



RECYCLING
PACKAGING
INSULATION
CONSTRUCTION
DECORATION



EPD REGISTRATION NUMBER
S-P-06987

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20/12/2027

PROGRAM
The International EPD® System
www.environdec.com

PROGRAM OPERATOR
EPD International AB

UN CPC
369 - Other Plastics Products

ENVIRONMENTAL PRODUCT DECLARATION



G. K. RIZAKOS S.A. - IPOR EPS031 RF CE
In accordance with ISO 14025 and EN 15804 + A2





PROGRAM INFORMATION

PROGRAM OPERATOR



OPERATOR: EPD International AB
ADDRESS: Box 210 60, 100 31 Stockholm, Sweden
WEBSITE: www.environdec.com
EMAIL ADDRESS: info@environdec.com

EPD OWNER



G.K.Rizakos S.A.
HEADQUARTERS: Industrial Estate of Lamia,
35100 Lamia
Tel.: (+30) 2231066061
EMAIL ADDRESS: info@rizakos.gr
WEBSITE: www.rizakos.gr

Product category rules (PCR):

PCR 2019:14 Construction products version 1.2.5 (EN 15804:A2)
C-PCR-005 Thermal insulation products (EN 16783)

PCR review was conducted by:

The Technical Committee of the International EPD System
Contact via info@environdec.com

Independent third-party verification of the declaration and data, according to ISO 14025:

- EPD process certification
- EPD verification (external)

Verified by:

Dr-Ing Nikolay Minkov, GREENZERO AX GmbH
nikolay.minkov@greenzero-ax.com

Approved by:

The International EPD® System Technical Committee,
supported by the Secretariat

Technical support:

SustChem Technical Consulting S.A. 
www.sustchem.gr

The EPD owner has the sole ownership, liability, and responsibility for the EPD. EPDs within the same product category but from different programmes may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804.





COMPANY'S PROFILE

Due to the specialized skills, the in-depth understanding of the market needs and the multiyear experience in the field of INSULATION - CONSTRUCTION - DECORATION & PACKAGING, G.K.RIZAKOS S.A. is in the position to offer to their customers a complete portfolio of products and services and to create innovative solutions, hence satisfying the demands of the market as well as those of the end user. Since 1980, **G.K.RIZAKOS S.A.** presents a continual growth and thus has gained a proven insight into the market requirements of INSULATION - CONSTRUCTION - DECORATION & PACKAGING. This awareness, along with the company's customer-centered philosophy, has turned the company's customers into their accredited collaborators whose profitability is also company's key objective. From the beginning to date, there is a careful and long-term planning in the company's operations. The decisive factors are the research and development capabilities and the use of innovative technologies that can lead to sustainable excellence in manufacturing. In this way, the products' quality was guaranteed from the start and that ensured the establishment of the brand name "RIZAKOS" in the market.

Having developed its corporate identity as a well-established and reliable partner, G.K.RIZAKOS S.A. is identified with:

- Reliability of products, human potential, and benefit of services to each collaborator
- Standing next to its customers, offering technical support even after sales are completed
- Support its customers with products & services of the highest quality while retaining at the same time its competitive sale prices
- Continuous research and development for new products

Values and Vision

G.K.RIZAKOS S.A. philosophy is to work closely with its customers seeing them as actual partners. At the same time, the company aims to offer the full portfolio of products and services, revolutionary ideas that will satisfy the market and end consumer needs, thus creating added value.

The company's objective is to be the leading force in the Greek Market in providing solutions for Insulation, Construction, Decoration & Packaging, in entrepreneurial ability and competitiveness and in respect to the individual, the society and the environment. The company's mission statement is:

- Profitable sales growth
- Customer Satisfaction
- Continuous cost reduction of the products and services to customer
- Employee training
- Constant update/education of the customer
- Complete alignment with the Regulations and Norms in effect
- Co-ordination and Communication
- Continuous improvement

Loyal to its long-held values of reliability, sincerity, confidence, dignity and morality the company is committed to retain and further develop its in-depth knowledge of EPS operation, follow-up on technological developments and keep improving towards a more sustainable and environmentally friendly way of doing business. The current LCA depicts partly the company's commitment to intergrade the principles of sustainability in its operation moving forward.

Further information on www.rizakos.gr



Milestones

1980: Establishment of **G.K.Rizakos S.A.**

1987: The company becomes anonymous with initial capital 200.000 € and relocates at new privately-owned installations on 1st km of Lamia - Domokos Old National Road, where the modernization of EPS production for construction products takes place for the first time.

