ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ČSN ISO 14025:2010
and EN 15804:2021+A2:2019+AC:2021

Organization	**UNION LESNÍ BRÁNA, a. s.**
Industry Program Operator	CENIA, Czech Environmental Information Agency, Executive Body of NPEZ Agency
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Fiberglass Thermal Acoustic Insulation

ROTAFLEX Super

1. General Information Declaration

UNION LESNÍ BRÁNA, a. s.	**ROTAFLEX Super**
Programme: „National programme of environmental labelling “- CR **Industry operator:** CENIA, Czech Environmental Information Agency, Executive body of the NPEZ Agency, Moskevská 1523/63, Praha 10, 101 00, www.cenia.cz ,	**Name and address of the manufacturer:** **UNION LESNÍ BRÁNA, a. s.** Novosedlická 248, Pozorka 417 03 Dubí
EPD registration number: **3015-EPD-030063010**	**Declared unit:** **1 kg of average uncoated product** – „Fiberglass thermal acoustic insulation ROTAFLEX Super“
Product category rules: EN 15804+A2:2019 as core PCR EN 16783:2017 **Publication Date:** 2022-04-12 **Valid until:** 2027-04-11 in accordance with EN 15804**+**A2:2019	**Product:** **Fiberglass thermal acoustic insulation ROTAFLEX Super**

UNION LESNÍ BRÁNA, a.s., based in northwest Bohemia in Dubí near Teplice, is an important and historically oldest Czech producer of mineral insulation materials (since the 60s first under the name Fibrex, later Rotaflex and in modern history – since 1992 - ROTAFLEX Super). It is engaged in the production of heat and sound insulation from glass fibres, intended mainly for construction of residential, civil, industrial, and agricultural buildings, but also usable in other industrial sectors. Their products come in a wide range of size, thickness and volume density and are offered in the form of rolls or boards.

Since 2013, gradual modernization of the entire production technology has begun, worth hundreds of millions of dollars. All reconstructions related to the production line were carried out in cooperation with leading consulting companies and experienced domestic and foreign suppliers of technologies in the field of glass melting and fiberizing. Innovations in the production process concerned the main technological nodes, not only the already mentioned melting (modernization of the melting furnace) and fiberizing of the molten glass, but also the distribution of the fibre in the forming hood, shaping of the fiberglass fleece, and finally its formatting and packaging into rolls or boards, as well as palletizing of these products for dispatch. This whole stage was completed by an extensive reconstruction at the end of 2020. The main parameter of these innovations was the achievement of modern comprehensive control of the production process, i.e., control of glass fibre forming and distribution online by x-raying of all production (GreCon dieffensor), control of thermal properties of products using the so-called lambdameter, inspection of the fibre diameter using the Diamscoppe device. These new technologies also included installation of equipment to minimize the negative impacts of production on the environment. All technical data are stored in an internal database and are then used to evaluate production efficiency and possible further optimization of the production process. For the purpose of quality, the management system in accordance with ISO 9001, the environmental management system in accordance with ISO 14001 and the safety system in accordance with ISO 45001 were certified. The products have received the Czech Quality Label Czech Made, which is awarded by the Czech Society for Quality-to-quality Czech products.

With regard to the possibility of comparing products **in the life cycle assessment of buildings** on the basis of their EPD, which is carried out by determining their contribution to the environmental properties of the building, it is necessary that the EPD of the construction products in question be prepared in accordance with the requirements of the standard **EN 15804+A2:2019** *Sustainability of construction works – Environmental product declaration – Core rules for the product category of construction products* and using PCR **EN 16783:2017** *Thermal insulation products - Product category rules (PCR) for products industrially manufactured and manufactured in situ*.

1. Product data

1.1.1. Product

The manufacturer produces heat and sound insulation from glass fibre RTX-2013 under the trademarks ROTAFLEX Super, DEKWOOL and IZOROLL the same technology and using the same production equipment.

The manufacturer supplies these main product groups according to the field of application:

Field of application	basic technical data - thermal conductivity (λ)

Pitched roof

Insulation used for thermal insulation of the unloaded pitched roof of your property.

- Thermal insulation band TP 01 0,039
- Thermal insulation band TP 02 0,038
- Rafter bands KP 01 0,037
- Rafter bands KP 02 0,035
- Rafter bands KP 03 0,033
- DEKWOOL G039 r 0,039
- DEKWOOL G035 r 0,035
- DEKWOOL G038 r 0,038
- DEKWOOL G033 r 0,033
- IZOROLL Profi 39 0,039
- IZOROLL Plus 35 0,035

Inner partition

Products intended in particular for insulation of inner partitions made of plasterboard or similar building materials

- UNI-board – multi-purpose insulation board 0,039
- Partition plates PDL 01 0,037
- Partition bands PP 01 0,037
- DEKWOOL DW r plate 0,037
- DEKWOOL DW r roll 0,037

Ventilated facades

Facade slabs designed for thermal insulation systems.

