

# ENVIRONMENTAL PRODUCT DECLARATION

according to SIST EN ISO 14025:2010

<b>Owner of the declaration</b>	URSA Slovenia
<b>Programme holder</b>	System EPD of Slovenian National Building and Civil Engineering Institute
<b>Publisher</b>	Slovenian National Building and Civil Engineering Institute
<b>Declaration number</b>	EPD-13/001
<b>Issue date</b>	30.08.2013
<b>Valid to</b>	30.08.2013

## Thermal insulation made of mineral glass wool URSA GLASSWOOL

URSA DF 40, URSA SF 35, URSA SF 32, URSA TWF 1  
URSA FDP 2, URSA FDP 2/Vf, URSA FDP 3/Vf



<http://www.zag.si>

**ZAG**  
EPD

## 1 Summary

<b>URSA SLOVENIJA</b>	<b>Thermal insulation made of mineral glass wool URSA GLASSWOOL:</b>  URSA DF 40 URSA SF 35 URSA SF 32 URSA TWF 1 URSA FDP 2 URSA FDP 2/Vf URSA FDP 3/Vf						
<b>Programme holder:</b>  Slovenian National Building and Civil Engineering Institute Dimičeva 12, 1000 Ljubljana <a href="http://www.zag.si">http://www.zag.si</a>	<b>Owner of the declaration:</b>  URSA SLOVENIA d.o.o. Povhova ulica 2 8000 Novo mesto <a href="http://www.ursa.si">http://www.ursa.si</a>						
<b>Declaration number:</b>  EPD-13/001	<b>Declared product/Declared unit:</b>  One cubic metre (1 m <sup>3</sup> ) of mineral glass wool for products URSA DF 40, URSA SF 35, URSA SF 32, URSA TWF 1, URSA FDP 2, URSA FDP 2/Vf and URSA FDP 3/Vf.						
<b>This Declaration if based on the Product Category Rules (PCR):</b>  Mineralische Dämmstoffe, IBU, July 2009.	<b>Scope:</b>  This EPD covers seven products of mineral wool manufactured by company URSA Novo mesto. This products are used for thermal insulation of roofs, partition walls, indoor and outdoor walls and ceilings.						
<b>Issue date:</b> 08.07.2013  <b>Valid tot:</b> 08.07.2018	<b>Verification:</b>  <table border="1" data-bbox="943 1377 1485 1626"> <tr> <td colspan="2">Standard SIST EN 15804:2012 serves as the core of PCR.</td> </tr> <tr> <td colspan="2">Internal verification of the EPD according to SIST EN ISO 14025:2010.</td> </tr> <tr> <td><input checked="" type="checkbox"/> Internally</td> <td><input type="checkbox"/> Externally</td> </tr> </table>	Standard SIST EN 15804:2012 serves as the core of PCR.		Internal verification of the EPD according to SIST EN ISO 14025:2010.		<input checked="" type="checkbox"/> Internally	<input type="checkbox"/> Externally
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<input checked="" type="checkbox"/> Internally	<input type="checkbox"/> Externally						
<b>Programmer holder:</b>  <i>mag. Franc Capuder, univ. dipl. ing. grad.</i>	<b>Verificator:</b>  <i>Friderik Knez, univ. dipl. fiz.</i>						

## 2 Product

### 2.1 Product description

URSA GLASSWOOL is thermal insulation made of mineral glass wool.

Elastic fibres interwoven into insulation fleece or slab are offering optimal combination of thermal and acoustic protection.

### 2.2 Application

- Thermal insulation of inclined roof: SF 32, SF 35, DF 40
- Thermal and acoustic insulation - partition wall: TWF 1
- Thermal and acoustic insulation - suspend ceiling: TWF 1
- Thermal insulation of ceiling – towards attic: SF 35, DF 40
- Thermal insulation of facade wall – outer insulation: FDP 1, FDP 2, FDP 2 Vf, FDP 3 Vf
- Thermal insulation of facade wall – inner insulation: TWF 1
- Thermal insulation of floor – unloaded floor: DF 40

### 2.3 Technical data

Product standard for products made of mineral wool is SIST EN 13162:2013 - Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification.

