# URSA GLASSWOOL slabs with lambda $\lambda_d$=0,035 W/mK


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**EPD program operator:**

Building Research Institute (ITB), 00-611 Warsaw, Filtrowa 1, www.itb.pl
Contact person: Dominik Bekierski - d.bekierski@itb.pl
ITB is the verified member of The European Platform for EPD program operators and LCA practitioners www.eco-platform.org

**Manufacturer:**

**URSA Polska Sp. z o.o.**
Address: Armii Krajowej 12; 42-520 Dąbrowa Górnicza
Telephone number: +48 322680129
Website: www.ursa.pl
E-mail address: ursa.polska@ursa.com
Technical Contact: Michał Dylewski - michal.dylewski@ursa.com

**Basic information**

This declaration is the type III Environmental Product Declaration (EPD) based on EN 15804 and verified according to ISO 14025 by an external auditor. It contains the information on the impacts of declared construction materials on environment and their aspects verified by the independent Body according to ISO 14025. Basically, a comparison or evaluation of EPD data is possible only if all the compared data were created according to EN 15804 (see point 5.3 of the standard).
**Life cycle:** A1-A3 modules in accordance with EN 15804 (Cradle to Gate)
**The year of preparing the EPD:** 2017
**Declared durability:** Under normal conditions, glasswool products are expected to last the service life of a building (30 years).
**Product standard:** PN-EN 13162+A1:2015-04 - Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification
**PCR:** EN 16783:2017, PCR A (PCR based on EN 15804)
**Declared unit:** FU:1 $m^2$ K/W for thermal conductivity $\lambda_d$=0,035 W/mK, weight=0,69 kg
**Reasons for performing LCA:** B2B
**Representativeness:** Polish product

## Manufacturer and Product Information

URSA offers glass mineral wool insulation materials to cover different building applications. URSA

URSA GLASSWOOL is a mineral wool with thermal and acoustic insulation properties. Due to fire-resistant properties, the product can be used as thermal and/or acoustic insulation of pitched roofs, cold roofs, partitions, external walls and ceilings.

### Application

URSA GLASSWOOL is a product for application in terms of thermal insulation especially used as an insulation of pitched roof, attic, cold roof, external walls, internal walls, floors, internal sound absorbers. Non-combustible, soundproof, vapor permeable, compressed, resistant to molds and fungi, made of elastic fibers - the material effectively wedges between rafters without mechanical application depending on the spacing of the rafters.

Insulation properties of glass wool allow to keep heat in room during winter and provide cold during the heat period. URSA GLASSWOOL protects also against unwanted noise, and as a non-flammable material, class A reaction to fire (euroclass) A1 reduces the risk of fire.

URSA GLASSWOOL slabs and plates with lambda 0,035 W/mK are produced in Dąbrowa Górnicza factory. Product's description is shown below in Table 1.

**Table 1. Characteristic of URSA GLASSWOOL plates and slabs produced in Dąbrowa Górnicza**

| **SLABS**:URSA DP 35, URSA MATA 35, URSA EUROMATA 35, URSA MULTISKIVA 35, URSA NORPLATTE 35, URSA SILENTIO 35, URSA TWP 35 (trade names for URSA GLASSWOOL plate with thermal conductivity $\lambda_d$=0,035 W/mK) | |
|---|---|
| Thickness [mm] | 20-250 |
| Width [mm] | 300-1250 |
| Length [mm] | 300-3000 |
| Colour | undefined |
| Finishes | no |

### Distinguishing features

Glass wool mostly produced with products coming from recycling (recovery) contains most important insulation features:

- durability and dimensional stability,
- constancy of insulation properties.

**Additional features:**

- fire resistance (euroclass A1),
- compression capability,
- low weight,
- possibility of transport and storage,
- no resistance to permeating water vapor.

