ENVIRONMENTAL PRODUCT DECLARATION

Rubin Bituminous Waterproofing Membrane

In accordance with: ISO 14025:2006, EN 15804:2012+A2:2019/AC:2021

Products included in the EPD:
Rubin Bituminous Waterproofing Membrane

An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com

EPD of multiple products based on a representative product

EPD Owner

ODE Yalıtım Sanayi ve Ticaret A.Ş.

Programme

International EPD System
www.environdec.com

Programme operator

EPD International AB

Licensee

EPD Türkiye

Registration number

EPD-IES-0032755:001

Version date

2026-06-29

Validity date

2031-06-28

TÜRKİYE EPD INTERNATIONAL EPD SYSTEM

ECO PLATFORM EPD VERIFIED

ODE INSULATES THE FUTURE

GENERAL INFORMATION

Programme information

Programme	International EPD System
Address	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website	www.environdec.com
E-mail	support@environdec.com

Product category rules

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)	
Product Category Rules (PCR)	2019:14 Construction products (EN 15804+A2) (version 2.0.1) 2.0.1
PCR review was conducted by	The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review chair: Rob Rouwette (chair), Noa Meron (co-chair). The review panel may be contacted via the Secretariat www.environdec.com/support.
Complementary Product Category Rules (c-PCR)	c-PCR-032 Flexible Sheets for Waterproofing (EN 17388:2024) (c- PCR to PCR 2019:14) (1.0.0)
c-PCR review was conducted by	The Technical Committee of the International EPD System

Verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via	☑ EPD verification through an individual EPD verification ☐ EPD verification through EPD Process Certification* ☐ EPD verification through a fully pre-verified tool
Third-party verifier	Vijay Thakur (VIJAY THAKUR)
Approved by	International EPD System
Procedure for follow-up of data during EPD validity involves third party verifier	☐ Yes ☑ No

*EPD Process Certification involves an accredited certification body certifying and periodically auditing the EPD process and conducting external and independent verification of EPDs that are regularly published. More information can be found in the General Programme Instructions on www.environdec.com.

Ownership and limitations on use of EPD

Limitations

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison.

Ownership

The EPD Owner has the sole ownership, liability, and responsibility for the EPD.

INFORMATION ABOUT EPD OWNER

EPD Owner	ODE Yalıtım Sanayi ve Ticaret A.Ş.
Contact person name	Emine DAHILOGLU OYSAL
Contact person e-mail	odekalite@ode.com.tr
Organisation address	Piyale Paşa Bulvarı Ortadoğu İş Merkezi K.12 Okmeydanı Şişli, İstanbul 34384 İstanbul Turkey
LCA Practitioner	Yildiray Yilmaz, yildiray.yilmaz@metsims.com

Description of the organisation of the EPD Owner

ODE embarked on its business journey in 1985 with contracting operations. In 1998, ODE decided to move forward in the insulation industry, one that would serve Turkey's need. Having become an importer in 1990 and a manufacturer in 1996, ODE now manufactures products in 2 main categories, Building and HVAC insulation. ODE is now among the largest manufacturers of the insulation industry with 8 state of-the-art manufacturing facilities, over 4 thousand product varieties, and expert workforce. We manufacture extruded polystyrene thermal insulating material under the brand of ODE Isıpan; polymer modified bituminous waterproofing blankets under the brand of ODE Membrane, glass wool products used for heat and sound insulation and fire safety under the brand of ODE Starflex; and elastomeric rubber foam insulating material under the brand of ODE R-Flex.

ODE Insulation manufactures XPS thermal insulation boards, polymer-modified bituminous waterproofing membranes, glass wool-based thermal and acoustic insulation solutions, and elastomeric rubber foam-based plumbing insulation materials. The products are developed to meet requirements for low thermal conductivity, water resistance, acoustic performance and fire safety. ODE Isıpan XPS products stand out for their high compressive strength and low water absorption, whilst the ODE Membrane and Epikon series of waterproofing solutions offer long-lasting performance. The Epikon series maintains its integrity at temperatures as low as -30°C thanks to its flexible structure. ODE Starflex glass wool products provide thermal and acoustic insulation as well as fire safety; ODE R-Flex products, meanwhile, offer condensation control and energy efficiency, particularly in HVAC and plumbing applications. As its Eskişehir Manufacturing Facility comes into play, ODE which currently exports to 8 continents aims to increase its export capacity even further, and become the leader in waterproofing in Turkey.

