

ENVIRONMENTAL PRODUCT DECLARATION

THERMAFIBER® MINERAL WOOL

OWENS CORNING



Owens Corning™ Thermafiber® Mineral Wool Insulation enhances comfort, energy savings and sustainability in new and existing structures.



Owens Corning, and its family of companies, is a leading global producer of residential and commercial building materials, glass fiber reinforcements, and engineered materials for composite systems. It uses a decision framework for managing the company as a sustainable enterprise. It is the foundation of the company's strategy of building market-leading businesses, global in scope – human in scale, and reflects the company's purpose: our people and products make the world a better place.

Owens Corning is committed to balancing economic growth with social progress and sustainable solutions to its building materials and composite customers around the world.

This Environmental Product Declaration is a component of our stated goal to provide life cycle information on all core products.

sustainability.ownenscorning.com



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

EPD PROGRAM AND PROGRAM OPERATOR NAME, ADDRESS, LOGO, AND WEBSITE	UL Environment 333 Pfingsten Road Northbrook, IL 60611	https://www.ul.com/ https://spot.ul.com
GENERAL PROGRAM INSTRUCTIONS AND VERSION NUMBER	General Program Instructions v.2.4 July 2018	
MANUFACTURER NAME AND ADDRESS	Owens Corning, One Owens Corning Parkway, Toledo, OH, USA	
DECLARATION NUMBER	4788956323.101.1	
DECLARED PRODUCT & FUNCTIONAL UNIT OR DECLARED UNIT	1 m ² insulation at R _{SI} -1	
REFERENCE PCR AND VERSION NUMBER	Part B: Building Envelope Thermal Insulation EPD Requirements, UL 10010-1	
DESCRIPTION OF PRODUCT APPLICATION/USE	Thermafiber® Mineral Wool is a type of slag wool insulation product used in a variety of building applications, both residential and commercial, requiring the use of thermal insulation.	
PRODUCT RSL DESCRIPTION (IF APPL.)	75 years	
MARKETS OF APPLICABILITY	North America	
DATE OF ISSUE	October 1, 2019	
PERIOD OF VALIDITY	5 Years	
EPD TYPE	Product-specific	
RANGE OF DATASET VARIABILITY	N/A	
EPD SCOPE	Cradle to gate with options (A4, A5, C1-C4)	
YEAR(S) OF REPORTED PRIMARY DATA	2018	
LCA SOFTWARE & VERSION NUMBER	SimaPro 9.0.0.35	
LCI DATABASE(S) & VERSION NUMBER	ecoinvent 3.5	
LCIA METHODOLOGY & VERSION NUMBER	TRACI 2.1 v1.05; Cumulative Energy Demand LHV (CED) V1.00	

This PCR review was conducted by:	UL Environment
	PCR Review Panel
	epd@ulenvironment.com
	Grant R. Martin, UL Environment
This life cycle assessment was independently verified in accordance with ISO 14044 and the reference PCR by:	Thomas P. Gloria, Industrial Ecology Consultants

LIMITATIONS

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; the level of accuracy in estimation of effect differs for any particular product line and reported impact.

Comparability: EPDs from different programs may not be comparable. Full conformance with a PCR allows EPD comparability only when all stages of a life cycle have been considered. However, variations and deviations are possible". Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

1. Product Definition and Information

1.1. Description of Company/Organization

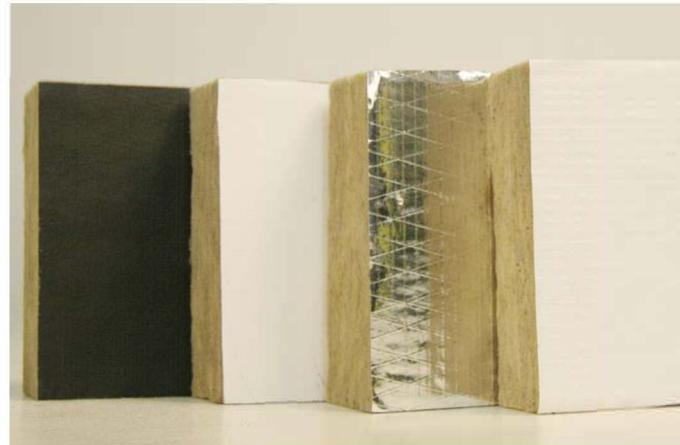
Founded in 1938, Owens Corning has been a leader in insulation, roofing and fiberglass composites. It has a global presence with 20,000 people in 33 countries. This Environmental Product Declaration is representative of product produced at the locations listed below.

