700	800	900	1000	1100
Characteristics:					
Compressive strength [kN/m²]	300	350	400	450	500
Stud height [mm]	8	8	8	8	8
Number of studs [pcs/m²]	1860	1860	1860	1860	1860
Drainage capacity [l/s/m]	4,6	4,6	4,6	4,6	4,6
Air volume between dimples [l/m²]	5,3	5,3	5,3	5,3	5,3
Temperature resistance [°C]	-40 to +80	-40 to +80	-40 to +80	-40 to +80	-40 to +80
Maximum width [m]	4	4	4	4	4
Standard roll sizes [m]	2.0×20; 4.0×20	2.0×20; 4.0×20	2.0×20; 4.0×20	2.0×20; 4.0×20	2.0×20; 4.0×20

The dimpled HDPE sheet forms a continuous drainage channel that allows water to flow along the membrane surface. The bonded geotextile layer prevents soil particles from entering the drainage cavity and ensures long-term filtration and drainage performance.

The membrane is resistant to biological degradation, microorganisms and typical soil chemistry. HDPE provides chemical stability within the typical pH range encountered in soils and groundwater.

The membranes are supplied in roll form in standard construction widths and lengths compatible with typical installation methods used for foundation drainage systems. Installation includes overlapping joints and mechanical fastening depending on project requirements.

Technical data sheets, installation recommendations and conformity documentation are available from the manufacturer upon request.

SUBSTANCES AND REACH DECLARATION

GXP® DREN does not contain substances of very high concern (SVHC) listed under Regulation (EC) No 1907/2006 (REACH) in concentrations exceeding 0.1% (1000 ppm). The product is 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 m² of GXP® DREN composite membrane.

The EPD covers product variants with an HDPE membrane basis weight ranging from 600 g/m² to 1000 g/m², corresponding to total product masses between 700 g/m² and 1100 g/m².

Environmental impacts for different variants are calculated proportionally based on the mass of the membrane and associated material inputs.

PRODUCT LIFE-CYCLE

RAW MATERIALS ACQUISITION AND TRANSPORT (A1, A2)

Module A1 covers the supply of input materials used for the production of GXP® DREN composite drainage membranes. The main component of the product is the GXP® Plus dimpled HDPE membrane, which acts as the structural drainage core of the composite system. This component is manufactured by Griltex at the same production site and is treated in the LCA model as an intermediate product.

The life cycle data for this component are derived from the existing Environmental Product Declaration for GXP® Plus membranes and incorporated as an upstream dataset in the GXP® DREN production model. The manufacturing processes already included in the GXP® Plus EPD are therefore not modelled again in module A3 of this study.

In addition to the HDPE drainage membrane, the product includes a nonwoven polypropylene (PP) geotextile filtration layer supplied by external manufacturers. Minor inputs include auxiliary materials such as polyethylene tape used during product finishing and packaging materials used for distribution. The life cycle data for the geotextile layers are modelled using supplier-specific Environmental Product Declarations (EPDs) and incorporated as upstream datasets in the life cycle model.

Module A2 includes the transport of externally supplied materials to the production facility. Transport is primarily carried out by road using diesel-powered heavy-duty trucks (>16 t, EURO 6). Transport distances used in the model represent typical supply chain conditions for the materials used in the product system.

Since the GXP® Plus drainage membrane is produced at the same manufacturing site where the GXP® DREN composite membrane is assembled, no additional transport is modelled for this component in module A2.

Transport distances and logistics assumptions represent typical supply chain conditions and are based on primary data provided by the manufacturer.

MANUFACTURING (A3)

Module A3 covers the manufacturing processes required for the production of GXP® DREN composite drainage membranes at the Griltex production facility.

The production process at the Griltex facility integrates two sequential stages within a single continuous manufacturing line. In the first stage, the GXP® Plus dimpled HDPE membrane is produced by extrusion, forming the characteristic studded drainage profile. Immediately following extrusion, the nonwoven polypropylene (PP) geotextile layer — supplied by external manufacturers — is applied to the studded surface and thermally bonded to the membrane structure without the use of adhesives. The resulting composite constitutes the GXP® DREN product, produced in a single uninterrupted operation.

After bonding, the membrane is cut to the required widths and lengths and prepared for packaging. Minor production trims and off-specification material generated during conversion are collected and managed according to the manufacturer's internal waste management procedures.

Energy use in module A3 includes electricity consumed by the bonding, cutting and handling equipment. Electricity consumption is based on site-specific production data and is supplied from the public electricity grid.

Finished products are wound into rolls of defined width and length, labelled for traceability and subjected to routine quality control procedures. These include verification of product mass, dimensional tolerances and bonding quality between the membrane and the geotextile layer. The rolls are then wrapped with polyethylene stretch film, secured on wooden pallets and prepared for shipment.

TRANSPORT TO THE BUILDING SITE (A4)

Module A4 covers the transport of finished GXP® DREN membranes from the manufacturing facility to the building site.

Distribution of the products is modelled using a representative logistics mix reflecting the manufacturer’s typical sales structure in 2024. The transport model combines road transport by EURO 6 heavy-duty trucks and sea container shipping for export deliveries.

Transport distances are expressed as kg·km per declared unit (1 m² of product) and reflect the average transport distances derived from manufacturer logistics data. The model therefore represents typical European and international distribution conditions for the product.