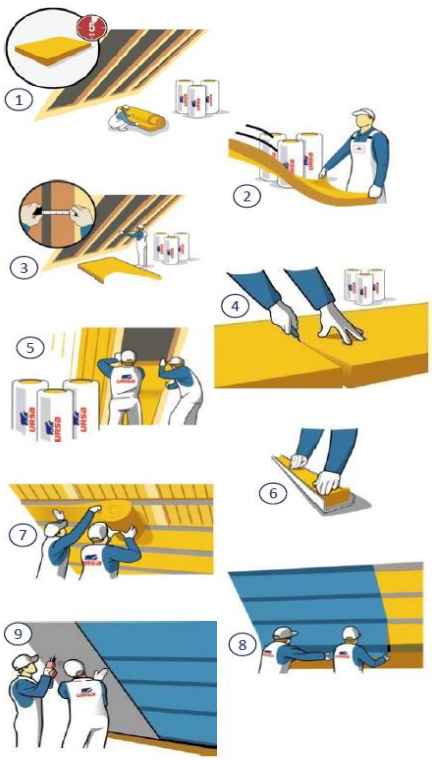

**Figure 1.** Application scheme for URSA GLASSWOOL

## LIFE CYCLE ASSESSMENT (LCA) – general rules applied

### Allocation

The allocation rules used for this EPD are based on general ITB-PCR A and EN 13162. The

glasswool production is a line process with multiple co-products in one factory in Dąbrowa Górnicza. Allocation was done on product mass basis.

All impacts from raw materials extraction are allocated in A1 module of EPD. 99,9% of impacts from line production were inventoried and allocated to all glasswool types production. Municipal waste and waste water of whole factory were allocated to module A3. Electricity was inventoried for whole production process. Emissions were measured separately and presented in A3 module.

**System limits**

The life cycle analysis of the examined products covers “Product Stage”, A1-A3 modules (Cradle to Gate) in accordance with EN 15804+A1 and ITB-PCR A. Details on systems limits are provided in product specific report. All materials and energy consumption inventoried in factory were included in calculation. Office impacts were also taken into consideration. In the assessment, all significant parameters from gathered production data are considered, i.e. all material used per formulation, utilised thermal energy, internal fuel and electric power consumption, direct production waste, and all available emission measurements. This study also takes into account some material flows of less than 1% and energy flows with a proportion of less than 1 %. It can be assumed that the total sum of omitted processes does not exceed 5% of all impact categories. In accordance with EN 15804, machines and facilities (capital goods) required for and during production are excluded, as is transportation of employees.

**A1 and A2 Modules: Raw materials supply and transport**

Raw materials for glass wool production come from local suppliers and from more distant locations. Data on transport of the different products to the manufacturing plants is collected and modelled for factory by assessor. Means of transport include truck, train and ship, and Polish and European fuel averages are applied.

**A3: Production**

The figure 2 shows the working process during the production of URSA GLASSWOOL. The raw materials are measured and sent to a melting furnace. In the process of glass wool production the raw materials are sand, limestone and soda ash, as well as recycled cullets and off-cuts from the production process. Recycled content in URSA factory in Dąbrowa Górnicza accounts from 66% in the mass basis. The reuse of off-cuts and recycled materials has helped to steadily reduce the energy input required to produce glass wool.

**Furnace**

The raw materials are melted in a furnace at temperatures, typically between 1,300°C and 1,500°C. The smoke created during this process is filtered and flue gases are cleaned to minimize any environmental impact.