1993: company expands by setting up its first subsidiary in Athens, where production starts for protective packaging (Flow Packing) and it installs a pantograph with two axes cutting equipment (CAD/CAM) for foam plastics.

1995: The first shape molding machines for molded EPS products are installed in the production line of Lamia. The company enters the Packaging sector.

2001: The company establishes new subsidiary in Thessaloniki.

2004: Relocation of the headquarters and production to the new industrial facilities at the Lamia Industrial Estate (building surface 9000m²).

2005: Take-over of the company ATLANTIS SA, EPS packaging manufacturer

2007: New industrial facilities in Menidi, Attica, set up in privately-owned location of 5.500 m², in order to merge the two Athens subsidiaries.

2020: The company begins construction of a new production building spanning 3.000 m² in the company's headquarters in the Industrial Estate of Lamia.





Quality & Certification

For **G.K.Rizakos S.A.** the Quality Assurance of products and services offered to its customer is top priority. Therefore, it zealously seeks the opportunities for continuous improvement in its operation that are identified during a certification process.

G.K.Rizakos S.A. operations and products hold the following certifications:

- ISO 9001:2015 Quality Management System
- ISO 14001:2015 Environmental Management System
- ISO 45001:2018 Occupational Health & Safety System
- Product Certificates according to European CE marking standard EN 13163:2012+A1:2015
- Certificate of Factory Production Control according to the European standard EN 13172:2012
- Declaration of Compliance for food contact according to European Regulation (EC) No 1935/2004 and Article 26 of Code for Food and Beverage
- Certificates of Analysis for migration tests performed by ESYPD-accredited lab

IPOR EPS031 RF CE

IPOR is a hybrid Expanded Polystyrene thermal insulating board made of a NEOPOR EPS 100 core raw material and a rigid pink EPS 200, surface layer made of PERIPOR raw material. This innovative product is the ideal solution for the ETICS application in buildings, has thermal conductivity $\lambda_d = 0,031$ W/mK and is CE certified according to EN 13163: 2012 and ETAG 004.

The thickness of the rigid EPS 200 layer remains constant at 10 mm and the final board thickness is reached by increasing the NEOPOR graphite EPS core. The EPS graphite core thickness varies accordingly. The EPS 100 graphite core ensures the elasticity required to protect the coatings from cracking and the robust PERIPOR EPS 200 pink external layer provides the necessary impact protection and perforation resistance to the board. This configuration allows the use of IPOR even in the underground level and waterproofing zone in balcony floors. Moreover, the pink IPOR layer is shaped with a diamond/rhombus pattern which improves better adhesion to the standard coating materials. The inner surface of the board, where the adhesive is placed, has the same rhombus/-diamond pattern providing a similar beneficial effect. Finally, due to its pink outer layer IPOR does not need the protection of a shade net on the scaffold, otherwise required for all graphite products. This is because the pink color absorbs much less of the sunlight spectrum and thus the consistency of the mortar and adhesive remain unaffected by high temperatures.

- No substances included in the Candidate List of Substances of Very High Concern for authorization under the REACH Regulations that exceed 0.1% of the total weight are present in the examined products.

