

Environmental Product Declaration

According to ISO 14025 and EN 15804





Mineral glass wool heat insulation URSA GLASSWOOL

EPD number
ECO EPD number
EPD owner
Program operator
Issue Date / Update Date
Valid until

EPD-18/0004
00000768
URSA Slovenia d.o.o., Povhova ulica 2, 8000 Novo mesto
ZAG EPD
07.11.2018
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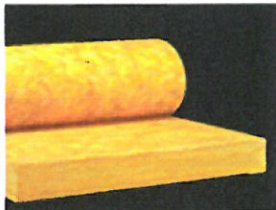
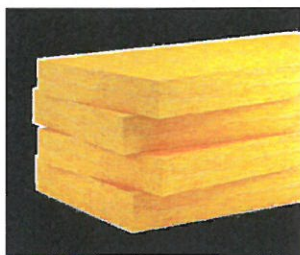
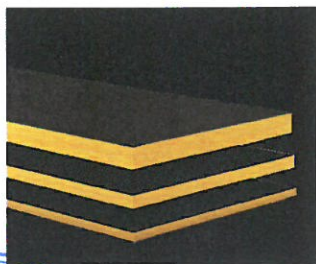
General information	URSA Slovenia products URSA DF39, URSA FDP2, URSA FDP2 Vr, URSA FDP3 Vr, URSA SF32, URSA SF34, URSA TWF1 in URSA TWF37 from mineral glass wool						
Programme holder: Slovenian National Building And Civil Engineering Institute - ZAG Dimičeva 12 1000 Ljubljana http://www.zag.si	Owner of the Declaration: URSA Slovenia d.o.o. Povhova ulica 2 8000 Novo mesto https://www.ursa.si/						
Declaration number: EPD-18/0004	Declared product / Declared unit: 1 m ³ of mineral glass wool						
This Declaration is based on the Product Category Rules (PCR): PCR by IBU: Part B: Requirements on the EPD for Mineral insulating materials (2012), ver. 1.6	Scope: Cradle to gate (A1-A3 modules)						
Issue date / update date: 07.11.2018	Verification: <table border="1" data-bbox="938 1294 1457 1527"> <tr> <td colspan="2">The CEN standard EN 15804 serves as the core product category rule (PCR)</td> </tr> <tr> <td colspan="2">Independent verification of the EPD according to EN ISO 14025:2010</td> </tr> <tr> <td><input checked="" type="checkbox"/> internal</td> <td><input type="checkbox"/> external</td> </tr> </table> Title and the handwritten signature of verifier: Katja Malovrh Rebec, PhD Slovenian National Building And Civil Engineering Institute – ZAG	The CEN standard EN 15804 serves as the core product category rule (PCR)		Independent verification of the EPD according to EN ISO 14025:2010		<input checked="" type="checkbox"/> internal	<input type="checkbox"/> external
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1 Product

1.1 Product description and application

URSA products are insulating materials made of mineral glass wool of different properties. URSA products have a form of felt panels that can be laminated with glass fibre reinforcing fleece. The products are divided into groups according to the thermal conductivity and resistance, density and purpose of use. Product range: URSA DF39, URSA FDP2, URSA FDP2 Vr, URSA FDP3 Vr, URSA SF32, URSA SF34, URSA TWF1 and URSA TWF37 (see Table1).



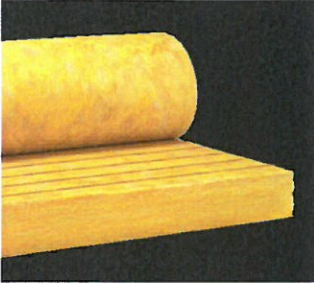
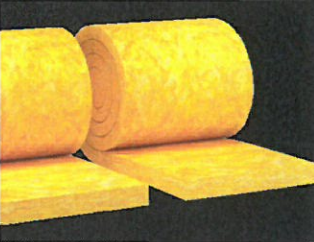
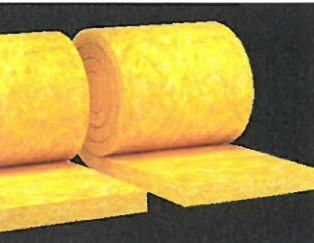
Table 1: Review of URSA products and their properties