Wabash Plant Wabash, IN 46992	Joplin Plant Joplin, MO 64804
----------------------------------	----------------------------------

1.2. Product Description

Product Identification

Thermafiber® Mineral Wool Insulation products are comprised of semi-rigid and rigid boards and batts. Mineral wool resists mold, fungi, and is vermin proof due to its being an inorganic material. The R-value of Thermafiber® Mineral Wool Insulation ranges from 3.7 - 4.3 per inch of thickness. It is available in multiple thicknesses, densities, and various facings by product type. Reflected by its R-value, mineral wool's insulating performance is achieved by its densely packed fibers. Its high resistance to heat flow translates into year-round comfort and energy savings.



Product Availability[†]

Product	Density	R-value per inch***	Thickness*	Widths**	Lengths**
Fire & Sound Guard ^a	2.5 pcf	---	3"	15", 23"	47"
Fire & Sound Guard ^b	2.5 pcf	---	3"	16", 24"	48"
FireSpan [®] 40 ^c	4.0 pcf	4.3	2" - 7"	24", 36", 72"	48", 60", 72"
FireSpan [®] 90 ^c	8.0 pcf	4.3	1" - 7"	24", 36", 72"	48", 60", 72"
Safing	4.0 pcf, 6.0 pcf	4.3	1" - 7"	16", 24", 36"	48", 60"
SAFB™	2.5 pcf	3.8	1½" - 7"	15", 16", 17", 23", 24", 25"	48"
SAFB™	4.0 pcf	4.2	1"	15", 16", 17", 23", 24", 25"	48"
RainBarrier [®] 45	4.5 pcf	4.3	1" - 7"	16", 24", 36"	48", 60"
RainBarrier [®] HD	6.0 pcf	4.3	1" - 7"	16", 24", 36"	48", 60"
UltraBatt ^{™a}	2.5 pcf	4.2	3.5", 5.5", 7.1"	15", 23"	47"
UltraBatt ^{™b}	2.5 pcf	4.2	2.5", 3.5", 6"	16", 24"	48"
VersaBoard [®] 35	3.5 pcf	4.2	1½" - 7"	24", 36"	48", 60"
VersaBoard [®] 40 & 60	4.0 pcf, 6.0 pcf	4.3	1" - 7"	24", 36"	48", 60"
VersaBoard [®] 80	8.0 pcf	4.3	1" - 5"	24", 36"	48", 60"
Tolerance	--	--	+1/4", -1/8"	± 1/8"	± 1/2"

*Thicknesses are available in 1/2" increments.; ** Custom sizes are available upon request.; *** R-value [=] hr·ft²·°F/BTU

a. Availability indicated for wood stud application; b. Availability indicated for steel stud application; c. Tolerance of length indicated is +3/4", -1/4"

†. For additional information, visit www.thermafiber.com.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Product Specification

	Fire & Sound Guard®	FireSpan® 90 & FireSpan® 40	Safing	SAFB™	RainBarrier® 45	RainBarrier® HD	UltraBatt™	VersaBoard® 35	VersaBoard® 40 & 60	VersaBoard® 80
Corrosion Resistance[‡] ASTM C665 (Type)										
Unfaced	I	I ¹	I ²	I ³	I ²	I ²	I	I ²	I ²	I ²
Foil Faced		III ¹	III ²		III ²	II ²		III ²	II ²	II ²
Black & White Mat, ASJ								II	II	II
Classification ASTM C612 (Type)	---	IA, IB, II, III, IVA	IA, IB, II	I ⁴	IA, IB, IVA	IA, IB, II, III, IVA	---	IA	IA, II, III, IVA	IA, II, III, IVA
Combustibility ASTM E136 (Rated Non-combustible per NFPA Standard 220)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Water Vapor Permeance[‡] ASTM E96 (Perms as tested)										
Unfaced	---	50	50	---	50	50	50	50	50	50
Foil Faced		0.02	0.02				0.02	0.02	0.02	0.02
ASJ							0.02	0.02	0.02	0.02
Surface Burning Characteristics[‡] ASTM E84 (Flame Spread/Smoke Developed)										
Unfaced	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0	0/0
Foil Faced		25/0	25/0				25/0	25/0	25/0	25/0
Surface Burning Characteristics CAN/ULC S102 (Flame Spread/Smoke Developed)										
Unfaced	0/0	0/5	0/0	0/5	0/5	0/5	0/0	0/0	0/0	0/0
Water Vapor Sorption ASTM C1104 (Absorption by volume)	<1%	<1%	<1%	<1%	0.03%	0.03%	<1%	<1%	<1%	<1%
Stability ASTM C356 (Linear shrinkage@1200°F (650°C))	---	<2%	---	---	<2%	<2%	---	<2%	<2%	<2%

[‡] Values for unfaced insulation are indicated; values for faced option are indicated if applicable.

