

Environmental Product Declaration



In accordance with ISO 14025 and EN 15804:2012+A2:2019 for:

TECHNO Family Mineral Fibre Insulation

from

Zavod TECHNO, LLC



Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-02297
Publication date:	2022-08-08
Valid until:	2027-08-07

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com



General information

Programme information

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

Accountabilities for PCR, LCA and independent, third-party verification

Product Category Rules (PCR)

CEN standard EN 15804 serves as the Core Product Category Rules (PCR)

Product Category Rules (PCR): 2019:14 Construction products, version 1.11
c-PCR-005 Thermal Insulation Products version 2019-12-20
UN CPC code: 379

PCR review was conducted by: The Technical Committee of the International EPD® System.
See <https://www.environdec.com/about-us/the-international-epd-system-about-the-system> for a list of members.

Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact

Life Cycle Assessment (LCA)

LCA and EPD performed by Dmitry Vadivasov, CIS Center LCA team

Third-party verification

Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:

EPD verification by individual verifier

Third-party verifier: *Dr Hudai Kara, Metsims Sustainability Consulting (www.metsims.com)*

Approved by: The International EPD® System

Procedure for follow-up of data during EPD validity involves third party verifier:

Yes No

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

EPDs within the same product category but from different programs may not be comparable. EPDs of construction products may not be comparable if they do not comply with EN 15804. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD:
Zavod TECHNO, LLC

Contact:
Vasily Aksyonov,
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Description of the organisation:

Zavod TECHNO, LLC is one of 59 production sites in 8 countries of the TECHNONIKOL global corporation. The TECHNONIKOL Corporation has 22 representative offices in 18 countries, 20 Training centers, 6 Research centers, staffed with high-tech equipment and qualified personnel. The centers regularly develop and implement new products and solutions for the construction industry. The company's products are exported to 118 countries. Headquarters are located in Russia, Poland, Italy, China and India.

"TECHNO plant was launched in the city of Ryazan in 2006. Today it is one of the largest enterprises in Russia and Europe for the production of mineral thermal insulation. The production capacity of three technological lines exceeds 4 million cubic meters of insulation per year.

Product-related or management system-related certifications:

Plant "Zavod TECHNO" is certified according to the international environmental quality management standard ISO 14001 and management system standard ISO 9001. The waste generated during the production of mineral insulation is not taken to a landfill, but is recycled into secondary raw materials for the production of products.

Name and location of production site(s):

Zavod TECHNO, LLC, Vostochny Promysel, 21, building 58, Ryazan, 390047, Russia.

Product information

Product name:
TECHNO Family Mineral Fibre Insulation

Product identification:

Mineral fibre insulating products under the EPD are manufactured in accordance with EN 13162:2012+A1:2015 Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification.

UN CPC code: 379

Product description:

The Environmental Product Declaration (EPD®) describes the environmental impacts of 1m² of mineral wool slabs without surfacing with an average thermal resistance of 2,38 K*m²*W⁻¹ and R-value of 2,38 m²K/W with a thickness of 89 mm. Apparent density used for the calculation of this specific LCA is 98 kg/m³ and the specific weight of modelled average slab taken for the calculations (=F.U.) is 8,73 kg.

“TECHNO” family Mineral wool products for building construction are available in a form of slabs (boards). Generally, slabs are designed for use in building structures, systems, structures for various purposes, for internal and external insulation of roofs, facades, as well as fire insulation. Detailed description of all of the slabs under the EPD and its application area could be found at the company’s web site: <https://teplo.tn.ru/> (or <https://technicol.com/>).

In manufacturing of the slabs, the following inorganic materials are used:

- Volcanic rocks (basalt mainly);
- Sedimentary rocks (dolomite);
- Metallurgical coke;
- Blast furnace slag;
- Briquettes made of recycled material such as stone wool scrap, aluminium production waste (imported to the plant), blast furnace slag and cement;
- Phenol formaldehyde resin as a binder

Few amount of organic additives such as ammonium sulphate, oil emulsion and silane are added to provide hydrophobic properties and to prevent dusting.

