

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	ROCKWOOL International A/S (ROCKWOOL Nordics)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	The Norwegian EPD Foundation
Declaration number	EPD-RWI-20200006-CCD1-EN
Registration number	NEPD-2055-925-EN
Issue date	11.02.2020
Valid to	10.02.2025

ROCKWOOL stone wool building technical insulation
ROCKWOOL International A/S (ROCKWOOL Nordics)

www.ibu-epd.com | <https://epd-online.com>



General Information

ROCKWOOL International A/S
(ROCKWOOL Nordics)

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Declaration number

EPD-RWI-20200006-CCD1-EN

This declaration is based on the product category rules:

Mineral insulating materials, 12.2018
(PCR checked and approved by the SVR)

Issue date

11.02.2020

Valid to

10.02.2025



Dipl. Ing. Hans Peters
(chairman of Institut Bauen und Umwelt e.V.)



Dr. Alexander Röder
(Managing Director Institut Bauen und Umwelt e.V.)

ROCKWOOL stone wool building
technical insulation

Owner of the declaration

ROCKWOOL International A/S (ROCKWOOL Nordics)
Hovedgaden 501
DK-2640 Hedehusene
Capital Region of Denmark

Declared product / declared unit

1m² of stone wool building technical insulation product.

Scope:

The spectrum of products, which is contained in this EPD refer to thermal insulation products for building equipment with a range of densities from 33 to 200 kg/m³. The declared technical insulation product in this EPD is 1m² of a VENTIMATT ALU stone wool mat with a thickness of 37 mm, without facing. The product comes with an aluminium facing, however, in order to facilitate the scaling calculations to other products, the user of the EPD has to add the impacts of the facing separately, based on the Annex provided. The corresponding thermal conductivity has been measured at 10°C as per EN 12667.

The ROCKWOOL thermal products presented in this declaration are produced in Moss (Norway), Trondheim (Norway), Vamdrup (Denmark) and Doense (Denmark). The properties of the ROCKWOOL products from the different production sites are identical. The EPD is based on LCA inventory data from the 4 plants. The reference flow is a weighted average based on the distribution of production capacity between the 4 plants.

For other specific ROCKWOOL products, the environmental impacts and indicators are determined by applying the appropriate scaling factors (please refer to section "Technical Data" for guidance). The LCA results of the facings are listed in the Annexe, accompanying this EPD. The production data correspond to the year 2017.

The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Verification

The standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025:2010

☐ internally ☒ externally



Dr. Frank Werner
(Independent verifier appointed by SVR)

Product

Product description/Product definition

ROCKWOOL stone wool thermal insulation is a fire-safe material for insulation against heat, cold, fire, vibrations and noise. It is traditionally made from

volcanic rock (typically basalt or dolomite), an increasing proportion of recycled material, and a low percentage of resin binder.

The unfaced and uncoated synthetic resin-bonded stone wool thermal insulation materials described in this declaration are produced in the form of slabs, mats or rolls in the density range from 33 up to 200 kg/m³. The calculation of the results for a specific product, which is mentioned in this EPD, is determined by applying the appropriate scaling factors and products R_D value. The assumed λ , for the calculation of R_D value, correlates with the temperature of 10°C. The scaling factors, presented in the tables below, show how much to multiply the impacts by, in order to obtain a thermal resistance of $R_D=1 \text{ m}^2 \text{ K/W}$ with other ROCKWOOL products. Stone wool insulation products marked with an asterisk (*) in the table are sold with extra features for special applications e.g. with a fleece, aluminium foil etc. The extra features are demonstrated in the Annexe. The impacts from the additional features shall be added to the final result. The scaling calculation shall follow the following formula:

$$\text{Environmental Impact per m}^2_{\text{product X-with facing}} = \frac{\text{Environmental Impact}_{\text{reference product}}}{\text{Environmental Impact}_{\text{facing material}}} \times \text{scaling factor} +$$