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

Module C1. At the end of life, GXP® DREN membranes are removed during refurbishment or demolition of the structure using standard construction practices. Removal typically involves manual handling of the membrane layers without the need for specialized equipment or auxiliary materials.

Energy consumption and emissions associated with removal per declared unit (1 m² of product) are considered negligible and fall below the 1% cut-off threshold defined in EN 15804+A2. Therefore, they are reported as zero in this module.

Module C2. After dismantling, post-use membranes are transported to waste management facilities by heavy-duty lorries (>16 t, EURO 6). A representative transport distance of 50 km is assumed.

Module C3. Mechanical pre-treatment processes such as sorting and size reduction are modelled prior to routing the post-use material to downstream waste-treatment processes.

Based on typical waste-management practices for plastic construction materials, the following treatment shares are assumed:

- 25% material recycling
- 50% energy recovery (incineration with energy recovery)
- 25% landfill disposal

These assumptions are based on available data for construction and demolition plastic waste streams reported by the European Recycling Industries' Confederation (EuRIC).

Module C4. Final disposal of the remaining 25% of product mass in sanitary landfill is modelled, with associated emissions reported in this module.

Module D reports potential environmental benefits associated with energy recovered during end-of-life treatment.

Energy generated during incineration is assumed to substitute average European grid electricity and heat from natural gas. The corresponding avoided burdens are reported in this module.

No benefits are reported for the material fraction sent to recycling because the LCA applies the cut-off approach (net-scrap approach) in accordance with EN 15804+A2 Annex D. Under this approach, recycled materials entering the system do not receive recycling credits at end of life.

LIFE-CYCLE ASSESSMENT

LIFE-CYCLE ASSESSMENT INFORMATION

Period for data	2024 year

DECLARED UNIT

Declared unit	1 m^2
Mass per declared unit	between 700 g/m² and 1100 g/m² depending on product variant.

Scope: Life Cycle Assessment (LCA) results are reported for a declared unit of 1 m² of GXP® DREN membrane. The product is manufactured in several variants differing in the basis weight of the HDPE drainage core (600–1000 g/m²). As a result, the total product mass ranges from 700 g/m² and 1100 g/m² including the bonded geotextile layer.

Environmental impacts for the different product variants are calculated proportionally based on the material mass of the membrane and associated inputs.

BIOGENIC CARBON CONTENT

Product's biogenic carbon content at the factory gate

Biogenic carbon content in product, kg C	-
Biogenic carbon content in packaging, kg C	-

SYSTEM BOUNDARY

The scope of the EPD is "cradle to gate with options". The modules A1 (Raw material supply), A2 (Transport) and A3 (Manufacturing), A4 (Distribution), C1 (Deconstruction), C2 (Waste Transport), C3 (Waste Processing), C4 (Waste Disposal) and D (Avoided burdens) are included in the study.

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	X	MND	MNR	MNR	MNR	MNR	MNR	MNR	MNR	X	X	X	X	X
Raw materials	Transport	Manufacturing	Distribution	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 15804:2012+A2:2019. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes which data are available for are 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, and distribution.

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: A 100% mass balance approach was applied to all raw material inputs based on manufacturer data. The main component of the product is the GXP® Plus HDPE drainage membrane manufactured by Griltex and used as an intermediate product. Life cycle data for this component are derived from the existing Environmental Product Declaration for GXP® Plus membranes and incorporated as an upstream dataset in the model.

The composite membrane also includes a polypropylene (PP) geotextile filtration layer supplied by external manufacturers. Life cycle data for the geotextile layers are modelled using supplier-specific Environmental Product Declarations (EPDs) and incorporated as upstream datasets. Minor auxiliary materials are modelled using background datasets from ecoinvent 3.9.1 (cut-off). The study applies the cut-off / net-scrap approach, therefore no Module D credits are assigned for recycled content.

Module A2: Transport of externally supplied materials to the production facility is modelled using road freight by heavy-duty trucks (>16 t, EURO 6). Transport distances represent typical supply chain conditions based on manufacturer logistics data.

Module A3: Module A3 includes the conversion processes required to produce the GXP® DREN composite membrane. These processes mainly involve bonding the geotextile layer to the HDPE drainage membrane and subsequent cutting and packaging operations. Electricity consumption is based on site-specific production data and supplied from the public electricity grid. Internal production scrap generated during conversion is managed through internal recycling where technically feasible.

Module A4. Distribution of finished products is modelled using a representative logistics mix reflecting the manufacturer's typical sales structure. The transport model includes road freight by heavy-duty trucks and sea container shipping for export deliveries. Transport work is expressed as kg·km per declared unit (1 m² of product).

Module C3: Mechanical pre-treatment processes (sorting and size reduction) are assumed prior to routing post-use membranes to downstream waste-treatment processes. Based on available data for plastic construction waste streams reported by the European Recycling Industries' Confederation (EuRIC), the scenario assumes 25% material recycling, 50% energy recovery (incineration with energy recovery) and 25% landfill disposal.

Module C4: 25% of the product mass is assumed to be disposed of in sanitary landfill. Associated emissions from landfill disposal are modelled using appropriate background datasets representative for European waste management conditions.

Module D: Module D reports potential environmental benefits and loads beyond the system boundary associated with energy recovery at end of life. Energy generated during incineration is assumed to substitute average European grid electricity and heat from natural gas.

No benefits are reported for the material fraction sent to recycling because the LCA applies the cut-off (net-scrap) approach in accordance with EN 15804+A2 Annex D.