IPOR EPS031 RF CE

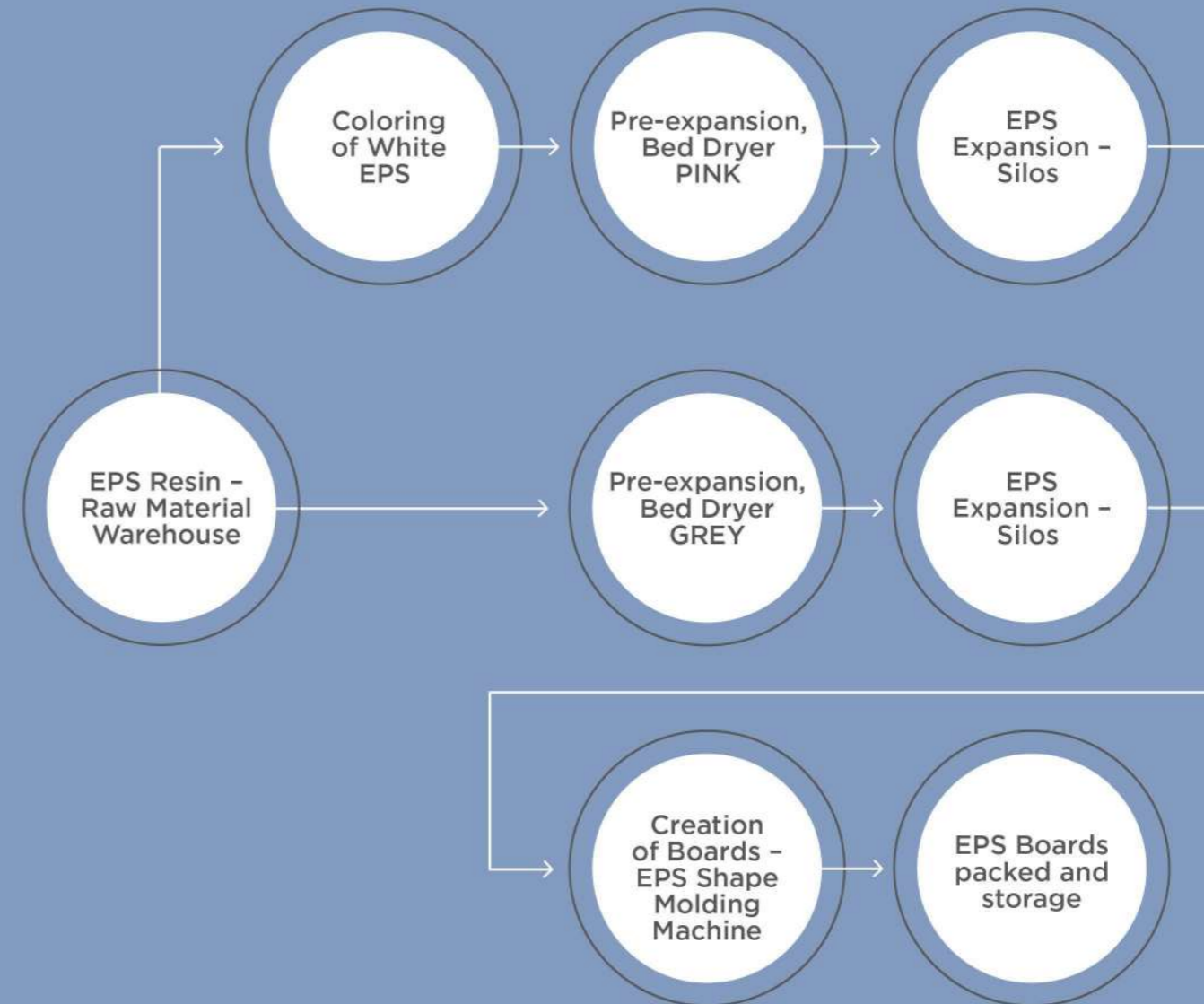
Parameter	Unit	Value	Control Norm
Thermal conductivity λ 10°C	W/m*K	0.031	EN 12667
Thermal Resistance R (50 mm)	m ² K/W	1.612	EN 12667
Thermal Resistance R (60 mm)	m ² K/W	1.935	EN 12667
Thermal Resistance R (70 mm)	m ² K/W	2.258	EN 12667
Thermal Resistance R (80 mm)	m ² K/W	2.580	EN 12667
Thermal Resistance R (90 mm)	m ² K/W	2.903	EN 12667
Thermal Resistance R (100 mm)	m ² K/W	3.225	EN 12667
Thermal Resistance R (120 mm)	m ² K/W	3.870	EN 12667
Thermal Resistance R (140 mm)	m ² K/W	4.516	EN 12667
Dimension Tolerance			
Length & Width	mm	± 2	EN 822
Thickness	mm	± 1	EN 823
Squareness	mm	± 2	EN 824
Flatness per meter run	mm	± 5	EN 825
Characteristics-specifications			
Bending strength σ_b	kPa	150	EN 12089
Compression strength for 10% deformation σ_{10}	kPa	100	EN 826
Tensile strength for 10% deformation σ_{10}	kPa	100	EN 1607
Resistance to vapour diffusion μ (Air $\mu=1$)	-	30 - 70	EN 12086
Resistance to fire	-	E	EN 13501-1



Manufacturing Process

IPOR EPS031 RF CE production is a continuous process divided into distinct phases which take place at Rizakos S.A. facilities. The following process flowchart depicts the complete manufacturing procedure of the product.