Product Name	Scaling Factor	Product Name	Scaling Factor
ALU-BRANDBATTS 120	3,5	CONLIT FIRE MAT EI30 *	2,0
ALU-BRANDBATTS 140	4,0	CONLIT FIRE MAT EI60/90 *	2,3
ALU-BRANDBATTS 80 *	2,3	IKI BATTS (20-29 mm) *	4,5
ALU-BRANDMATTA VENT *	2,3	IKI BATTS (30-49 mm) *	3,9
ALU-BRANDMATTE 80 *	2,4	IKI BATTS (50-120 mm) *	1,8
ALU-BRANDMATTE VENT *	2,0	INDUSTRIBATTS 50	1,4
ALU-VÄRMEMATTA *	1,9	INDUSTRIBATTS 80 *	2,1
ALU-VERKKOMATTO 85 *	2,4	INDUSTRIBATTS SORT LET *	1,3
BRANDBATTS 110	3,2	INDUSTRIBATTS SORT PLATE *	1,4
BRANNPLATE 50	1,5	INDUSTRIBATTS SORT TUNG *	2,0
CONLIT 120 *	3,9	KANALBATTS 100 M/VLIES *	2,9
CONLIT 150 *	5,3	KANALBATTS 65 M/VLIES *	1,9
CONLIT ALU BRANDMATTA EI30 *	2,4	KOMFORT BRANDMATTA 80 *	2,4
CONLIT ALU BRANDMATTA EI60 *	2,4	KOMFORT BRANDMATTA A VENT *	2,0
CONLIT ALU BRANNPLATE EI30 *	3,5	KOMFORVÄRMEMATTA *	1,9
CONLIT ALU BRANNPLATE EI60 *	4,2	LAMELMATTE w. facing*	1,1
CONLIT BRANDPLADE 120 M/ALU *	3,5	RP-KGD	5,1
CONLIT FIRE BOARD EI120 *	6,6	Tecit Hangers *	7,5
CONLIT FIRE BOARD EI30 *	3,3	UNIVERSALRØRSKÅL *	2,1
CONLIT FIRE BOARD EI60 *	5,5	VENTIMATT ALU (30-49 mm) *	1,8
CONLIT FIRE BOARD EI90 *	6,6	WIRED VENTIMATT *	1,4

For the mandrel wound pipe sections the scaling factors correspond to pipe length of 1 m. The factors are calculated according to the density of the Universal Rørskål Pipe Section, the external diameters of the uninsulated mandrel wound pipe (in mm) and the different thicknesses of the mandrel wound insulation pipe. The input data is according to the technical information that is found in the product datasheet.

SCALING FACTORS Universal rørskaal/Universal Pipe section						
	Insulation Pipe Thickness (mm)					
	mm	20	30	40	50	60
Pipe Diameter	15	0,1	0,2	0,4	0,6	0,8
	18	0,1	0,3	0,4	0,6	0,8
	22	0,1	0,3	0,4	0,6	0,9
	25	0,2	0,3	0,5	0,7	0,9
	28	0,2	0,3	0,5	0,7	0,9
	35	0,2	0,3	0,5	0,8	1,0
	42	0,2	0,4	0,6	0,8	1,1
	48	0,2	0,4	0,6	0,9	1,2
	54	0,3	0,4	0,7	0,9	1,2
	60	0,3	0,5	0,7	1,0	1,3
	64	0,3	0,5	0,7	1,0	1,3
	70	0,3	0,5	0,8	1,1	1,4
	76	0,3	0,6	0,8	1,1	1,4
	89	0,4	0,6	0,9	1,2	1,6
	114	0,5	0,8	1,1	1,5	1,9

For ROCKWOOL products from European factories the *Regulation (EU) No 305/2011* applies, for the placing on the market of construction products in the EU/EFTA European Union (European Free Trade Association) (with the exception of Switzerland). The products need a Declaration of Performance taking into consideration the harmonized product standard. This is *EN 14303*: "Thermal insulation products for building equipment and industrial installations, factory-made mineral wool (MW) products – specification" or for fire protection products *EN 13162* "Thermal insulation products for buildings - Factory made mineral wool (MW) products – Specification" and the CE-marking. For the applications and use, national regulations apply.