Commercial Product Name	Technical Data	Product Photo
URSA DF 39	Thermal conductivity: 0,039 W/mK Thermal resistance R_d : 1,25 – 6,15 m^2K/W Density: 13,0 kg/m^3 Class of fire resistance: A1 Lightweight insulating felt made of glass wool, pressed packed in a ratio of 1: 5.	
URSA FDP2	Thermal conductivity: 0,035 W/mK Thermal resistance R_d : 1,40 – 6,85 m^2K/W Density: 21,5 kg/m^3 Class of fire resistance: A1 Facade insulating boards made of water-repellent mineral glass wool, packed in packages.	
URSA FDP2 Vr	Thermal conductivity: 0,035 W/mK Thermal resistance R_d : 1,40 – 6,85 m^2K/W Density: 21,5 kg/m^3 Class of fire resistance: A1 Facade insulating plate made of water-repellent mineral wool, one-side is laminated with glass fibre reinforcing fleece	

Products are certified according to EN 13162. URSA products are used for thermal and acoustic insulation of external walls, sloping roofs, partitions, suspended facades and wooden walls and other structures.

1.2 Technical data

The URSA product specifications are summarized in Table 1.

URSA FDP3 Vr	<p>Thermal conductivity: 0,034 W/mK Thermal resistance R_d: 1,45 – 6,45 m^2K/W Density: 24 kg/m^3 Class of fire resistance: A1 Facade insulating boards made of water-repellent mineral wool, one-sided laminated with glass fibre reinforcing fleece.</p>	
URSA SF 32	<p>Thermal conductivity: 0,032 W/mK Thermal resistance R_d: 1,55 – 5,00 m^2K/W Density: 30 kg/m^3 Class of fire resistance: A1 Clamp film from mineral wool, unilaterally marked with labels for easier cutting, compressed and packed in a 1: 2,8 ratio.</p>	
URSA SF 34	<p>Thermal conductivity: 0,034 W/mK Thermal resistance R_d: 1,45 – 7,05 m^2K/W Density: 21 kg/m^3 Class of fire resistance: A1 Unilaterally labelled clamping thermal insulating felt made of glass mineral wool, pressed and packed in a ratio of 1: 4.</p>	
URSA TWF 1	<p>Thermal conductivity: 0,039 W/mK Thermal resistance R_d: 1,25 – 2,55 m^2K/W Density: 13 kg/m^3 Class of fire resistance: A1. Self-supporting light insulating felt made of glass mineral wool, pressed packed in a ratio of 1: 5.</p>	
URSA TWF37	<p>Thermal conductivity: 0,037 W/mK Thermal resistance R_d: 1,35 – 2,70 m^2K/W Density: 16,5 kg/m^3 Class of fire resistance: A1 Self-supporting light insulating felt made of glass mineral wool, compressed in a 1: 4 ratio.</p>	

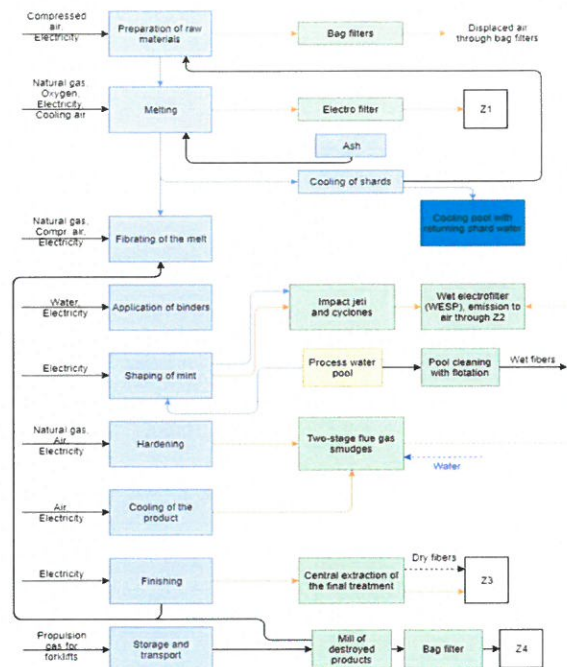


1.3 Basic materials

Isolation products made of mineral glass wool are made of inorganic raw materials. The basic material is processed waste glass, which is purchased on the market (up to 70%). Powdered basic materials for the production of glass are used as well. The basic materials for the production of glass fibres are quartz sand, soda, dolomite, limestone, calcite and borax as a source of B_2O_3 . All materials, except for soda and borax, are naturally occurring and are the source of various inorganic oxides.