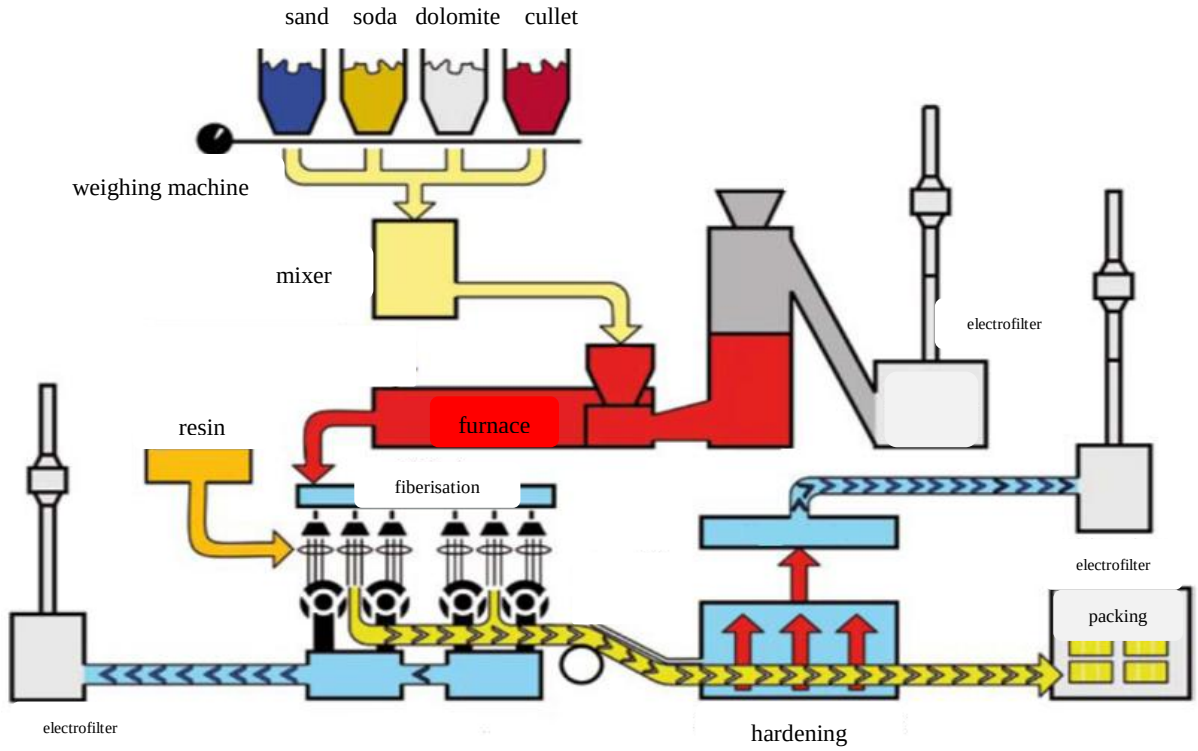


**Figure 2.** Production scheme for URSA GLASSWOOL

### Spinning

The droplets of melted glass exiting the furnace are spun into fibers. Droplets fall through tiny holes in rapidly rotating spinners. This process shapes it into fibers.

### Binding

Small quantities of binding agents such as a resin are added to the fibers. The structure and density of the product are adapted according to its final usage.

### Curing

The glasswool is then hardened in a curing oven at around 200°C.

### Cutting

The glasswool is cut to the required size and shape into slabs or plates or it can be customized for use with other products. Off-cuts and other wool scraps are recycled back into the production process, which further reduces inputs and energy requirements.

### Packaging

Glasswool is compressed during packaging to reduce its volume. This makes it easier to handle and results in lower carbon emissions due to transportation.

### Gases and waste

Gases emitted during the production process are cleaned using electrofilters in order to minimize the environmental impact. Water use in the production process is generally confined to closed circuit systems. This has a twofold advantage: reduces fresh water consumption and eliminates by-products.

### Data collection period

The data for manufacture of the examined products refer to period between dates 1.10.2015-30.09.2016. The life cycle assessments were prepared for locations in Poland as reference area.

### Data quality

The values determined to calculate the LCA originate from verified URSA Polska inventory data.

### Assumptions and estimates

The impacts of the representative URSA GLASSWOOL products for each glasswool product were aggregated using weighted average. The weighted average method was used according to the percentage of each product in glass wool based on the relation to whole production quantity. Impacts were inventoried and calculated for all products in glasswool product group.

### Calculation rules

LCA was done in accordance with PCR A document.