- Facade slabs FD 01 0,035
- Facade slabs FD 02 0,032

Acoustic Insulation

For insulation of walls and ceilings in living spaces,

- Acoustic plates ADP 01 0,035

Heavy floating floors

For acoustic insulation of floors in living spaces that dampen in particular impact noise

- TSPS 02 boards for impact noise attenuation 0,032

Special insulation

Insulation for special application, such as acoustic or technical insulation.

- Roll with aluminium foil
- Rolls with black woven fabric (glasseide)
- Rolls with black non-woven fabric (vlies)

The average volume density of products is 13,63 kg/m3.

The reaction to fire is A1.

Water vapour diffusion is MU1.

Detailed characteristics of each type of product are available on the manufacturer's website: http://www.rotaflex.cz/, where there is also a downloadable product catalogue.

Fig. 1 Production line

1.1.2. Product data sheet

The ROTAFLEX Super thermal insulation product is manufactured in accordance with **EN 13162+A1:2015** *Thermal insulation products for the construction industry - Industrially manufactured mineral wool (MW) products - Specifications*.

Furthermore, the standard **EN 13172:2012** *Thermal insulation products - Conformity assessment* is essential for the product.

Products are subject to EU Regulation 305/2011 (CPR) and a Declaration of Performance has been issued for the product (DoP).

Product packaging:

Most of the products is packed in rolls (using foil) or blocks and stored on pallets for transport.

1.1.3. Rules for use

The fields of application of the products are listed in Art. 1.1.1.

Products are manufactured and declared in accordance with the standards specified in 1.1.2. Products are subject to mandatory certification and the manufacturer issues the appropriate declaration of conformity.

Environment and health during use

Under normal conditions of use, the products do not produce any adverse health effects or release volatile organic compounds into the indoor air.

Due to the fields of application of the product, no environmental impacts and emissions to water, air or soil are expected.

Reference lifetime

Reference Life (RSL) for ROTAFLEX Super is not declared. For this type of thermal insulation products, the service life (ESL) is commonly estimated at 50 years (AT data).

1.1.4. Delivery method

The products are delivered in accordance with the standards specified in 1.1.2. Most of the products are packed in rolls (using foil) or blocks and stored on pallets for transport.

Product quality is ensured by an effective quality management system according to EN ISO 9001 and in accordance with technical regulations regarding the type of the product. The company also has a certified integrated environmental system according to EN ISO 14001, occupational health and safety according to the standard ČSN ISO 45001.

1.1.5. Basic raw materials and auxiliary materials

The main raw materials for the production of glass fibre are cullets (> 55 % hm.), sand (circa 10-14 %), soda ash (cca 8-10 %), dolomite (cca 6 %), borax (cca 8 %) and phonolite. Fibre interconnection is achieved by using about 4-5% binder based on phenol-formaldehyde resin in the finished product.

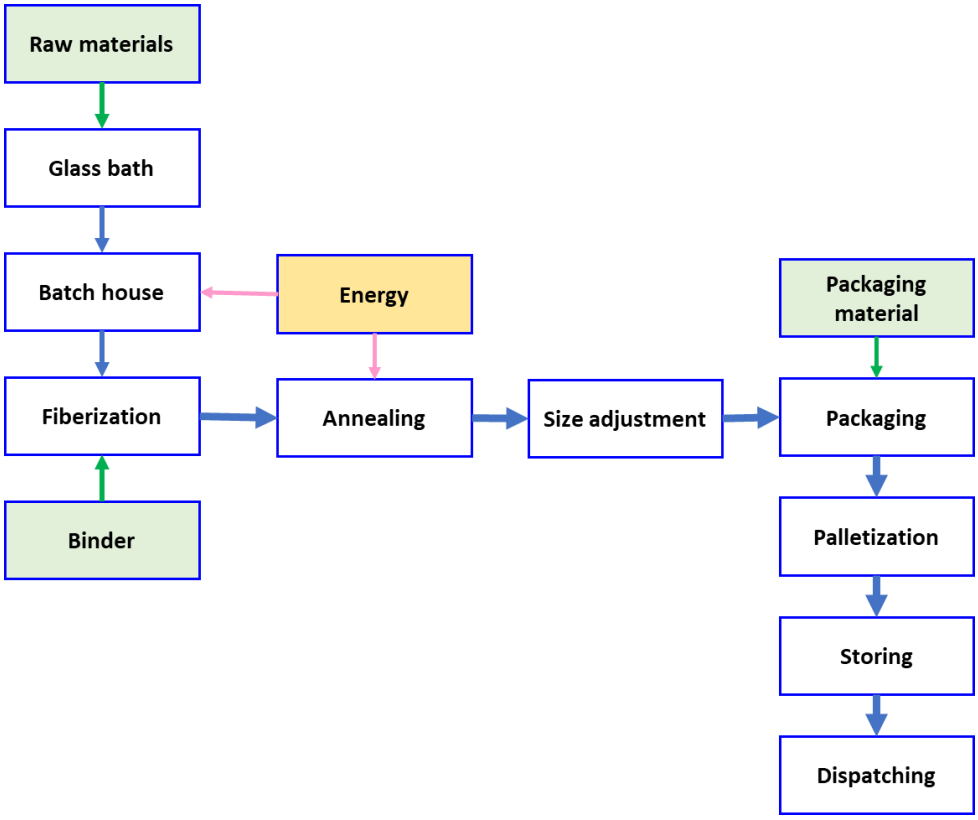
Substances on the List of Substances of Very High Concern subject to authorisation by the European Chemicals Agency are not present in ROTAFLEX Super in declarable quantities.