Technical data for products URSA DF 40, URSA SF 35, URSA SF 32, URSA TWF 1, URSA FDP 2, URSA FDP 2/Vf in URSA FDP 3/Vf are listed in Table 1.

Table 1: Technical data for products

Name	Value/ Class
Density in accordance with SIST EN 1602:1997	$\leq 13 - 30 \text{ kg/m}^3$
Thermal conductivity in accordance with SIST EN 12667:2002	0,032 – 0,040 W/mK
Thermal resistance in accordance with SIST EN 12667:2002	1,25 - 5,70 m <sup>2</sup> K/W

Coefficient of air flow resistance in accordance with SIST EN 29053:1999	AFR > 5 kPas/m <sup>2</sup>
Coefficient of water diffusion in accordance with SIST EN 12086:2013	$\mu = 1$
Reaction to fire in accordance with SIST EN 13501-1:2007+A1:2009	Class A1 (unflammable)

### 2.4 Placing on the market/ Application rules

The product is manufactured in accordance with standard SIST EN 13162:2013 - Thermal insulation products for buildings - Factory made mineral wool (MW) products - Specification and has CE marking and declaration of conformity, ensuring compliance is secured through internal and external control.

### 2.5 Placing on the market/ Application rules

Table 2: Deliverable dimensions.

Product commercial name	Deliverable dimensions thickness/width/length (mm)
URSA DF 40	50-200/1200/3500-15000
URSA FDP 2 Vf	50-200/600/1250
URSA FDP 2	50-100/600/1250
URSA FDP 3 Vf	60-120/600/1250
URSA SF 32	50-160/1200/2500-7600
URSA SF 35	50-200/1200/2800-11200
URSA TWF 1	50-100/2×625/7500-15000

### 2.6 Base materials

Table 3: Content of basic materials in final products.

Material	Amount in % for products URSA DF 40, URSA SF 35, URSA SF 32, URSA TWF 1, URSA FDP 2, URSA FDP 2/Vf and URSA FDP 3/Vf
Siliceous sand	ca. 9%

Soda	ca. 5%
Dolomite	ca. 2%
Borax	ca. 4%
Clay	ca. 5%
Calcite	< 1%
Waste glass	ca. 62%
Phenolic resin	ca. 7%
Urea	ca. 1%
Ammonium sulphate	< 1%
Ammonia	< 1%
Silan	< 1%
Mineral oil	< 1%
Polydimethylsiloxane emulsion, emulsion in water	< 1%
Black fleece	ca. 2%

## 2.7 Manufacture

Raw materials for glass are weighted, mixed and pneumatically transported to daily silos nearby the furnace (glazing compound). Melting takes place in the oxygen glass furnace ("oxy-fuel"), heated with natural gas. Pure oxygen is used as an oxidant. At a temperature of 1200 - 1300 ° C, raw materials are melted to form a homogeneous melt (melting process). The melt is stabilized and guided through a nozzle into a centrifugal rotor, where the glass is firmed in fibres (fibrization process), wetted with liquid binder (impregnation) and formed in the crude blanket with negative pressure in settling chamber on the perforated circular conveyer belt. Settling chamber is washed with process water in a closed loop in the manufacturing process. Process water is used for dilution of binder prior to application on the fibres.

This is followed by a process of water evaporation and binder polymerization under the influence of high temperature in the hardening chamber (polymerization process), after which the product gets an adequate shape. All the water which is used in the process, evaporates in the process of

impregnation and polymerization. Wet and cleaned flue gases are emitted into the environment.

This is followed by product cooling and mechanical treatment (edge trimming, where trimmed material is recycled back into the settling chamber). Certain products can be cut along the whole depth and coated with different materials (aluminium foil, paper, glass fibre fleece). Then the product is cut along the edge across the whole length of the product. The products are produced in the form of fleece, (lower density) or boards. Felts are compressed and wrapped on the rolling device, followed by primary packaging in PE foil, labelling, "Multipack" packaging on wooden pallets and secondary packaging with PE foil (which allows outdoor storage). Plates are packed in the form of packages and the final product is then stored. Storage can be external (prevailing) or internal - certain products are stored in the indoor warehouse waiting for shipment and transport. Declassed products generated at the end of the production line or in storage shall be grind in a mill. Milled material is stored and returned in the process of blanket formation.