--- indicates specification is not applicable to product.

1. Class A, Category 1

2. Non-corrosive, Type I, III

3. Type I, per Federal Specification HH-I-521F

4. Type I, per Federal Specification HH-I-558B



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation



According to ISO 14025,
EN 15804 and ISO 21930:2017

Product Average

The results of this declaration represent an average performance for the listed products and manufacturing locations. Reported densities for included products and production locations are from manufacturing, facility-level data to create a production-weighted average, which was used to determine the mass of the functional unit for the LCA.

1.3. Application

Thermafiber® mineral wool insulation products are used in residential and multi-family construction as nonstructural thermal-insulating materials in floor-ceiling assemblies, attics, crawl spaces and walls. In exterior walls, it can be used as continuous insulation in the building envelope, and within interior walls, it can be used as acoustic insulation for partitions.

Mineral wool is commonly used in curtain wall perimeter fire containment applications because of its fire resistant properties. In commercial applications it can be used as continuous insulation in the building envelope. Additionally, the high density of mineral wool insulation offers excellent sound absorption properties, making these products an integral part of overall wall systems designed to reduce sound transmission.

1.4. Declaration of Methodological Framework

This declaration is a product-specific EPD and is cradle-to-installation with end-of-life. The underlying LCA upon which this EPD is based included the following life cycle modules: *Raw Material supply (A1); Inbound Transportation (A2); Manufacturing (A3); Distribution (A4); Installation (A5); End-of-life, Transport (C2) and End-of-life, Disposal (C4)*. No known flows have been deliberately excluded. The product is expected to perform as claimed for the 75-year reference service life if it remains clean and dry in its installed state.

1.5. Technical Requirements

At a minimum, Thermafiber® Mineral Wool Insulation products for commercial applications meet or exceed one of the following:

- ❖ **Corrosion Resistance**
 - Type I, II or III when tested in accordance with ASTM C665, *Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing*
- ❖ **Classification**
 - Type IA, IB, II, III or IVA when tested in accordance with ASTM C612, *Standard Specification for Mineral Fiber Block and Board Thermal Insulation*
- ❖ **Combustibility**
 - Rated Non-combustible per NFPA Standard 220 when tested in accordance with ASTM E136, *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C*
- ❖ **Water Vapor Permeance**
 - 50 perms when tested in accordance with ASTM E96, *Standard Test Methods for Water Vapor Transmission of Materials*
- ❖ **Surface Burning Characteristics**
 - Flame Spread 0, Smoke Developed 0 when tested in accordance with ASTM E84, *Standard Test Method for Surface Burning Characteristics of Building Materials*
- ❖ **Water Vapor Sorption**
 - Absorption of less than 1% by volume when tested in accordance with ASTM C1104, *Standard Test Method for Determining the Water Vapor Sorption of Unfaced Mineral Fiber Insulation*
- ❖ **Stability**
 - Linear Shrinkage <2% @1200°F (650°C) when tested in accordance with ASTM C356, *Standard Test Method for Linear Shrinkage of Preformed High-Temperature Thermal Insulation Subjected to Soaking Heat*

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

1.6. Properties of Declared Product as Delivered

When installed in typical building and construction assemblies according to all applicable Owens Corning specifications, recommendations and guidelines, Thermafiber® Mineral Wool Insulation delivers its advertised R-value.

1.7. Material Composition

Thermafiber® Mineral Wool Insulation consists of two major components, charge and binder. The primary raw material used is blast furnace slag, a by-product of the steel industry. The reuse of slag into mineral wool prevents this material from being discarded into landfills and results in a minimum total recycled content of 70% in the final product. These materials are sourced locally and transported to manufacturing facilities.

Material Component	Material Component%	
	Heavy Density	Light Density
Charge		
Slag	67-70%	67-70%
Feldspar	6-9%	6-9%
Trap rock	20-23%	23-26%
Binder		
Resin	1-4%	1-4%
Urea	1-3%	1-3%
Other	< 1%	< 1%

1.8. Manufacturing

Manufacturing Locations

Owens Corning North American manufacturing locations can be found across the United States. Primary data from these two manufacturing facilities were used for the underlying life cycle assessment. Results provided in this declaration are based on a production-weighted average of these two manufacturing facilities.