Application

The products covered in this EPD are used for technical insulation and fire protection. Technical insulation of building equipment, such as pipe lines, ventilation ducts, boilers, vessels, tanks and in other types of Heating, Ventilation and Air Conditioning (HVAC) building equipment solutions. The products for fire protection, includes the products, for fire protection of HVAC installations, building penetrations and building elements.

Technical Data

The technical specifications of the products within the scope of the EPD shall be listed, including the reference to the test methods/test standards for each specification.

For products with CE marking, the technical specifications must be specified in accordance with information in the declaration of performance.

Technical data

Name	Value	Unit
Thermal conductivity EN12667, EN 12939 (for thick products) and EN ISO 8497 for pipe sections	0.033 - 0.04	W/(mK)
Gross density	33 - 200	kg/m³
Water vapour transmission EN 13162	MU1 ($\mu=1$)	
Dimensional stability EN 1604	<DS(70,90)	
Compressive strength EN 826	<CS(10)60	kPa
Tensile strength perpendicular to faces EN 1607	<TR7,5	kPa
Point load EN 12430	<PL(5)550	N
Maximum service Temperature	<ST(+)610	°C

EN 14706		
Water absorption EN 1609	WS (≤ 1)	kg/m ²

The ROCKWOOL technical insulation products and pipe sections from European factories are CE marked in accordance with the CPR (Construction Products Regulation) (*Regulation no. 305/2011*), based on the harmonised product standard *EN 14303* "Thermal insulation products for building equipment and industrial installations, factory-made mineral wool (MW) products – specification" or for fire protection products *EN 13162* "Thermal insulation products for buildings - Factory made mineral wool (MW) products – Specification".

Base materials/Ancillary materials

The average composition used for this EPD is the following (based on average factory consumption figures for raw materials as a conservative approach:

- non-scarce natural stone and cement [75%]
- slags and other secondary or waste materials [17,5%]
- mineral oil and bonding agent [0,3%]
- binder [7,2%]

Packaging represents 7% of the final product delivered to the customer. The raw materials are non-scarce stones, secondary materials and briquettes, which are made of rock mineral wool waste, other secondary materials and cement. The binder is a water-based phenol-formaldehyde resin which is polymerized into a solid resin during the production of the final stone wool

product and is contained in lower than 4% for general building insulation products.

This product/article/at least one partial article contains substances listed in the candidate list (ECHA/PR/20/02) (date 16.01.2020) exceeding 0.1 percentage by mass: **no**.

Mineral wool fibres produced by ROCKWOOL are classified as non-hazardous under REACH (Regulation (EC) No 1272/2008 of the European parliament and of the council of 16 December 2008 on classification, labelling and packaging of substances and mixtures). ROCKWOOL are registered with REACH under the following definition: "Man-made vitreous (silicate) fibres with random orientation with alkaline oxide and alkali earth oxide (Na₂O+K₂O+CaO+MgO+BaO) content greater than 18% by weight and fulfilling one of the Note Q conditions".

ROCKWOOL products produced in Europe fulfil the Note Q requirements. This is certified by the independent certification body EUCEB (European Certification Board for mineral wool products). More information on EUCEB can be found at www.euceb.org.

Reference service life

When used correctly, the service life of ROCKWOOL stone wool is only limited by the service life of the building component where it is placed. For the purpose of this EPD the reference service life is considered to be a minimum 60 years, which is usually the assumption about the lifetime of the building where this is installed.

LCA: Calculation rules

Declared Unit

The specific product referred to in the declared unit is 1m² of VENTIMATT ALU stone wool batt with a thermal resistance $R_D=1$ m²K/W.

The reference product is a 37 mm thick ROCKWOOL stone wool board with a density of 33 kg/m³. For the calculation of the results in this declaration, averages are formed on the basis of the production volumes at the plants. This approach is considered conservative, as it contains increased binder composition as contained in higher density and speciality products. The unfaced and uncoated stone wool products do not display any differences in terms of the production process or production technology. For certain applications, the insulation materials are provided with a functional facing (like the reference product VENTIMATT ALU) on one or both sides. For the environmental impacts of the facing options please refer to the Annexe. If the product comes with a functional facing, the environmental impacts of the unfaced product and the facing option shall be aggregated.

