

APPENDIX C-018113 – LEED v4.1 MATERIALS REPORTING FORM (FOR REFERENCE ONLY)

LEED-NC v4 Materials Reporting Form

Please complete this form for all permanently installed products within the Divisions noted below. Check boxes for the appropriate product type and complete all fields as indicated. Provide backup documentation for each environmental claim. See page 2 for definitions and submittal requirements.

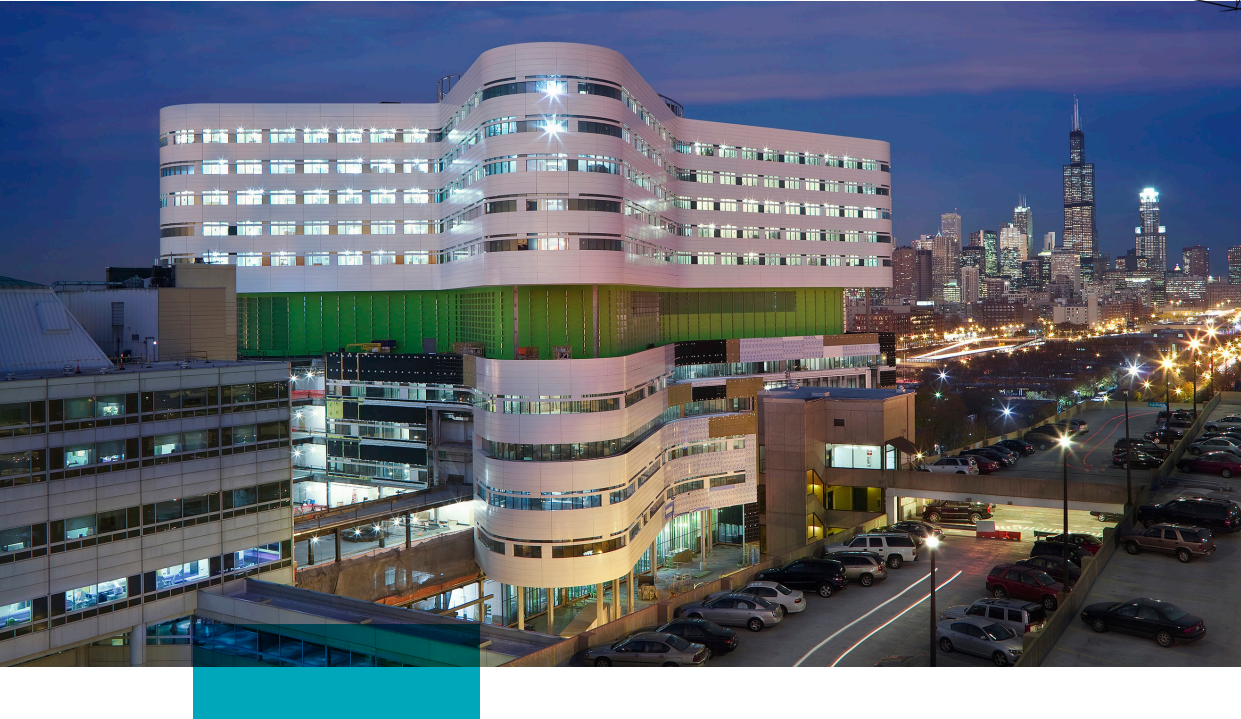
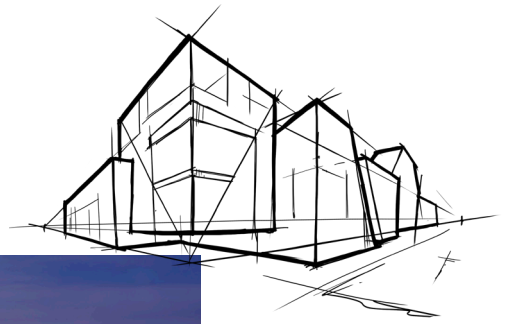
Submittal Number : N/A	Product Name or Model # : Cavityrock	Total Material Cost (w/o site labor/equip) :
Submittal Name : N/A	Manufacturer : Rockwool	Location of Product : Interior <input checked="" type="checkbox"/> Exterior <input type="checkbox"/>
Subcontractor: N/A	Manufacturer Contact: N/A	Is product used in building structure or enclosure? Y <input type="checkbox"/> N <input checked="" type="checkbox"/>

REQUIRED FOR ALL PRODUCTS - DIVS 3-12, 31, 32	REQUIRED FOR INTERIOR PRODUCTS - ALL DIVS	NOTES
1. MRc2 Environmental Product Declaration (EPD) Does the product have one of the documents listed below: a) EPD Y <input checked="" type="checkbox"/> N <input type="checkbox"/> b) 3rd Party Life Cycle Assessment (LCA) Y <input checked="" type="checkbox"/> N <input type="checkbox"/> 2. MRc3 Sourcing of Raw Materials Does the product's manufacturer have a corporate sustainability report? Y <input checked="" type="checkbox"/> N <input type="checkbox"/> Does the product meet one of the attributes below? a) Take-back program Y <input type="checkbox"/> N <input checked="" type="checkbox"/> b) Bio-based materials 0 % c) Materials reuse 0 % d) FSC Certified Wood 0 % - COC# N/A e) Recycled content 40 % - Pre-consumer 0 % - Post-consumer 0 % f) Extraction, manufacture, and purchase locations all within 100 miles? Y <input type="checkbox"/> N <input checked="" type="checkbox"/> 3. MRc4 Material Ingredients Does the product disclose material ingredients via one of the applicable programs below? a) Manufacturer Inventory Y <input type="checkbox"/> N <input checked="" type="checkbox"/> b) Health Product Declaration Y <input checked="" type="checkbox"/> N <input type="checkbox"/> c) Cradle to Cradle Certificate Y <input type="checkbox"/> N <input checked="" type="checkbox"/> d) GreenScreen Assessment Y <input checked="" type="checkbox"/> N <input type="checkbox"/> e) REACH Optimization Y <input type="checkbox"/> N <input checked="" type="checkbox"/> f) Declare Label Y <input checked="" type="checkbox"/> N <input type="checkbox"/> g) UL Product Lens Y <input type="checkbox"/> N <input checked="" type="checkbox"/>	4. EQc2 Low-Emitting Materials Select the appropriate section for the type of product submitted: <input type="checkbox"/> ADHESIVES / SEALANTS / PAINTS / COATINGS Provide VOC content (grams/Liter): _____ g/L Estimate installed volume (Liters): _____ L General Emissions Evaluation available?: Y <input type="checkbox"/> N <input type="checkbox"/> Type of documentation: 3 rd Party Certificate* <input type="checkbox"/> or Testing Report <input type="checkbox"/> TVOC range: <0.5 mg/m ³ <input type="checkbox"/> 0.5-5.0 mg/m ³ <input type="checkbox"/> >5.0 mg/m ³ <input type="checkbox"/> <input type="checkbox"/> COMPOSITE WOOD PRODUCTS Confirm CARB compliance with one of the following: ULEF <input type="checkbox"/> or NAF <input type="checkbox"/> or CARB Exempt <input type="checkbox"/> <input checked="" type="checkbox"/> FLOORING / CEILINGS / WALLS / INSULATION PRODUCTS General Emissions Evaluation available?: Y <input checked="" type="checkbox"/> N <input type="checkbox"/> Type of documentation: 3 rd Party Certificate* <input type="checkbox"/> or Testing Report <input checked="" type="checkbox"/> TVOC range: <0.5 mg/m ³ <input checked="" type="checkbox"/> 0.5-5.0 mg/m ³ <input type="checkbox"/> >5.0 mg/m ³ <input type="checkbox"/> OR, is the product inherently non-emitting? Y <input type="checkbox"/> N <input checked="" type="checkbox"/> <input type="checkbox"/> FURNITURE PRODUCTS Furniture Evaluation available?: Y <input type="checkbox"/> N <input type="checkbox"/> Type of documentation: 3 rd Party Certificate* <input type="checkbox"/> or Testing Report <input type="checkbox"/>	
Contractor Certification: I _____ a duly authorized representative of _____ hereby certify that the material information contained herein is an accurate representation of the material qualifications to be provided by us, as components of the final building construction. Furthermore, I understand that any change in such qualification during the purchasing period will require prior written approval from the Construction Manager and Owner. Signature of Authorized Representative _____ Date: _____		

* See the USGBC Low-Emitting Materials Third Party Certification table for acceptable 3rd party certifications and programs:
<https://www.usgbc.org/resources/low-emitting-materials-third-party-certification-table>

CAVITYROCK®

Exterior Insulation for Cavity Wall
and Rainscreen Applications



ROCKWOOL CAVITYROCK® products are semi-rigid stone wool insulation boards designed for exterior cavity wall and rainscreen applications, and are compatible with numerous cladding attachment systems.