Wabash Plant Wabash, IN 46992	Joplin Plant Joplin, MO 64804
----------------------------------	----------------------------------

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation



According to ISO 14025,
EN 15804 and ISO 21930:2017

Manufacturing Process

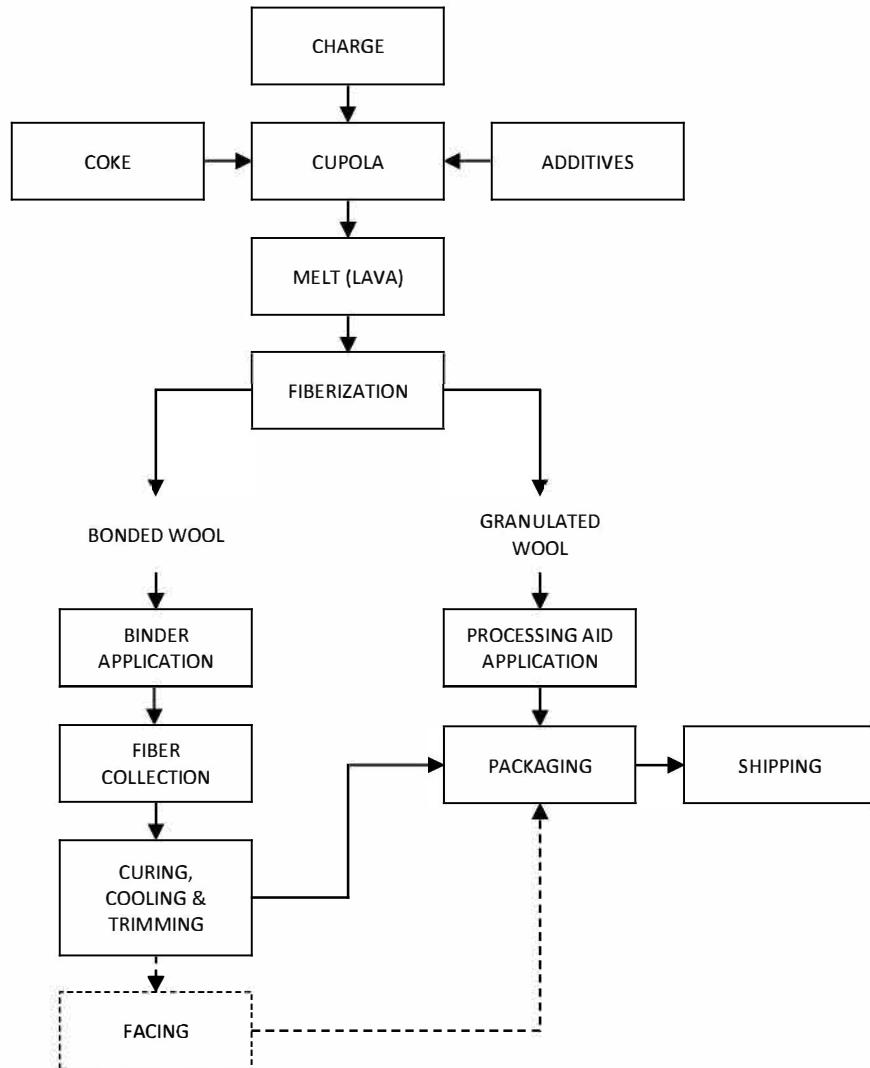


Figure 1. Process Flow Diagram for Manufacturing of Mineral Wool Insulation

The diagram above for Thermafiber® Mineral Wool Insulation is representative of the processes used by the manufacturing facilities. Although minor differences exist due to the availability of specific suppliers for materials, there are no significant process differences among manufacturing locations.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

1.9. Packaging

Thermafiber® Mineral Wool Insulation products are packaged using LDPE (low-density polyethylene) film in the form of bags or plastic film. Regional disposal scenarios for the U.S. were used as a default assumption for the packaging waste generated during installation. Disposal rates used by material type and waste treatment method are shown in the table below.

Country/Region	Material Type	Recycling Rate	Landfill Rate	Incineration Rate
United States	Plastics	15%	68%	17%
	Metals	57%	34%	9%
	Pulp (cardboard, paper)	75%	20%	5%

1.10. Transportation

The product outbound transportation from manufacturing facility is by diesel-truck. The average distance from manufacturing facility to construction site for Thermafiber® Heavy Density and Light Density Mineral Wool Insulation is 1,090 mi (1,750 km) and 1,100 mi (1,770 km), respectively.