1.4 Production process

The production process that was included in the environmental footprint assessment for the EPD declaration begins with the acquisition of basic raw materials and transport to the manufacturing site. The production process begins with the preparation of the glass mixture and continues with the process of melt-blasting and liquid binder coating. The mixture is then formed into a raw mint. The process of hardening, cooling of the product and mechanical treatment then takes place. Certain products are glued with laminating materials. The finished product is packaged and stored and then transported to the customer.



1.5 Packaging

Auxiliary and packing materials used:

- Colour LDPE foil for primary packaging, supplied in rolls.
- Transparent LDPE foil for secondary packaging in modules and on a pallet (stretch), which is supplied in rolls.
- Wooden pallets - non-standard, supplied specifically for URSA Slovenia.

1.6 Other information

Other information can be found online:

<https://www.ursa.si/>

2 LCA: Calculation rules

2.1 Declared unit

The declared unit according to the PCR calculation rules is

$1m^3$.



The calculation rules also state that the EPD is required to indicate the density of the product or product group and the conversion factor table (see Table 1).

2.2 System boundary

Type of EPD: *"from cradle to gate"*.

Product life cycle assessment includes modules:

A1: extraction of raw materials, production of basic materials and required energy

A2: transport to the production plant and within the plant

A3: production of auxiliary materials and packaging, including the production and use of energy during the production process and the emissions emitted

2.3 Cut-off criteria

The share of missing data in accordance with standard EN 15804 represents less than 1% of primary renewable and non-renewable energy consumed in less than 1% of the total mass of the input material in each production process and less than 5% of the energy consumed in the mass in each module.

2.4 Background data

For the calculation of modules A1 to A3, the software Gabi 6 (Thinkstep) and the PE database were used.

2.5 Data quality

Generic data used from databases are not older than 10 years. To calculate the production process, specific manufacturer data was used for the reference period 1.7.2017 - 30.4.2018.

2.6 Period under review

The data on the production process represent an average for the reference period 1.7.2017 - 30.4.2018.

2.7 Allocation

The allocation by mass was used in distributing the consumption of auxiliary materials and energy in the production process between individual products.



3 LCA: Results

Table 1: Selected phases of LCA

SYSTEM BOUNDARY																
PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport	Construction-installation process	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction 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
☒	☒	☒	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA	MNA
The modules of the product lifecycle, which are included in EPD are marked by "X" Modules not included are marked with a "MNA" = module not assessed.																

3.1 Indicators of environmental impacts

According to the EN 15804 standard, the environmental impacts are presented with seven indicators (Table 3).

Table 2: Abbreviations and units of environmental impact indicators

Abbreviation	Indicators of environmental impacts	Unit
GWP ₁₀₀	Global warming potential	kg CO ₂ equiv
AP	Acidification Potential	kg CFC 11 equiv
EP	Eutrophication Potential	kg SO ₂ equiv
ODP	Ozone Depletion Potential	kg (PO ₄) ³⁻ equiv
POCP	Photochemical ozone creation potential	kg Ethene equiv
ADP ele	Abiotic Resources Depletion Potential – elements	kg Sb equiv
ADP fos	Abiotic Resources Depletion Potential –fossil fuels	MJ

The environmental impact indicators for eight products from mineral glass wool (URSA DF39, URSA FDP2, URSA FDP2 Vr, Ursa FDP3 Vr, URSA SF32, URSA SF34, URSA TWF1 and URSA TWF37) are shown in Table 4:

Table 3: Indicators of environmental impacts

		DF39	FDP2	FDP2 Vr	FDP3 Vr	SF32	SF34	TWF1	TWF37
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ADP (ele)	[kg Sb eq.]	1,02E-03	1,74E-03	1,88E-03	1,82E-03	2,38E-03	2,38E-03	1,04E-03	1,31E-03
ADP (fos)	[MJ]	3,29E+02	6,70E+02	6,28E+02	6,64E+02	8,11E+02	8,10E+02	3,28E+02	4,13E+02
AP	[kg SO ₂ eq.]	5,42E-02	1,05E-01	1,09E-01	1,14E-01	1,34E-01	1,33E-01	5,40E-02	6,79E-02
EP	[kg Phosphate eq.]	3,23E-02	6,83E-02	6,87E-02	6,84E-02	8,62E-02	8,79E-02	3,22E-02	4,08E-02
GWP	[kg CO ₂ eq.]	1,47E+01	2,75E+01	2,77E+01	2,92E+01	3,47E+01	3,52E+01	1,44E+01	1,79E+01
ODP	[kg R11 eq.]	1,25E-06	1,07E-04	1,11E-04	1,06E-04	4,40E-06	4,41E-06	1,25E-06	2,20E-06
POCP	[kg Ethene eq.]	7,13E-03	1,47E-02	1,47E-02	1,45E-02	1,83E-02	1,85E-02	7,09E-03	8,93E-03