CAVITYROCK® is non-combustible and fire resistant, and will not develop toxic smoke or promote flame spread, even when directly exposed to fire. Approved for use in many NFPA 285-compliant designs, it is an important component of fire-resilient exterior wall systems when used as a continuous insulation.

CAVITYROCK® also offers long-term thermal efficiency, moisture control and acoustic performance – improving the energy efficiency and comfort of buildings.

Choose mono-density insulation in thicknesses up to 2" or dual-density in thicknesses of 2.5" to 6".

Learn more at rockwool.com

Thermal Performance

The use of CAVITYROCK® as a continuous insulation helps you meet building code requirements.



CAVITYROCK®

Exterior Insulation for Cavity Wall and Rainscreen Applications

Technical Data Sheet

Board Insulation 07210* • Board Insulation 07 21 13**
Cavity Wall Unit Masonry 04 27 23**

ROCKWOOL CAVITYROCK® is a semi-rigid, mineral wool insulation board designed for exterior cavity wall and rainscreen applications.

	Performance	Test Standard
Compliance	Mineral Fiber Block and Board Thermal Insulation - Type IVB Compliant	ASTM C612
	MEA Approval, New York City Approval	236 - 05 - M
	For information on CAN/ULC S702 compliance, contact ROCKWOOL Technical Support	
Reaction to Fire	Flame spread index = 0; Smoke developed index = 0	ASTM E84 (UL 723)
	Flame spread index = 0; Smoke developed index = 0	CAN/ULC S102
	Determination of Non Combustibility of Building Materials - Non Combustible	CAN/ULC S114
	Behaviour of materials at 750°C - Non Combustible	ASTM E136
Monolithic Density (thickness: 1", 1.5", 2")	> 4.3 lbs/ft³ (>69 kg/m³)* * Density will change with thickness, please contact ROCKWOOL for more information	ASTM C303
Density (thickness ≥ 2.5")	Dual Density - 6.2 lbs/ft³ (100 kg/m³) outer layer and 3.8 lbs/ft³ (61 kg/m³) inner layer	ASTM C303
Corrosion Resistance	Stress Corrosion Cracking Tendency of Austenitic Stainless Steel - Passed Corrosion of Steel - Passed	ASTM C795 ASTM C665
Thermal Resistance	R-Value / inch @ 75°F 4.3 hr.ft².F/Btu RSI value / 25.4 mm @ 24°C 0.75 m²K/W	ASTM C518 (C177)
Reaction to Moisture	Moisture Sorption - 0.03% by volume	ASTM C1104
	Water Vapor Transmission, Desiccant Method - 1555ng/Pa.s.m² (27 perm)	ASTM E96
	Determination of Fungi Resistance - Passed	ASTM C1338
Thickness Dimensions	1" (25.4 mm) to 4" (101.6 mm) in 1/2" increments. 5" (127 mm) and 6" (152.4 mm) 24" x 48" (610 mm x 1219 mm) and 16" x 48" (406 mm x 1219 mm)	
Acoustical Performance	Thickness 125 Hz 250 Hz 500 Hz 1000 Hz 2000Hz 4000 Hz NRC	ASTM C423
	1.5" 0.19 0.55 1.03 1.06 1.02 1.01 0.9	
	2" 0.26 0.71 1.14 1.09 1.04 1.03 1	
	3" 0.72 0.93 0.88 0.84 0.9 0.97 0.9	

Issued 01-01-18
Supersedes 08-23-17



Please contact ROCKWOOL for
Declare labels for other ROCKWOOL
manufacturing facilities.

NOTE: *Master Format 1995 Edition **Master Format 2004 Edition. As ROCKWOOL has no control over installation design and workmanship, accessory materials or application conditions, ROCKWOOL does not warranty the performance or results of any installation containing ROCKWOOL's products. ROCKWOOL's overall liability and the remedies available are limited by the general terms and conditions of sale. This warranty is in lieu of all other warranties and conditions expressed or implied, including the warranties of merchantability and fitness for a particular purpose.

ROCKWOOL LEED v4 Solutions Guide

The right choice for creating sustainable buildings
and achieving LEED® certification.



The ROCKWOOL Group is the world leader in stone wool solutions. Our product portfolio is well placed to tackle many of today's biggest sustainability and development challenges and we offer carefully designed, innovative sustainable solutions for your comfort, safety and for the benefit of the environment.

Our products

ROCKWOOL stone wool insulation products not only help in creating sustainable buildings; they are made from a natural fire safe and durable material with no added flame retardants or blowing agents.

Rock: A natural, renewable resource

All ROCKWOOL products are made from stone wool – consisting of a blend of naturally occurring volcanic diabase rock. This stone is a renewable and plentiful natural resource in itself, but just as importantly our high-tech production process ensures that all our insulation products are produced in a sustainable and environmentally responsible way.

Major energy savings

One of the best ways to reduce the energy consumption of a building is through proper insulation. ROCKWOOL stone wool products are a major energy and CO₂ saver, as they allow new and existing buildings to benefit from durable, efficient and

versatile thermal insulation. Actually, the energy savings obtained from installing the right insulation will outweigh the energy consumption used for its production in just a few months time.

In most cases, properly installed insulation can cut the building's energy need for heating or cooling of up to 70-90%. In addition, ROCKWOOL insulation works continuously and requires no maintenance or replacement. In other words, it's an investment, which will quickly pay off!

Creating sustainable buildings

The LEED® v4 Green Building Rating System includes revised performance criteria for certifying the design and construction of commercial, institutional and residential buildings. LEED® works for all buildings anywhere, regardless of where they are in their life cycle and the process is designed to inspire innovative solutions that support healthy, highly efficient and cost-saving green buildings during the design, construction, operation and maintenance of these high-performance structures.

ROCKWOOL insulation is the right choice for creating sustainable buildings and achieving LEED® v4 points for your high-performance buildings.



Energy & Atmosphere

Minimum energy performance & Optimize energy performance

Energy efficient building design requires a well-insulated and properly constructed building envelope. ROCKWOOL provides a range of thermal insulation products that can be used on the exterior, interior or both to achieve the prerequisite minimum energy performance and optimized energy performance credits.



Materials & Resources

Building life-cycle impact reduction

A properly constructed and well-insulated building envelope utilizing the long lasting high performance of ROCKWOOL thermal insulation products can assist your project team in achieving the building life-cycle impact reduction through a whole-building life-cycle assessment.

Building product disclosure and optimization - environmental product declarations

ROCKWOOL can deliver third-party UL certified industry wide cradle-to-grave EPDs according to ISO 14025 and ISO 14044 and are available for download at www.ROCKWOOL.com.

Building product disclosure and optimization - sourcing of raw materials

The ROCKWOOL Group Code of Conduct for Suppliers addresses topics such as equal opportunities, trade union recognition, fair employment terms and the abolition of child labour. This document must be signed by all of our major suppliers including but not limited to suppliers of raw materials and equipment for repair, maintenance, operations as well as suppliers with whom we spend more than US \$100,000. Currently, 75% of our key suppliers have already signed the Code of Conduct.