1.11. Product Installation



Thermafiber® Mineral Wool Insulation products are made for easy handling and installation. As a semi-rigid product that is easy to cut and install, its flexibility allows it to conform to building shapes and construction irregularities. It comes in standard-sized sheets and is easily cut with a serrated knife.

The boards and batts can be friction fitted in between studs with the ends of each piece butted closely together to fill all voids. Mineral wool can also be mechanically attached depending on the application.

Rainscreen and cavity wall systems vary greatly from types of hangers and how they are installed. Generally, mineral wool insulation is installed with abutted joints and mechanically secured and attached to the building substrate without the need to tape joints.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation



According to ISO 14025,
EN 15804 and ISO 21930:2017

1.12. Use

Due to its nature, Thermafiber® Mineral Wool Insulation is a passive device requiring no utilities or maintenance over its useful life. Provided the mineral wool is used as intended, during the use phase, reductions in a building's energy consumption do occur; however, the energy savings from the use of thermal insulation have not been included within the system boundaries.

1.13. Reference Service Life and Estimated Building Service Life

The product is assumed to remain in service for the life of the building, 75 years.

1.14. Reuse, Recycling, and Energy Recovery

Thermafiber® Mineral Wool Insulation may be reused; however, no formal recycling programs currently exist for mineral wool insulation.

1.15. Disposal

The End of Life stage modeled for mineral wool insulation consisted of the transportation by tractor-trailer truck of the insulation for an assumed distance of 100 miles to a landfill and the subsequent disposal of the used insulation in the landfill.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

2. Life Cycle Assessment Background Information

2.1. Function and Functional Unit

The functional unit is 1 m² of insulation material with a thickness that gives an average thermal resistance $R_{SI} = 1 \text{ m}^2\text{K/W}$ and with a building service life of 75 years. Faced Thermafiber® Mineral Wool Insulation additionally has 1 m² of a facing addon, which is applied to the top surface of the insulation material. For this study, the declared unit amount of the facing addon is 1 m², and the amount of the declared unit required for the functional unit is 1 m².

Table 1. Functional Unit Properties of Thermafiber® Mineral Wool Insulation

Thermafiber® Heavy Density Mineral Wool Insulation	
Functional unit	1 m ² of insulation material with a thickness that gives an average thermal resistance $R_{SI} = 1 \text{ m}^2\text{K/W}$
Mass of Functional unit	3.49E+00 kg
Thickness to achieve Functional unit	3.38E-02 m
Thermafiber® Light Density Mineral Wool Insulation	
Functional unit	1 m ² of insulation material with a thickness that gives an average thermal resistance $R_{SI} = 1 \text{ m}^2\text{K/W}$
Mass of Functional unit	1.68E+00 kg
Thickness to achieve Functional unit	3.47E-02 m

Table 2. Declared Unit Properties of Facing Addons for Faced Thermafiber® Mineral Wool Insulation

Facing	Mass of Declared unit (1 m ²)	Description
F-140001, 5225T-White	5.81E-02 kg	Plain White Foil Scrim (2x2) Polyethylene
F-140011, 5225T Printed	5.37E-02 kg	Printed Foil Scrim (2x2) Polyethylene
F-140012, 5263 Printed 5x5	6.35E-02 kg	Printed Foil Scrim (5x5) Polyethylene
F-140021, 30J	1.42E-01 kg	White All Service Jacket (ASJ)
F-140024, WMP-VR	8.30E-02 kg	White Polypropylene Scrim Kraft
F-140031, 3114B	6.84E-02 kg	Black Nonwoven Glass Fiber Mat
F-140041, 7503	7.08E-02 kg	White Nonwoven Glass Fiber Nonwoven Mat
F-140042, G/47499	3.76E-02 kg	Black Nonwoven Polyester Fiber Mat
F-140071, 3035/PE 2.0	1.37E-01 kg	Perforated Foil Scrim (2x3) Kraft
F-140081, 5225T	5.37E-02 kg	Plain Foil Scrim (2x2) Polyethylene
F-140091, 5229	9.28E-02 kg	Plain Foil Scrim (1.8x1.8) Polyethylene
F-140095, 5229 Printed	9.28E-02 kg	Printed Foil Scrim (1.8x1.8) Polyethylene