As previously mentioned IPOR EPS031 RF CE Product comprises of a 10 mm thick layer of PERIPOR EPS 200 and a layer of graphite EPS 100 of varying thickness, made of NEOPOR. The manufacturing procedure of all products of various thicknesses examined is the same in terms of the steps followed and the respective raw materials and utilities used, and they only differ in terms of their thickness and subsequently the quantity of NEOPOR used.





Functional Unit

The functional unit is one (1) m² of IPOR EPS031 RF CE, 140 mm thickness, R-value of 4.516K*m²/W.

Conversion factors to other thicknesses

The LCA Results can be converted to account for the Potential Environmental Impacts for the various thicknesses of IPOR EPS 031 RF CE product, using the conversion factors of the following table.

ENVIRONMENTAL IMPACTS CONVERSION FACTORS								
Thickness value (mm)	50	60	70	80	90	100	120	140
Conversion Factor	0.4204	0.4848	0.5492	0.6136	0.6780	0.7424	0.8712	1.00

System boundaries

This EPD covers the "cradle-to-grave and module D" approach. Therefore, the defined system boundaries include modules A1-A3, A4-A5, B, C and D.

DESCRIPTION OF EXAMINED MODULES

	Product Stage			Construction Process Stage		Use Stage							End of Life Stage			Resource Recovery Stage	
	Raw material	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction, demolition	Transport	Waste processing	Disposal	Reuse, Recovery, Recycling potentials
Modules	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules Declared	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Geography	EU27	EU27	GR	EU27		EU27							EU27			EU27	
Specific data used	>80%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - products	From -12.87% to -57.93%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation - sites	Not relevant			-	-	-	-	-	-	-	-	-	-	-	-	-	-

* The variations of -12.87% and -57.93% correspond to the difference in GWP-GHG indicator results in A1-A3 between the reference thickness of 140 mm and the thicknesses 120mm and 50mm, respectively.

Reference Period Considered

January 2021 - December 2021

Reference Service Life

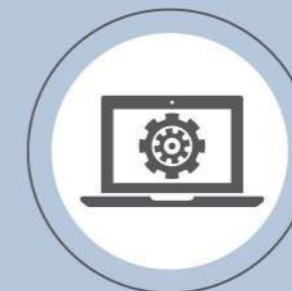
Based on bibliography it is concluded that the EPS Products retain their technical characteristics for a period of 70 years minimum.

EPD TYPE



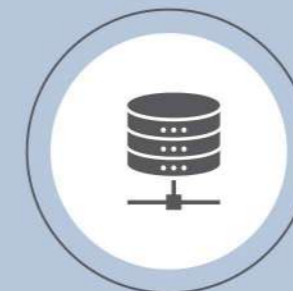
Specific

SOFTWARE



GaBi ts version 10.6.0.110

DATABASE



Ecoinvent 3.8.1 & Professional 2021



DESCRIPTION OF EXAMINED MODULES



A1: Raw Material Extraction/Production

Module A1 includes the production of all raw materials (polystyrene granulate, graphite, etc.) and utilities (i.e. electricity, HFO, water) required for the manufacturing procedure.



A2: Transport to Rizakos' Facilities

Module A2 includes the transport of all raw materials and utilities to the company's plant at the Industrial Estate of Lamia.



A3: Manufacturing

Module A3 depicts the environmental impact potentials attributed to all processes taking place at the EPS manufacturing plant of G.K. Rizakos.



A4: Finished Products Transport

Module A4 includes the transport of finished product (IPOR EPS031 RF CE) to clients/Building sites. Actual data of distances of sites locations have been taken into account.



A5: Construction Installation

EPS products are installed manually to the construction, and thus, no ancillary material, water or any other energy resource is required for the installation. The wastage of finished products during installation is assumed to be equal to 2% of the total.



B1-B7: Use phase

IPOR EPS031 RF CE does not require maintenance, repair, replacement or refurbishment during use in standard conditions and in case that is properly installed. No consumption of energy or water takes place during use phase of building.



C1: Deconstruction/Demolition

Regarding deconstruction/demolition, a scenario has been developed since no actual data are available. More specifically, it has been considered that an excavator (diesel, 100kW) is used.



C2: EPS Waste Transport

A nominal distance of 100 km is assumed for the transport of EPS from building demolition to sorting/recovery plants and disposal facilities (Truck 12-14 tons).



C3: EPS Waste Processing

Based on bibliography in relation to European market, EPS construction waste energy recovery via incineration equals to 67%. Recycling accounts for 10% of the total construction waste.



C4: Disposal

The remaining quantity of 23% is being disposed.