ODE reflects its social responsibility awareness to all its operations, and is the first company in the insulation industry of Turkey to publish a "Corporate Social Responsibility Report". Furthermore, ODE has been the first among its peers to earn the internationally recognized Environmental Product Declaration (EPD) certificate which is compatible with European standards and which applies for all markets to all heat and water insulation products manufactured by ODE in its facilities in Çorlu. Having implemented pioneering efforts toward raising public awareness of insulation and energy awareness, and taking care to be involved in projects that will hand down permanent value to the future, ODE changed its company motto to "Insulates the Future" in 2014. ODE Insulation continues to contribute to the national economy. With a vision of becoming a global brand, ODE Insulation operates with a team of talented individuals who are preparing for the future, constantly developing their skills, open to innovation, and committed to environmental and social responsibility.

PRODUCT INFORMATION

Product name	Rubin Bituminous Waterproofing Membrane
Product identification	ODE bituminous waterproofing membrane products are flexible waterproofing materials manufactured by combining bitumen with polymer modifiers and reinforcing carriers to form durable sheet membranes. The bitumen compound provides waterproofing performance, while the reinforcement contributes to mechanical strength and dimensional stability. Membrane insulation products are supplied in roll form and may be manufactured with different thicknesses, surface finishes, and reinforcement types, depending on the intended application requirements.
Product description	Bituminous waterproofing membrane products are designed to provide a continuous and durable waterproofing layer in building applications by limiting the penetration of liquid water and moisture into structural components. The membranes act as an effective barrier against water ingress while maintaining mechanical integrity under service conditions, thereby contributing to the durability and protection of building elements exposed to moisture. Bituminous waterproofing membrane products are manufactured in accordance with relevant European standards, including EN 13707 for bitumen sheets used for roof waterproofing, EN 13969 for flexible sheets used as damp proof membranes, and EN 14965 for plastic and rubber sheets used as damp proof membranes. These standards define requirements related to watertightness, tensile strength, elongation, resistance to tearing, dimensional stability, flexibility at low temperatures, and resistance to elevated temperatures, ensuring reliable performance under varying climatic and environmental conditions. The products are suitable for use in applications such as roofs, foundations, terraces, and other building elements where exposure to water and moisture occurs. Depending on the application requirements, bituminous waterproofing membrane products are available with different thicknesses, reinforcement types, and surface finishes to provide adequate mechanical performance, resistance to cracking at low temperatures, dimensional stability at high temperatures, and long term durability under normal conditions of use.
Product information from external sources	www.ode.com.tr
Technical purpose of product	The product is a reinforced flexible waterproofing sheet designed to protect building and infrastructure structures against water penetration. It is used as a durable waterproofing layer in roofs, foundations, terraces, bridges, viaducts, roads, and other structures, providing watertightness, mechanical resistance, and long-term protection against environmental exposure.
Manufacturing or service provision description	Bitumen is transferred from the bitumen silo to the intermediate tank according to the product recipe and heated to the required processing temperature. The heated bitumen is then fed into vertical mixers, where polymers such as APP, SBS, and IPP are added in accordance with the formulation. After polymer addition, flux is introduced into the vertical mixers, and the mixture is melted and homogenized. Once the vertical mixing stage is completed, the compound is transferred to horizontal mixers, where the filler material (calcite) is added, and final homogenization is completed. A quality control sample is taken, and the batch proceeds only after approval. The approved compound is then directed to the coating tank, where surface coating is applied using the appropriate reinforcement felt/carrier depending on the product type. Before entering the cooling section, HDPE film is applied to the surface of the membrane. This step ensures proper bonding and surface protection during the cooling process. After HDPE film application, the material passes through cooling pools. At the exit, the material passes through the fan group where surface finishing is completed. At the winding station, roll length is adjusted, and the rolls are wound to the required weight and thickness. The finished rolls are palletized, and the quality control department takes final samples for