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

2.2. System Boundary

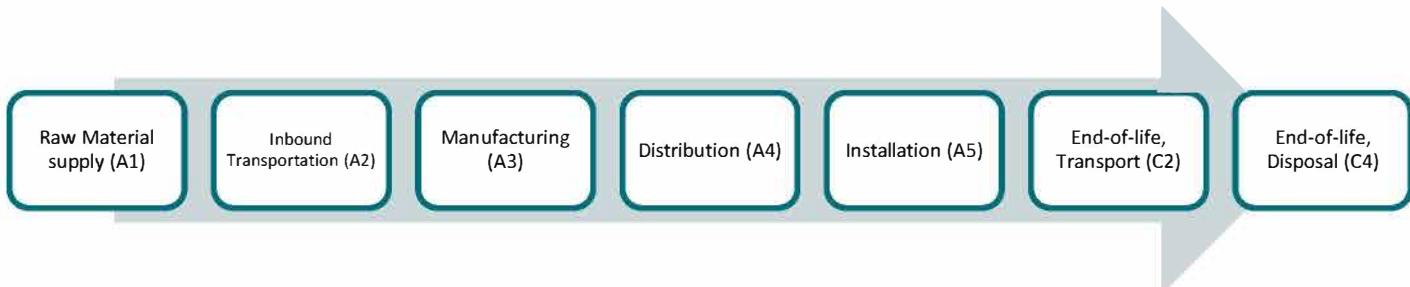


Figure 2. System Boundary of Thermafiber® Mineral Wool Insulation

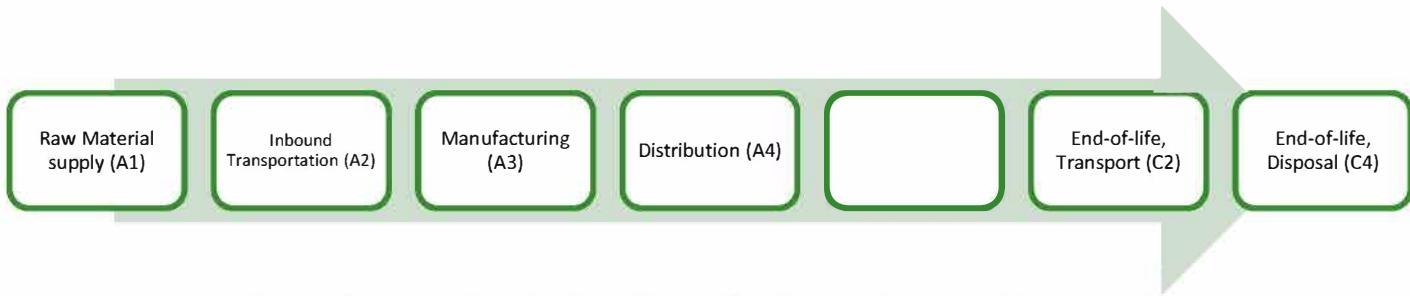


Figure 3. System Boundary of Facing Addons for Faced Thermafiber® Mineral Wool Insulation

The system boundaries for this study include inputs and outputs for the following life cycle stages for mineral wool insulation:

- ❖ Raw Material supply (A1) – applicable to Thermafiber® Mineral Wool Insulation and Facing Addons
 - extraction of resources and production of raw materials
 - collection and processing of recycled materials
 - extraction of resources and production of packaging materials for finished goods
- ❖ Inbound Transportation (A2) – applicable to Thermafiber® Mineral Wool Insulation and Facing Addons
 - transportation of all input materials to manufacturing facilities
- ❖ Manufacturing (A3) – applicable to Thermafiber® Mineral Wool Insulation and Facing Addons
 - electricity and water use and combustion of natural gas and coke (consumption and associated emissions)
 - transportation of fuels and consumable materials used in manufacturing
 - transportation of waste materials for recycling externally
 - transportation of waste-to-landfill waste to landfill as well as disposal in landfill
 - air emissions from fiber collection as well as from curing, cooling, cutting and trimming bonded mineral wool insulation including other releases to environmental media
- ❖ Distribution (A4) – applicable to Thermafiber® Mineral Wool Insulation and Facing Addons
 - transportation from manufacturing facilities to distribution centers
 - transportation from distribution centers to construction site
- ❖ Installation (A5)
 - transportation and disposal of packaging waste – applicable to Thermafiber® Mineral Wool Insulation
- ❖ End-of-life, Transport (C2) – applicable to Thermafiber® Mineral Wool Insulation and Facing Addons
 - transportation from building deconstruction site to landfill
- ❖ End-of-life, Disposal (C4) – applicable to Thermafiber® Mineral Wool Insulation and Facing Addons
 - disposal in landfill