D: Reuse, Recovery, Recycling Potential

Module D covers the net benefits arising from the substitution of primary polystyrene with secondary material (10%) and the energy produced from the incineration of 67% of the EPS Waste retrieved from buildings' demolition.



LIFE CYCLE ASSESSMENT INFORMATION

Cut-off criteria

All major raw materials, elements and all the essential energy flows required are included within the system boundaries. Data for elementary flows to and from the product system contributing to minimum of 99% of the declared environmental impacts are included in the study. Thus, it is assumed that the total neglected input flows are less than 1% of total energy and mass. The only flows that have been omitted from the modelling of the studied system is the evaporation of pentane, since the total potential environmental impacts in relation to the GWP occurring from the specific stream is less than 0.5% of the total GWP of the modelled system, and the use of pigment since it is used in minor quantities to produce PERIPOR, and thus, its contribution on the total potential environmental impacts is negligible.

Assumptions, Allocation and Limitations

- G.K. Rizakos' production processes yield no commercial by-products in its plant. Thus, there is no need for by-product allocation in the manufacturing process.
- A nominal distance of 100 km from the construction sites was taken into account in relation to the transportation of PE (used for packaging) waste to sorting facilities and the transportation of collected EPS waste to treatment and disposal facilities.
- A default mean of road transportation "Truck Euro 6 - 9.3t payload - 12-14t gross weight" was assumed. Weighted average of the distance covered was taken into account. Regarding ship transportation, "Average ship, 3,500t payload capacity" was assumed due to lack of actual data.
- Energy recovery (incineration) rate of 67% is assumed for construction applications based on European Bibliography. 10% of the total EPS waste is recycled while the remaining 23% is considered to be disposed.

Background data and data quality

For all processes, primary data were collected and provided by G.K.RIZAKOS S.A. Data related to material and energy flows of the defined system, were acquired from the company developing the EPD and data related to life cycle impacts resulted from calculations based on widely used and trust-worthy databases. Primary data refer to January - December 2021 reference period. Regarding modules C1-C4 and D no actual data were available and hence specific scenarios were developed based on bibliography and the most common industry practices. However, these scenarios were modeled based on accurate and area representative datasets available either into Professional 2021 or Ecoinvent 3.8.1. Thus, these data are expected to be of high quality too. The LCA software GaBi version 10.6.0.110 was used for inventory and impact assessment calculations based on data entry of the developed mode. A compilation of Ecoinvent v.3.8.1 and Professional 2021 databases was used.

Comparability









EPDs within the same product category but registered in different EPD programs, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same 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 equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterization factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.



ENVIRONMENTAL PERFORMANCE INDICATORS

IPOR EPS031 RF CE PRODUCT

POTENTIAL ENVIRONMENTAL IMPACTS / 1 m² of IPOR EPS031 RF CE, 140 mm thickness, R-value = 4.516 K*m²/W

Core Environmental Impact Indicators	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	Total	D
											