Product representative unit for which life cycle impacts are accounted comprises a group of the TECHNO family mineral insulation slabs nomenclatures. Trademarks under the TECHNO Family slabs are given in the table below.

TECHNO family		
TECHNOLITE EXTRA	TECHNOROOF V70	TECHNOROOF 45
TECHNOLITE OPTIMA	TECHNOROOF V50G	TECHNOROOF 50
TECHNOVENT STANDARD	TECHNOROOF V60G	TECHNOROOF 50G
TECHNOROOF N30	TECHNOROOF V70G	TECHNOROOF TAPERED N30
TECHNOROOF N30G	TECHNOFACADE EXTRA	TECHNOROOF TAPERED N35
TECHNOROOF N35	TECIINOFACADE COTTAGE	TECHNOROOF TAPERED N40
TECHNOROOF N35G	TECHNOFACADE OPTIMA	TECHNOROOF TAPERED V50
TECHNOROOF N40	TECHNOFACADE	TECHNOROOF TAPERED V60
TECHNOROOF N40G	TECHNOSANDWICH WALL	TECHNOROOF TAPERED V70
TECHNOROOF V50	TECIINOSANDWICH ROOF	TECHNOROOF TAPERED 45
TECHNOROOF V60	TECHNOFLOOR STANDARD	TECHNOROOF TAPERED 50

The following is a summary table with the technical specifications of the products.

Parameter	Value. TECHNO Family	Value. Representative unit
Density, kg/m ³	25-180	97.78
Thickness, mm	30-230	89.09
Length, mm	1200	1200
Width, mm	600	600
Thermal conductivity, W/m ² °C	0.035-0,039	0.037
Thermal resistance, K*m2/W	0.79-6,67	2.38
Reaction to fire, RtF	A1 (non-combustible)	A1 (non-combustible)

Recycled material

In TECHNO mineral fibre insulation slabs imported recycled materials in form of aluminum waste (SEROX or its analogues) and blast furnace slags are using. Total Post- and Pre-consumer material comprise up to 28,96 % of mass of the finished product (see “Content Information” unit).

Geographical scope:

End-of-Life Geographical scope calculated for European Union countries (EU-28) as all of the mineral fibre insulating slabs under the EPD exported to European countries mostly.

LCA information

Functional unit / declared unit:

The functional unit of product under the research is 1 m² of mineral fiber insulation slab with thermal conductivity 0,037 W/m*K.

Reference service life:

When used in accordance with the intended purpose and if the following conditions are met: proper product, planning, execution and maintenance quality, no extreme internal or external ambience conditions, the useful life of the mineral fibre insulation slabs corresponds to that of the building project concerned.

Time representativeness:

The primary data cover the period January 2020 - December 2020.

Database(s) and LCA software used:

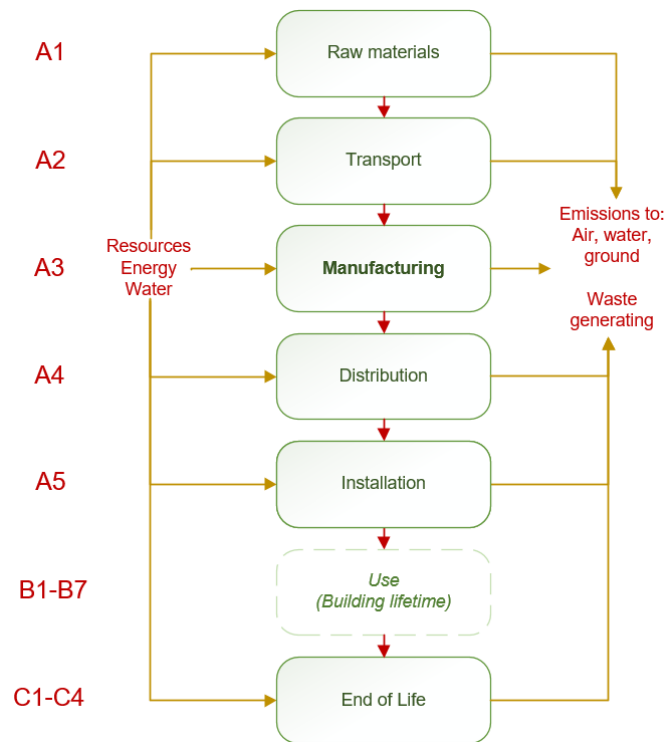
GaBi software version 10.6.1.35 and GaBi databases content version 2022.1 was used to perform LCA modelling.