The ROCKWOOL Group procurement policy provides opportunity to engage with our suppliers on social and ethical topics, and implies that high-risk suppliers will be audited against our Code of Conduct. The ROCKWOOL Group has adopted the ICC *"Business Charter for Sustainable Development – Principles for Environmental Management"*, where our suppliers are also required to ensure their own suppliers meet the same standards.

Our commitment is documented through our corporate governance published in the ROCKWOOL Group Annual Report as well as the ROCKWOOL Group Sustainability Report which is self-declared and follows the Global Reporting Initiative (GRI) Sustainability Report CSR framework (GRI G4).

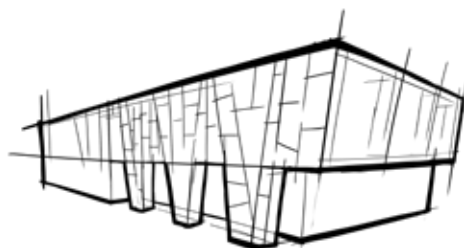
Building product disclosure and optimization - material ingredients

ROCKWOOL stone wool products are made up of approximately 97 percent minerals such as volcanic rock, as well as upcycled and recycled materials from our factories and other industries that might otherwise be landfilled or downcycled. Stone wool is also fully recyclable and can be recycled again and again without degrading its quality.

ROCKWOOL values transparency and has published complete content inventory for the product at 0.1% (1000 ppm) identified by name and Chemical Abstract Service Registration Number (CASRN), disclosing role, amount and hazard screen using GreenScreen benchmark, as defined in GreenScreen v1.2. Our AFB evo™ product also holds a Declare label.

≤ 40 %

The average recycled content of the stone wool core is up to 40%, depending on production site and product.



ROCKWOOL Products for LEED® v4

		Energy and Atmosphere (EA)		Materials & Resources (MR)				Indoor Environmental Quality (EQ)			
		Minimum Energy Performance	Optimize Energy Performance	Building Life-Cycle Impact Reduction	Building Product Disclosure and Optimization - Environmental Product Declarations	Building Product Disclosure and Optimization - Sourcing of Raw Materials	Building Product Disclosure and Optimization - Material Ingredients	Minimum Acoustical Performance	Low-Emitting Materials	Thermal Comfort	Acoustic Performance
ROCKWOOL Products											
Walls	Exterior Walls										
	CAVITYROCK®	x	x	x	x	x	x	x		x	x
	COMFORTBOARD™ 110	x	x	x	x	x	x	x		x	x
	COMFORTBOARD™ 80	x	x	x	x	x	x	x		x	x
	COMFORTBATT®	x	x	x	x	x	x	x	x	x	x
	Interior Walls										
	AFB®			x	x	x	x	x	x		x
	AFB evo™			x	x	x	Declare	x	x*		x
	SAFE'n'SOUND®			x	x	x	x	x	x		x
	ROCKBOARD® 40/60/80			x	x	x	x	x			x
	Curtain Wall										
	CURTAINROCK® 40/80	x	x	x	x	x	x	x		x	x
	Firestopping										
	ROXUL SAFE™				x	x	x	x			x
	ROXUL SAFE™ 45				x	x	x	x			x
	Metal Building										
	PLUS™ MB	x	x	x	x	x	x	x		x	x
	ROXUL SAFE™ 65	x	x	x	x	x	x	x		x	x
	ROXUL SAFE™ 55	x	x	x	x	x	x	x		x	x
	Sandwich Wall										
	CONROCK 60®	x	x	x	x	x	x	x		x	x
	CONROCK®	x	x	x	x	x	x	x		x	x
Roofs	Flat Roof										
	TOPROCK® DD	x	x	x	x	x	x	x		x	x
	TOPROCK® DD PLUS	x	x	x	x	x	x	x		x	x
	ROCKWOOL MULTIFIX™	x	x	x	x	x	x	x		x	x
	MONOBOARD®	x	x	x	x	x	x	x		x	x
	MONOBOARD® Plus	x	x	x	x	x	x	x		x	x

* UL validated formaldehyde free

Indoor Environmental Quality

Low-emitting materials

Our wellbeing goes hand-in-hand with the comfort of the environment where we work, live, learn, play or even – in the case of a hospital – recover.

All ROCKWOOL stone wool insulation batt products are certified according to GREENGUARD Gold in accordance with California Department of Public Health (CDPH) Standard Method v1.1–2010.

In addition, AFB evo[™] is UL validated to be Formaldehyde Free.



ROCKWOOL North American production facilities

With production facilities strategically placed to support local resources and reduced environmental impacts from transportation, ROCKWOOL's primary raw material sources are located in close vicinity of our facilities though certain materials may be sourced from further than 100 miles (160 km).

Milton, Ontario, Canada

The ROCKWOOL Group entered the North American market for the first time in 1988. This location marks the group's first factory and serves as ROCKWOOL's head office for North American operations.

Grand Forks, British Columbia, Canada

This facility has been in operation since November 1999 and was the first expansion for ROCKWOOL within North America. The Grand Forks facility operates to meet the needs of North America's western regions.

Byhalia, Mississippi, USA

In the spring of 2014, a new 600,000 sq. ft. facility opened in Marshall County, Mississippi; approximately 30 miles south of Memphis.

***COMING SOON (2020) – Ranson, West Virginia, USA**

This new manufacturing facility will cover some 460,000 square feet and employ around 150 people.



For information on how ROCKWOOL products and resource-efficient solutions support sustainable design strategies, or for assistance with your calculations, contact one of our Technical Specialists at 1-877-823-9790 or visit www.ROCKWOOL.com.

At the ROCKWOOL Group, we are committed to enriching the lives of everyone who comes into contact with our solutions. Our expertise is perfectly suited to tackle many of today's biggest sustainability and development challenges, from energy consumption and noise pollution to fire resilience, water scarcity and flooding. Our range of products reflects the diversity of the world's needs, while supporting our stakeholders in reducing their own carbon footprint.

Stone wool is a versatile material and forms the basis of all our businesses. With more than 11,000 employees in 39 countries, we are the world leader in stone wool solutions, from building insulation to acoustic ceilings, external cladding systems to horticultural solutions, engineered fibres for industrial use to insulation for the process industry and marine and offshore.

AFB®, CAVITYROCK®, COMFORTBATT®, CONROCK®, CURTAINROCK®, ROCKBOARD®, TOPROCK®, MONOBOARD®, ROXUL® are registered trademarks of the ROCKWOOL Group in USA and ROXUL Inc. in Canada.

ROCKWOOL™, COMFORTBOARD™, FABROCK™, ROXUL SAFE™, ROCKWOOL PLUS™, and AFB evo™ are trademarks of the ROCKWOOL Group in USA and ROXUL Inc. in Canada.

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Publication date - edition: 01/2018



ROCKWOOL
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Milton, ON L9T 6W3
Tel: 1 800 265 6878
rockwool.com

Declare.

**ROCKWOOL™ Exterior Stone Wool
Insulation-Unfaced: CAVITYROCK®,
CURTAINROCK® 40/80,
COMFORTBOARD™ 110/80, ROXUL
SAFE™**

ROCKWOOL

Final Assembly: Byhalia, Mississippi, USA

Life Expectancy: Life of Structure

End of Life Options: Salvageable/Reusable in its
Entirety, Landfill (100%)

Ingredients:

**Glass, Oxide, Chemicals, Urea, Polymer with
Formaldehyde and Phenol¹; Syrups, Hydrolized
Starch, Proprietary Ingredient (0.05-0.2%)²**

¹LBC Temp Exception I10-E9 Phenol Formaldehyde in Mineral
Wool Insulation

²LBC Temp Exception I10-E4 Proprietary Ingredients <1%

Living Building Challenge Criteria:

RXL-1002

VOC Content: N/A

Declaration Status

EXP. 01 OCT 2020

VOC Emissions: N/A

☐ LBC Red List Free

☒ LBC Compliant

☐ Declared

MANUFACTURER RESPONSIBLE FOR LABEL ACCURACY

INTERNATIONAL LIVING FUTURE INSTITUTE™ declareproducts.com

Safe Use Instruction Sheet

This ROCKWOOL Safe Use Instruction Sheet [SUIS] is provided for manufactured articles neither regulated by OSHA Hazard Communication Standard, 29 CFR 1910.1200 nor by the Canada Hazardous Products Regulation SOR/2015-17 [WHMIS 2015].