Manufacturing process of products from glass wool is an energy-intensive process. The main energy sources are natural gas and electricity. Diesel fuel is used for forklifts.

## 2.8 Environment and health during manufacturing

In accordance with the regulation of the management of the Group in Spain, measurements of chemical hazards, microclimate, noise and lighting are performed every year, including all other obligations associated with the provisions of the Act about safety and health during manufacturing. Additional improvement of working conditions is achieved by the introduction of technological and organizational measures.

Company URSA Slovenia has integral environmental permission obtained in 2007, where monitoring systems for all environmental fields in accordance with the regulations are defined. Internally, as part of the manufacturing process, ecological process are described and defined in accordance with standard ISO 9001. Tendency in the production process is towards substitution of hazardous substances with non-hazardous and use of recyclable materials (waste glass) instead of the

raw materials. Provisions for optimizing energy use are also used.

## 2.9 Packaging

Fleeces of mineral glass wool are compressed and wrapped on the rolling device, followed by primary packaging in PE foil, labelling, "Multipack" packing on wooden pallets and secondary packaging in PE foil (which allows outdoor storage). Plates are packed in the form of packages.

## 2.10 Further information

All information about products is available on the producer's web site (URSA Novo mesto):

<http://www.ursa.si>

## 3 LCA: Calculation rules

### 3.1 Declared unit

Declared unit in accordance with PCR (Product Category Rules) "Mineralische Dämmstoffe", 2007 is:

1 cubic metre of mineral glass wool

For recalculation of results of the LCA analyse from one cubic metre into kilogram densities of all products of mineral glass wool are listed in the table below.

Table 4: Density of the products

Name	Density (kg/m <sup>3</sup> )
URSA DF 40	≤13
URSA FDP 2 Vf	≤22,5
URSA FDP 2	≤22,5
URSA FDP 3 Vf	≤25,00
URSA SF 32	≤30,00
URSA SF 35	≤21,00
URSA TWF 1	≤15,00

### 3.2 System boundary

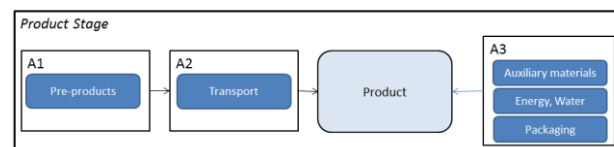
Type of EPD: »from cradle to gate«.

The setting of the system boundaries follows the »modularity principle« in accordance with SIST EN 15804. Analysis of the products includes phases of the Product manufacturing stage (Modules A1 to A3) which includes:

A1: raw material extraction and processing, processing of primary, auxiliary and secondary materials including consumption of energy.

A2: transport to the manufacturer.

A3: manufacturing of auxiliary materials, products and packaging.



Picture 1: General scheme of the product manufacturing phase.

### 3.3 Estimates and assumptions

Following data for energy carriers in the manufacturing process of mineral glass wool URSA GLASSWOOL produced by company URSA Slovenia in the manufacturing plant in Novo mesto were considered:

- electricity (supplier GEN-I): Slovenian mix,
- natural gas (supplier GEOPLIN): data for Austria
- diesel fuel (supplier PETROL): data for Europe

### 3.4 Cut-off rules

Data excluded from LCA analyse in accordance with SIST EN 15804, is less than 1% of used primary renewable and non-renewable primary energy usage and less than 1% of the total mass of that unit process. The total of neglected input flows per module is less than 5% of energy usage and mass.

### 3.5 Background data

Software Gabi 6 (developed by PE International) and data base Ecoinvent integrated 2.2 were used for calculation of modules A1 to A3 for a set of mineral wool products URSA.

### 3.6 Input data quality

Used generic data from database Ecoinvent integrated 2.2 are generally not older than 10 years.

For the calculation of manufacturing process specific data of producer for the reference year 2011 were used.

### 3.7 Period under review

Specific data of manufacturing process represents one year average for reference year 2011.

### 3.8 Allocation

For distribution of auxiliary materials, energy and emissions in the manufacturing process between each product, mass allocation was used.

### 3.9 Comparability

Comparison or evaluation of results from this EPD is possible only if all data were collected in accordance with standard EN 15804 and all specific characteristics of product and manufacturing

process, including PCR Rules were taken into account.