Description of system boundaries:

System boundary: Cradle to grave with mandatory stages A1-A3, B1-B7, C1-C4 and optional stage D.

System diagram:

Overall system boundary of the TECHNO mineral fibre insulation slabs is presented below.



Flow diagram of the Life Cycle

More information:

For the LCA Module A3, primary data was collected directly from the manufacturer and checked for consistency. Background high quality data from the GaBi Databases was used. Mass allocation was performed to partition the flows of finished products that not concerned by the EPD®.

In the underlying LCA the following Assumptions and Cut-offs were made.

Assumptions:

- There is no emissions during product use stage, so it assumed that there is no impact from life cycle module B.
- It is assumed that the data sets for the inputs with a reference year greater or less than 2020 would be suitable for modelling the life cycle of the MFI slab TECHNO.
- No benefits from module D is assumed due to strict requirements to chemical composition of mineral wool in the European Union, so the reusing of such waste in production is currently considered unacceptable and the landfill scenario was taken as a conventional EoL scenario.
- A transport distance of 75 km was assumed for the disposal of packaging waste (A5) and the product at waste status (C2) in the End of Life.

Cut-offs:

- All the relevant flows are included in LCA. Labels made of polypropylene used on packaging were excluded from the study because its weight in the total volume of the product so as in the lifecycle environmental impact is negligible.
- Euro pallets EoL modelling (module A5) are also excluded due to its reusing and thus the negligible role in LCIA of TECHNO slabs.

Additional information on the product or company description could be found at company's and corporation's websites, respectively: <https://teplo.tn.ru/> and <https://technicol.com/>.

LCA performed and EPD prepared by CIS Center LCA team specialist Dmitry Vadivasov (d.vadivasov@ciscenter.org). CIS Center website: <https://ciscenter.org/>

Life Cycle Stages (X=included; MND= Module not Declared)

System Boundaries

	Product stage					Construction process stage					Use stage					End of life stage			*
	Raw material supply	Transport	Manufacturing	Transport	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		
<i>Modules declared</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
<i>Geography</i>	RU	RU	RU	RU	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27	EU-27		
<i>Specific data used</i>	>90%					-	-	-	-	-	-	-	-	-	-	-	-		
<i>Variation – products</i>	<10%					-	-	-	-	-	-	-	-	-	-	-	-		
<i>Variation – sites</i>	Not relevant					-	-	-	-	-	-	-	-	-	-	-	-		

* Resource recovery stage

Content information

Product components	Weight, kg	Post-consumer material, weight-kg	Renewable material, weight-%
Mineral wool	8.33	0.13	2.4
Binder rate	0.39	0	0
Additives	0.01	0	0
TOTAL	8.73 kg	0.13	2.4
Packaging materials	Weight, kg	Weight-% (versus the product)	
PE film	0.04	0.47	
Wooden EURO pallet	0.05	0.53	
TOTAL	0.09	0.99	

According to confirmation of REACH compliance on assessed product the product "Stone wool" does not contain a SVHC substance(s) listed on the Candidate List