Declared unit

Name	Value	Unit
Declared Unit	1	m ²
Gross density	33	kg/m ³
Surface	1	m ²
Weight	1.22	kg
Conversion factor to 1 kg	0.82	-

System boundary

The type of this EPD is **cradle to grave**.

The modules considered in the life cycle assessment as per system boundaries, outlined in section 5.5. of the PCR Part A: "Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report" are described as follows:

The product stage **A1-A3** includes:

- Provision of preliminary products and energy and relevant upstream processes;
- Transporting the raw materials and preliminary materials to the plant;
- Production process in the plant including energy inputs and emissions;
- Electricity consumption;
- Waste processing up to the end-of-waste state or disposal of waste residues, during the production stage;
- Production of packaging;
- Manufacturing of products and co-product.

In the product system under assessment, the slags, alumina and ashes are considered co-products from the steel and coal-fired electricity production

respectively with the application of economic allocation so their environmental impact is accounted for. Recycled stone wool comes free of environmental burden, as it enters the product system as waste. Recycled fuels also come free of environmental burden, but their transport to the factory is accounted for. During the melting of raw materials, pig iron is created in the cupola furnace. Pig iron is a co-product, which is subsequently sold to the market and economic allocation is applied. ROCKWOOL supplies district heating in the two factories in Denmark (Doense, Vamdrup) and in the factory in Trondheim (Norway). For the Danish factories, 7% and 20% of the heating energy consumed, respectively, is supplied and therefore allocated to district heating. The amount of excess heat to district heating was substituted by using the energy content as the substitution key. The emissions associated with energy production have been substituted in the same way. Modules A1, A2 and A3 are to be declared as an aggregated Module A1-3.

The Construction Stage **A4-A5** includes:

- A4 transport to the building site;
- A5 installation to the building.

The transport in A4 is modelled by volume, as the most conservative approach. The default vehicle is the truck and all the values are based on annual average delivery data.

In A5 the default installation is assumed to be manual, therefore no energy consumption or ancillary equipment is needed. The product waste from installation is assumed to be 2% and according to the modularity principle of *EN 15804* its impacts are fully allocated to A5. The A5 stage includes also waste processing up to the end-of-waste state or disposal of final residues during the construction process stage and impacts and aspects related to product losses during installation. Finally, the A5 module includes also the corresponding end-of-life considerations for packaging. The credits from heat and electricity recovery from incineration, or material recycling from module A5 are attributed to module D.

The use-stage **B1-B7**, related to the building fabric includes:

- B1 use or application of the installed product;
- B2 maintenance; ROCKWOOL products do not require maintenance during use in standard conditions and if correctly applied (according to manufacturer instructions). The default environmental impacts are in this case assumed to be zero;

- B3 repair; ROCKWOOL products are not repaired during use in standard conditions and if correctly applied (according to manufacturers' instructions). The default environmental impacts are in this case assumed to be zero;
- B4 replacement; ROCKWOOL Group products will not be replaced during use in standard conditions and if correctly applied (according to manufacturers' instructions). The default environmental impacts are in this case assumed to be zero
- B5 refurbishment; ROCKWOOL products are not refurbished during use in standard conditions and if correctly applied (according to manufacturers' instructions). The default environmental impacts are in this case assumed to be zero
- B6 – Operational energy use: ROCKWOOL products do not use energy during the use of the building. The default environmental impacts are zero
- B7 – Operational water use: ROCKWOOL products do not use water during the use of the building. The default environmental impacts are zero.