Global Warming Potential -total	kg CO ₂ eq.	1.432E+01	2.923E-04	4.677E-01	0.00E+00	2.004E-03	3.945E-02	7.450E+00	5.291E-02	2.234E+01	-3.718E+00
Global Warming Potential - fossil fuels	kg CO ₂ eq.	1.427E+01	2.903E-04	4.666E-01	0.00E+00	2.078E-03	3.918E-02	7.449E+00	5.343E-02	2.228E+01	-3.696E+00
Global Warming Potential - biogenic	kg CO ₂ eq.	5.628E-02	-3.701E-07	1.052E-03	0.00E+00	-9.107E-05	-5.017E-05	4.011E-04	-5.578E-04	5.703E-02	-1.959E-02
Global Warming Potential - land use and land use change	kg CO ₂ eq.	1.914E-03	2.381E-06	7.297E-05	0.00E+00	1.640E-05	3.212E-04	1.131E-04	4.467E-05	2.485E-03	-2.271E-03
Global Warming Potential (GWP-GHG)	kg CO ₂ eq.	1.427E+01	2.927E-04	4.666E-01	0.00E+00	2.095E-03	3.950E-02	7.449E+00	5.347E-02	2.228E+01	-3.698E+00
Ozone Depletion Potential	kg CFC 11 eq.	1.207E-10	3.714E-20	1.722E-10	0.00E+00	2.558E-19	5.013E-18	8.489E-09	1.289E-16	8.781E-09	-3.670E-14
Acidification Potential	Mole of H ⁺ eq.	5.440E-02	2.841E-07	1.177E-03	0.00E+00	9.873E-06	3.834E-05	9.824E-04	1.601E-04	5.677E-02	-4.914E-03
Eutrophication Potential Freshwater	kg P eq.	1.371E-05	8.630E-10	4.193E-06	0.00E+00	5.944E-09	1.165E-07	1.587E-05	9.868E-06	4.377E-05	-4.870E-06
Eutrophication Potential Marine	kg N eq.	1.099E-02	8.870E-08	2.565E-04	0.00E+00	4.643E-06	1.197E-05	2.721E-04	3.632E-05	1.157E-02	-1.389E-03
Eutrophication Potential Terrestrial	mol N eq.	1.198E-01	1.070E-06	2.736E-03	0.00E+00	5.139E-05	1.444E-04	4.057E-03	3.981E-04	1.272E-01	-1.490E-02
Formation Potential of Tropospheric Ozone	kg NMVOC eq.	3.611E-02	2.437E-07	8.181E-04	0.00E+00	1.305E-05	3.288E-05	7.535E-04	1.161E-04	3.784E-02	-4.156E-03
Abiotic Depletion Potential, minerals and metals*	kg Sb eq.	1.521E-06	2.213E-11	5.252E-08	0.00E+00	1.524E-10	2.987E-09	6.065E-07	3.678E-09	2.187E-06	-5.941E-07
Abiotic Depletion Potential, fossil resources*	MJ net calorific value	3.924E+02	3.870E-03	8.213E+00	0.00E+00	2.665E-02	5.223E-01	2.079E+00	7.792E-01	4.040E+02	-7.553E+01
Water Deprivation Potential*	m ³ world eq. deprived	1.723E+00	2.526E-06	5.361E-02	0.00E+00	1.739E-05	3.407E-04	6.220E-01	-6.581E-04	2.399E+00	-2.685E-01










* 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.



ENVIRONMENTAL PERFORMANCE INDICATORS

IPOR EPS031 RF CE PRODUCT

POTENTIAL ENVIRONMENTAL IMPACTS / 1 m² of IPOR EPS031 RF CE, 140 mm thickness, R-value = 4.516 K*m²/W










Use of Resources	Unit	A1-A3 	A4 	A5 	B1-B7 	C1 	C2 	C3 	C4 	Total	D 
Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ. net calorific value	1.360E+01	2.159E-04	2.926E-01	0.00E+00	1.487E-03	2.915E-02	2.224E-01	5.656E-02	1.421E+01	-1.247E+01
Use of renewable primary energy resources used as raw materials	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ. net calorific value	1.360E+01	2.159E-04	2.926E-01	0.00E+00	1.487E-03	2.915E-02	2.224E-01	5.656E-02	1.421E+01	-1.247E+01
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ. net calorific value	3.927E+02	3.874E-03	8.218E+00	0.00E+00	2.669E-02	5.230E-01	2.080E+00	7.794E-01	4.043E+02	-7.555E+01
Use of non-renewable primary energy resources used as raw materials	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ. net calorific value	3.927E+02	3.874E-03	8.218E+00	0.00E+00	2.669E-02	5.230E-01	2.080E+00	7.794E-01	4.043E+02	-7.555E+01
Use of secondary material	kg	3.243E-02	0.00E+00	6.486E-04	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.308E-02	0.00E+00
Use of renewable secondary fuels	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of non-renewable secondary fuels	MJ. net calorific value	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water	m ³	6.383E-02	2.472E-07	1.726E-03	0.00E+00	1.703E-06	3.336E-05	1.457E-02	7.184E-06	8.017E-02	-1.503E-02



ENVIRONMENTAL PERFORMANCE INDICATORS

IPOR EPS031 RF CE PRODUCT

POTENTIAL ENVIRONMENTAL IMPACTS / 1 m² of IPOR EPS031 RF CE, 140 mm thickness, R-value = 4.516 K*m²/W