ALLOCATION

Allocation follows the requirements of EN 15804+A2. Foreground inputs and outputs for the year 2024 were inventoried for the full product portfolio and allocated to the declared unit (1 m² of membrane) on a mass basis, as the same production processes and resources are used for all product variants differing only in basis weight.

Internal production scrap generated during conversion processes remains within module A3 and is internally recycled where technically feasible. These flows are accounted for through process yields and therefore do not generate additional burdens or credits in other life cycle modules.

DATA QUALITY

For foreground data, the LCA study relies on high-quality primary data gathered by Griltex for the year 2024 (energy meters, materials procurement, transport distances, production volumes). Background data are taken from ecoinvent 3.9.1 (cut-off), accessed in openLCA; datasets are recent, documented, and consistent with EF 3.1 impact assessment.

Life cycle data for selected product components are derived from Environmental Product Declarations (EPDs) provided by upstream suppliers and incorporated as upstream datasets in the model.

Electricity in A3 reflects the Emission Factors for Electricity in Poland reported in December 2024 by KOBiZE - the National Centre for Emissions Management in Poland, while PV is counted with ~0 operational GWP.

GEOGRAPHIC REPRESENTATIVENESS

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

ENVIRONMENTAL IMPACT DATA: GXP® DREN membrane 700 g/m^2 [DU=1m^2]

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.	1,11E+00	2,12E-02	2,35E-01	9,70E-02	MND	0,00E+00	1,13E-02	1,13E+00	2,23E-02	-1,18E+00
GWP-fossil	kg CO2 eq.	1,10E+00	2,12E-02	2,34E-01	9,69E-02	MND	0,00E+00	1,13E-02	1,13E+00	2,23E-02	-1,18E+00
GWP-biogenic	kg CO2 eq.	2,47E-03	1,93E-05	1,28E-03	8,83E-05	MND	0,00E+00	1,04E-05	-1,30E-04	1,66E-05	-3,10E-03
GWP-luluc	kg CO2 eq.	7,26E-04	1,06E-05	6,86E-05	4,79E-05	MND	0,00E+00	5,59E-06	4,63E-05	1,59E-06	-2,60E-04
ODP	kg CFC-11 eq.	8,32E-09	4,60E-10	1,05E-09	2,11E-09	MND	0,00E+00	2,46E-10	8,98E-10	4,86E-11	-3,45E-08
AP	mol H+ eq.	4,39E-03	4,61E-05	1,65E-03	2,20E-04	MND	0,00E+00	2,47E-05	3,10E-04	1,50E-05	-3,80E-03
EP-freshwater	kg P eq.	4,60E-04	1,53E-06	2,80E-04	6,87E-06	MND	0,00E+00	8,04E-07	9,87E-06	2,80E-07	-5,60E-04
EP-marine	kg N eq.	9,55E-04	1,16E-05	2,40E-04	5,64E-05	MND	0,00E+00	6,24E-06	1,40E-04	8,38E-05	-6,60E-04
EP-terrestrial	mol N eq.	8,51E-03	1,20E-04	2,08E-03	5,80E-04	MND	0,00E+00	6,34E-05	1,26E-03	5,92E-05	-6,16E-03
POCP	kg NMVOC eq.	2,79E-03	7,13E-05	6,00E-04	3,40E-04	MND	0,00E+00	3,84E-05	3,90E-04	2,56E-05	-2,48E-03
ADPE (disc.2)	kg Sb eq.	1,51E-06	5,08E-08	7,08E-08	2,25E-07	MND	0,00E+00	2,63E-08	1,47E-07	2,46E-09	-4,70E-07
ADPF (disc.2)	MJ, (NCV)	1,94E+01	3,02E-01	2,63E+00	1,39E+00	MND	0,00E+00	1,62E-01	7,63E-01	4,53E-02	-1,61E+01
WDP (disc.2)	m3 World eq.	3,53E-01	1,52E-03	4,96E-02	6,87E-03	MND	0,00E+00	8,00E-04	4,40E-02	2,60E-04	-1,23E-01
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	2,60E-08	1,23E-09	2,73E-09	5,76E-09	MND	0,00E+00	6,74E-10	3,94E-09	3,15E-10	-8,71E-09
IRP (disc.1)	kBq U235 eq.	8,69E-02	4,20E-04	7,55E-03	1,86E-03	MND	0,00E+00	2,20E-04	2,53E-03	6,28E-05	-2,90E-02
ETP-fw (disc.2)	CTUe	2,85E+00	1,49E-01	6,85E-01	6,78E-01	MND	0,00E+00	7,93E-02	4,66E-01	3,36E-02	-1,86E+00
HTP-c (disc.2)	CTUh	5,93E-10	9,56E-12	7,24E-11	4,34E-11	MND	0,00E+00	5,07E-12	1,02E-10	1,22E-12	-2,69E-10
HTP-nc (disc.2)	CTUh	7,51E-09	1,85E-10	2,58E-09	8,47E-10	MND	0,00E+00	9,93E-11	2,11E-09	4,68E-11	-6,31E-09
SQP (disc.2)	Dimensionless	1,60E+01	1,77E-01	5,61E-01	8,29E-01	MND	0,00E+00	9,72E-02	5,09E-01	1,02E-01	-1,34E+00
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	4,87E-03	2,43E-01	2,16E-02	MND	0,00E+00	2,53E-03	3,52E-02	8,30E-04	-5,94E-01
PERM	MJ, (NCV)	3,70E-04	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ, (NCV)	4,02E+00	4,87E-03	2,43E-01	2,16E-02	MND	0,00E+00	2,53E-03	3,52E-02	8,30E-04	-5,94E-01
PENRE	MJ, (NCV)	1,99E+01	3,02E-01	2,63E+00	1,39E+00	MND	0,00E+00	1,62E-01	7,63E-01	4,53E-02	-1,61E+01
PENRM	MJ, (NCV)	4,51E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ, (NCV)	2,44E+01	3,02E-01	2,63E+00	1,39E+00	MND	0,00E+00	1,62E-01	7,63E-01	4,53E-02	-1,61E+01
SM	kg	5,87E-01	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ, (NCV)	1,10E-07	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ, (NCV)	1,02E-08	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	1,75E-02	5,03E-05	7,04E-03	2,30E-04	MND	0,00E+00	2,66E-05	8,20E-04	4,92E-05	-1,43E-02
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	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	1,75E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	3,50E-01	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	2,25E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	9,03E+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	2,36E-05	1,91E-06	1,58E-06	8,76E-06	MND	0,00E+00	1,02E-06	3,70E-06	2,22E-07	-4,95E-05
NHWD	kg	2,99E-03	8,73E-06	3,93E-05	3,90E-05	MND	0,00E+00	4,56E-06	1,20E-04	1,75E-01	-2,50E-04
RWD	kg	1,54E-04	1,03E-07	1,85E-06	4,51E-07	MND	0,00E+00	5,28E-08	6,38E-07	1,51E-08	-7,25E-06
Acronyms	HWD – Hazardous waste disposed; NHWD – Non-hazardous waste disposed; RWD – Radioactive waste disposed.										