### Databases

The data for the processes come from the following databases: Ecoinvent, Ullmann's, ITB-Data. Specific data quality analysis was a part of external ISO 14001 audit. Characterization factors are CML ver. 4.2 based on EN 15804:2013+A1 version (PN EN 15804+A1:2014-04)

## LIFE CYCLE ASSESSMENT (LCA) - Results

### Declared unit

The declaration refers to functional unit (FU) - 1 $m^2$ glasswool insulation material with a thickness that gives a declared thermal resistance of $R_d$= 1 $m^2$ K/W.

**Table 2. System boundaries for environmental characteristic for URSA GLASSWOOL**

| Environmental assessment information (MNA – Module not assessed, MD – Module Declared, INA – Indicator Not Assessed) | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Product stage | | | Construction process | | Use stage | | | | | | | End of life | | | | Benefits and loads beyond the system boundary |
| Raw material supply | Transport | Manufacturing | Transport to construction site | Construction-installation process | Use | Maintenance | Repair | Replacement | Refurbishment | Operational energy use | Operational water use | Deconstruction demolition | Transport | Waste processing | Disposal | Reuse-recovery-recycling potential |
| A1 | A2 | A3 | A4 | A5 | B1 | B2 | B3 | B4 | B5 | B6 | B7 | C1 | C2 | C3 | C4 | D |
| MD | MD | MD | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA | MNA |

# URSA GLASSWOOL slabs ($\lambda_d$=0,035 W/mK)

| Environmental impacts: (FU) | | | | | |
|---|---|---|---|---|---|
| **Indicator** | **Unit** | **A1** | **A2** | **A3** | **A1-A3** |
| Global warming potential | [kg $CO_2$ eq.] (100 years) | 0,28 | 0,03 | 0,66 | 0,97 |
| Depletion potential of the stratospheric ozone layer | [kg CFC 11 eq.] | 2,39E-08 | 0,00E+00 | 0,00E+00 | 2,39E-08 |
| Acidification potential of soil and water | [kg $SO_2$ eq.] | 8,91E-04 | 2,58E-04 | 8,35E-03 | 9,50E-03 |
| Formation potential of tropospheric ozone | [kg Ethene eq.] | 9,67E-05 | 1,48E-05 | 1,49E-04 | 2,61E-04 |
| Eutrophication potential | [kg $(PO_4)^{3-}$ eq.] | 4,57E-04 | 4,50E-05 | 1,49E-03 | 1,99E-03 |
| Abiotic depletion potential (ADP-elements) for non-fossil resources | [kg Sb eq.] | 1,09E-04 | 0,00E+00 | 2,45E-06 | 1,11E-04 |
| Abiotic depletion potential (ADP-fossil fuels) for fossil resources | [MJ] | 6,08 | 0,80 | 20,96 | 27,84 |
| **Environmental aspects on resource use: (FU)** | | | | | |
| **Indicator** | **Unit** | | | | |
| Use of renewable primary energy excluding renewable primary energy resources used as raw materials | [MJ] | 1,19E-01 | 5,92E-03 | 8,12E-01 | 9,37E-01 |
| Use of renewable primary energy resources used as raw materials | [MJ] | 3,69E-02 | 8,76E-04 | 1,38E+00 | 1,41E+00 |
| Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials) | [MJ] | 1,56E-01 | 6,80E-03 | 2,19E+00 | 2,35E+00 |
| Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials | [MJ] | INA | INA | INA | INA |
| Use of non-renewable primary energy resources used as raw materials | [MJ] | INA | INA | INA | INA |
| Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials) | [MJ] | INA | INA | INA | INA |
| Use of secondary material | [kg] | 6,28E-02 | 0,00 | 6,28E-02 | 1,26E-01 |
| Use of renewable secondary fuels | [MJ] | INA | INA | INA | INA |
| Use of non-renewable secondary fuels | [MJ] | INA | INA | INA | INA |
| Net use of fresh water | [$dm^3$] | 0,71 | 0,076 | 3,87 | 4,66 |
| **Other environmental information describing waste categories: (FU)** | | | | | |
| **Indicator** | **Unit** | **A1** | **A2** | **A3** | **A1-A3** |
| Hazardous waste disposed | [kg] | 9,87E-06 | INA | 1,40E-04 | 1,50E-04 |
| Non-hazardous waste disposed | [kg] | 1,21E-03 | INA | 4,65E-03 | 5,87E-03 |
| Radioactive waste disposed | [kg] | INA | INA | INA | INA |
| Components for re-use | [kg] | 0,00E+00 | INA | 0,00E+00 | 0,00E+00 |
| Materials for recycling | [kg] | 0,00E+00 | INA | 1,27E-02 | 1,27E-02 |
| Materials for energy recovery | [kg] | INA | INA | INA | INA |
| Exported energy | MJ per energy carrier | INA | INA | INA | INA |