	verification. After packaging, the pallets are transferred to the internal storage area. The same production process applies to all listed membrane products manufactured in both factories.
Material properties	Area density: 3.61 kg/m^2 Thickness: 0.003 m
Manufacturing site	ODE Yalıtım Sanayi ve Ticaret A.Ş. Çorlu factory Velimeşe OSB Mah. 207. Sok. No:6/1 Ergene / Tekirdağ / Türkiye 59860 Tekirdağ Turkey
UN CPC code	37940. Bituminous mixtures based on natural and artificial stone materials and bitumen, natural asphalt or related substances as a binder
Geographical scope(s)	Republic of Türkiye
Geographical scope description	Production takes place in Türkiye, while the remaining life cycle stages are considered representative of European conditions.
Actual or technical lifespan	25 year(s)

PRODUCT IMAGES

TECHNICAL CHARACTERISTICS AND PERFORMANCE

Technical performance

Product name	Thickness (mm)	Flexibility at Low Temperature °C	Type category	Type category	Type category	Type category	Type category	Type category	Type category	Type category	Type category
Rubin Membrane	1.25 - 5.2	-15 -20									

CONTENT DECLARATION

Content declaration of multiple products	The content declaration below represents the composition of 1 m² of Rubin bituminous waterproofing membrane with a thickness of 3 mm and a mass of 3.61 kg/m².
Hazardous and toxic substances	The product does not contain any substances from the SVHC candidate list in concentrations exceeding 0.1% of its weight.

PRODUCT CONTENT

Content name	Mass, kg	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material[1], kg C/declared unit
Mineral filler	1.84	0	0	0
Bitumen	1.25	0	0	0
Polymeric modifiers & additives	0.38	0	0	0
Reinforcement carrier	0.12	0	0	0
Surface films	0.02	0	0	0
Total	**3.61**	**0**	**0**	**0**
Note 1	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2			

PACKAGING MATERIALS

Material name	Mass, kg	Mass-% (versus the product)	Biogenic material[1], kg C/declared unit
Euro Pallet	0.06	1.66	0.024
Cardboard	0.002	0.06	0.00078
Plastic packaging	0.006	0.17	0
Total	**0.068**	**1.89**	**0.02478**
Note 1	1 kg biogenic carbon is equivalent to 44/12 kg of CO_2		

LCA INFORMATION

EPD based on declared or functional unit	Declared unit
Declared unit and reference flow	1 m2 of Rubin Bituminous Wateproofing Membrane Area: 1 m^2
Conversion factor to mass	0.28
Are infrastructure or capital goods included in any upstream, core or downstream processes?	☐ Yes ☑ No
Data sources used for this EPD	ecoinvent database (general) ecoinvent 3.11 database
LCA Software	SimaPro 10.2
Version of the EN 15804 reference package	EF Reference Package 3.1
Characterisation methods	EN 15804 EF 3.1
Technology description including background system	The products considered are bituminous waterproofing membranes intended for roofing and building waterproofing applications. The products consist mainly of bitumen, mineral fillers, polymer modifiers and reinforcement carrier materials, together with surface films and other performance-enhancing additives. Depending on the product type, the membranes may contain SBS and/or APP modified bitumen compounds to improve flexibility, durability and waterproofing performance.
Scrap (recycled material) inputs contribution level	Less than 10% of the GWP-GHG results in modules A1-A3 come from scrap inputs

Data quality assessment

Description of data quality assessment and reference years	Life Cycle Assessment (LCA) for this Environmental Product Declaration (EPD) is based on both primary and secondary data. Primary data were collected directly from the manufacturer's production processes and site-specific operations for the reference year 2025. The quality and representativeness of all data used for the EPD have been evaluated in terms of time, geography, and technology according to the principles outlined in EN 15804:2012+A2:2019, Annex E, and the data quality requirements specified in EN 15941:2010 for life cycle data. All relevant datasets were reviewed for completeness, consistency, and reliability, and the assessment confirmed that no data were classified as "poor" or "very poor" in quality.