Environmental Information

Potential environmental impact – mandatory indicators according to EN 15804

Results for 1 m ² of TECHNO mineral fiber insulation slab with thermal conductivity 0,037 W/m ² K										
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D
GWP-fossil	kg CO ₂ eq.	4.25E+00	8.42E-01	5.14E-04	0.00E+00	0.00E+00	4.60E-02	2.42E-02	1.40E-01	0.00E+00
GWP-biogenic	kg CO ₂ eq.	4.13E+00	7.94E-01	5.20E-04	0,00E+00	0.00E+00	4.33E-02	2.26E-02	1.26E-01	0.00E+00
GWP-luluc	kg CO ₂ eq.	1.16E-01	4.59E-02	-4.53E-06	0,00E+00	0.00E+00	2.50E-03	1.53E-03	1.30E-02	0.00E+00
GWP-total	kg CO ₂ eq.	1.06E-03	3.04E-03	-2.74E-08	0,00E+00	0.00E+00	1.66E-04	1.04E-04	2.33E-04	0.00E+00
ODP	kg CFC 11 eq.	1.64E-12	1.62E-13	4.44E-17	0,00E+00	0.00E+00	8.81E-15	3.36E-14	3.00E-13	0.00E+00
AP	mol H ⁺ eq.	4.03E-02	2.31E-03	-3.01E-06	0,00E+00	0.00E+00	1.35E-04	1.17E-04	8.96E-04	0.00E+00
EP-freshwater	kg P eq.	5.64E-06	1.57E-06	-4.73E-11	0,00E+00	0.00E+00	8.57E-08	6.48E-08	2.15E-07	0.00E+00
EP-marine	kg N eq.	8.68E-03	1.07E-03	-4.67E-07	0,00E+00	0.00E+00	6.32E-05	5.33E-05	2.29E-04	0.00E+00
EP-terrestrial	mol N eq.	1.06E-01	1.19E-02	-4.81E-06	0,00E+00	0.00E+00	7.05E-04	5.88E-04	2.52E-03	0.00E+00
POCP	kg NMVOC eq.	2.20E-02	2.10E-03	-1.40E-06	0,00E+00	0.00E+00	1.23E-04	1.45E-04	6.96E-04	0.00E+00
ADP-minerals&metals*	kg Sb eq.	6.68E-07	7.91E-08	-4.24E-11	0,00E+00	0.00E+00	4.31E-09	2.50E-08	1.30E-08	0.00E+00
ADP-fossil*	MJ	1.15E+02	1.05E+01	-1.32E-02	0,00E+00	0.00E+00	5.70E-01	4.42E-01	1.66E+00	0.00E+00
WDP	m ³	5.85E-01	4.86E-03	-2.07E-04	0,00E+00	0.00E+00	0.00E+00	1.76E-03	8.41E-03	0.00E+00
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									

* Disclaimer: 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.

Use of resources

Results for 1 m ² of TECHNO mineral fiber insulation slab with thermal conductivity 0,037 W/m*K										
Indicator	Unit	A1-A3	A4	A5	B7	C1	C2	C3	C4	D
PERE	MJ	4.65E+00	6.89E-01	- 6.50E-04	0.00E+00	0.00E+00	3.75E-02	3.55E-02	2.49E-01	0.00E+00
PERM	MJ	4.60E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	4.70E+00	6.89E-01	- 6.50E-04	0.00E+00	0.00E+00	3.75E-02	3.55E-02	2.49E-01	0.00E+00
PENRE	MJ	1.15E+02	1.05E+01	- 1.32E-02	0.00E+00	0.00E+00	5.71E-01	4.43E-01	1.66E+00	0.00E+00
PENRM	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
PENRT	MJ	1.15E+02	1.05E+01	- 1.32E-02	0.00E+00	0.00E+00	5.71E-01	4.43E-01	1.66E+00	0.00E+00
SM	kg	2.53E+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
RSF	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
NRSF	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
FW	m ³	5.08E+00	3.51E-02	- 1.84E-03	0.00E+00	0.00E+00	1.91E-03	1.10E-02	7.46E-02	0.00E+00
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									

Waste production and output flows

Waste production

Results for 1 m ² of TECHNO mineral fiber insulation slab with thermal conductivity 0,037 W/m*K											
Indicator	Unit	A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D	TOTAL
Hazardous waste disposed	kg	8.59E-09	4.57E-11	- 1.32E-12	0.00E+00	0.00E+00	2.49E-12	5.53E-12	8.52E-11	0.00E+00	8.73E-09
Non-hazardous waste disposed	kg	3.28E-02	1.70E-03	9.70E-07	0.00E+00	0.00E+00	9.28E-05	1.17E-04	8.48E+00	0.00E+00	8.51E+00
Radioactive waste disposed	kg	1.78E-03	1.32E-05	- 6.37E-07	0.00E+00	0.00E+00	7.17E-07	5.83E-06	1.81E-05	0.00E+00	1.82E-03