1.1.6. Production

Rotaflex Super is produced by fiberizing molten glass using rotation-pulling method. The fibres are bound by an artificial resin that polymerizes in the drying and curing furnace, giving the product its shape (thickness). The final dimensions are adjusted from the infinite strip using longitudinal trimmings to the desired width and using a chopper to the desired length. This way, two basic types of products are created: rolls and boards. Rolls are packed in a rolling machine; boards are packed into bales. Individual packages are further packed on pallets.

The manufacturing process is shown schematically in Fig. 2:

Fig.2: Scheme of the manufacturing process



1.1.7. Waste management

Waste generated during the production process is collected according to the type and reported in accordance with the regulations. Part of the waste from the product is returned (up to about 10%) to the production process.

Possibility to recycle used products (at the end of their service life)

At the end of the service life of the building, it is possible to remove thermal insulation from a dry building, sort out dirty or degraded material (in the amount of about 10%). Then, the material can be handled as follows:

- Tear and use as blown-in insulation
- Crush and return to the production technology in the amount of about 10% of the pulp in the product
- Crush and use as filler for concrete mixtures
- Landfill the unused material, waste type O (waste code 101103)

1.1.8. Other environmental information

The total amount of recycled content in the product is in accordance with ISO 14021, Section 7.8, larger than **65%**.

1.2. LCA: Calculation rules

1.2.1. Declared unit

The declared unit shall be 1 kg of the average uncoated product produced —**ROTAFLEX Super**.

All inputs and outputs of this report were considered as consumption or production related to the production of 1 kg of the mentioned product.

For the possibility of determining conversion factors for 1 m3 of the average product, the average density is considered 13,63 kg/m3.

Table 1 Declared unit and conversion factors

Identification	Unit	Value
Declared unit	kg	1
Volume density	kg/m^3	13,63
Conversion factor from kg to m^3	m^3	0,07337
Conversion factor from m^3 to kg	kg	13,63

2. System boundary according to the modular approach

The boundary of the product life cycle system consists of **the information module A1 – A3 "Production phase", "End of life cycle phase" C1-C4 and D** in accordance with EN 15804+A2:2019. The project report includes all relevant processes for the EPD type "***From cradle to gate with modules C1-C4 and module D*** "(cradle to gate with modules C1–C4 and module D).

Information on product system boundaries is shown in Table 2.

Table 2: Information about product system boundaries – information modules

Information about product system boundaries – information modules (**X** = Included, **ND** = module not declared)																
Production stage			**Construction stage**		**Usage stage**							**End-of-life stage**				**Additional information beyond the life cycle**
Supply of mineral resources	Transport	Production	Transport to the construction site	Construction/installation process	Usage	Maintenance	Repair	Replacement	Reconstruction	Operational energy consumption	Operating water consumption	Demolition/deconstruction	Transport	Waste treatment	Removal	Benefits and costs beyond the system. Potential for reuse, recovery, and recycling
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	**X**	**X**	ND	ND	ND	ND	ND	ND	ND	ND	ND	**X**	**X**	**X**	**X**	**X**

The system boundary is set to include both those processes that provide material and energy inputs to the system and subsequent production and transport processes up to the factory gate, and the treatment of all waste resulting from these processes.

The production stage includes the following modules:

- **A1** – extraction and processing of raw materials and production of packaging from input raw materials
- **A2** - transport of input raw materials from supplier to manufacturer, waste collection
- **A3 -** production of products, production of auxiliary materials and semi-finished products, energy consumption, including treatment of waste, up to reaching end-of-waste or after the last material residues have been removed during the production phase.