DATA QUALITY ASSESSMENT

Process name	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Thermal energy used in manufacturing	Calculated Data	EPD Owner	2025	Primary	4.2%
Electricity used in manufacturing	Calculated Data	EPD Owner	2025	Primary	5%
Upstream Transport	Calculated Data	EPD Owner	2025	Primary	1.6%
Others	Database	ecoinvent 3.11	2015 - 2025	Secondary	0%
Total share of primary data, of GWP-GHG results for A1-A3					**10.8%**
Note	The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.				

Comment on the data sources and other information in the table	The total share of primary data contributing to the declared GWP-GHG results of modules A1-A3 is provided in the table above. The share for modules A1-A3 is 10.8% of the total A1-A3; primary data, specific from the EPD owner, and secondary data (e.g. based on assumptions or other sources) contribution to the A1-A3 can be found above.

ELECTRICITY USED IN THE MANUFACTURING PROCESS IN A3 (A5 FOR SERVICES)

Type of electricity mix	Residual electricity mix on the market	
Energy sources	Hydro	0%
	Wind	0%
	Solar	0%
	Biomass	0%

	Geothermal	0%
	Waste	0%
	Nuclear	0%
	Natural gas	35%
	Coal	65%
	Oil	0%
	Peat	0%
	Other	0%
Climate impact (GWP-GHG):	0.89 kg CO_2 eq./kWh	

Method used to calculate residual electricity mix	The market data for Türkiye is modified to exclude all the renewable sources as there is no 'secondary data' on the residual market mix for Türkiye.

SYSTEM BOUNDARY

Description of the System boundary	b) Cradle to gate with options, modules C1-C4, module D and with optional modules (A1-A3 + C + D and additional modules).
Excluded modules	Yes, there is an excluded module, or there are excluded modules
Justification for omission of modules	The use stage modules (B1–B7) are excluded from the scope of this study because the assessed product does not require energy, water, maintenance, repair, replacement, refurbishment, or operational inputs during its service life. Furthermore, no significant environmental exchanges occur during the use phase that would materially influence the overall life cycle impacts. Therefore, the inclusion of use stage modules is not considered relevant for the intended application of the product.

	Product stage			Construction process stage		Use stage							End of life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport to site	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	Global	Global	Global	Global	Global	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Global	Global	Global	Global	Global
Share of specific data	10.8%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	81%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	0%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Disclaimer	The share of specific/primary data and both variations (products and sites) refer to GWP-GHG results only.																

Process flow diagram(s) related images

DEFAULT SCENARIO

Name of the default scenario	None
Description of the default scenario	None

Module A4: Transport to the building site

Explanatory name of the default scenario in module A4	None
Description of the default scenario in module A4	Impacts at this stage are considered based on real shipment distances.

Module A4 information	Value	Unit
Capacity utilization (including empty returns)	50	%
Volume capacity utilization factor (factor: =1 or <1 or ≥1 for compressed or nested packaged products)	1	N/A

Module A5: Installation in the building

Explanatory name of the default scenario in module A5	None
Description of the default scenario in module A5	The installation scenario includes additional membrane consumption due to overlaps; treatment of packaging waste generated during installation; and propane/LPG consumption for torch-applied membranes. In accordance with EN 17388, an overlap factor of 1.09 is applied, corresponding to an additional membrane consumption of 9% during installation. Installation waste arising from overlaps, off-cuts, and packaging materials is assumed to be disposed of via landfill.

Module A5 information	Value	Unit
Propane/LPG consumption	0.15	kg
Packaging waste	0.068	kg
Overlapping factor	1.09	N/A

Module C: End-of-life

Explanatory name of the default scenario in module C	100% landfill
Description of the default scenario in module C	At end-of-life, membrane products are primarily disposed of via landfill due to current technical and economic limitations in recycling/incineration. Therefore, conservative distribution is assumed with 100% landfill of the product. The environmental impact values in the reference table are provided on a basis of 1,000 kg of product. Since the final product mass in this study is significantly lower, all impact calculations were proportionally adjusted according to the actual final mass of the product.