The End-of-life stage **C1-C4** includes:

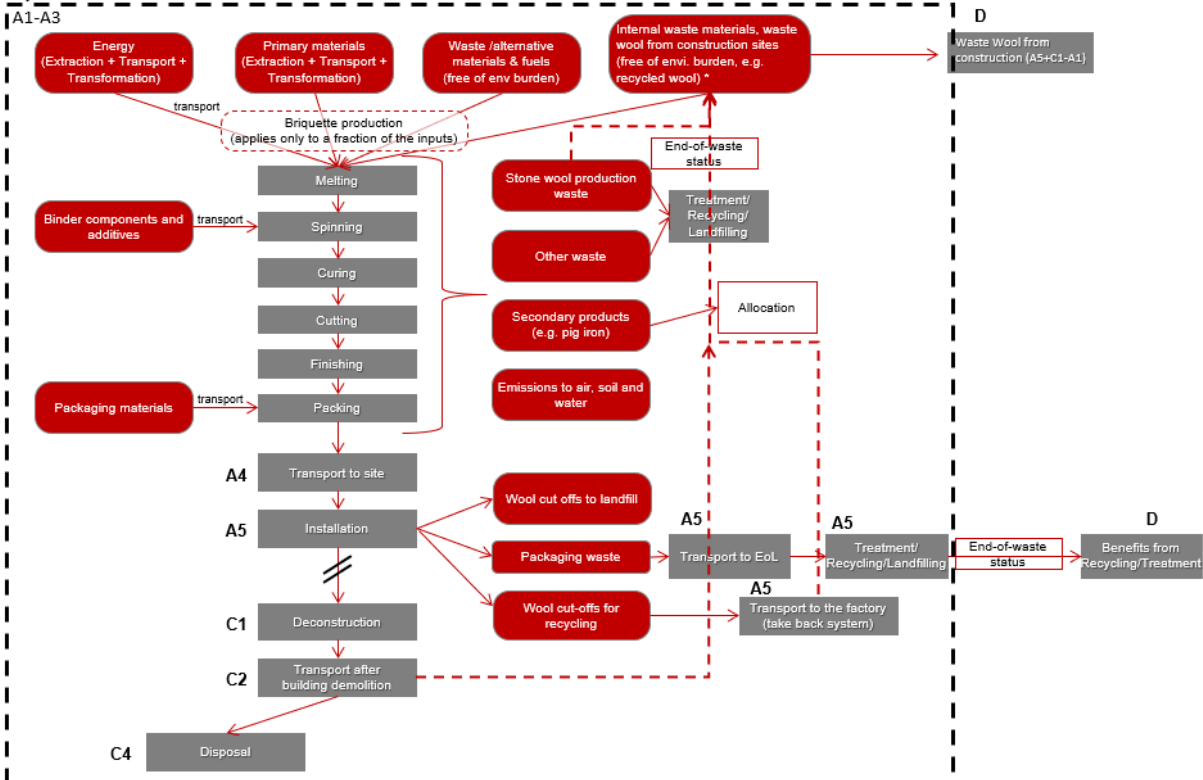
- C1 de-construction, demolition
- C2 transport to waste processing
- C3 waste processing for reuse, recovery and/or recycling
- C4 disposal.

These stages also include the provision and all transport, provision of all materials, products and related energy and water use.

Manual deconstruction is assumed for C1, therefore no impacts are assigned. The credits from disposal (heat or electricity recovery) are assigned to module D. Module D includes reuse, recovery and/or recycling potentials expressed as net impacts and benefits. Here the credits for the packaging disposal in A5 and the recycling potential of ROCKWOOL material in C are considered.

The product system with the system boundaries is presented in the graph below:

System Boundaries



Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to EN 15804 and the building

context, respectively the product-specific characteristics of performance, are taken into account.

The used software for the development of the declaration was *GaBi ts, version 8.0.1.257* by thinkstep.

LCA: Scenarios and additional technical information

The following technical information for the declared modules can be used for scenario development in a building context.

Transport to the building site (A4)

Name	Value	Unit
Litres of fuel volumetric transport considered	38	l/100km
Transport distance weighted average from factory specific distances	225	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	25	kg/m ³

The transport of the materials to the customer is modelled as a volumetric transport, meaning that the truck reaches its capacity with volume before its reaches it with mass. The same conservative approach is followed for all the products of this EPD, even for the ones with high density.