ENVIRONMENTAL IMPACT DATA: GXP® DREN membrane 800 g/m^2 [DU=1m^2]

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.	1,21E+00	7,69E-03	2,34E-01	1,11E-01	MND	0,00E+00	1,30E-02	1,29E+00	2,55E-02	-1,35E+00
GWP-fossil	kg CO2 eq.	1,20E+00	7,68E-03	2,33E-01	1,11E-01	MND	0,00E+00	1,29E-02	1,29E+00	2,55E-02	-1,35E+00
GWP-biogenic	kg CO2 eq.	1,27E-02	6,97E-06	1,28E-03	1,00E-04	MND	0,00E+00	1,18E-05	-1,50E-04	1,89E-05	-3,55E-03
GWP-luluc	kg CO2 eq.	8,51E-04	3,96E-06	6,85E-05	5,47E-05	MND	0,00E+00	6,39E-06	5,29E-05	1,81E-06	-2,90E-04
ODP	kg CFC-11 eq.	1,81E-08	1,67E-10	1,05E-09	2,40E-09	MND	0,00E+00	2,82E-10	1,03E-09	5,56E-11	-3,94E-08
AP	mol H+ eq.	5,47E-03	1,67E-05	1,65E-03	2,60E-04	MND	0,00E+00	2,83E-05	3,60E-04	1,72E-05	-4,35E-03
EP-freshwater	kg P eq.	7,41E-04	5,70E-07	2,80E-04	7,84E-06	MND	0,00E+00	9,19E-07	1,13E-05	3,20E-07	-6,30E-04
EP-marine	kg N eq.	1,14E-03	4,13E-06	2,40E-04	6,44E-05	MND	0,00E+00	7,13E-06	1,60E-04	9,58E-05	-7,50E-04
EP-terrestrial	mol N eq.	9,81E-03	4,19E-05	2,08E-03	6,60E-04	MND	0,00E+00	7,25E-05	1,45E-03	6,77E-05	-7,04E-03
POCP	kg NMVOC eq.	3,31E-03	2,56E-05	6,00E-04	3,80E-04	MND	0,00E+00	4,39E-05	4,40E-04	2,92E-05	-2,84E-03
ADPE (disc.2)	kg Sb eq.	1,90E-06	1,95E-08	7,07E-08	2,56E-07	MND	0,00E+00	3,01E-08	1,68E-07	2,82E-09	-5,37E-07
ADPF (disc.2)	MJ, (NCV)	2,13E+01	1,10E-01	2,63E+00	1,58E+00	MND	0,00E+00	1,85E-01	8,72E-01	5,18E-02	-1,84E+01
WDP (disc.2)	m3 World eq.	3,33E-01	5,60E-04	4,96E-02	7,84E-03	MND	0,00E+00	9,20E-04	5,03E-02	2,90E-04	-1,40E-01
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	4,13E-08	4,28E-10	2,72E-09	6,57E-09	MND	0,00E+00	7,70E-10	4,51E-09	3,60E-10	-9,95E-09
IRP (disc.1)	kBq U235 eq.	1,72E-01	1,60E-04	7,55E-03	2,12E-03	MND	0,00E+00	2,50E-04	2,89E-03	7,18E-05	-3,31E-02
ETP-fw (disc.2)	CTUe	4,05E+00	5,45E-02	6,84E-01	7,74E-01	MND	0,00E+00	9,06E-02	5,32E-01	3,83E-02	-2,13E+00
HTP-c (disc.2)	CTUh	7,18E-10	3,53E-12	7,18E-11	4,95E-11	MND	0,00E+00	5,79E-12	1,17E-10	1,39E-12	-3,07E-10
HTP-nc (disc.2)	CTUh	9,66E-09	6,71E-11	2,57E-09	9,67E-10	MND	0,00E+00	1,13E-10	2,41E-09	5,35E-11	-7,21E-09
SQP (disc.2)	Dimensionless	1,92E+01	6,09E-02	5,61E-01	9,46E-01	MND	0,00E+00	1,11E-01	5,81E-01	1,16E-01	-1,53E+00
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)	3,97E+00	1,86E-03	2,43E-01	2,46E-02	MND	0,00E+00	2,89E-03	4,02E-02	9,50E-04	-6,79E-01
PERM	MJ, (NCV)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ, (NCV)	3,97E+00	1,86E-03	2,43E-01	2,46E-02	MND	0,00E+00	2,89E-03	4,02E-02	9,50E-04	-6,79E-01
PENRE	MJ, (NCV)	2,20E+01	1,10E-01	2,63E+00	1,58E+00	MND	0,00E+00	1,85E-01	8,72E-01	5,18E-02	-1,84E+01
PENRM	MJ, (NCV)	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ, (NCV)	2,20E+01	1,10E-01	2,63E+00	1,58E+00	MND	0,00E+00	1,85E-01	8,72E-01	5,18E-02	-1,84E+01
SM	kg	6,81E-01	0,00E+00	0,00E+00	0,00E+00	MND	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	0,00E+00	MND	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	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	1,57E-02	1,87E-05	7,04E-03	2,60E-04	MND	0,00E+00	3,04E-05	9,30E-04	5,62E-05	-1,63E-02
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	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	2,00E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	4,00E-01	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	2,58E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	1,03E+01	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	2,75E-05	6,93E-07	1,58E-06	1,00E-05	MND	0,00E+00	1,17E-06	4,23E-06	2,54E-07	-5,66E-05
NHWD	kg	1,94E-03	3,30E-06	3,92E-05	4,45E-05	MND	0,00E+00	5,21E-06	1,30E-04	2,00E-01	-2,80E-04
RWD	kg	2,58E-05	4,00E-08	1,85E-06	5,15E-07	MND	0,00E+00	6,04E-08	7,29E-07	1,73E-08	-8,28E-06
Acronyms	HWD – Hazardous waste disposed; NHWD – Non-hazardous waste disposed; RWD – Radioactive waste disposed.										