## 4 LCA: Scenarios and additional technical information

Description of scenarios and RSL (reference service life) is not obligatory for this type of EPD »from cradle to gate« (modules A1 to A3).

## 5 LCA: Results

Tabela 1: LCA results.

SYSTEM BOUNDARIES																	
PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE								END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport	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	
<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	
Modules of life cycle included in the EPD are marked with »X«; modules excluded are marked with »MND« = module not declared																	
RESULTS OF THE LCA – Parameters describing resource use: 1 m <sup>3</sup> of mineral glass wool URSA																	
Parameter (abbreviation)		PERM [MJ]	PERE [MJ]	PERT [MJ]	PENRM [MJ]	PENRE [MJ]	PENRT [MJ]	SM [kg]	RSF [MJ]	NRSF [MJ]	FW [m <sup>3</sup> ]						
Manufacturing process URSA DF 40	A1	0,00E+00	2,93E+00	2,93E+00	0,00E+00	1,26E+02	1,26E+02	7,00E+00	0	0	4,00E-02						
	A2	0,00E+00	7,72E-03	7,72E-03	0,00E+00	3,06E+00	3,06E+00	0,00E+00	0	0	8,01E-02						
	A3	1,08E+01	2,39E+01	3,46E+01	1,51E+02	1,11E+02	2,62E+02	0,00E+00	0	0	4,21E-01						
	SA1-A3	1,08E+01	2,68E+01	3,76E+01	1,51E+02	2,41E+02	3,92E+02	7,00E+00	0,00E+00	0,00E+00	5,41E-01						
Manufac	A1	0,00E+00	6,75E+00	6,75E+00	0,00E+00	2,92E+02	2,92E+02	1,18E+01	0	0	6,37E-01						