Installation into the building (A5)

Name	Value	Unit
Electricity consumption	0	kWh
Material loss	2	%

Reference service life

Name	Value	Unit
Reference service life (according to ISO 15686-1, -2, -7 and -8)	60	a
declared product properties	Product standards: EN 13162 "Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specifications" EN 16783:2017 PCR for thermal insulation products EN 14064 "Thermal insulation products for buildings - In-situ formed loose-fill mineral wool (MW) products - Part 1 and 2"	
design application parameters including references to the appropriate practices	See installation guidelines. Installation to be conducted in accordance with manufacturers guidelines	
Quality of work assumption when installed in accordance with the manufacturers instructions	It is assumed that the manufacturer's instructions are clear and followed. In case of any uncertainty the manufacturer should be	

	contacted for instructions	
Outdoor environment e.g. weathering, pollutants, UV and wind	Not for outdoor application, except if specifically stated on the product, External Wall Insulation Systems (EWIS) and External Thermal Insulation Cladding System (ETICS).	
Indoor Environment temperature, moisture etc.	Not in direct contact with indoor environment, except if specifically stated on the product.	
Usage conditions e.g. frequency of use, mechanical exposure etc.	No usage conditions, except if specifically stated on the product. Please follow manufacturer's guidelines	
Maintenance e.g. required frequency, type and quality of replacement components	No maintenance is generally required, unless specifically stated on the product. Please refer to manufacturer guidelines	

End of life (C1 - C4)

Name	Value	Unit
Recycling	0.03	kg
Landfilling	0.97	kg
Transport to recycling	150	km
Transport to landfill	50	km
Utilization rate	50	%

ROCKWOOL insulation products are fully recyclable. Currently ROCKWOOL has successfully established a recycling program in 5 countries including in the Nordics (Denmark, Sweden and Norway) and aims at increasing the number of countries in the future (*ROCKWOOL Sustainability Report*). The benefits from the recycling program are not thereby depicted in the assessment and the conservative approach of landfill is considered here.

Reuse, recovery and/or recycling potentials (D), relevant scenario information

Any declared benefits and loads from net flows leaving the product system that have not been allocated as co-products and that have passed the end-of-waste state are included in module D. Such declared benefits can for ROCKWOOL products occur in stages A5, C3 and C4. The generated energy, such as heat and electricity from waste incineration of packaging is assigned to module D. The benefits are calculated using current average substitution processes. The heat is credited for with heat from natural gas. The electricity is credited for with the specific country's electricity mix. This is also applied for materials that are landfilled as the avoided impact of electricity production and/or thermal energy recovery from landfill gas recovery is included in module D. For the recycling of stone wool it is important that no double counting occurs. The outputs of waste stone wool from modules A5 and C1 are considered linked to the inputs of waste stone wool into A1. Therefore only the net output flow (output from A5 plus C1 minus input to A1) is considered as a net output flow from the system and considered in Module D.

LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED; MNR = MODULE NOT RELEVANT)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	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
X	X	X	X	X	X	X	MNR	MNR	MNR	X	X	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m2 of building technical insulation product with an R=1m2K/W

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	1.35E+0	1.51E-1	1.67E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.60E-3	0.00E+0	1.91E-2	-8.42E-2
ODP	[kg CFC11-Eq.]	3.64E-9	5.03E-14	2.43E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.53E-15	0.00E+0	1.93E-14	-6.47E-14
AP	[kg SO ₂ -Eq.]	7.30E-3	1.38E-4	1.86E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.39E-6	0.00E+0	1.13E-4	-2.38E-4
EP	[kg (PO ₄) ³ -Eq.]	1.18E-3	2.88E-5	3.99E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.35E-7	0.00E+0	1.54E-5	-1.82E-5
POCP	[kg ethene-Eq.]	4.75E-4	6.57E-7	1.52E-5	1.27E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-5.76E-8	0.00E+0	8.89E-6	-3.25E-5
ADPE	[kg Sb-Eq.]	4.02E-7	1.20E-8	1.12E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.67E-10	0.00E+0	6.85E-9	-1.38E-8
ADPF	[MJ]	1.65E+1	2.07E+0	5.19E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.30E-2	0.00E+0	2.47E-1	-2.26E+0

Caption: GWP = Global warming potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP = Formation potential of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources

RESULTS OF THE LCA - RESOURCE USE: 1 m2 of building technical insulation product with an R=1m2K/W