Data provided by UNION LESNÍ BRÁNA, a. s. for the period 12/2020-05/2021 have been used. This time data was chosen with regard to significant changes in production technology affecting the structure and quantification of input data. From August to October 2020, the melting unit was overhauled, and a new drying line was installed. Both pieces of key equipment have been significantly upgraded. The data for this period are relevant enough to capture production throughout the year. During the remaining months, there are no significant changes in production or in the technological process. Part of the modernization was equipment for combustion products cleaning. After the installation of these devices, an authorized emission measurement was carried out. This measurement showed a reduction in emissions in all monitored parameters.

The end-of-life stage includes modules:

- **C1,** deconstruction, demolition; of the product from the building, including its dismantling or demolition, including the initial classification of materials at the site of construction
- **C2,** transport to the waste treatment site; transport of the discarded product as part of the waste treatment, e.g., to the recycling site, and transport of the waste, e.g., to the final disposal site.
- **C3,** treatment of waste for re-use, recovery and/or recycling, e.g., collection of waste fractions from deconstruction, treatment of waste from material flows intended for re-use, recycling, and energy recovery.
- **C4,** disposal of waste, including its pre-treatment and management of the disposal site

The benefits and costs beyond the product system are set out in Module D.

Module D includes:

- **D,** potential for reuse, recovery and/or recycling, expressed in net impacts or benefits.

The boundaries of the product system are considered in such a way that they **include only production processes, not administrative activities**.

As **end-of-life scenarios for** products (C1-C4, D), data resulting from an expert estimate of the possibility of reprocessing part of this glass insulation after the deconstruction of the building (as part of the take-back as a replacement for part of the inputs to production, reprocessing into another product – e.g., blown-in insulation, etc.) were used. These schemes are:

Module C1

Decomposition and/or dismantling of insulation are part of the demolition of the entire building. Insulating material is dismantled without any relevant energy consumption. In this case, it is assumed that the impact on the environment is very small and can be neglected.

Module C2

Transport from the dismantled building is executed by a truck with a load capacity of 7.5 t (EURO 5) to the landfill of inert material as demolition of a mixed building, the estimated transport distance according to calculations: 30 km to the recycling centre and 15 km to the landfill.

Module C3

A scenario where 90% of the glass wool is deposited in an inert landfill is envisaged. For the use of cleaned insulation as a recyclable material, 10% is considered (treatment for blown-in insulation, filler for concrete mixtures, take-back for return to production).

Module C4

90% of the dismantled glass wool is disposed of as mixed construction debris in a landfill of inert material, without considering the energy use of landfill gas from (small) organic components.

Potential for reuse, recovery, and recycling (D)

The scenario of Module D considers the 10 % saving of primary raw material inputs (without consideration of transport and energy) in another product system.

2.1. Preconditions and measures taken

Information modules **A4 to A5**, which are intended to provide additional information beyond the production stage, have not been included in the LCA due to the difficult availability of input data and are therefore not declared.

Information modules from the **usage stage B1 to B7** are also not declared because according to EN 16783 these types of products do not require maintenance, repair, or replacement during the normal life in the usage stage, provided that they are used correctly. Also, during the usage stage, they do not require consumption of energy or water.

The reference lifetime of the products is also not declared because of unavailability of representative data on the operating conditions in the usage stage of the product.

In addition, the production process includes a so-called closed-loop-recycling). It is the use of production waste that is returned to the production process. These inputs are not considered in the study to avoid double counting of primary raw material inputs.

Within the product system studied, there are also co-products – fiberglass granulates and glass fibre for the production of filters, which are for sale. The quantity is indicated in the input data and the input data has been reduced by this amount, except for the consumption of packaging material for finished products.

For the study, all operational data related to the consumption of main and auxiliary materials for the production of the product, energy data, diesel consumption and the distribution of annual waste and emissions according to the plant records were taken. For all inputs and outputs considered, transport costs were considered or differences in transport distances were recognised.

From the point of view of the waste produced, only the waste clearly related to production activities was included in the analysis – see Chapter. 3.3.2

For some input data, due to their complexity in obtaining them, alternative methods have been chosen in the form of a qualified calculation based on the available information. Some input data was converted into units that were needed for the selected generic process data in the environmental impact assessment calculation program.

These are:

- Energy data relating to **diesel** expressed in CU – were determined by calculation based on data on diesel consumption in litres and a coefficient of 0,845 kg/l for diesel and an energy value of 42,6 MJ/kg.
- Energy data relating to fuel for the operation of means of transport for in-house transport for **CNG**– were determined by calculation based on data on the consumption of kg of CNG and the energy value 87,86 MJ/kg
- Data on natural gas consumption in Kwh – were determined by conversion from the consumed quantity to MJ (1 kWh = 3,6 MJ)
- Data on production of emissions to air and water were calculated on the basis of measurement protocols and recalculated for the reference period
- Data on the production of waste were taken from the continuous register of waste for the reference period, except for waste plastic (taken as a value equal to the input amount of packaging material of the feedstock) and iron (taken as the value of the required number of spare parts)
- Weight of the packaging material for the packaging of the output products was determined by direct weighing.