## Verification

The process of verification of this EPD is in accordance with EN ISO 14025 and ISO 21930. After verification, this EPD is valid for a 5-year-period. EPD does not have to be recalculated after 5 years, if the underlying data have not changed significantly.

| The basis for LCA analysis was EN 15804 and ITB PCR A |
|---|
| Independent verification corresponding to ISO 14025 & 8.3.1.<br>☒ external ☐ internal |
| External verification of EPD: PhD. Eng. Halina Prejzner<br>LCA, LCI audit and input data verification: M.Sc. Eng. Dominik Bekierski, d.bekierski@itb.pl<br>Verification of LCA: PhD Eng. Michał Piasecki, m.piasecki@itb.pl |

## Normative references

- ITB PCR A- General Product Category Rules for Construction Products
- EN 16783:2017 Thermal insulation products - Product category rules (PCR) for factory made and in-situ formed products for preparing environmental product declarations
- ISO 14025:2006, Environmental management – Type III environmental declarations – Principles and procedure
- ISO 21930:2007, Sustainability in building and construction – Environmental declaration of building products
- ISO 14044:2006, Environmental management – Life cycle assessment – Requirements and guidelines
- ISO 15686-1:2000, Buildings and constructed assets — Service life planning — Part 1: General principles
- ISO 15686-8:2008, Buildings and constructed assets – Service life planning – Part 8: Reference service life
- EN 15804:2012+A1:2013, Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.
- EN15942:2011, Sustainability of construction- Environmental product declarations. Communication format business-to-business

Building Research Institute
00-611 Warszawa, ul. Filtrowa 1

KIEROWNIK
Zakładu Fizyki Cieplnej, Akustyki i Środowiska
dr inż. Michał Piasecki

Instytut Techniki Budowlanej
00-611 Warsaw, Filtrowa 1

Thermal Physics, Acoustics and Environment Department
02-656 Warsaw, Ksawerów 21

# CERTIFICATE № 053/2017
# of TYPE III ENVIRONMENTAL DECLARATION

Products:

**URSA GLASSWOOL slabs with lambda $\lambda_d$ 0,035 W/mK**
**URSA DP 35**
**URSA MATA 35**
**URSA EUROMATA 35**
**URSA MULTISKIVA 35**
**URSA NORPLATTE 35**
**URSA SILENTIO 35**
**URSA TWP 35**

Manufacturer:

**URSA Polska Sp. z o.o.**
42-520 Dąbrowa Górnicza, Armii Krajowej 12

confirms the correctness of the data included in the development of
Type III Environmental Declaration and accordance with the requirements of the standard

**PN-EN 15804+A1:2014-04**

**Sustainability of construction works.**
**Environmental product declarations.**
**Core rules for the product category of construction products.**

This certificate, issued for the first time on 9th February 2017 is valid for 5 years
or until amendment of mentioned Environmental Declaration

Head of the Thermal Physic, Acoustics and Environment Department
Michał Piasecki, PhD

INSTYTUT TECHNIKI BUDOWLANEJ

Deputy Director for Research and Innovation
Krzysztof Kuczyński, PhD

Warsaw, February 2017