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	2.96E+0	1.04E-1	1.14E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.17E-3	0.00E+0	2.98E-2	-3.19E-1
PERM	[MJ]	1.54E+0	0.00E+0	-1.10E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	4.50E+0	1.04E-1	4.11E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.17E-3	0.00E+0	2.98E-2	-3.19E-1
PENRE	[MJ]	1.41E+1	2.08E+0	2.67E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.32E-2	0.00E+0	2.56E-1	-2.40E+0
PENRM	[MJ]	3.02E+0	0.00E+0	-7.70E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	1.71E+1	2.08E+0	1.90E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.32E-2	0.00E+0	2.56E-1	-2.40E+0
SM	[kg]	3.49E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.01E-2
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m ³]	5.94E-3	1.93E-4	3.48E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.87E-6	0.00E+0	4.87E-5	-9.90E-4

Caption: PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m2 of building technical insulation product with an R=1m2K/W

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	4.01E-7	1.09E-7	2.73E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.32E-9	0.00E+0	4.05E-9	-7.57E-10
NHWD	[kg]	2.25E-1	1.59E-4	9.07E-3	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.83E-6	0.00E+0	1.19E+0	-1.40E-3
RWD	[kg]	1.31E-4	2.83E-6	1.65E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.62E-8	0.00E+0	3.49E-6	-9.13E-6
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	3.43E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.30E-2	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	1.30E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	3.88E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

Caption: HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy

References

Construction Products Regulation (CPR) EU, Nr. 305/2011

Regulation (EU) No 305/2011 of the European Parliament and of the Council of 9 March 2011 laying down harmonized conditions for the marketing of construction products and repealing Council Directive 89/106/EEC Text with EEA relevance.

ECHA PR/20/02

The Candidate List of substances of very high concern, available via <https://echa.europa.eu/-/four-new-substances-added-to-candidate-list>, accessed Feb.2020

EN 826

EN 826:2013: Thermal insulating products for building applications.
Determination of compression behavior.

EN 1604

EN 1604: 2013: Thermal insulating products for building applications. Determination of dimensional stability under specified temperature and humidity conditions.

EN 1607

EN 1607:2013: Thermal insulating products for building applications. Determination of tensile strength perpendicular to faces.

EN 1609

EN 1609:2013: Thermal insulating products for building applications. Determination of short term water absorption by partial immersion

EN 8497

EN 8497:1947: Thermal insulation — Determination of steady-state thermal transmission properties of thermal insulation for circular pipes

EN 12430

EN 12430:2013: Thermal insulating products for building applications. Determination of behavior under point load.

EN 12667

EN 12667:2001: Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Products of high and medium thermal resistance.

EN 12939

EN 12939:2001: Thermal performance of building materials and products. Determination of thermal resistance by means of guarded hot plate and heat flow meter methods. Thick products of high and medium thermal resistance.

EN 13162

EN 13162:2008: Thermal insulation products for buildings. Factory made mineral wool (MW) products. Specification.

EN 14303

EN 14303:2009+A1:2013: Thermal insulation products for building equipment and industrial installations. Factory made mineral wool (MW) products. Specification

EN 14706

EN 14706:2005: Thermal insulation products for building equipment and industrial installations. Determination of maximum service temperature

EN 15804

EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

ISO 14025

DIN EN /ISO 14025:2011-10/, Environmental labels and declarations — Type III environmental declarations — Principles and procedures

ISO 15686

ISO 15686 series of standards: Buildings and constructed assets -- Service life planning.

EUCB

Website of European Certification Board for mineral wool products: <http://www.euceb.org/> [Accessed: January 2019].

GaBi ts

Leinfelden - Echterdingen GaBi Software - System and Database for Life cycle Engineering. Thinkstep AG, LBP, University of Stuttgart and PE. Program version 8.0.1.257, database schema 8006 International, 2011.

GaBi-Dokumentation

Thinkstep AG: GaBi 6 life cycle inventory data documentation, 2018.
<http://www.gabisoftware.com/support/gabi/gabi-6-lcidocumentation> [Accessed: January 2019].

IBU PCR - Part A

Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, version 1.6, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, November 2017.