Waste Categories	Unit	A1-A3 	A4 	A5 	B1-B7 	C1 	C2 	C3 	C4 	Total	D 
Hazardous Waste Disposed	kg	2.787E-08	1.953E-13	5.644E-10	0.00E+00	1.345E-12	2.634E-11	1.481E-10	1.402E-10	2.875E-08	-1.413E-08
Non-hazardous Waste Disposed	kg	7.956E-02	5.757E-07	1.698E-02	0.00E+00	3.966E-06	7.769E-05	2.644E-02	7.428E-01	8.659E-01	-3.032E-02
Radioactive Waste Disposed	kg	1.281E-03	4.687E-09	2.677E-05	0.00E+00	3.229E-08	6.325E-07	4.723E-05	9.049E-06	1.365E-03	-3.933E-03
Output Flows	Unit										
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	0.00E+00	0.00E+00	8.775E-02	0.00E+00	0.00E+00	0.00E+00	3.243E-01	0.00E+00	4.120E-01	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.175E+00	0.00E+00	2.175E+00	0.00E+00
Exported energy. electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy. thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Additional Environmental Impact Indicators	Unit										
Particulate matter emissions	Disease incidence	3.774E-07	1.702E-12	8.615E-10	0.00E+00	1.117E-10	2.297E-10	9.675E-09	1.569E-09	3.898E-07	-4.041E-08
Ionizing radiation human*	kBq U235 eq.	1.389E-01	6.711E-07	1.932E-03	0.00E+00	4.622E-06	9.055E-05	1.387E-02	1.298E-03	1.561E-01	-6.414E-01
Eco-toxicity, freshwater	CTUe	2.271E+02	2.797E-03	5.188E-01	0.00E+00	1.927E-02	3.773E-01	1.613E+00	7.403E-01	2.304E+02	-2.422E+01
Human toxicity, cancer effects	CTUh	5.305E-09	5.644E-14	1.115E-11	0.00E+00	3.887E-13	7.617E-12	1.855E-10	3.317E-11	5.543E-09	-7.828E-10
Human toxicity, non-cancer effects	CTUh	2.026E-07	2.919E-12	4.161E-10	0.00E+00	2.338E-11	4.390E-11	2.554E-09	2.779E-09	2.084E-07	-3.257E-08
Land use related impacts/Soil quality	dimensionless	5.533E+00	1.329E-03	2.077E-01	0.00E+00	9.154E-03	1.794E-01	1.158E+00	5.299E-02	7.142E+00	-8.577E+00

* 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.



IPOR EPS031 RF CE

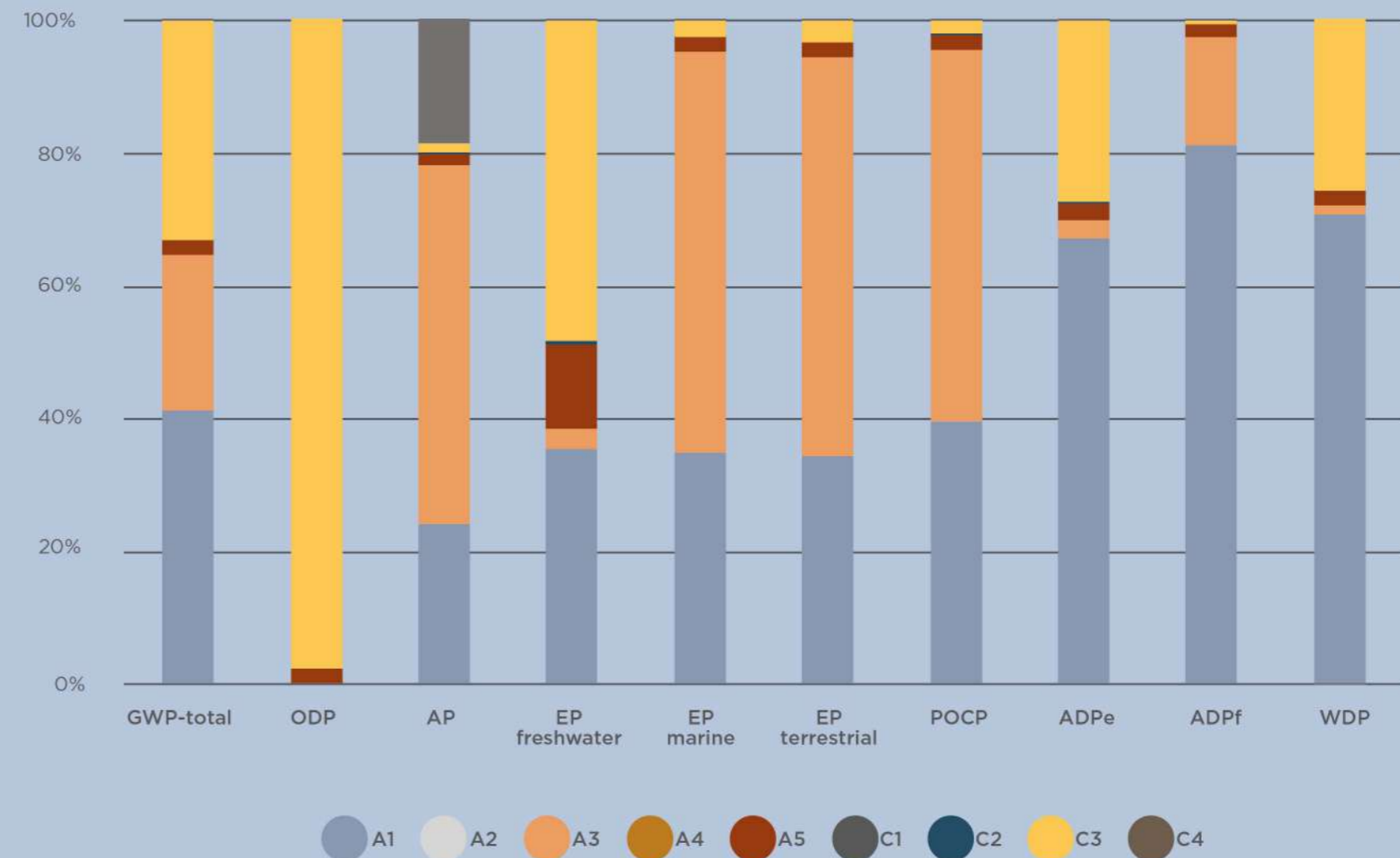
The following figure represents the contribution of each examined module (A1-A5, C1-C4) on the core environmental impact indicators formation. It can be clearly depicted that the majority of the analyzed impact categories are mainly influenced by modules A1, A3 and C3.