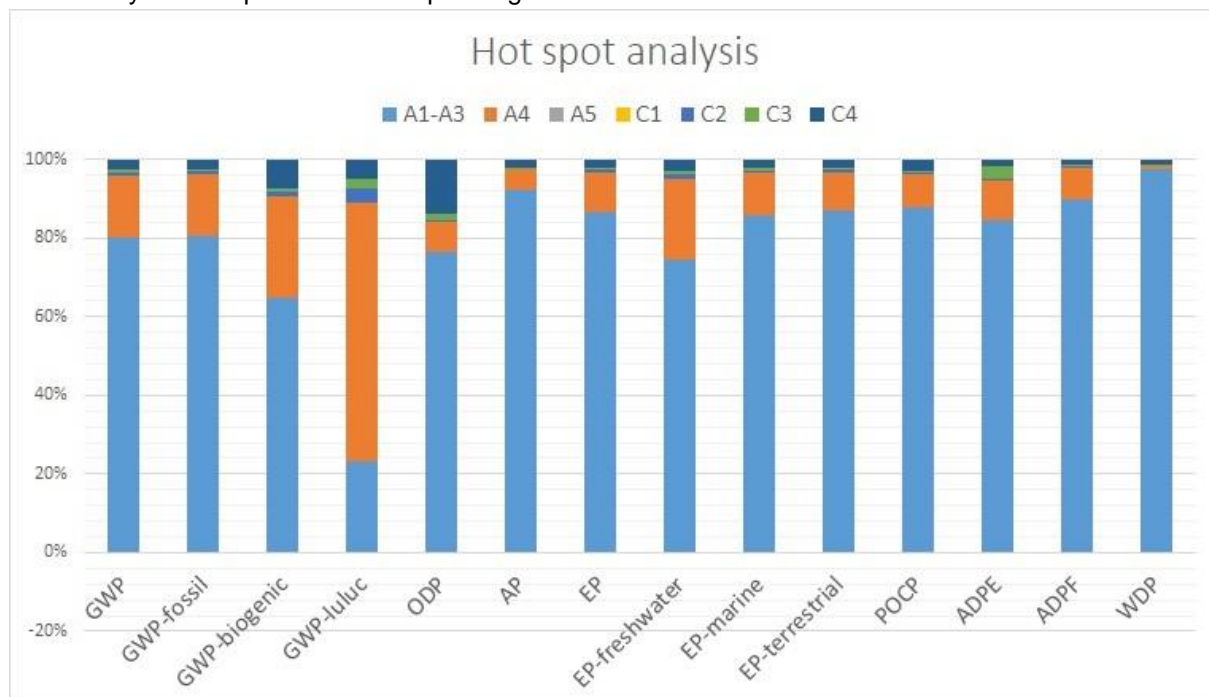
Output flows

Results for 1 m ² of TECHNO mineral fiber insulation slab with thermal conductivity 0,037 W/m*K											
Indicator	Unit	Tot.A1-A3	A4	A5	B1-B7	C1	C2	C3	C4	D	TOTAL
Components for re-use	kg	5.41E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.41E-01
Material for recycling	kg	1.84E-01	0.00E+00	4.71E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.31E-01
Materials for energy recovery	kg	0.00E+00	0.00E+00	4.16E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.16E-02
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.78E-01	0.00E+00	0.00E+00	0.00E+00	2.78E-01
Exported energy, thermal	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	4.94E-01	0.00E+00	0.00E+00	0.00E+00	4.94E-01