ROCKWOOL provides this SUIS for safe handling and use instructions.

1. Identification of the article

Product Name Resin-Bonded Stone Wool Insulation

Product Family	Product Identification	Intended Use
I.	AFB evo™	Interior Wall and Floor Applications
II.	COMFORTBOARD™, COMFORTBATT®, SAFE'N'SOUND®, AFB®, CAVITYROCK®, CURTAINROCK®, ROCKBOARD®, ROXUL Plus®, SAFE®	Interior and Exterior Applications
III.	MONOBOARD® PLUS, TOPROCK® DD Plus, MULTIFIX	Roof Insulation or Insulating Cover Board over Other Insulations
IV.	MONOBOARD®, TOPROCK® DD, TOPROCK® DD	Low-Slope Roof Applications
V.	CONROCK®, FABROCK™	OEM
VI.	ProRox® NA, SeaRox® NA	Industrial Piping and Equipment Applications

Manufacturer ROCKWOOL

Address	Canada	USA
	8024 Esquesing Line	4594 Cayce Rd
	Milton, Ontario	Byhalia
	Canada	MS 38611
	L9T 6W3	USA

Company Phone Number 1-800-265-6878
1-877-823-9790 (8:30 am to 5:00 pm ET)

Email contactus@rockwool.com

2. Hazards identification

OSHA This product is considered an article as per OSHA 29 CFR 1910.1200.

29 CFR 1910.1200(c) defines an article as follows: "Article" means a manufactured item other than a fluid or particle: (i) which is formed to a specific shape or design during manufacture; (ii) which has end use function(s) dependent in whole or in part upon its shape or design during end use; and (iii) which under normal conditions of use does not release more than very small quantities, e.g., minute or trace amounts of a hazardous chemical (as determined under paragraph (d) of this section), and does not pose a physical hazard or health risk to employees.

Articles meeting the above definition are not regulated by OSHA 29 CFR 1910.1200 and are exempt from SDS and label requirements.



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rockwool.com

2. Hazards identification - Continued

WHMIS

This product is considered an article per the Canadian Hazardous Products Regulation SOR/2015-17. Manufactured articles that meet the definition of the Canadian Hazardous Products Act (any article that is formed to a specific shape or design during manufacture, the intended use of which when in that form is dependent in whole or in part on its shape or design, and that, when being installed, if the intended use of the article requires it to be installed, and under normal conditions of use, will not release or otherwise cause an individual to be exposed to a hazardous product) are not regulated by the Canadian Hazardous Products Regulation SOR/2015-17 and are exempt from SDS and label requirements.

Adverse physiochemical, human health and environmental effects

This product may cause temporary mechanical irritation to the eyes and skin. Temporary irritation of the upper respiratory tract (scratchy throat, coughing, congestion) may result from exposure to dusts and fibers in excess of applicable exposure limits. Pre-existing chronic eye, skin and respiratory conditions may temporarily worsen due to exposure to dusts and fibers (see section 8 for safe handling instructions).

3. Composition / information on ingredients

Product Family	Stone wool (a, b)	Non added formaldehyde binder	Phenol Formaldehyde Binder	Syrups, hydrolysed starch	Mineral Oil
I.	97%	<3%	-	<1%	<0.2%
II.	97%	-	<3%	<1%	<0.2%
III.	94-96%	-	<6%	<1%	<0.2%
IV.	94-96%	-	<6%	<1%	<0.2%
V.	97%	-	<3%	<1%	<0.2%
VI.	97%	-	<3%	<1%	<0.2%

a: 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 Note Q conditions

b: Man Made Vitreous Wool Fibres are IARC classified as Group 3 (not classifiable as to their carcinogenicity to humans)

Possible facing materials: Mineral fleece. Aluminium foil, Aluminium foil reinforced mineral fiber grid, PE craft paper, Wired mesh, PP film, Plaster board, Mineral cloth, Bitumen.

4. First aid measures

Eye contact

Rinse immediately with water for at least 15 minutes.

Skin contact (if itching occurs)

Remove contaminated clothing and wash skin gently with cold water and a mild soap. Never use compressed air to remove fibers from skin or clothing.

Inhalation

If affected, remove from exposure.

Ingestion

Rinse mouth and drink plenty of water.

If any irritation persists, seek immediate medical attention.

5. Fire fighting measures

Suitable extinguishing media Water, Foam, Carbon Dioxide or dry powder (No unsuitable extinguishing firefighting media known.)

Protective equipment for firefighters Do not enter fire area without proper protective equipment, including NIOSH-approved self-contained breathing apparatus (SCBA). Observe normal fire fighting procedures.

6. Accidental release

Personal precautions In case of high concentrations of dust: Ventilate and/or use same protective equipment as mentioned in section 8

Methods for cleaning up Use personal protective equipment as required. Clean contaminated surface with vacuum or dampen with water spray prior to sweeping up. Place waste in appropriate containers for disposal.

7. Handling and storage

Precautions and safe handling No specific measures required. A serrated knife for cutting is preferred. Minimize dust creation and ensure adequate ventilation of workplace.

Storage conditions Keep product dry and in original packaging until use.

Incompatible materials None known.

8. Exposure controls / personal protection

Exposure guidelines Follow all applicable exposure limits. Local regulations may apply. ROCKWOOL recommends that users of the products adhere to the OSHA-recommended PEL of 1 f/cc TWA (fibers longer than 5 µm with diameters less than 3µm). This recommended PEL, together with recommended work practices and personal protective equipment, were adopted in a Health and Safety Partnership Program (HSPP) agreement in 1999 between OSHA and the North American Insulation Manufacturers Association (NAIMA), of which ROCKWOOL is a member. Adherence to the OSHA-recommended PEL, work practices and protective equipment in the HSPP is expected to provide appropriate protection against all inhalation-related health risks that may be associated with exposures to mineral wool fibers (ACGIH, 1997; NAIMA, 1999; OSHA, 1999; National Research Council, 2000; IARC, 2001), and to minimize eye and skin irritation.

Reference	Exposure	Legal or Recommended Exposure Limit
OSHA	Synthetic Vitreous Fibers, > 5 µm length, < 3 µm diameter	1 f/cc TWA (recommended)
	Inert dust and particulates not otherwise regulated	15 mg/m3 TWA-PEL (total particulate) 5 mg/m3 TWA-PEL (respirable particulate)
ACGIH	Synthetic Vitreous Fibers, > 5 µm length, < 3 µm diameter	1 f/cc TWA (threshold limit value TLV)
	Particulates not otherwise classified, containing no asbestos and < 1% crystalline silica	10 mg/m3 TWA-PEL (inhalable particulate) 3 mg/m3 TWA-PEL (respirable particulate)

8. Exposure controls / personal protection

Engineering controls Provide local exhaust and/or general ventilation to main exposure below regulatory and recommended limits. Vacuum or wet cleaning methods recommended.

Individual protection measures, including personal protection

Eyes	Wear safety glasses with side shielding or similar
Skin/body	Wear protective gloves
	Wear long sleeve shirt and long trousers
Respiratory	Ensure proper ventilation
	Use appropriate certified respirator when airborne particulates are above exposure limits (properly fitted NIOSH disposable N95 type dust respirator or better is recommended)
General hygiene	Wash hands with cold water after handling products
	Remove and wash clothes worn during working with product.