ENVIRONMENTAL IMPACT DATA: GXP® DREN membrane 900 g/m^2 [DU=1m^2]

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.	1,35E+00	2,14E-02	2,36E-01	1,25E-01	MND	0,00E+00	1,46E-02	1,45E+00	2,87E-02	-1,52E+00
GWP-fossil	kg CO2 eq.	1,34E+00	2,14E-02	2,35E-01	1,24E-01	MND	0,00E+00	1,46E-02	1,45E+00	2,87E-02	-1,52E+00
GWP-biogenic	kg CO2 eq.	2,97E-03	1,95E-05	1,28E-03	1,10E-04	MND	0,00E+00	1,33E-05	-1,70E-04	2,13E-05	-3,99E-03
GWP-luluc	kg CO2 eq.	9,56E-04	1,07E-05	6,86E-05	6,15E-05	MND	0,00E+00	7,18E-06	5,96E-05	2,04E-06	-3,30E-04
ODP	kg CFC-11 eq.	1,11E-08	4,65E-10	1,05E-09	2,70E-09	MND	0,00E+00	3,17E-10	1,15E-09	6,25E-11	-4,44E-08
AP	mol H+ eq.	5,53E-03	4,66E-05	1,65E-03	2,90E-04	MND	0,00E+00	3,18E-05	4,00E-04	1,93E-05	-4,89E-03
EP-freshwater	kg P eq.	6,10E-04	1,55E-06	2,80E-04	8,82E-06	MND	0,00E+00	1,03E-06	1,27E-05	3,59E-07	-7,10E-04
EP-marine	kg N eq.	1,21E-03	1,17E-05	2,40E-04	7,24E-05	MND	0,00E+00	8,02E-06	1,80E-04	1,10E-04	-8,50E-04
EP-terrestrial	mol N eq.	1,06E-02	1,20E-04	2,08E-03	7,40E-04	MND	0,00E+00	8,15E-05	1,63E-03	7,61E-05	-7,92E-03
POCP	kg NMVOC eq.	3,52E-03	7,20E-05	6,00E-04	4,30E-04	MND	0,00E+00	4,94E-05	5,00E-04	3,29E-05	-3,19E-03
ADPE (disc.2)	kg Sb eq.	2,00E-06	5,15E-08	7,08E-08	2,88E-07	MND	0,00E+00	3,38E-08	1,89E-07	3,17E-09	-6,04E-07
ADPF (disc.2)	MJ, (NCV)	2,26E+01	3,06E-01	2,63E+00	1,78E+00	MND	0,00E+00	2,08E-01	9,81E-01	5,83E-02	-2,07E+01
WDP (disc.2)	m3 World eq.	4,18E-01	1,54E-03	4,96E-02	8,81E-03	MND	0,00E+00	1,03E-03	5,65E-02	3,30E-04	-1,58E-01
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	3,47E-08	1,24E-09	2,74E-09	7,39E-09	MND	0,00E+00	8,67E-10	5,07E-09	4,05E-10	-1,12E-08
IRP (disc.1)	kBq U235 eq.	1,16E-01	4,30E-04	7,56E-03	2,38E-03	MND	0,00E+00	2,80E-04	3,25E-03	8,08E-05	-3,72E-02
ETP-fw (disc.2)	CTUe	3,80E+00	1,51E-01	6,86E-01	8,70E-01	MND	0,00E+00	1,02E-01	5,99E-01	4,31E-02	-2,39E+00
HTP-c (disc.2)	CTUh	7,92E-10	9,67E-12	7,30E-11	5,57E-11	MND	0,00E+00	6,51E-12	1,31E-10	1,57E-12	-3,46E-10
HTP-nc (disc.2)	CTUh	1,00E-08	1,87E-10	2,58E-09	1,09E-09	MND	0,00E+00	1,28E-10	2,71E-09	6,01E-11	-8,11E-09
SQP (disc.2)	Dimensionless	2,14E+01	1,78E-01	5,62E-01	1,06E+00	MND	0,00E+00	1,25E-01	6,54E-01	1,31E-01	-1,72E+00
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)	5,11E+00	4,94E-03	2,43E-01	2,77E-02	MND	0,00E+00	3,25E-03	4,52E-02	1,07E-03	-7,64E-01
PERM	MJ, (NCV)	3,70E-04	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ, (NCV)	5,11E+00	4,94E-03	2,43E-01	2,77E-02	MND	0,00E+00	3,25E-03	4,52E-02	1,07E-03	-7,64E-01
PENRE	MJ, (NCV)	2,30E+01	3,06E-01	2,63E+00	1,78E+00	MND	0,00E+00	2,08E-01	9,81E-01	5,83E-02	-2,07E+01
PENRM	MJ, (NCV)	4,51E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ, (NCV)	2,75E+01	3,06E-01	2,63E+00	1,78E+00	MND	0,00E+00	2,08E-01	9,81E-01	5,83E-02	-2,07E+01
SM	kg	7,83E-01	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ, (NCV)	1,10E-07	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ, (NCV)	1,02E-08	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,19E-02	5,09E-05	7,04E-03	2,90E-04	MND	0,00E+00	3,42E-05	1,05E-03	6,32E-05	-1,84E-02
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	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	2,25E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	4,50E-01	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	2,90E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	1,16E+01	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	3,14E-05	1,93E-06	1,58E-06	1,12E-05	MND	0,00E+00	1,32E-06	4,76E-06	2,86E-07	-6,37E-05
NHWD	kg	3,54E-03	8,84E-06	3,93E-05	5,00E-05	MND	0,00E+00	5,86E-06	1,50E-04	2,25E-01	-3,20E-04
RWD	kg	1,61E-04	1,04E-07	1,85E-06	5,79E-07	MND	0,00E+00	6,79E-08	8,20E-07	1,94E-08	-9,32E-06
Acronyms	HWD – Hazardous waste disposed; NHWD – Non-hazardous waste disposed; RWD – Radioactive waste disposed.										