LCA Interpretation

Environmental Impacts

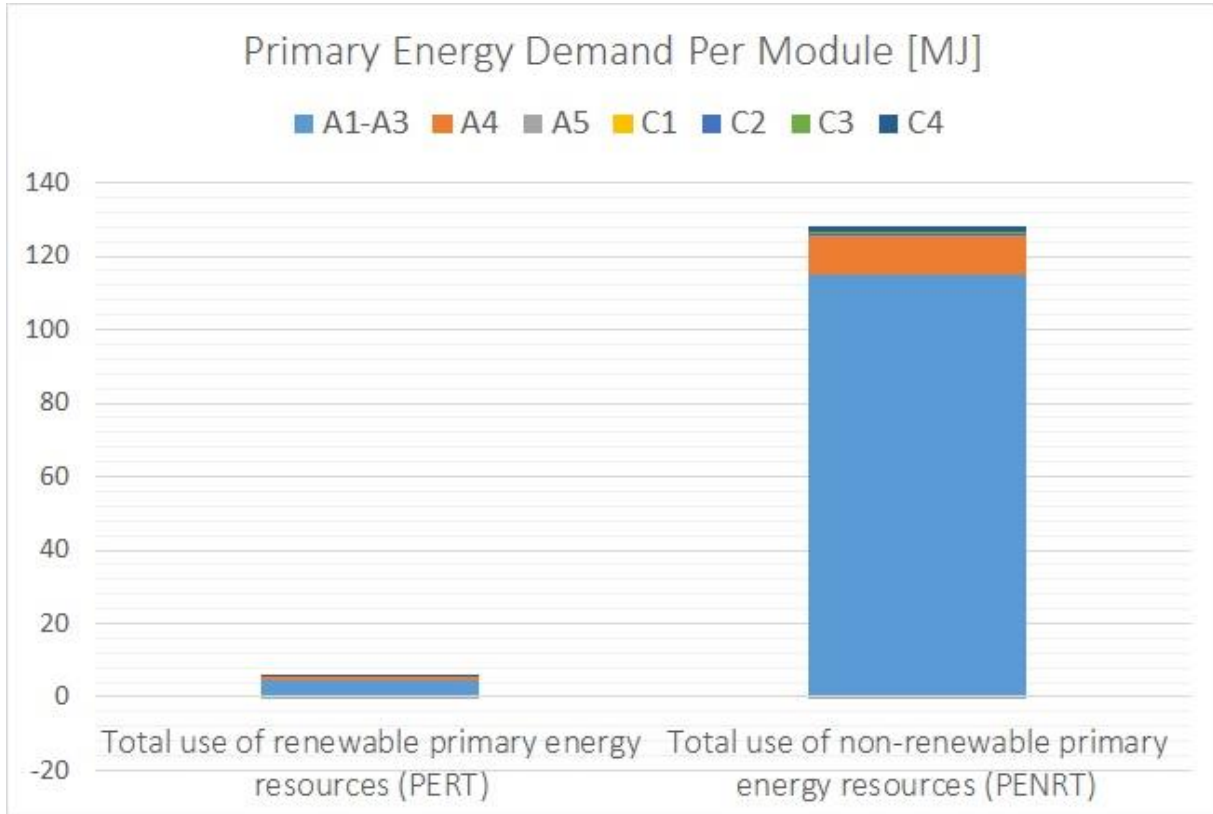
The hot spot analysis shows that modules A1-A3 are the dominant life cycle stages in most impact categories. The main contributors here are upstream processes such as coke production, phenol-formaldehyde resin production and power generation.



Due to the significant distances of raw material supply and distribution of finished products, the contribution of A4 module can be considered moderately significant. This is particularly the case in the category GWP-luluc that is mainly influenced by rail transports in module A4.

Use of resources

Throughout the life cycle of the investigated product, the predominance of consumption of non-renewable energy resources is evident, as shown in Figure below. The predominant consumption of fresh water occurs in modules A1-A3.



Waste categories

The vast majority (99.8%) of waste generated during the life cycle is non-hazardous waste, 99.57% of the mass of which is attributed to the stage of disposal of finished products in a landfill (module A4).

References

General Programme Instructions of the International EPD[®] System. Version 3.01.

PCR 2019:14 Construction products, version 1.11

c-PCR-005 Thermal Insulation Products version 2019-12-20

ISO 14025:2006, Environmental labels and declarations – Type III Environmental declarations – Principles and procedures, International Organization for Standardization (ISO)

ISO 14040:2006 Environmental management – Life cycle assessment – Principles and framework, International Organization for Standardization (ISO)

ISO 14044:2017 Environmental management – Life cycle assessment – Requirements and guidelines, International Organization for Standardization (ISO)

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

GaBi software version 10.6.1.35



<https://teplo.tn.ru/>



www.environdec.com