9. Physical and chemical properties

Physical State Solid

Color Grey, green, brown

Odor May have slight resin odor

Melting Point Approximately 2150°F (1177°C)

Water solubility Insoluble in water

10. Stability and reactivity

Reactivity and Stability Stable under normal conditions of use

Decomposition products Primary combustion products of the cured urea extended phenolic formaldehyde binder, when heated above 390°F (200°C), are carbon monoxide, carbon dioxide, ammonia, water and trace amounts of formaldehyde. Other undetermined compounds could be released in trace quantities. Emission usually only occurs during the first heating. The released gases may be irritating to the eyes, nose and throat during initial heat-up. Use appropriate respirators (air supplied) particularly in tightly confined or poorly ventilated areas during initial heat-up.

11. Toxicological information

Stone wool fibers are not classifiable as OSHA irritants. Coarse fibers and dust from mineral wool products can cause temporary and reversible irritation (itching, redness) of the skin and eyes. The itching and possible inflammation are a mechanical reaction to dust and coarse fibers (more than about 5 µm in diameter) and are not damaging in the way chemical irritants may be. The symptoms generally abate within a short time after the end of exposure. When products are handled continually, the skin itching generally diminishes.

Man Made Vitreous Wool Fibers are IARC classified as Group 3 (not classifiable as to their carcinogenicity to humans)

12. Ecological information

The products are stable, not expected to cause harm to animals, plants or fish, and have no known adverse environmental effects.

13. Disposal considerations

The products, as supplied, are not expected to be a characteristic hazardous waste under RCRA if discarded. Products are not considered to be a hazardous waste. Dispose of waste material according to federal, state, provincial and Local environmental regulations. Comply with relevant regulations with regards to disposal, recycling, treatment, transportation and storage of contents and containers.

14. Transport information

No special precautions. This product is not considered to be a hazardous material for transport.

15. Regulatory information

International Inventories

Articles are exempt from registration or listing chemicals inventories like TSCA (USA), DSL/NDL (CAN), REACH (EU), ENCS (JP), IECSC (CN), KECL (KR), PICCS (PH), AICS (AUS). Per Section 2. these products are considered an article.

Product Family	California Proposition 65 Status
I.	This product does not contain any Proposition 65 chemicals.
II. - V.	These products contain formaldehyde, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm.

16. Other information

Date of preparation

16-AUG-2018

Date of revision

10-MAY-2019

Comments to revision

Inclusion of ProRox and SeaRox Technical Insulation

Disclaimer

Disclaimer: The information contained herein is based upon data considered to be accurate. However, no warranty is expressed or implied regarding the accuracy of these data, the results to be obtained from the use thereof, or that any such use will not infringe upon any patent. This information is furnished as a guide only and upon the condition that the person receiving it shall make tests to determine the accuracy and suitability for his or her own purpose. No responsibility is assumed for injury or damage from the use of the products described herein.

ROCKWOOL reserves the right, at its discretion, to change and modify this Safe Use Instruction Sheet. This version supersedes any Safety Data Sheets and older versions. ROCKWOOL will not take responsibility for documents downloaded from any website except those downloaded directly from www.rockwool.com. ROCKWOOL takes no responsibility for documentation supplied by a third party as ROCKWOOL cannot control the content of such documentation to ensure accuracy.

MANUFACTURERS DECLARATION OF PRODUCT CONFORMITY FOR PRODUCT SPECIFIC VOC EMISSIONS

The products listed below are determined compliant in accordance with California Department of Public Health (CDPH) Standard Method v1.2–2017 and GreenGuard Gold for classrooms.

Products covered by this declaration:

COMFORTBOARD™ 80 – 1", 1.25", 1.5", 2"

Extended product grouping covered by this declaration:

CAVITYROCK® – 1", 1.5", 2", 2.5", 3", 3.5", 4"

COMFORTBOARD™ 110 – 1", 1.25"

CURTAINROCK® – 1", 2", 3", 4"

CURTAINROCK® 40 – 2", 3", 4", 5"

CURTAINROCK® 80 – 1", 2", 3", 4"

ROCKBOARD® 40 – 1", 1.5", 2", 2.5", 3", 4"

ROCKBOARD® 60 – 2"

ROCKBOARD® 80 – 1", 1.5", 2"

ROXUL SAFE™ – 2", 3", 4"

VOC Testing:

Test method: ASTM D 5116

Product category: Insulation

Environment: Classroom

Report number: UL 1000405206-1395765 – COMFORTBOARD™ 80, 2"

Report Date: 14th March 2018

Results:

	168 hr emission rate
TVOC	< 0.22mg/m3
Formaldehyde	< 9 µg/m3
Total aldehydes	< 0.043 ppm
Individual VOCs	< ½ CREL or 1/100 TLV

Laboratory:

UL Environment ISO/IEC 17025 approved testing laboratory

Accreditation number AT-1297

Quality Control:

ROCKWOOL has a documented quality control (QC) plan for the production of the above building products with in-plant quality control testing to demonstrate continuing compliance.

This declaration follows the requirements as laid out in the CDPH v1.1 2010 and CDPH v1.2 2017 Standard Method for the Testing & Evaluation of VOC Emissions, Part 8 GUIDELINES FOR USE OF STANDARD METHOD AS BASIS FOR A BUILDING PRODUCT CLAIM.

For more information, please contact ROCKWOOL Technical Innovations at 1.877.823.9790 or contactus@rockwool.com

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ENVIRONMENTAL PRODUCT DECLARATION

ROCKWOOL™ STONE WOOL Insulation

ROCKWOOL NORTH AMERICA



ROCKWOOL™ Stone Wool/Mineral Wool Insulation is optimized for performance, delivering on Thermal Comfort, Acoustics, Fire protection and more.



ROCKWOOL North America is Part of the ROCKWOOL Group, the world's leading stone wool/mineral wool manufacturer. Operating globally for over 80 years, over 30 years in North America the company manufactures stone wool insulation products that serve a wide range of applications in the Commercial, Residential, and Industrial/Technical segments.

Across the full range of our products and operations, ROCKWOOL is dedicated to enriching modern living. We strive to increase our positive impact on people and society by maximizing our positive product impact and minimizing our operational footprint. We recognize that operating with integrity and as a responsible business is equally important and underpins everything we do.

The United Nations Sustainable Development Goals (SDGs) steer our ambitions. We committed to 10 out of the 17 SDGs—pursuing the goals where we can have the greatest impact and that are the most aligned with our business competencies.

Our Environmental Product Declaration is another element of our commitment to serving our customers and the industry's requirements for sustainable solutions.



ENVIRONMENTAL PRODUCT DECLARATION



Rockwool International A/S (Rockwool North America)
Rockwool Stone wall thermal insulation


According to EN 15804 and ISO 14025
Dual Recognition by UL Environment and Institut Bauen und Umwelt e.V.

This declaration is an environmental product declaration (EPD) in accordance with ISO 14025. EPDs rely on Life Cycle Assessment (LCA) to provide information on a number of environmental impacts of products over their life cycle. **Exclusions:** EPDs do not indicate that any environmental or social performance benchmarks are met, and there may be impacts that they do not encompass. LCAs do not typically address the site-specific environmental impacts of raw material extraction, nor are they meant to assess human health toxicity. EPDs can complement but cannot replace tools and certifications that are designed to address these impacts and/or set performance thresholds – e.g. Type 1 certifications, health assessments and declarations, environmental impact assessments, etc. **Accuracy of Results:** EPDs regularly rely on estimations of impacts, and the level of accuracy in estimation of effect differs for any particular product line and reported impact. **Comparability:** EPDs are not comparative assertions and are either not comparable or have limited comparability when they cover different life cycle stages, are based on different product category rules or are missing relevant environmental impacts. EPDs from different programs may not be comparable.



PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	ROCKWOOL International A/S (Rockwool North America)
ULE DECLARATION NUMBER	4789092768.101.1
IBU DECLARATION NUMBER	EPD-RWI-20190075-CCD1-EN
DECLARED PRODUCT	ROCKWOOL stone wool Thermal Insulation
REFERENCE PCR	Product Category Rules Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Background Report, 03.2018 Product Category Rules Part B: Mineral insulating materials, 12.2018

DATE OF ISSUE	17/07/2019
DATE OF EXPIRATION	17/06/2024

CONTENTS OF THE DECLARATION	General information	
	Product / Product description	
	LCA calculation rules	
	LCA scenarios and further technical information	
	LCA results	
References		
The PCR review was conducted by:	IBU – Institut Bauen und Umwelt e.V.	
	PCR was approved by the Independent Expert Committee (IEC) of IBU	
The CEN Norm EN 15804 serves as the core PCR. This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories <input type="checkbox"/> INTERNAL <input checked="" type="checkbox"/> EXTERNAL		
	Grant R. Martin, UL Environment	
This life cycle assessment was independently verified in accordance with EN 15804 and the reference PCR by:	IBU – Institut Bauen und Umwelt e.V.	



ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	ROCKWOOL International A/S (ROXUL Inc. - ROCKWOOL North America)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-RWI-20190075-CCD1-EN
Issue date	18.06.2019
Valid to	17.06.2024

ROCKWOOL stone wool Thermal Insulation
ROCKWOOL International A/S (ROXUL Inc. -
ROCKWOOL North America)

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



General Information

ROCKWOOL International A/S (ROCKWOOL North America)

Programme holder

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

Declaration number

EPD-RWI-20190075-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


18.06.2019

Valid to

17.06.2024



Prof. Dr.-Ing. Horst J. Bossenmayer
(President of Institut Bauen und Umwelt e.V.)



Dr. Alexander Röder
(Head of Board IBU)

ROCKWOOL stone wool Thermal Insulation

Owner of the declaration

ROXUL Inc.
d/b/a ROCKWOOL North America
8024 Esquesing Line
Milton, Ontario
Canada
L9T 6W3

Declared product / declared unit

1 m² of stone wool thermal insulation product with an
 $R_D=1 \text{ m}^2\text{K/W}$.

Scope:

The span of products, which are contained in this EPD refer to thermal insulation products for the North American market, for wall (interior and exterior) and roof applications with a range of densities from 36 to 200 kg/m³ (2.2 to 12.5 lbs/ft³). The declared reference product in this EPD is 1m² Safe'n' Sound stone wool batt for interior partition of wood and steel frame constructions with a thermal resistance of $R_D=1 \text{ m}^2 \text{ K/W}$ ($R_{US}=5.68$). The corresponding thermal conductivity has been measured at 24°C as per ASTM C518.

The products included in this EPD are all manufactured in one or several of the ROCKWOOL North American facilities:

- Milton (Ontario, Canada)
- Grand Forks (British Columbia, Canada)
- Byhalia, (Mississippi, US).

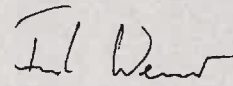
The EPD is based on weighted LCA inventory data from the 3 plants. The environmental impacts and indicators are determined by applying the product specific scaling factor and R_D value (please refer to section "Technical Data" for guidance). Speciality facings are not included in the scaling factors. The LCA results for these are listed in the Annex. 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 firesafe 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, a low percentage of resin binder, which in ROCKWOOL thermal insulation products are usually up to 3%, syrups/ hydrolyzed starch in less than 1% and mineral oil in less than 0.2%. The ROCKWOOL Products described in this declaration are produced for the North American market in the form of slabs or mats in the density range from 36 up to 200 kg/m³. The products are supplied in thicknesses of 25 to 203 mm.

Product-specific environmental impacts are compiled by applying the relevant scaling factor (listed in the Scaling Factor table) in the Product Specific Scaling formula.

Product Name	scaling compared to reference	Product Name	scaling compared to reference
SAFE'n'SOUND	1,0	CURTAINROCK 80	2,4
AFB	1,0	CURTAINROCK 80 RFF *	2,4
AFB evo	0,9	FABROCK 120	3,5
CAVITYROCK	1,6	FABROCK 30	1,1
COMFORTBATT R10	0,9	FABROCK 60	1,7
COMFORTBATT R14	0,9	FABROCK 85	2,4
COMFORTBATT R15	1,0	FABROCK BATT	1,1
COMFORTBATT R22	0,9	FABROCK HD	5,1
COMFORTBATT R22.5	0,9	FABROCK LT	1,3
COMFORTBATT R23	1,1	FABROCK WRAP	1,4
COMFORTBATT R24 WS	1,3	MONOBOARD	4,9
COMFORTBATT R24 SS	0,9	MONOBOARD PLUS	4,9
COMFORTBATT R28	0,9	ROCKBOARD 40	1,5
COMFORTBATT R30	0,9	ROCKBOARD 40 BM *	1,5
COMFORTBATT R32	0,9	ROCKBOARD 60	2,2
COMFORTBOARD 110	4,3	ROCKBOARD 80	3,1
COMFORTBOARD 80	3,1	ROCKWOOL PLUS MB	0,9
CONROCK	3,2	ROXUL SAFE	-1,8
CONROCK 60	2,2	ROXUL SAFE 45	1,6
CURTAINROCK	1,3	ROXUL SAFE 55	2,0
CURTAINROCK 40	1,6	ROXUL SAFE 65	2,5
CURTAINROCK 40 RFF *	1,6	TOPROCK DD	4,3
		TOPROCK DD PLUS	4,3

*) See annex for Environmental impact of specialty facing.

Product Specific Scaling Formula:

Environmental Impact per m² = Environmental Impact reference product * scaling factor + Environmental Impact facing material**.

**) Only add facing material for products with specialty facings.

Please note that the R_D-values used for scaling give a very good indication of the amount of material needed to achieve the desired insulation effect of other product types, but it is not an exact measure.

For the use and application of the product the respective Federal or local legal provisions at the place of use (outside European Union) apply.

Application

The spectrum of products, included in the scope of this EPD refer to thermal insulation products, for interior and exterior wall and roof applications with a range of densities from 36 to 200 kg/m³ (2 to 12 lb/sqf).

The products included in this EPD along with their intended use are presented in the table below:

Product Family	Product Identification	Intended use
I.	AFB evo™	Interior Wall and Floor Applications
II.	COMFORTBOARD™, COMFORTBATT®, SAFE'n'SOUND®, AFB®, CAVITYROCK®, CURTAINROCK®, ROXUL SAFE™, ROCKBOARD®, PLUS™ MB	Interior and Exterior Applications
III.	MONOBOARD®, TOPROCK® DD, TOPROCK® DD MULTIFIX™	Roof Insulation or Insulating Cover Board over Other Insulation
IV.	MONOBOARD® PLUS, TOPROCK® DD Plus	Low-Slope Roof Applications
V.	CONROCK®, FABROCK®	OEM

Technical Data

The technical specifications for the products described in the EPD are stated below. Further documentation is available via www.rockwool.com.

Technical data

Name	Value	Unit
Sound absorption coefficient /ASTM C423/	7 - 11	%
Compressive Strength /ASTM C165/	0 - 190	kPa at 25% compression
Reaction to Moisture (Water Vapor Transmission, Desiccant Method) /ASTM E96/	27 - 41	perm
Thermal Resistance /ASTM C518 (C177)/	3.9-4.3	Fhr.ft ² /Btu
Flame Spread/Smoke Developed /ASTM E84 [UL 723] / CAN/ULC S102/	0/0	
Determination of Fungi Resistance /ASTM C1338/	Passed	

Performance data of the product with respect to its characteristics in accordance with the relevant technical provision.