2.2. Cut-off criteria

The processes required for the installation of production equipment and the construction of infrastructure were not included in the analysis. Administrative processes are not included either – inputs and outputs are balanced on the production stage.

Data on coating materials were not included in the inventory data.

2.3. Sources of environmental data

All inputs and outputs were entered in SI units, namely:

- Material and auxiliary inputs and product outputs in kg, pcs, m^3
- Sources used as energy input (primary energy), in MWh or MJ and GJ, including renewable energy sources (hydropower, wind energy)
- Water consumption in kg or m^3
- Inputs related to transport in km (distance), tkm (material transfer) and in kg (diesel consumption)
- Time was stated in practical units depending on the scale of the assessment: minutes, hours, days, years.

The time range of the required specific data provided by UNION LESNÍ BRÁNA, a. s., for the purpose of this report was set as a representative period calendar **12/2020-05/2021**. For this period, all available data were provided by the organization for their further processing.

The basic source of the necessary data in the field of production, purchasing, maintenance, etc. was the information system – IS Dialog 3000 Skylla, or operational records of maintenance activities. The annual ISPOP waste production report and the operational records for the production plant were used to determine the waste production. Only those types of waste that are related to the production stage were included in this report, such as waste destined for disposal in a landfill and waste for energy recovery, which have no benefit to the organisation in the product system because these benefits will be allocated to another product system that will use them as inputs.

Measured values from monitoring and measuring emissions leakage to air and water were used to determine the amount of emissions from the production process.

For the following inputs it was proceeded this way (direct data not available):

- Distances on the transport of inputs and outputs (waste) – data from Google maps were used

For the complete analysis of environmental parameters were used:

- computing software SimaPro, version 9.3 SimaPro Analyst (database Ecoinvent version 3.8)

2.4. Data quality

The data used to calculate the EPD meet the following principles:

Time period: For specific data, manufacturer's data from 12/2020 to 05/2021 have been used. This is due to significant technological changes in the production process. For generic data, the data of the Ecoinvent version database 3.8 have been used. Based on the evaluation in accordance with EN 15804+A2, Annex E, tab. E.1 the generic data used meet the quality level - medium.

Technological aspect: Data corresponding to the current production of individual types of sub-products and corresponding to the current state of new technologies in the plant used have been used.

Based on the evaluation in accordance with EN 15804+A2, Annex E, tab. E.1 the generic data used meet the level of quality - good.

Completeness and complexness aspect: Most of the input data is based on consumption balances, which are precisely recorded in the information system. As part of the completeness check, the company UNION LESNÍ BRÁNA, a. s. was visited, and it was checked whether all used inputs/outputs are entered in the records. The reliability of the source of specific data is determined by the uniformity of the methodology of the information system collection method.

Geographical aspect: The generic data used from the Ecoinvent database are used with validity for the Czech Republic (e.g., energy inputs) and if data are not available for the Czech Republic, data valid for the EU or according to the supplier's location are used. Based on the evaluation according to EN 15804+A2, Annex E, tab. E.1 used generic data meet the level of quality - medium.

Consistency aspect: Uniform aspects are used throughout the scope of the report (allocation rules, age of data, technological scope of validity, time scope of validity, geographical scope of validity).

Credibility aspect: All important data were checked to ensure cross-comparison of weight balances.

2.5. Period considered

As the period of the required specific data, provided by union LESNÍ BRÁNA, a. s., for the purpose of this report, a calendar period **12/2020-05/2021** was determined as a representative period.

2.6. Allocation

Within the product system studied, there are also co-products – fiberglass granulate and glass fibre for the production of filters, which are for sale. The quantity is indicated in the input data and the input data has been reduced by this amount, except for the consumption of packaging material for finished products.

2.7. Comparability

Environmental product declarations from different programmes may not be comparable. Comparison or assessment of EPD data is only possible if all compared data reported in accordance with EN 15804+A2:2019 have been determined according to the same rules.

2.8. Product variability

The resulting data are given for **1 kg of average uncoated product ROTAFLEX Super**.

2.9. LCA: Results

Information on environmental impacts is indicated in the following tables. The individual results for the impact categories are presented in Tables 3 and 4. Tables 5 to 7 provide additional environmental information. They are related to the declared unit (DJ) – **1 kg of the average uncoated product ROTAFLEX Super**.

The impact assessment was carried out using the characterisation factors used in the European Life Cycle Reference Database (ELCD) provided by the European Commission – Directorate-General of the Joint Research Centre – Institute for Environment and Sustainability.