Module C information	Value	Unit
C1, Demolition/deconstruction of steel, wood, and other materials	1.1	kWh
C2, Transport (for products/materials not to be incinerated)	80	km
C4, Compacting inert construction waste for landfills	1.6	kWh

Module D: Beyond product life cycle

Explanatory name of the default scenario in module D	None
Description of the default scenario in module D	As 100% of the product at EOL is conservatively considered disposed, no benefit nor load is associated in module D.

ENVIRONMENTAL PERFORMANCE

The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

Mandatory environmental performance indicators according to EN 15804

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - total	GWP-total	kg CO_2 eq.	2.42E+0	2.17E-1	9.59E-1	ND	ND	ND	ND	ND	ND	ND	1.35E-3	8.86E-2	0.00E+0	4.28E-1	0.00E+0
Climate change - fossil	GWP-fossil	kg CO_2 eq.	2.50E+0	2.17E-1	8.69E-1	ND	ND	ND	ND	ND	ND	ND	1.35E-3	8.86E-2	0.00E+0	4.28E-1	0.00E+0
Climate change - biogenic	GWP-biogenic	kg CO_2 eq.	-8.49E-2	7.93E-6	9.01E-2	ND	ND	ND	ND	ND	ND	ND	6.78E-8	3.07E-6	0.00E+0	7.82E-6	0.00E+0
Climate change - land use and land-use change	GWP-luluc	kg CO_2 eq.	1.45E-3	3.94E-6	2.59E-4	ND	ND	ND	ND	ND	ND	ND	5.57E-8	1.40E-6	0.00E+0	2.37E-5	0.00E+0
Ozone depletion	ODP	kg CFC-11 eq.	2.00E-6	4.91E-9	1.91E-7	ND	ND	ND	ND	ND	ND	ND	2.06E-11	2.01E-9	0.00E+0	1.25E-9	0.00E+0
Acidification	AP	mol H^+ eq.	8.09E-3	8.42E-4	1.88E-3	ND	ND	ND	ND	ND	ND	ND	1.25E-5	2.29E-4	0.00E+0	5.46E-4	0.00E+0
Eutrophication aquatic freshwater	EP-freshwater	kg P eq.	6.15E-5	1.42E-7	9.23E-6	ND	ND	ND	ND	ND	ND	ND	1.13E-8	4.56E-7	0.00E+0	4.86E-7	0.00E+0
Eutrophication aquatic marine	EP-marine	kg N eq.	1.50E-3	1.91E-4	5.63E-4	ND	ND	ND	ND	ND	ND	ND	5.89E-6	8.72E-5	0.00E+0	3.29E-4	0.00E+0
Eutrophication terrestrial	EP-terrestrial	mol N eq.	1.60E-2	2.11E-3	6.10E-3	ND	ND	ND	ND	ND	ND	ND	6.46E-5	9.53E-4	0.00E+0	1.27E-3	0.00E+0
Photochemical ozone formation	POCP	kg NMVOC eq.	6.68E-2	9.01E-4	8.17E-3	ND	ND	ND	ND	ND	ND	ND	1.93E-5	3.78E-4	0.00E+0	5.53E-4	0.00E+0
Depletion of abiotic resources - minerals and metals	ADP-minerals&metals[1]	kg Sb eq.	1.35E-6	5.47E-9	4.34E-7	ND	ND	ND	ND	ND	ND	ND	4.74E-11	2.31E-9	0.00E+0	7.29E-8	0.00E+0
Depletion of abiotic resources - fossil fuels	ADP-fossil[1]	MJ, net calorific value	7.61E+1	2.96E+0	1.60E+1	ND	ND	ND	ND	ND	ND	ND	1.77E-2	1.18E+0	0.00E+0	9.15E-1	0.00E+0
Water use	WDP[1]	m^3 world eq. deprived	6.12E-1	2.34E-3	7.13E-2	ND	ND	ND	ND	ND	ND	ND	2.23E-5	9.34E-4	0.00E+0	-3.57E-1	0.00E+0
Acronyms	GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption																
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																
Disclaimer 1	The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator																

Additional mandatory environmental performance indicators

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Climate change - GWP-GHG	GWP-GHG[1]	kg CO_2 eq.	2.50E+0	2.17E-1	8.73E-1	ND	ND	ND	ND	ND	ND	ND	1.35E-3	8.86E-2	0.00E+0	4.28E-1	0.00E+0
Acronyms	GWP-GHG = Global warming potential greenhouse gas.																
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																
Disclaimer 1	The GWP-GHG indicator is termed GWP-IOBC/GHG in the ILCD+EPD+ data format. The indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.																