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

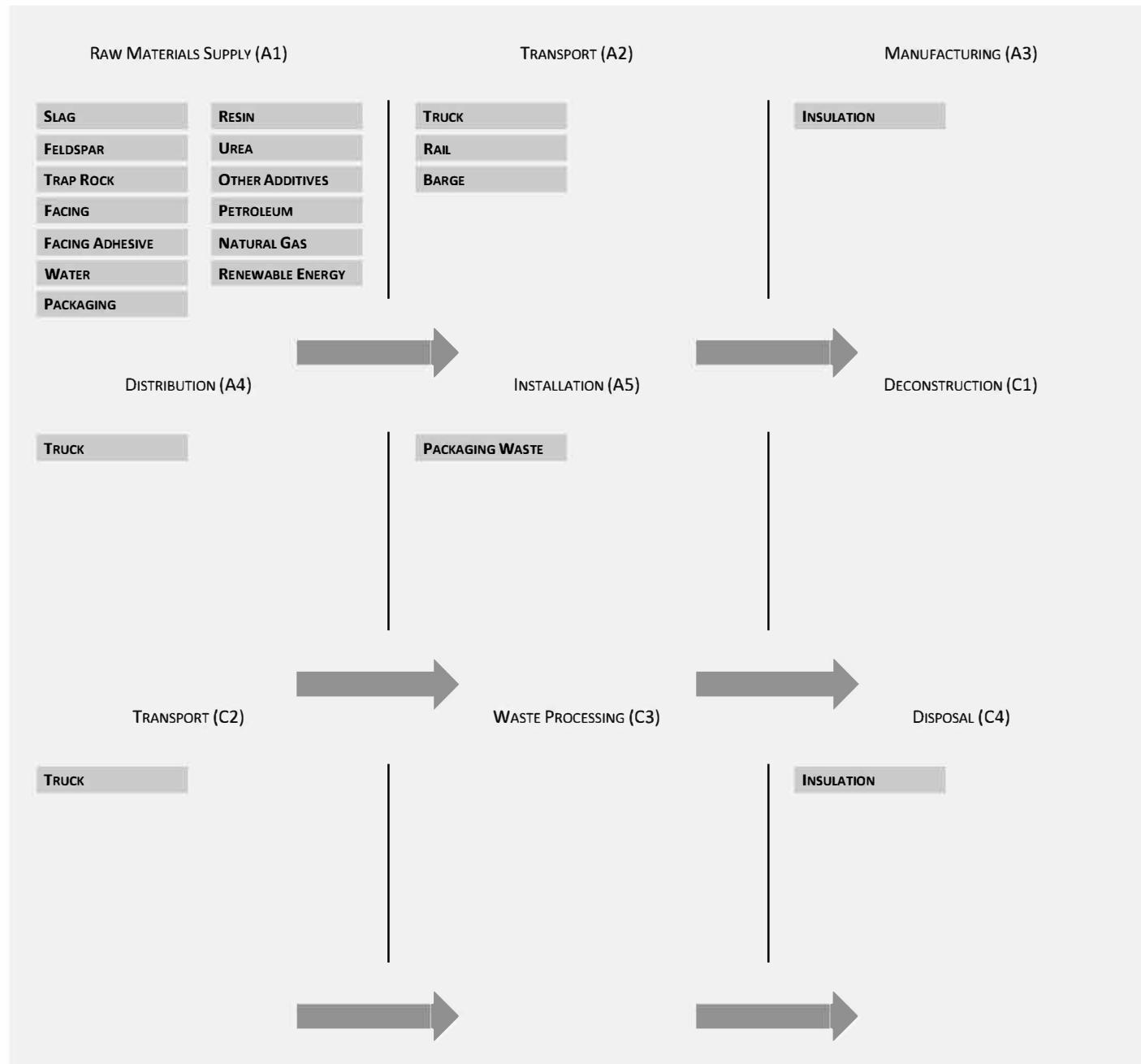


Figure 4. Flow Diagram of Thermafiber® Mineral Wool Insulation

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation



According to ISO 14025,
EN 15804 and ISO 21930:2017

2.3. Estimates and Assumptions

Thermafiber® Mineral Wool Insulation is a passive device requiring no utilities or maintenance over its useful life; it is assumed that the product remains in service for the 75-year reference service.

2.4. Cut-off Criteria

Per section 2.9 of the governing PCR, the procedure detailed in ISO 21930, section 7.1.8 was followed regarding the exclusion of inputs and outputs. For energy, mass and environmental impacts, the cut-off criteria were 1% per the standard. Per the standard "the total of neglected input flows per module shall be a maximum of 5% of energy usage, mass and environmental impacts." Flows excluded for this study include infrastructure, capital goods and workforce burdens. Inputs and outputs associated with infrastructure (construction, maintenance and demolition of buildings/plants, road surfaces, transport equipment, etc.) are not included. This choice is based on experience from previous LCAs where the contribution from these items was negligible due to the long lifetime of the equipment compared to the high production volume of material during that lifetime. Although pallets are used in the transportation of packaged, finished mineral wool insulation boards, pallets have been excluded due to their high reuse rates since they would have a negligible impact if otherwise included.