turing process URSA FDP 2 Vf	A2	0,00E+00	1,46E-02	1,46E-02	0,00E+00	5,78E+00	5,78E+00	0,00E+00	0	0	1,12E-03
	A3	1,43E+01	9,18E+01	1,06E+02	2,67E+02	2,68E+02	5,35E+02	0,00E+00	0	0	5,52E-01
	SA1-A3	1,43E+01	9,85E+01	1,13E+02	2,67E+02	5,66E+02	8,33E+02	1,18E+01	0	0	1,19E+00
Manufac turing process URSA FDP 2	A1	0,00E+00	9,10E+00	9,10E+00	1,15E+00	2,71E+02	2,73E+02	1,17E+01	0	0	6,77E-01
	A2	0,00E+00	1,36E-02	1,36E-02	4,43E-01	8,10E-01	1,25E+00	0,00E+00	0	0	3,64E-03
	A3	1,44E+01	8,72E+01	1,02E+02	2,67E+02	2,41E+02	5,08E+02	0,00E+00	0	0	4,30E-01
	SA1-A3	1,44E+01	9,63E+01	1,11E+02	2,69E+02	5,13E+02	7,82E+02	1,17E+01	0	0	1,11E+00
Manufac turing process URSA FDP 3 Vf	A1	0,00E+00	7,37E+00	7,37E+00	0,00E+00	3,18E+02	3,18E+02	1,33E+01	0	0	6,90E-01
	A2	0,00E+00	1,64E-02	1,64E-02	0,00E+00	6,48E+00	6,48E+00	0,00E+00	0	0	1,26E-03
	A3	1,61E+01	1,46E+02	1,62E+02	2,99E+02	2,86E+02	5,86E+02	0,00E+00	0	0	5,98E-01
	SA1-A3	1,61E+01	1,54E+02	1,70E+02	2,99E+02	6,11E+02	9,11E+02	1,33E+01	0	0	1,29E+00
Manufac turing process URSA SF 32	A1	0,00E+00	7,40E+00	7,40E+00	0,00E+00	3,28E+02	3,28E+02	1,61E+01	0	0	7,63E-01
	A2	0,00E+00	1,82E-02	1,82E-02	0,00E+00	7,22E+00	7,22E+00	0,00E+00	0	0	1,40E-03
	A3	1,94E+01	8,42E+01	1,04E+02	3,62E+02	2,51E+02	6,12E+02	0,00E+00	0	0	5,92E-01
	SA1-A3	1,94E+01	9,16E+01	1,11E+02	3,62E+02	5,86E+02	9,48E+02	1,61E+01	0	0	1,36E+00
Manufac turing process URSA SF 35	A1	0,00E+00	5,23E+00	5,23E+00	0,00E+00	2,31E+02	2,31E+02	1,11E+01	0	0	5,44E-01
	A2	0,00E+00	1,26E-02	1,26E-02	0,00E+00	5,00E+00	5,00E+00	0,00E+00	0	0	9,72E-04
	A3	1,34E+01	3,67E+01	5,01E+01	2,50E+02	1,67E+02	4,17E+02	0,00E+00	0	0	4,01E-01
	SA1-A3	1,34E+01	4,19E+01	5,54E+01	2,50E+02	4,03E+02	6,53E+02	1,11E+01	0	0	9,46E-01
Manufac turing process URSA TWF 1	A1	0,00E+00	3,37E+00	3,37E+00	0,00E+00	1,45E+02	1,45E+02	8,04E+00	0	0	3,36E-01
	A2	0,00E+00	8,96E-03	8,96E-03	0,00E+00	3,55E+00	3,55E+00	0,00E+00	0	0	6,90E-04
	A3	9,57E+00	2,72E+01	3,68E+01	0,00E+00	1,23E+02	3,02E+02	0,00E+00	0	0	2,93E-01
	SA1-A3	9,57E+00	3,06E+01	4,02E+01	0,00E+00	2,72E+02	4,51E+02	8,04E+00	0	0	6,29E-01
Caption	Use of renewable primary energy excluding renewable primary energy resources used as raw materials (PERE); Use of renewable primary energy resources used as raw materials (PERM); total use of renewable primary energy resources (PERT); Use of renewable primary energy excluding non-renewable primary energy resources used as raw materials (PENRE); Use of non-renewable primary energy resources used as raw materials (PENRM); Total use of non-renewable primary energy resources (PENRT); Use of secondary material (SM); Use of renewable secondary fuels (RSF); Use of non-renewable secondary fuels (NRSF); Use of net fresh water (FW)										
<b>RESULTS OF THE LCA - LCA – Other output information describing waste categories and output flows: 1 m<sup>3</sup> of mineral glass wool URSA</b>											
Indicator (abbreviation)		HWD [kg]	NHWD [kg]	RWD [kg]	CRU [kg]	MFR [kg]	MER [kg]	EE [kg]			
Manufac turing	A1	0	0	0	0	0	0	0			
	A2	0	0	0	0	0	0	0			