Additional voluntary environmental performance indicators according to EN 15804

Impact category	Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Particulate matter emissions	PM	Disease incidence	9.66E-8	1.59E-8	2.59E-8	ND	ND	ND	ND	ND	ND	ND	3.60E-10	5.89E-9	0.00E+0	6.95E-9	0.00E+0
Ionizing radiation - human health	IRP[1]	kBq U235 eq.	4.68E-2	2.79E-4	6.79E-3	ND	ND	ND	ND	ND	ND	ND	3.43E-6	2.96E-4	0.00E+0	4.23E-4	0.00E+0
Eco-toxicity - freshwater	ETP-fw[2]	CTUe	1.17E+1	1.17E-1	1.62E+0	ND	ND	ND	ND	ND	ND	ND	5.07E-4	4.21E-2	0.00E+0	8.45E-2	0.00E+0
Human toxicity - cancer effects	HTP-c[2]	CTUh	4.84E-10	1.62E-11	1.29E-10	ND	ND	ND	ND	ND	ND	ND	7.24E-14	6.00E-12	0.00E+0	1.12E-11	0.00E+0
Human toxicity - non-cancer effects	HTP-nc[2]	CTUh	1.40E-8	1.74E-9	2.50E-9	ND	ND	ND	ND	ND	ND	ND	1.34E-12	5.89E-10	0.00E+0	6.95E-10	0.00E+0
Land-use related impacts/soil quality	SQP[2]	Dimensionless	9.39E+0	3.77E-3	1.22E+0	ND	ND	ND	ND	ND	ND	ND	3.00E-5	1.50E-3	0.00E+0	2.08E+0	0.00E+0
Acronyms	PM = Potential incidence of disease due to particulate matter emissions; IRP = Potential human exposure efficiency relative to U235; ETP-fw = Potential comparative toxic unit for ecosystems; HTP-c = Potential comparative toxic unit for humans; HTP-nc = Potential comparative toxic unit for humans; SQP = Potential soil quality index.																
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).																
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 of these results are high or as there is limited experience with the indicator.																

Resource use indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
PERE	MJ, net calorific value	2.20E+0	7.22E-3	1.12E+0	ND	ND	ND	ND	ND	ND	ND	3.86E-5	2.94E-3	0.00E+0	1.48E-2	0.00E+0
PERM	MJ, net calorific value	7.57E-1	0.00E+0	-7.57E-1	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ, net calorific value	2.96E+0	7.22E-3	3.60E-1	ND	ND	ND	ND	ND	ND	ND	3.86E-5	2.94E-3	0.00E+0	1.48E-2	0.00E+0
PENRE	MJ, net calorific value	7.58E+1	2.96E+0	1.63E+1	ND	ND	ND	ND	ND	ND	ND	1.77E-2	1.18E+0	0.00E+0	9.15E-1	0.00E+0
PENRM	MJ, net calorific value	3.05E-1	0.00E+0	-3.05E-1	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	MJ, net calorific value	7.61E+1	2.96E+0	1.60E+1	ND	ND	ND	ND	ND	ND	ND	1.77E-2	1.18E+0	0.00E+0	9.15E-1	0.00E+0
SM	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	MJ, net calorific value	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ, net calorific value	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m^3	1.49E-2	5.71E-5	1.76E-3	ND	ND	ND	ND	ND	ND	ND	5.36E-7	2.28E-5	0.00E+0	-8.31E-3	0.00E+0
Acronyms	PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water.															
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).															

Waste indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
HWD	kg	2.17E-3	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NHWD	kg	8.11E-3	0.00E+0	6.60E-2	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	3.61E+0	0.00E+0
RWD	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Acronyms	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed.															
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).															