Base materials / Ancillary materials

The stone wool raw materials are non-scarce natural stone and secondary raw materials in a percentage up to 97%. The raw materials are used either in their natural form, crushed or in a cement-bound briquette. The product composition is presented below:

- virgin stone (71%)
- slags and other secondary materials (23%)
- binder (5.7%)
- mineral oil and bonding agent (0.3%)

Mineral wool fibers 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) fibers 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".

Non added formaldehyde alternatives are available

and covered by this EPD. (Regulation (EC) No 1272/2008 - REACH)

The possible facing materials include Mineral fleece. Aluminium foil, Aluminium foil reinforced mineral fiber grid, PE craft paper, Wired mesh, PP film, Plaster board, Mineral cloth, Bitumen and are presented in the Annex.

The product is typically packaged in PE shrink wrap bundles, that are shipped on single use wooden pallets. The packaging consists of 8% of the final product.

Reference service life

When installed correctly, the service life of ROCKWOOL stone wool is only limited by the service life of the structure wherein the product is installed. For the purpose of this EPD the reference service life of the structure is considered to be 75 years, as also defined in the North American PCR /UL 10010-1:2018/. For more information, please refer to the scenario section in this EPD.

LCA: Calculation rules

Declared Unit

The specific product, referred to in the declared unit is 1m² of Safe 'n' Sound stone wool batt with a thermal resistance $R_{Si}=1\text{m}^2\text{K/W}$. The reference product has a thickness of 37mm (1.5 in) and a density of 40 kg/m³ (2.5 lb/ft³).

Applied averages are based on the annual production volumes at the North American production facilities.

The environmental impacts of applied facing are listed in Annex.

Declared unit (reference product)

Name	Value	Unit
Declared Unit	1	m ²
Gross density	40	kg/m ³
Surface	1	m ²
Weight	1.48	kg
Conversion factor to 1 kg	0.676	-
Thickness to achieve declared unit	0.037	m

System boundary

EPD type: **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:

Production

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

- Provision of preliminary products and energy and relevant upstream processes;
- Transporting the raw materials and preliminary materials to ROCKWOOL production facilities;
- Production process in the ROCKWOOL production facilities 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 material;
- Manufacturing of products and co-product.

The environmental impact of co-products from the steel and coal fired electricity production (slags, alumina and ashes entering the system as inputs to the manufacturing) is accounted for and economic allocation is applied.

Recycled stone wool and fuels come free of environmental burden, as it enters the product system as waste. 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.

Modules A1, A2 and A3 are declared as an aggregated Module A1-A3.

State or Province electricity grid mixes have been applied.

Construction/Installation

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

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

The transport in A4 is modeled by volume with truck as a default vehicle, as the most conservative approach. 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 /EN15804/ its impacts are fully allocated to A5.

The A5 stage, according to /EN 15804/ 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 default assumption here for installation waste is 100% landfill.

Building Use

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

- B1 use or application of the installed product;
- B2 maintenance;
- B3 repair;
- B4 replacement;
- B5 refurbishment;
- B6 – Operational energy use;
- B7 – Operational water use;

ROCKWOOL Stone wool insulation is installed permanently in the structure and does not require maintenance, repair, replacement or refurbishment under normal use conditions. Similarly,

ROCKWOOL stone wool insulation has no operational energy or water use.

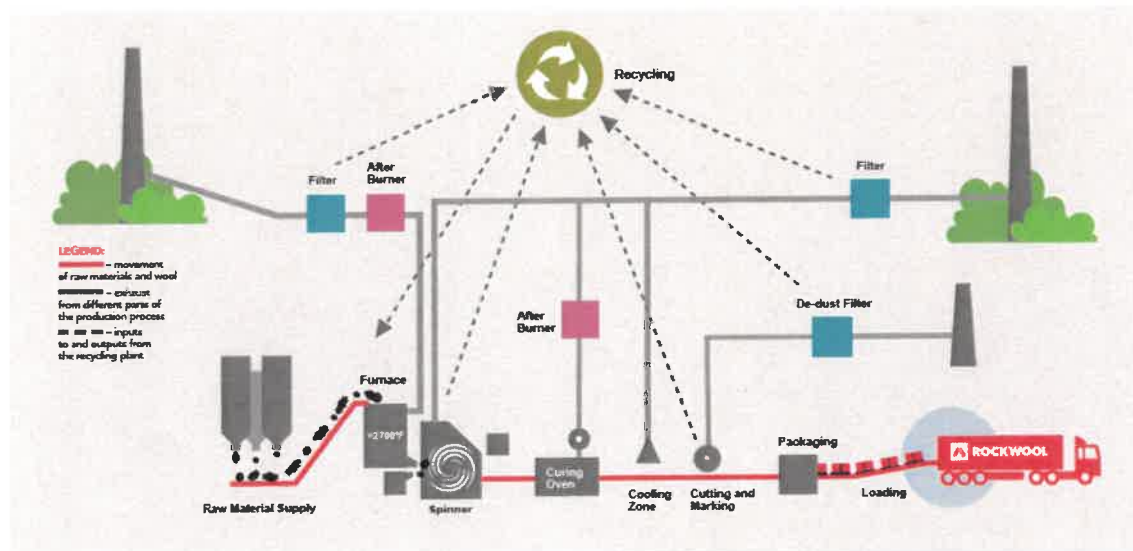
End of Life

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 provision and all transport, provision of all materials, products and related energy and water use. Manual deconstruction is assumed for C1 and 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 from electricity generation on landfill are considered.



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.

LCA results across EPDs can be calculated with different background databases, modelling assumptions, geographic scope and time periods, all of which are valid and acceptable according to Product Category Rules (PCR) and ISO standards. Caution should be used when attempting to compare EPD results.

The used software for the development of the declaration was /GaBi/, 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/	981	km
Capacity utilisation (including empty runs)	85	%
Gross density of products transported	40	kg/m ³

The transport of the materials to the customer is modeled as a volumetric transport, meaning that the truck reaches its capacity with volume before it 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
Other resources	-	kg
Electricity consumption	0	kWh
Material loss	2	%

Reference service life

The declared reference service life only applies for the reference conditions which are stated below.

Name	Value	Unit
Life Span according to the manufacturer	75	a
Declared product properties	/ASTM C423/: "Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method" /ASTM C165/: "Standard Test Method for Measuring Compressive Properties of Thermal Insulations".	

	-/ASTM E96/: "Standard Test Methods for Water Vapor Transmission of Materials". -/ASTM C518 (C177)/: "Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus". -/ASTM E84 (UL 723)/: "Standard Test Method for Surface Burning Characteristics of Building Materials". -/ASTM C1338/: "Standard Test Method for determining Fungi Resistance of Insulation Materials and Facings".	
Design Application parameters, including references to the appropriate practices	See installation guidelines. Installation to be conducted in accordance with manufacturer's guidelines	
Quality of work assumption when installed in accordance with the manufacturer's 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	
Indoor Environment, e.g. 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	

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. For the internal 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.