Table 3: Parameters describing **the basic environmental impacts**

Ultimately LCA – Parameters describing basic environmental impacts (DJ = 1 kg of the product)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Global Warming Potential total (**GWP-total**)	kg CO_2 Eq.	2,14E+00	0	3,54E-03	1,81E-03	4,26E-03	-3,30E-02
Global Warming Potential fossil fuels (**GWP-fossil**)	kg CO_2 eq.	2,16E+00	0	3,54E-03	1,81E-03	4,24E-03	-3,30E-02
Global Warming Potential biogenic (**GWP-biogenic)**)	kg CO_2 eq.	-1,78E-02	0	3,21E-06	3,79E-06	1,80E-05	-5,85E-05
Global Warming Potential land use and land use change (**GWP-luluc**)	kg CO_2 eq.	1,95E-03	0	1,66E-06	8,54E-07	9,55E-07	-4,56E-05
Depletion potential of the stratospheric ozone layer (**ODP**)	kg CFC 11 eq.	1,22E-07	0	7,95E-10	4,71E-10	2,10E-09	-4,42E-09
Acidification potential, Accumulated Exceedance (**AP**)	mol H+ eq.	8,94E-03	0	1,41E-05	1,75E-05	4,16E-05	-1,74E-04
Eutrophication potential, fraction of nutrient reaching freshwater end compartment (**EP freshwater**)	kg P eq.	2,57E-03	0	2,66E-07	1,95E-07	2,42E-07	-6,33E-06
Eutrophication potential, fraction of nutrient reaching marine end compartment (**EP marine**)	kg N eq.	1,96E-03	0	4,09E-06	7,10E-06	1,57E-05	-2,59E-05
Eutrophication potential, Accumulated Exceedance (**EP terrestrial**)	mol N eq.	1,72E-02	0	4,47E-05	7,76E-05	1,73E-04	-4,23E-04
Formation potential of tropospheric ozone (**POCP**)	kg NMVOC eq.	4,47E-03	0	1,37E-05	2,17E-05	4,94E-05	-8,20E-05
Abiotic depletion potential for **non-fossil resources (ADP minerals & metals)**)	kg Sb eq.	8,13E-06	0	1,61E-08	2,97E-09	8,28E-09	-5,65E-07
Abiotic depletion for fossil resources potential (**ADP fossil fuels**)	MJ, calorific value	3,23E+01	0	5,28E-02	3,28E-02	1,37E-01	-5,73E-01
Water (user) deprivation potential, deprivation-weighted water consumption (**WDP**)	m3 eq. scarcity	8,65E-01	0	1,75E-04	7,19E-04	3,82E-04	-4,29E-02

Table 4 Parameters describing **additional environmental impacts**

LCA result – Parameters indicating additional environmental impacts (DJ = 1 kg of the product)							
Indicator	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Potential incidence of disease due to Particulate Matter emissions (**PM**)	Occurrence of the disease	4,71E-08	0	2,63E-10	1,17E-09	9,22E-10	2,70E-09
Potential Human exposure efficiency relative to U235 (**IRP**)	kBq U235 eq.	5,15E-01	0	2,80E-04	1,90E-04	6,61E-04	1,79E-03
Potential Comparative Toxic Unit for ecosystems (**ETP-fw**)	CTUe	3,27E-02	0	6,80E-06	3,86E-06	1,56E-05	3,23E-03
Potential Comparative Toxic Unit for humans (**HTP-c**) – cancer effects	CTUh	1,98E-09	0	1,56E-13	5,40E-14	1,08E-13	1,94E-10
Potential Comparative Toxic Unit for humans (**HTP-nc**) – non-cancer effects	CTUh	6,60E-11	0	1,13E-12	7,75E-14	5,03E-13	3,29E-12
Potential Soil Quality Index (**SQP**)	dimensionless	6,57E+00	0	3,12E-02	3,49E-02	3,05E-01	1,21E-01

Table 5: Parameters describing **resource consumption**

LCA result – Parameters describing resource consumption (DJ = 1 kg of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Use of renewable primary energy excluding renewable primary energy resources used as raw materials **(PERE)**	MJ	4,28E-01	0	0,00E+00	5,35E-04	5,69E-08	0,00E+00
Use of renewable primary energy resources used as raw materials (**PERM**)	MJ	0,00E+00	0	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) (**PERT**)	MJ	4,28E-01	0	0,00E+00	5,35E-04	5,69E-08	0,00E+00
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials (**PENRE**)	MJ	9,97E+00	0	7,92E-03	7,38E-03	2,83E-02	0,00E+00
Use of non-renewable primary energy resources used as raw materials (**PENRM**)	MJ	2,05E+02	0	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) (**PENRT**)	MJ	2,15E+02	0	7,92E-03	7,38E-03	2,83E-02	0,00E+00
Use of secondary material (**SM**)	kg	6,70E-01	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of renewable secondary fuels (**RSF**)	MJ	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Use of non-renewable secondary fuels (**NRSF**)	MJ	7,61E-03	0	0,00E+00	9,50E-06	1,01E-09	0,00E+00
Net use of fresh water (**FW**)	m^3	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 6 Other environmental information **- waste category description**