3.2 Indicators describing resource use

The results describing resource use are in accordance with the EN 15804 standard, presented with ten indicators (Table 5). Indicators include the use of renewable and non-renewable energy, the use of renewable and non-renewable material resources and the use of water.

Table 4: Abbreviations and units for indicators describing resource use

Abbreviation	Indicators describing resource use	Unit
PERE	Use of renewable primary energy excluding renewable primary energy resources used as raw materials	MJ, net calorific value
PERM	Use of renewable primary energy resources used as raw materials	MJ, net calorific value
PERT	Total use of renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value
PENRE	Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials	MJ, net calorific value
PENRM	Use of non-renewable primary energy resources used as raw materials	MJ, net calorific value
PENRT	Total use of non-renewable primary energy resources (primary energy and primary energy resources used as raw materials)	MJ, net calorific value
SM	Use of secondary material	kg
ESF	Use of renewable secondary fuels	MJ, net calorific value
NRSF	Use of non-renewable secondary fuels	MJ, net calorific value
FW	Use of net fresh water	kg

Indicators describing resource use for eight mineral glass wool products (URSA DF39, URSA FDP2, URSA FDP2 Vr, Ursa FDP3 Vr, URSA SF32, URSA SF34, URSA TWF1 and URSA TWF37) are shown in Table 6.



Table 6: Indicators describing resource use

		DF39	FDP2	FDP2 Vr	FDP3 Vr	SF32	SF34	TWF1	TWF37
PERE	[MJ]	4,09E+01	6,85E+01	6,68E+01	7,48E+01	1,09E+02	1,06E+02	4,47E+01	6,07E+01
PERM	[MJ]	5,40E+00	2,14E+01	2,09E+01	2,09E+01	2,95E+01	2,25E+01	8,53E+00	1,30E+01
PENRT	[MJ]	4,10E+02	8,23E+02	7,81E+02	8,27E+02	1,01E+03	1,00E+03	4,09E+02	5,15E+02
PENRE	[MJ]	4,00E+02	7,92E+02	7,47E+02	7,93E+02	9,83E+02	9,77E+02	4,00E+02	5,05E+02
PENRM	[MJ]	9,90E+00	3,15E+01	3,42E+01	3,42E+01	2,66E+01	2,35E+01	9,36E+00	9,95E+00
PERT	[MJ]	5,08E+01	1,00E+02	1,01E+02	1,09E+02	1,36E+02	1,29E+02	5,41E+01	7,06E+01
SM	[kg]	1,06E+01	1,84E+01	1,70E+01	1,70E+01	2,51E+01	2,42E+01	1,05E+01	1,32E+01
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
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
FW	[kg]	1,35E+02	2,66E+02	2,78E+02	2,84E+02	3,39E+02	3,40E+02	1,35E+02	1,69E+02

3.3 Other environmental information describing waste categories and output flows

According to the EN 15804 standard, the results for other environmental information (waste disposal data) are presented with three indicators, and the output flows from the system with four indicators (Table 7).

Table 7: Abbreviations and units for other environmental impact indicators

Abbreviation	Indicators for other environmental information	Unit
HWD	Hazardous waste disposed	kg
NHWD	Non-hazardous waste disposed	kg
RWD	Radioactive waste disposed	kg
Abbreviation	Indicators of output flows	Unit
CRU	Components for re-use	kg
MFR	Materials for recycling	kg
MER	Materials for energy recovery	kg
EE	Exported energy	MJ for the energy carrier

Indicators for other environmental information and the output flow indicators for eight products from mineral glass wool (URSA DF39, URSA FDP2, URSA FDP2 Vr, Ursa FDP3 Vr, URSA SF32, URSA SF34, URSA TWF1 and URSA TWF37) are shown in Table 8.