ENVIRONMENTAL IMPACT DATA: GXP® DREN membrane 1000 g/m^2 [DU=1m^2]

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.	1,46E+00	2,19E-02	2,36E-01	1,38E-01	MND	0,00E+00	1,62E-02	1,61E+00	3,19E-02	-1,69E+00
GWP-fossil	kg CO2 eq.	1,46E+00	2,19E-02	2,35E-01	1,38E-01	MND	0,00E+00	1,62E-02	1,61E+00	3,19E-02	-1,69E+00
GWP-biogenic	kg CO2 eq.	3,21E-03	1,99E-05	1,28E-03	1,30E-04	MND	0,00E+00	1,48E-05	-1,90E-04	2,36E-05	-4,43E-03
GWP-luluc	kg CO2 eq.	1,07E-03	1,10E-05	6,86E-05	6,84E-05	MND	0,00E+00	7,98E-06	6,62E-05	2,27E-06	-3,60E-04
ODP	kg CFC-11 eq.	1,25E-08	4,76E-10	1,05E-09	3,01E-09	MND	0,00E+00	3,52E-10	1,28E-09	6,95E-11	-4,93E-08
AP	mol H+ eq.	6,10E-03	4,76E-05	1,65E-03	3,20E-04	MND	0,00E+00	3,53E-05	4,50E-04	2,15E-05	-5,43E-03
EP-freshwater	kg P eq.	6,90E-04	1,59E-06	2,80E-04	9,80E-06	MND	0,00E+00	1,15E-06	1,41E-05	3,99E-07	-7,90E-04
EP-marine	kg N eq.	1,33E-03	1,19E-05	2,40E-04	8,04E-05	MND	0,00E+00	8,92E-06	2,00E-04	1,20E-04	-9,40E-04
EP-terrestrial	mol N eq.	1,16E-02	1,20E-04	2,08E-03	8,20E-04	MND	0,00E+00	9,06E-05	1,81E-03	8,46E-05	-8,80E-03
POCP	kg NMVOC eq.	3,88E-03	7,36E-05	6,00E-04	4,80E-04	MND	0,00E+00	5,49E-05	5,50E-04	3,65E-05	-3,55E-03
ADPE (disc.2)	kg Sb eq.	2,24E-06	5,31E-08	7,08E-08	3,20E-07	MND	0,00E+00	3,76E-08	2,10E-07	3,52E-09	-6,71E-07
ADPF (disc.2)	MJ, (NCV)	2,41E+01	3,13E-01	2,63E+00	1,98E+00	MND	0,00E+00	2,31E-01	1,09E+00	6,48E-02	-2,30E+01
WDP (disc.2)	m3 World eq.	4,50E-01	1,58E-03	4,96E-02	9,80E-03	MND	0,00E+00	1,15E-03	6,28E-02	3,70E-04	-1,75E-01
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	3,90E-08	1,26E-09	2,74E-09	8,22E-09	MND	0,00E+00	9,63E-10	5,63E-09	4,49E-10	-1,24E-08
IRP (disc.1)	kBq U235 eq.	1,30E-01	4,40E-04	7,56E-03	2,65E-03	MND	0,00E+00	3,10E-04	3,61E-03	8,98E-05	-4,14E-02
ETP-fw (disc.2)	CTUe	4,27E+00	1,54E-01	6,86E-01	9,68E-01	MND	0,00E+00	1,13E-01	6,65E-01	4,79E-02	-2,66E+00
HTP-c (disc.2)	CTUh	8,90E-10	9,92E-12	7,30E-11	6,19E-11	MND	0,00E+00	7,24E-12	1,46E-10	1,74E-12	-3,84E-10
HTP-nc (disc.2)	CTUh	1,13E-08	1,91E-10	2,58E-09	1,21E-09	MND	0,00E+00	1,42E-10	3,01E-09	6,68E-11	-9,02E-09
SQP (disc.2)	Dimensionless	2,41E+01	1,81E-01	5,62E-01	1,18E+00	MND	0,00E+00	1,39E-01	7,27E-01	1,45E-01	-1,92E+00
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)	5,65E+00	5,09E-03	2,43E-01	3,08E-02	MND	0,00E+00	3,61E-03	5,02E-02	1,19E-03	-8,49E-01
PERM	MJ, (NCV)	3,70E-04	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ, (NCV)	5,65E+00	5,09E-03	2,43E-01	3,08E-02	MND	0,00E+00	3,61E-03	5,02E-02	1,19E-03	-8,49E-01
PENRE	MJ, (NCV)	2,46E+01	3,13E-01	2,63E+00	1,98E+00	MND	0,00E+00	2,31E-01	1,09E+00	6,48E-02	-2,30E+01
PENRM	MJ, (NCV)	4,51E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ, (NCV)	2,91E+01	3,13E-01	2,63E+00	1,98E+00	MND	0,00E+00	2,31E-01	1,09E+00	6,48E-02	-2,30E+01
SM	kg	8,80E-01	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ, (NCV)	1,10E-07	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ, (NCV)	1,02E-08	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,41E-02	5,23E-05	7,04E-03	3,20E-04	MND	0,00E+00	3,80E-05	1,17E-03	7,02E-05	-2,04E-02
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	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	2,50E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	5,00E-01	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	3,22E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	1,29E+01	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	3,54E-05	1,98E-06	1,58E-06	1,25E-05	MND	0,00E+00	1,46E-06	5,29E-06	3,18E-07	-7,07E-05
NHWD	kg	3,82E-03	9,10E-06	3,93E-05	5,56E-05	MND	0,00E+00	6,51E-06	1,70E-04	2,50E-01	-3,50E-04
RWD	kg	1,65E-04	1,08E-07	1,85E-06	6,44E-07	MND	0,00E+00	7,55E-08	9,11E-07	2,16E-08	-1,04E-05
Acronyms	HWD – Hazardous waste disposed; NHWD – Non-hazardous waste disposed; RWD – Radioactive waste disposed.										

ENVIRONMENTAL IMPACT DATA: GXP® DREN membrane 1100 g/m^2 [DU=1m^2]