LCA result — Other environmental information — waste category description (DJ = 1 kg of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Hazardous waste disposed (**HWD**)	kg	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Non-hazardous waste disposed (**NHWD**)	kg	3,37E-02	0	0,00E+00	0,00E+00	9,00E-01	0,00E+00
Radioactive waste disposed (**RWD**)	kg	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00

Table 7 Other environmental information **- description of output flows**

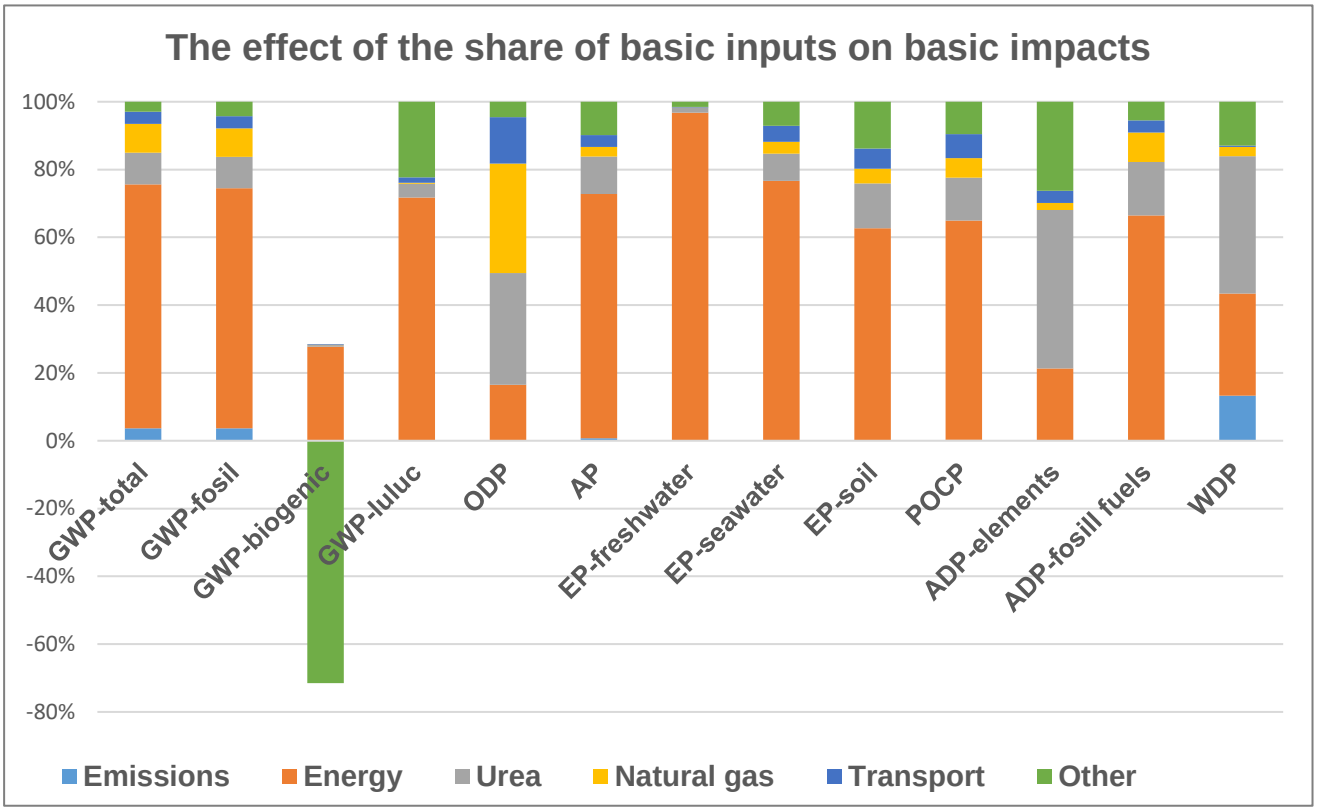
LCA result - Other environmental information - description of output flows (DJ = 1 kg of the product)							
Parameter	**Unit**	**A1-A3**	**C1**	**C2**	**C3**	**C4**	**D**
Components for re-use (**MFR**)	kg	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Materials for recycling (**MER**)	kg	2,59E-04	0	0,00E+00	1,00E-01	0,00E+00	1,00E-01
Materials for energy recovery (**EEE**)	kg	1,30E-04	0	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Exported energy (**EET**)	MJ per energy carrier	0,00E+00	0	0,00E+00	0,00E+00	0,00E+00	1,94E-03