Table 8: Indicators for other environmental information

		DF39	FDP2	FDP2 Vr	FDP3 Vr	SF32	SF34	TWF1	TWF37
HWD	[kg]	1,58E-05	2,68E-05	2,48E-05	2,52E-05	3,74E-05	3,49E-05	1,53E-05	1,85E-05
NHWD	[kg]	1,98E+00	3,32E+00	3,15E+00	3,16E+00	4,69E+00	4,38E+00	1,92E+00	2,33E+00
RWD	[kg]	1,53E-02	2,53E-02	2,54E-02	2,84E-02	3,54E-02	3,53E-02	1,53E-02	1,94E-02
CRU	[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
MFR	[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
MER	[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
EE	[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

4 LCA: Interpretation

The influence on the abiotic depletion of elements is greatest due to the use of borax, which represents 95% of the effect for products with no black reinforced glass fibre layer. It is followed by the use of soda with 3%. For products with black reinforced glass fibre layer, this layer brings about 8 to 11% of the impact on abiotic depletion. For these products, the influence of borax is reduced to 85 - 87%.

Abiotic depletion of fossil fuels is greatest due to the use of natural gas (between 32% and 37%), phenolic resins (27-31%) and electricity (between 8 and 11%). The use of borax and PE foils add values between 5 and 9%, and soda between 5 and 6%.

The use of phenolic resin, which represents between 28 and 33%, has the greatest influence on the acidification of soil and water. It is followed by the use of electricity (between 19 and 23%), soda (between 11 and 16%), borax (between 8 and 11%) and, where it is present, black reinforced glass fibre layer (between 5 and 8%). PE foil adds 8% of total impact, natural gas and polydimethylsiloxane (where present), an additional 5%.

Eutrophication is most dependent on the use of phenolic resin. This brings between 74 and 82% of

the total parameter value, borax brings between 5% and 7% and natural gas around 5%. In products containing polydimethylsiloxane and black reinforced glass fibre, these two substances add 5% each to the eutrophication parameter.

Global warming is caused by the use of phenolic resin (between 25 and 31%), electricity (between 21 and 25%) and natural gas (between 11 and 13%), followed by the use of soda (between 8 and 12%), oxygen (between 9 and 11%), borax (between 8 and 10%) and PE foil (between 7 and 8%).

The use of phenolic resin contributes most to the formation of photochemical ozone near the earth's surface (between 55 and 61 %), followed by natural gas (between 9 and 11%), electricity (8-10%), soda (5-8%), PE foil (4 - 8%) and borax (between 5 and 6%).

The greatest percentage of the total primary non-renewable energy consumption has the use of natural gas (between 28 and 33%), followed by the influence of the use of phenolic resin (between 25 and 29%), electricity (between 14 and 18%), borax (between 5 and 6%), PE foil (between 5 and 9%) and oxygen and soda with 5%.

The largest share of the total primary renewable energy use is contributed by the use of electricity (between 49% and 59%), followed by the use of

liquid oxygen (between 15% and 18%), wooden pallets (between 15% and 20%) and phenolic resin (between 6% and 7%).

mineral wool URSA GLASSWOOL DF39, FDP2, FDP2 Vr, FDP3 Vr, SF32, SF34, TWF1 and TWF37, from 5.11.2018.

The use of water is the biggest in the production of phenolic resin (this represents 36 - 41% of total water use). It is followed by the use of technological water in the production of mineral glass wool (between 17 and 22%), water use for the production of consumed electricity (13-16%), PE foil (5-11%), borax and soda (4-6%) and water in the production oxygen (4 - 5%).

5 References

1. GaBi 6, Ecoinvent integrated 3.5, Gabi professional and extension database
2. EN 15804:2012+A1:2013: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products
3. ISO 14040:2006: Environmental management - Life cycle assessment - Principles and framework
4. ISO 14044:2006: Environmental management - Life cycle assessment - Requirements and guidelines
5. ISO 14025:2010: Environmental labels and declarations - Type III environmental declarations. Principles and procedures
6. Report No.: P 0315 / 18-530-1, Environmental Analysis Report of Thermal insulation from

The data specified in the EPD is calculated on the basis of the data provided by the manufacturer. In the case that the manufacturer's information is incorrect, the calculations do not apply.