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.	1,58E+00	2,28E-02	2,36E-01	1,52E-01	MND	0,00E+00	1,78E-02	1,77E+00	3,51E-02	-1,86E+00
GWP-fossil	kg CO2 eq.	1,58E+00	2,27E-02	2,35E-01	1,52E-01	MND	0,00E+00	1,78E-02	1,77E+00	3,51E-02	-1,85E+00
GWP-biogenic	kg CO2 eq.	3,46E-03	2,07E-05	1,28E-03	1,40E-04	MND	0,00E+00	1,63E-05	-2,10E-04	2,60E-05	-4,88E-03
GWP-luluc	kg CO2 eq.	1,18E-03	1,15E-05	6,86E-05	7,53E-05	MND	0,00E+00	8,78E-06	7,28E-05	2,49E-06	-4,00E-04
ODP	kg CFC-11 eq.	1,39E-08	4,95E-10	1,05E-09	3,31E-09	MND	0,00E+00	3,87E-10	1,41E-09	7,64E-11	-5,42E-08
AP	mol H+ eq.	6,67E-03	4,95E-05	1,65E-03	3,50E-04	MND	0,00E+00	3,89E-05	4,90E-04	2,36E-05	-5,98E-03
EP-freshwater	kg P eq.	7,70E-04	1,66E-06	2,80E-04	1,08E-05	MND	0,00E+00	1,26E-06	1,55E-05	4,39E-07	-8,70E-04
EP-marine	kg N eq.	1,45E-03	1,23E-05	2,40E-04	8,85E-05	MND	0,00E+00	9,81E-06	2,20E-04	1,30E-04	-1,04E-03
EP-terrestrial	mol N eq.	1,26E-02	1,30E-04	2,08E-03	9,00E-04	MND	0,00E+00	9,97E-05	1,99E-03	9,31E-05	-9,68E-03
POCP	kg NMVOC eq.	4,24E-03	7,63E-05	6,00E-04	5,30E-04	MND	0,00E+00	6,03E-05	6,10E-04	4,02E-05	-3,90E-03
ADPE (disc.2)	kg Sb eq.	2,49E-06	5,59E-08	7,08E-08	3,53E-07	MND	0,00E+00	4,13E-08	2,31E-07	3,87E-09	-7,38E-07
ADPF (disc.2)	MJ, (NCV)	2,58E+01	3,25E-01	2,63E+00	2,18E+00	MND	0,00E+00	2,54E-01	1,20E+00	7,12E-02	-2,53E+01
WDP (disc.2)	m3 World eq.	4,84E-01	1,65E-03	4,96E-02	1,08E-02	MND	0,00E+00	1,26E-03	6,91E-02	4,10E-04	-1,93E-01
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	4,34E-08	1,30E-09	2,74E-09	9,04E-09	MND	0,00E+00	1,06E-09	6,19E-09	4,94E-10	-1,37E-08
IRP (disc.1)	kBq U235 eq.	1,45E-01	4,70E-04	7,56E-03	2,92E-03	MND	0,00E+00	3,40E-04	3,97E-03	9,87E-05	-4,55E-02
ETP-fw (disc.2)	CTUe	4,74E+00	1,61E-01	6,86E-01	1,07E+00	MND	0,00E+00	1,25E-01	7,32E-01	5,27E-02	-2,93E+00
HTP-c (disc.2)	CTUh	9,89E-10	1,03E-11	7,30E-11	6,81E-11	MND	0,00E+00	7,96E-12	1,61E-10	1,91E-12	-4,22E-10
HTP-nc (disc.2)	CTUh	1,25E-08	1,99E-10	2,58E-09	1,33E-09	MND	0,00E+00	1,56E-10	3,31E-09	7,35E-11	-9,92E-09
SQP (disc.2)	Dimensionless	2,67E+01	1,86E-01	5,62E-01	1,30E+00	MND	0,00E+00	1,53E-01	7,99E-01	1,60E-01	-2,11E+00
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)	6,19E+00	5,35E-03	2,43E-01	3,39E-02	MND	0,00E+00	3,97E-03	5,53E-02	1,31E-03	-9,34E-01
PERM	MJ, (NCV)	3,70E-04	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ, (NCV)	6,19E+00	5,35E-03	2,43E-01	3,39E-02	MND	0,00E+00	3,97E-03	5,53E-02	1,31E-03	-9,34E-01
PENRE	MJ, (NCV)	2,62E+01	3,25E-01	2,63E+00	2,18E+00	MND	0,00E+00	2,54E-01	1,20E+00	7,12E-02	-2,53E+01
PENRM	MJ, (NCV)	4,51E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PENRT	MJ, (NCV)	3,07E+01	3,25E-01	2,63E+00	2,18E+00	MND	0,00E+00	2,54E-01	1,20E+00	7,12E-02	-2,53E+01