End of life (C1 - C4)

Name	Value	Unit
Landfilling	1.48	kg
Transport to landfill	50	km
Utilization rate	50	%

LCA: Results

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

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	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
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 thermal 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.]	1.31E+0	4.25E-1	2.65E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.29E-3	0.00E+0	2.20E-2	-9.93E-2
ODP	[kg CFC11-Eq.]	2.11E-9	7.06E-17	3.50E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.76E-19	0.00E+0	1.28E-16	2.27E-15
AP	[kg SO ₂ -Eq.]	1.03E-2	3.60E-4	2.62E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.84E-6	0.00E+0	1.32E-4	-2.44E-4
EP	[kg (PO ₄) ₃ -Eq.]	1.14E-3	7.96E-5	4.96E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.09E-6	0.00E+0	1.50E-5	-1.99E-5
POCP	[kg ethene-Eq.]	1.84E-3	1.38E-6	4.56E-5	1.54E-10	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.40E-7	0.00E+0	1.01E-5	-3.35E-5
ADPE	[kg Sb-Eq.]	4.63E-7	3.29E-8	7.19E-9	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.09E-10	0.00E+0	8.10E-9	-1.61E-8
ADPF	[MJ]	1.57E+1	5.79E+0	5.97E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.19E-2	0.00E+0	3.08E-1	-2.70E+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 thermal insulation product with an R=1m2K/W

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
PERE	[MJ]	3.88E+0	3.24E-1	1.91E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.06E-3	0.00E+0	3.97E-2	-3.27E-1
PERM	[MJ]	2.29E+0	0.00E+0	-1.74E+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]	6.17E+0	3.24E-1	1.66E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.06E-3	0.00E+0	3.97E-2	-3.27E-1
PENRE	[MJ]	1.50E+1	5.83E+0	7.56E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.23E-2	0.00E+0	3.19E-1	-3.08E+0
PENRM	[MJ]	2.91E+0	0.00E+0	-6.76E-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]	1.79E+1	5.83E+0	6.89E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.23E-2	0.00E+0	3.19E-1	-3.08E+0
SM	[kg]	6.41E-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	0.00E+0
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]	1.44E-2	5.70E-4	8.21E-4	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	7.07E-6	0.00E+0	8.04E-5	-1.37E-3

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 thermal insulation product with an R=1m2K/W

Parameter	Unit	A1-A3	A4	A5	B1	B2	B6	B7	C1	C2	C3	C4	D
HWD	[kg]	4.18E-7	3.24E-7	1.50E-8	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	4.03E-9	0.00E+0	5.44E-9	-9.09E-10
NHWD	[kg]	1.32E-1	4.72E-4	1.54E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.86E-6	0.00E+0	1.48E+0	6.42E-3
RWD	[kg]	7.49E-4	7.88E-6	3.23E-5	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	9.79E-8	0.00E+0	4.28E-6	-1.05E-4
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	3.71E-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
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	2.28E-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	6.84E-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

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Annex

For the following facing options, applicable to ROCKWOOL technical insulation products:

Black mat facer, reinforced foil facer, fiberglass facer
to the

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/

Owner of the Declaration	ROCKWOOL International A/S (ROCKWOOL Technical Insulation)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-RWI-20190075-CCD1-EN
Issue date	18.06.2019
Valid to	17.06.2019

ROCKWOOL stone wool technical insulation
ROCKWOOL International A/S (ROCKWOOL
Technical Insulation)



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

Below the impact assessment results and life cycle indicators are presented, for all the possible facing options that can be available in a ROCKWOOL Technical Insulation product. If the provided product has the specific facing, its final impact result is given by adding the result of the product, as calculated above, and the result of the specific facing option. Both results are expressed per m² therefore no additional conversion is needed. The final result is given by the formula:

Impact facing material

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² Black Mat Facer (black tissue)

Param	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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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

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

Experiment	Unit	A1 A2	A4	A5	B1	C1	C2	C3	C4	D
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Caption	<p>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</p>
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Caption	<p>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</p>
---------	--

	A1	A2	A3	A4	A5	B1	C1	C2	C3	C4	D
--	----	----	----	----	----	----	----	----	----	----	---

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

Caption	HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Component for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EEE = Exported thermal energy
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DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

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	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² Reinforced foil facer

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
GWP	[kg CO ₂ -Eq.]	4.58E-01	3.03E-03	0.00E+00	0.00E+00	0.00E+00	4.26E-04	0.00E+00	7.43E-04	0.00E+00
ODP	[kg CFC11-Eq.]	1.89E-19	4.24E-19	0.00E+00	0.00E+00	0.00E+00	7.09E-20	0.00E+00	4.05E-18	0.00E+00
AP	[kg SO ₂ -Eq.]	2.14E-03	2.42E-06	0.00E+00	0.00E+00	0.00E+00	3.65E-07	0.00E+00	4.05E-06	0.00E+00
EP	[kg (PO ₄) ³ -Eq.]	1.33E-04	4.85E-07	0.00E+00	0.00E+00	0.00E+00	8.11E-08	0.00E+00	4.73E-07	0.00E+00
POCP	[kg ethene-Eq.]	1.34E-04	1.21E-08	0.00E+00	0.00E+00	0.00E+00	1.35E-09	0.00E+00	3.38E-07	0.00E+00
ADPE	[kg Sb-Eq.]	1.60E-07	1.82E-10	0.00E+00	0.00E+00	0.00E+00	3.31E-11	0.00E+00	2.70E-10	0.00E+00
ADPF	[MJ]	5.18E+00	3.64E-02	0.00E+00	0.00E+00	0.00E+00	5.81E-03	0.00E+00	1.01E-02	0.00E+00

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: Reinforced foil facer

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	[MJ]	2.50E+00	1.82E-03	0.00E+00	0.00E+00	0.00E+00	3.45E-04	0.00E+00	1.35E-03	0.00E+00
PERM	[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	0.00E+00
PERT	[MJ]	2.50E+00	1.82E-03	0.00E+00	0.00E+00	0.00E+00	3.45E-04	0.00E+00	1.35E-03	0.00E+00
PENRE	[MJ]	6.20E+00	3.03E-02	0.00E+00	0.00E+00	0.00E+00	5.88E-03	0.00E+00	1.08E-02	0.00E+00
PENRM	[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	0.00E+00
PENRT	[MJ]	6.20E+00	3.03E-02	0.00E+00	0.00E+00	0.00E+00	5.88E-03	0.00E+00	1.08E-02	0.00E+00
SM	[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	0.00E+00
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	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	0.00E+00
FW	[m ³]	6.22E-03	3.03E-06	0.00E+00	0.00E+00	0.00E+00	5.74E-07	0.00E+00	2.64E-06	0.00E+00

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: Reinforced foil facer

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
HWD	[kg]	4.98E-09	1.90E-09	0.00E+00	0.00E+00	0.00E+00	3.27E-10	0.00E+00	1.79E-10	0.00E+00
NHWD	[kg]	1.22E-01	2.77E-06	0.00E+00	0.00E+00	0.00E+00	4.76E-07	0.00E+00	4.89E-02	0.00E+00
RWD	[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	0.00E+00
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	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	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	0.00E+00

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

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	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X	

[illegible]

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
PERE	[MJ]	1.87E-01	1.12E-03	0.00E+00	0.00E+00	0.00E+00	2.10E-04	0.00E+00	8.31E-04	0.00E+00
PERM	[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	0.00E+00
PERT	[MJ]	1.87E-01	1.12E-03	0.00E+00	0.00E+00	0.00E+00	2.10E-04	0.00E+00	8.31E-04	0.00E+00
PENRE	[MJ]	1.02E+00	2.05E-02	0.00E+00	0.00E+00	0.00E+00	3.61E-03	0.00E+00	6.44E-03	0.00E+00
PENRM	[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	0.00E+00
PENRT	[MJ]	1.02E+00	2.05E-02	0.00E+00	0.00E+00	0.00E+00	3.61E-03	0.00E+00	6.44E-03	0.00E+00
SM	[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	0.00E+00
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	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	0.00E+00
FW	[m ³]	2.29E-04	2.05E-06	0.00E+00	0.00E+00	0.00E+00	3.53E-07	0.00E+00	1.62E-06	0.00E+00

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

Parameter	Unit	A1-A3	A4	A5	B1	C1	C2	C3	C4	D
HWD	[kg]	1.15E-09	1.17E-09	0.00E+00	0.00E+00	0.00E+00	2.01E-10	0.00E+00	1.10E-10	0.00E+00
NHWD	[kg]	5.78E-03	1.70E-06	0.00E+00	0.00E+00	0.00E+00	2.93E-07	0.00E+00	3.00E-02	0.00E+00
RWD	[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	0.00E+00
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	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	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	0.00E+00
EEE	[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	0.00E+00
EET	[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	0.00E+00

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