- The Global Warming Potential - total in relation to the production of 1 m² of IPOR EPS031 RF CE, 140 mm thickness, is shared among the extraction/production of raw materials and the treatment of EPS Waste accounting for 40.61% and 33.35% respectively. The manufacturing of IPOR EPS031 RF CE accounts for 23.51% of the total environmental impact of modules A1-A5 and C1-C4.
- Regarding Ozone Depletion Potential, C3 - Waste Processing is the dominant parameter that contributes to the overall impact indicator approaching the value of 100%.
- Depletion of abiotic resources (fossil) is highly influenced by Module A1 (approximately 81%) whereas for the Depletion of minerals and metals abiotic resources production/extraction of raw materials is the main contributor to the overall impact indicator (66.80%), followed by Module C3 (27.73%).
- Acidification Potential is mainly influenced by module A3 with the respective percentage being equal to 66.80%. Raw material production (Module A1) follows with a percentage of 29.02%.
- As for the Eutrophication Potential Freshwater it is observed to be mainly influenced by module C3 (36.26%) while raw materials production and EPS Waste disposal adds on the total impact indicator for approximately 28.93% and 22.55%, respectively.



RESULTS INTERPRETATION

Relative Contribution of the examined modules





References

- International EPD® System, c-PCR-005 Thermal Insulation Products (EN 16783:2017), version 2019-12-20
- International EPD® System, PCR 2019:14 Construction Products, version 1.2.5 (EN 15804:A2)
- EN 15804:2012+A2:2019 Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products
- International EPD® System, General Program Instructions for the International EPD System, version 4
- International Organization for Standardization (ISO), Environmental labels and declarations – Type III environmental declarations – Principles and procedures. ISO 14025:2006
- International Organization for Standardization (ISO), Environmental management – Life Cycle assessment – Principles and framework. ISO 14040:2006
- International Organization for Standardization (ISO), Environmental management – Life Cycle assessment – Requirements and guidelines. ISO 14044:2006
- The International EPD® System – The International EPD System is a programme for type III environmental declarations, maintaining a system to verify and register EPDs as well as keeping a library of EPDs and PCRs in accordance with ISO 14025. www.environdec.com
- EN ISO 14001:2015 – Environmental Management Systems – Requirements
- ISO 14020:2000 – Environmental Labels and Declarations – General Principles
- Sphera – GaBi Product Sustainability software – www.sphera.com
- EPS construction waste treatment in Europe – <https://polystyreneloop.eu/wp-content/uploads/2021/01/Conversio-study.pdf>
- Reference Service Life – <https://www.epshellas.com/>

ENVIRONMENTAL PRODUCT DECLARATION



RECYCLING
PACKAGING
INSULATION
CONSTRUCTION
DECORATION



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In accordance with ISO 14025 and EN 15804 + A2