SM	kg	9,77E-01	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ, (NCV)	1,10E-07	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ, (NCV)	1,02E-08	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m3	2,65E-02	5,46E-05	7,04E-03	3,60E-04	MND	0,00E+00	4,18E-05	1,28E-03	7,73E-05	-2,25E-02
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	0,00E+00	MND	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MFR	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	2,75E-01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	5,50E-01	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	3,54E+00	0,00E+00	0,00E+00
EET	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	MND	0,00E+00	0,00E+00	1,42E+01	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	3,93E-05	2,05E-06	1,58E-06	1,38E-05	MND	0,00E+00	1,61E-06	5,81E-06	3,49E-07	-7,78E-05
NHWD	kg	4,10E-03	9,54E-06	3,93E-05	6,12E-05	MND	0,00E+00	7,16E-06	1,80E-04	2,75E-01	-3,90E-04
RWD	kg	1,69E-04	1,14E-07	1,85E-06	7,08E-07	MND	0,00E+00	8,30E-08	1,00E-06	2,38E-08	-1,14E-05
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	Emission Factors for Electricity in Poland reported in December 2024 by KOBiZE - the National Centre for Emissions Management in Poland.
Electricity CO2e / kWh	0,701 kg CO2e / kWh

BIBLIOGRAPHY

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EN 15804:2012+A2:2019 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

EN 15978:2011 Sustainability of construction works – Assessment of environmental performance of buildings – Calculation method.

ecoinvent Association (2022). ecoinvent database v3.9.1, system model: Allocation, cut-off by classification. Zürich, Switzerland.

KOBiZE (2024). Wskaźniki emisyjności CO2, SO2, NOx, CO i pyłu całkowitego dla energii elektrycznej. National Centre for Emissions Management (KOBiZE), Warsaw, Poland.

EuRIC AISBL (European Recycling Industries' Confederation), 2020. Plastic Recycling Factsheet.

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	Anna Puchyła-Rau Vice President of the Board
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Note: The sole ownership, liability, and liability of this declaration are with the owner. Construction product declarations may not be comparable if they do not comply with EN 15804. For detailed information on comparability, please refer to EN 15804 and ISO 14025.

EPD Polska Certificate

CERTIFICATE

TYPE III EPD DECLARATION

(ENVIRONMENTAL PRODUCT DECLARATION)

Reg. No. EPD-P 10.12.2025

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

Composite drainage membrane GXP® DREN

manufactured in accordance with standard **EN 13252:2017**, 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 December 31, 2025 and is valid until December 31, 2030, 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

Grzegorz Suwara
CEO Multicert Sp. z o.o.

Warsaw, December 31, 2025