process	A3	0	0	0	0	0	0	0
Manufacturing process URSA	A1	0	0	0	0	0	0	0
	A2	0	0	0	0	0	0	0
	A3	0	0	0	0	0	0	0
Manufacturing process URSA	A1	0	0	0	0	0	0	0
	A2	0	0	0	0	0	0	0
	A3	0	0	0	0	0	0	0
Manufacturing process URSA	A1	0	0	0	0	0	0	0
	A2	0	0	0	0	0	0	0
	A3	0	0	0	0	0	0	0
Manufacturing process URSA SF	A1	0	0	0	0	0	0	0
	A2	0	0	0	0	0	0	0
	A3	0	0	0	0	0	0	0
Manufacturing process URSA SF	A1	0	0	0	0	0	0	0
	A2	0	0	0	0	0	0	0
	A3	0	0	0	0	0	0	0
Manufacturing process URSA	A1	0	0	0	0	0	0	0
	A2	0	0	0	0	0	0	0
	A3	0	0	0	0	0	0	0
Caption	Hazardous waste disposed (HWD); non-hazardous waste disposed (NHWD); Radioactive waste disposed (RWD); Components for re-use (CRU); Materials for recycling (MFR); Materials for energy recovery (MER); Exported energy per energy carrier (EE)							
<b>REZULTATI LCA - LCA – Parameters describing environmental impacts: 1 m<sup>3</sup> of mineral glass wool URSA</b>								
Parameter (abbreviation)	GWP [kg CO <sub>2</sub> equiv]	ODP [kg CFC 11 equiv]	AP [kg SO <sub>2</sub> equiv]	EP [kg (PO <sub>4</sub> ) <sup>3-</sup> equiv]	POCP [kg Ethane equiv]	ADPE [kg Sb equiv]	ADPF [MJ]	
Manufacturing process URSA DF 40	A1	6,19E+00	4,98E-07	2,33E-02	1,03E-02	4,38E-03	1,18E-03	1,26E+02
	A2	2,25E-01	3,27E-08	1,66E-03	3,03E-04	1,49E-04	1,95E-08	3,06E+00
	A3	1,57E+01	2,48E-06	1,29E-01	3,66E-02	7,64E-03	1,68E-06	2,62E+02
	SA1-A3	2,21E+01	3,01E-06	1,54E-01	4,72E-02	1,22E-02	1,18E-03	3,92E+02
Manufacturing process URSA FDP 2 Vf	A1	1,46E+01	1,10E-06	6,03E-02	2,35E-02	1,04E-02	2,18E-03	2,92E+02
	A2	4,24E-01	6,21E-08	2,91E-03	5,48E-04	2,80E-04	3,69E-08	5,78E+00
	A3	3,40E+01	4,13E-06	3,08E-01	9,07E-02	1,84E-02	4,40E-06	5,35E+02
	SA1-A3	4,91E+01	5,30E-06	3,71E-01	1,15E-01	2,91E-02	2,19E-03	8,33E+02
Manufacturing process URSA FDP 2	A1	1,25E+01	9,27E-07	4,81E-02	2,00E-02	9,45E-03	2,00E-03	2,59E+02
	A2	4,05E-01	5,92E-08	2,88E-03	5,35E-04	2,74E-04	3,52E-08	5,53E+00
	A3	3,24E+01	4,14E-06	3,00E-01	8,86E-02	1,78E-02	4,18E-06	5,18E+02
	SA1-A3	4,53E+01	5,13E-06	3,51E-01	1,09E-01	2,75E-02	2,01E-03	7,82E+02
Manufacturing process URSA	A1	1,59E+01	1,22E-06	6,54E-02	2,57E-02	1,13E-02	2,48E-03	3,18E+02
	A2	4,75E-01	6,95E-08	3,29E-03	6,17E-04	3,15E-04	4,13E-08	6,48E+00
	A3	3,71E+01	4,65E-06	3,40E-01	1,01E-01	2,09E-02	5,49E-06	5,86E+02



FDP 3 Vf	SA1-A3	5,35E+01	5,94E-06	4,09E-01	1,27E-01	3,26E-02	2,49E-03	9,11E+02
Manufacturing process URSA SF 32	A1	1,58E+01	1,27E-06	5,87E-02	2,62E-02	1,15E-02	2,65E-03	3,28E+02
	A2	5,29E-01	7,73E-08	3,79E-03	7,00E-04	3,59E-04	4,59E-08	7,22E+00
	A3	3,67E+01	5,48E-06	3,68E-01	1,09E-01	2,07E-02	4,16E-06	6,12E+02
	SA1-A3	5,30E+01	6,83E-06	4,30E-01	1,36E-01	3,26E-02	2,65E-03	9,48E+02
Manufacturing process URSA SF 35	A1	1,11E+01	8,73E-07	4,12E-02	1,84E-02	8,14E-03	1,90E-03	2,31E+02
	A2	3,66E-01	5,35E-08	2,67E-03	4,88E-04	2,51E-04	3,18E-08	5,00E+00
	A3	2,49E+01	3,77E-06	2,52E-01	7,47E-02	1,37E-02	2,49E-06	4,17E+02
	SA1-A3	3,64E+01	4,70E-06	2,96E-01	9,36E-02	2,21E-02	1,90E-03	6,53E+02
Manufacturing process URSA TWF 1	A1	7,11E+00	5,70E-07	2,68E-02	1,19E-02	5,07E-03	1,35E-03	1,45E+02
	A2	2,60E-01	3,80E-08	1,90E-03	3,46E-04	1,78E-04	2,26E-08	3,55E+00
	A3	1,80E+01	2,69E-06	1,80E-01	5,34E-02	9,97E-03	1,83E-06	3,02E+02
	SA1-A3	2,53E+01	3,30E-06	2,09E-01	6,57E-02	1,52E-02	1,35E-03	4,51E+02
Caption	Global warming potential (GWP); Ozone depletion (ODP); Acidification for soil and water (AP); Eutrophication (EP); Photochemical ozone creating (POCP); Depletion of abiotic resources - elements (APDE); Depletion of abiotic resources – fossil fuels (APDF)							