Table 8 Information describing the biogenic carbon content of the plant gate

LCA result – Information describing the biogenic carbon content at the plant gate (DJ = 1 kg of the product)		
Parameter	**Unit**	**At the plant gate**
Biogenic carbon content in product	kg C	0
Biogenic carbon content in accompanying packaging	kg C	3,46E-02

2.9.1. LCA: Interpretation

The impact of basic groups of inputs on basic environmental impacts is shown in Figure 3:
Figure. 3 Impact of the share of basic inputs on the basic impacts



The picture shows that **electricity consumption and its energy mix have** a very significant impact on environmental impacts. (CZ).

3. LCA: scenarios and other technical information

Information modules A4, A5 and B1-B7 were not included in the LCA analysis.

4. LCA: Additional information

EPD does not include additional documentation related to the declaration of supplementary information.

5. References

ČSN ISO 14025:2010 Environmentální značky a prohlášení - Environmentální prohlášení typu III - Zásady a postupy (Environmental labels and declarations - Type III environmental declarations - Principles and procedures)

ČSN EN 15804+A2:2020 Udržitelnost staveb - Environmentální prohlášení o produktu - Zásadní pravidla pro produktovou kategorii stavebních výrobků (Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products)

ČSN EN ISO 14040:2006 Environmentální management - Posuzování životního cyklu - Zásady a osnova (Environmental management - Life Cycle Assessment - Principles and Framework)

ČSN EN ISO 14044:2006 Environmentální management - Posuzování životního cyklu – Požadavky a směrnice (Environmental management - Life Cycle Assessment – Requirements and guidelines)

ČSN ISO 14063:2007 Environmentální management - Environmentální komunikace - Směrnice a příklady (Environmental management - Environmental communication - Guidelines and examples)

ČSN EN 15643-1:2011 Udržitelnost staveb - Posuzování udržitelnosti budov - Část 1: Obecný rámec (Sustainability of construction works - Sustainability assessment of buildings - Part 1: General framework)

ČSN EN 15643-2:2011 Udržitelnost staveb - Posuzování udržitelnosti budov - Část 2: Rámec pro posuzování environmentálních vlastností (Sustainability of construction works - Assessment of buildings - Part 2: Framework for the assessment of environmental performance)

ČSN EN 15942:2013 Udržitelnost staveb - Environmentální prohlášení o produktu - Formát komunikace mezi podniky (Sustainability of construction works - Environmental product declarations - Communication format business-to-business)

TNI CEN/TR 15941:2012 Udržitelnost staveb - Environmentální prohlášení o produktu - Metodologie výběru a použití generických dat (Sustainability of construction works - Environmental product declarations - Methodology for selection and use of generic data)

ILCD handbook - JRC EU, 2011

Zákon č. 541/2020 Sb. v platném znění (Zákon o odpadech) / Act. No. 541/2020 Coll., as amended (Waste Act)

Vyhláška č. 8/2021 Sb. Katalog odpadů – Katalog odpadů / Decree No. 8/2021 Coll. Waste catalogue – Waste catalogue

Nařízení Evropského parlamentu č. 1907/2006 o registraci, hodnocení, povolování a omezování chemických látek a o zřízení Evropské agentury pro chemické látky - REACH (registrace, evaluace a autorizace chemických látek) / Regulation (EC) No 1907/2006 of the European Parliament concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency - REACH (Registration, Evaluation and Authorisation of Chemicals

Nařízení Evropského parlamentu a Rady (ES) č. 1272/2008 o klasifikaci, označování a balení látek a směsí, o změně a zrušení směrnic 67/548/EHS a 1999/45/ES a o změně nařízení (ES) č. 1907/2006 (nařízení CLP) / Regulation (EC) No 1272/2008 of the European Parliament and of the Council on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC and amending Regulation (EC) No 1907/2006 (CLP Regulation)

SimaPro LCA Package, Pré Consultants, the Netherlands, www.pre-sustainability.com

Ecoinvent Centre, www.Ecoinvent.org

Explanatory documents are available from the Head of Quality Management Department of UNION LESNÍ BRÁNA, a. s.

6. EPD verification

CEN standard EN 15804+A2 serves as the core PCR	
Independent verification of the declaration and data, according to EN ISO 14025:2010: ☐ Internal ☒ External	
Third party verifier: Technický a zkušební ústav stavební Praha, s.p. Prosecká 811/76a, Praha 9, 190 00 Czech Republic Certification Body for EPD, accredited by CAI - Czech Accreditation Institute, under No. 51/2021	

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