Output flow indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
CRU	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MER	kg	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	MJ, net calorific value	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ, net calorific value	0.00E+0	0.00E+0	0.00E+0	ND	ND	ND	ND	ND	ND	ND	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Acronyms	CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy.															
General disclaimer	The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3/A1-A5 for services).															

Additional LCA Results (other environmental performance results) of the product group

This EPD is developed as an average EPD, using a representative product selected for the product group. Since the product thickness determines the mass per 1 m², the environmental impacts vary accordingly. The table below provides the percentage change in the environmental indicators relative to the reference product over A-C stages.

Best-case product	Rubin Bituminous Waterproofing Membrane (1.25 mm)
Worst-case product	Rubin Bituminous Waterproofing Membrane (5.2 mm)
Description	The study has been conducted based on the product thickness of 3 mm, which represents the declared product configuration assessed within the scope of the EPD. For the best-case scenario, minimum product thickness of 1.25 mm and worst-case scenario, maximum product thickness of 5.2 mm have been considered.

Indicator	Unit	Rubin (1.25 mm)	Rubin (5.2 mm)
GWP-total	kg CO_2 eq.	-50%	73%
GWP-fossil	kg CO_2 eq.	-52%	67%
GWP-biogenic	kg CO_2 eq.	-53%	-61%
GWP-luluc	kg CO_2 eq.	-54%	79%
ODP	kg CFC-11 eq.	-53%	69%
AP	mol H+ eq.	-48%	90%
EP-freshwater	kg P eq.	-49%	87%
EP- marine	kg N eq.	-50%	79%
EP-terrestrial	mol N eq.	-50%	80%
POCP	kg NMVOC eq.	-44%	87%
ADP - minerals & metals	kg Sb eq.	-46%	539%
ADP-fossil	MJ, net calorific value	-47%	85%
WDP	m^3 world eq. deprived	-48%	132%
GWP-GHG	kg CO_2 eq.	-52%	67%

INFORMATION RELATED TO EPDS OF MULTIPLE PRODUCTS

Justification for why this is representative	The most representative thickness is chosen as representative product.

ABBREVIATIONS

General Abbreviations

CEN: European Committee for Standardization

Ecoinvent: LCA database referenced (Ecoinvent v3.11)

EN: European Norm (Standard)

EPD: Environmental Product Declaration

GPI: General Programme Instructions

ISO: International Organization for Standardization

LCA: Life Cycle Assessment

PCR: Product Category Rules

Environmental Impact Indicators (EN 15804)

ADP-fossil: Abiotic depletion for fossil resources potential

ADP-minerals&metals: Abiotic depletion potential for non-fossil resources

AP: Acidification potential, Accumulated Exceedance

EP-freshwater: Eutrophication potential, fraction of nutrients reaching freshwater end compartment

EP-marine: Eutrophication potential, fraction of nutrients reaching marine end compartment

EP-terrestrial: Eutrophication potential, Accumulated Exceedance

ETP-c: Human toxicity, cancer effects

ETP-fw: Ecotoxicity (freshwater)

FW: Use of net fresh water

GWP-biogenic: Global Warming Potential biogenic

GWP-fossil: Global Warming Potential fossil fuels

GWP-GHG: Global Warming Potential – Greenhouse gas

GWP-luluc: Global Warming Potential land use and land use change

HTP-c: Human toxicity, cancer effects

HTP-nc: Human toxicity, non-cancer effects

IRP: Ionising radiation, human health

ODP: Depletion potential of the stratospheric ozone layer

PM: Particulate matter emissions

POCP: Formation potential of tropospheric ozone

SQP: Land use related impacts / soil quality

WDP: Water (user) deprivation potential, deprivation-weighted water consumption

Resource Use Indicators

NRSF: Use of non-renewable secondary fuels

PENRE: Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials

PENRM: Use of non-renewable primary energy resources used as raw materials

PENRT: Total use of non-renewable primary energy re-sources

PERE: Use of renewable primary energy excluding renewable primary energy resources used as raw materials

PERM: Use of renewable primary energy resources used as raw materials

PERT: Total use of renewable primary energy resources

RSF: Use of renewable secondary fuels

SM: Use of secondary material

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VERSION HISTORY

Version 001, 2026-06-29

Original version of the EPD