## 6 LCA: Interpretation of results

### 6.1 Global warming

The highest contribution to GWP (69-71%) within all products represents manufacturing process (module A3), stage of raw material extraction and processing (module A1) contributes 28-30%, transport (module A2) represents negligible part (ca. 1%).

In module A3 the highest contribution represents the manufacturing process itself (25-27%), electricity (19-24%), natural gas (8-11%) and liquid oxygen (6-7%). In module A1 the biggest contribution represents input material borax (6-8%) and phenolic resin (10-13%).

### 6.2 Acidification

The highest contribution (83-86%) to AP within all products represents the manufacturing process (module A3) - electricity (46-56%) and manufacturing process (19-25%).

### 6.3 Eutrophication

The highest contribution to EP (78-81%) within all products represents the manufacturing process (module A3). Electricity contributes the highest

part (46-57%). Manufacturing process itself represents 13-18%. In module A1 phenolic resin represents the highest contribution (8-9%).

### 6.4 Ozone depletion

The highest contribution to ODP within all products (78-82%) represents the manufacturing process (module A3). The highest contribution represents natural gas (70-75%). Within module A1 dominates borax (4-6%).

### 6.5 Photochemical ozone formation

The highest contribution to POCP (62-66%) within all products represents the manufacturing process (module A3). The highest contribution represents electricity (26-33%) and natural gas (13-19%). In module A1 phenolic resin represents the highest contribution (20-24%).

### 6.6 Depletion of abiotic resources (elements)

The highest contribution to ADPE (99-100%) within all products represents the stage of raw material extraction and processing (module A1). The highest contribution represents borax (86-98%).

## 6.7 Depletion of abiotic resources (fossil fuels)

The highest contribution to ADPF (64-67%) within all products represents manufacturing process (module A3). Stage of raw material extraction and processing (module A1) contributes 32-35%, transport (module A2) represents negligible part (ca. 1%). In module A3 the highest contribution represents natural gas (27-34%) and electricity (16-20%). In module A1 the highest contribution represents phenolic resin (17-19%) and borax (5-7%).

## 6.8 Use of primary energy

The highest contribution to primary renewable energy use (91-96%) within all products represents manufacturing process (module A3). The highest contribution to primary non-renewable energy use (64-67%) within all products represents manufacturing process (module A3). Module A1 contributes 32-35%.

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## 7 Evidence

### 7.1 Declaration of performance (DoP)

### 7.2 EUCEB/RAL certificate

Evidence that fibre glass is health integrable.

### 7.3 Biological resistance

Products of mineral wool are considered as biological resistant.

### 7.4 Radioactivity

Products of mineral wool are considered as non-radioactive.

### 7.5 Formaldehyde and HOS emissions

There were no measurements taken of releasing formaldehyde and HOS from the products.

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## 8 References

### 8.1 Software

- GaBi 6

- <http://www.pe-international.com/ce-eu-english/index/>

### 8.2 Databases

- Ecoinvent integrated 2.2
- <http://ecoinvent.org/>

### 8.3 Standards

EN 15804:2012 Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products.

EN ISO 14040:2006 Environmental management - Life cycle assessment - Principles and framework (ISO 14040:2006).

EN ISO 14044:2006 Environmental management - Life cycle assessment - Requirements and guidelines (ISO 14044:2006).

ISO 14025:2006 Environmental labels and declarations - Type III environmental declarations - Principles and procedures (ISO 14025:2006).

### 8.4 Documents

ECO WGII- Report on verification of the IBU EPD and background report, version 0.2

PCR "Mineralische Dämmstoffe", 2007

Fulfilled questionnaires of declaration owner URSA Slovenia for seven products of mineral wool URSA DF 40, URSA SF 35, URSA SF 32, URSA TWF 1, URSA FDP 2, URSA FDP 2/Vf in URSA FDP 3/Vf).