IBU 2017, PCR, Part B

PCR- Part B: Requirements on the EPD for mineral insulating products, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, January 2019.

Regulation (EC) No 1272/2008 - REACH

Regulation (EC) No 1272/2008 of the European parliament and of the council of 16 December 2008 on classification, labeling and packaging of substances and mixtures. Available at: <https://eurlex.europa.eu/legalcontent/EN/TXT/?uri=celex:32008R1272> [Accessed: March 2019].

ROCKWOOL Sustainability Report

"Impact built-in": Sustainability report from ROCKWOOL Group, 2017. Available at: <https://www.rockwoolgroup.com/about-us/sustainability/sustainability-report/> [Accessed: November 2019]

IBU 2016

IBU (2016): General Programme Instructions for the
Preparation of EPDs at the Institut Bauen und Umwelt

e.V., Version 1.1 Institut Bauen und Umwelt e.V.,
Berlin. www.ibu-epd.de

**Publisher**

Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@ibu-epd.com
Web www.ibu-epd.com

**Programme holder**

Institut Bauen und Umwelt e.V.
Panoramastr 1
10178 Berlin
Germany

Tel +49 (0)30 - 3087748- 0
Fax +49 (0)30 - 3087748 - 29
Mail info@ibu-epd.com
Web www.ibu-epd.com

**Author of the Life Cycle
Assessment**

ROCKWOOL International A/S
Hovedgaden 584
2640 Hedehusene
Denmark

Tel +45 46 56 03 00
Fax +45 46 56 33 11
Mail info@rockwool.com
Web www.rockwoolgroup.com

**Owner of the Declaration**

ROCKWOOL International A/S
Hovedgaden 584
2640 Hedehusene
Denmark

Tel +45 46 56 03 00
Fax +45 46 56 33 11
Mail info@rockwool.com
Web www.rockwoolgroup.com

Annex 1

Self declaration from EPD owner

Specific Norwegian requirements

1 Applied electricity data set used in the manufacturing phase

The selection of the background data for the electricity generation is in line EN 15804. Within the different plants the country specific Danish or Norwegian power grid mix (reference year 2017) is applied.

<0,00985 kg CO₂ eqv/MJ> (Norwegian power mix year according to GaBi 8.0 database)

<0,115 kg CO₂ eqv/MJ> (Danish power mix year according to GaBi 8.0 database)

2 Content of dangerous substances

- ☒ The product contains no substances given by the REACH Candidate list or the Norwegian priority list.
- ☐ The product contains substances that are less than 0.1% by weight given by the REACH Candidate or the Norwegian priority list.
- ☐ The product contains dangerous substances more than 0.1% by weight given in the REACH candidate list or the Norwegian Priority List, concentrations is given in the EPD:

Dangerous substances from the REACH candidate list or the Norwegian Priority List	CAS No.	Quantity (concentration, wt%/FU(DU)).
Substance 1		
Substance n		

3 Transport from the place of manufacture to a central warehouse

Transport distance and CO₂-eqv./DU from transport of the product from factory gate to central warehouse in Oslo shall be given.

The transport distance here is set as a weighted average, based on the transport distances from all four Nordic factories to Oslo.

Type	Capacity utilisation (incl. return) %	Type of vehicle	Distance km	Fuel/Energy use	Unit	Value (l/t)	CO ₂ -eqv./DU
Boat	48%	Container Ship	107	4,23E-04	Kg HFO/kg of cargo	0,346	1,34E-03
Truck*	13%	Truck, Euro 6, 17,3t payload	259	0,38	l/km	44,73	69,8E-03
Railway							
Total							

*The capacity utilization has been modelled based on volumetric capacity modelling for low density products as a conservative case. This means that the truck will be filled with volume before it is filled with mass. For high density products the capacity utilization will be higher.

4 Impact on the indoor environment

☒ Indoor air emission testing has been performed; specify test method and reference:

The products meet the requirements for low emissions (M1) and requirements according to EN15251: 2007 Appendix E.

ROCKWOOL products are recognized by the M1 label. M1 certificates will be provided on request.

☐ No test has been performed

☐ Not relevant; specify _____