2.5. Data Sources

Primary data was collected from the locations listed in the Manufacturing section. Life-cycle modeling and calculation of potential environmental impacts were conducted using the LCA software SimaPro 9, version 9.0.0.35, developed by PRÉ Consultants bv. The LCI database used for secondary data was the ecoinvent 3.5 database, provided with the Developer version of the software. In situations where LCI databases did not contain life-cycle inventory data for certain specific materials or processes used in either the manufacturing of precursor, input raw materials or the manufacturing of the mineral wool insulation itself, LCI data for a similar material or process was used as a substitute. In order to determine the most representative substitute, preliminary analyses were conducted.

2.6. Data Quality

To determine how representative the data used to model the life-cycle of Owens Corning® Thermafiber® Mineral Wool Insulation manufactured in 2018 is, the temporal, geographical and technological aspects of the data were assessed. For the Owens Corning facilities analyzed in the underlying LCA study, the data used adequately represents the technology used in 2018 in the United States.

2.7. Period under Review

For the manufacturing facilities considered in the LCA, Owens Corning primary data was collected for the 2018 calendar year.

2.8. Allocation

The products studied in this analysis are all members of the Thermafiber® Mineral Wool Insulation product family. Plants reported the total amount of Thermafiber® Mineral Wool Insulation produced as well as the amount produced of each individual product. In general, the characteristics that differentiate one product from another within the family are its density, form and the use and type of a binder. Particular product application can be considered another differentiating characteristic; however, these three attributes are the main physical properties that distinguish one product from another.

Exceptions to this are Faced Thermafiber® Mineral Wool Insulation. For these products, it was possible to avoid additional allocation by treating the facing materials as separate modular processes, the LCIs of which were analyzed separately. Aside from those mentioned, no other allocation modeling considerations were necessary.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

3. Life Cycle Assessment Scenarios

Table 3. Transport to the building site (A4)

	Thermafiber® Heavy Density Mineral Wool Insulation (1 m ² , R _{SI} -1)	Thermafiber® Light Density Mineral Wool Insulation (1 m ² , R _{SI} -1)	
Fuel type	diesel, low-sulfur	diesel, low-sulfur	
Liters of fuel	1.59E-02	7.65E-03	l/100km
Vehicle type	Transport, freight, lorry 16-32 metric ton, EURO3	Transport, freight, lorry 16-32 metric ton, EURO3	
Transport distance	1.75E+03	1.77E+03	km
Capacity utilization (including empty runs, mass based) [‡]	63%	63%	%
Gross density of products transported	1.03E+02	4.86E+01	kg/m ³
Weight of products transported (if gross density not reported)	3.49E+00	1.68E+00	kg
Volume of products transported (if gross density not reported)	3.38E-02	3.47E-02	m ³
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	1	1	-

[‡] EcoTransIT. World. Ecological Transport Information Tool for Worldwide Transports Methodology and Data - Update 4th December 2014.
(https://www.ecotransit.org/download/EcoTransIT_World_Methodology_Report_2014-12-04.pdf)

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 4. Transport to the building site (A4) for F-1400XX Facing Addon

Fuel type	diesel, low-sulfur	F-140001	diesel, low-sulfur	F-140011	diesel, low-sulfur	F-140012	diesel, low-sulfur	F-140021	diesel, low-sulfur	F-140024	diesel, low-sulfur	F-140031	diesel, low-sulfur	F-140041	diesel, low-sulfur	F-140042	diesel, low-sulfur	F-140071	diesel, low-sulfur	F-140081	diesel, low-sulfur	F-140091	diesel, low-sulfur	F-140095
Liters of fuel (l/100km)	2.64E-04	2.44E-04	2.88E-04	6.43E-04	3.77E-04	3.10E-04	3.21E-04	1.71E-04	6.21E-04	2.44E-04	4.21E-04	4.21E-04	1.76E+03	1.76E+03										
Vehicle type	Transport, freight, lorry 16-32 metric ton, EURO3																							
Transport distance (km)	1.76E+03	1.76E+03																						
Capacity utilization (including empty runs, mass based)†	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%	63%
Gross density of products transported (kg/m³)	3.81E+02	3.58E+02	3.25E+02	6.19E+02	4.08E+02	1.42E+02	1.11E+02	1.64E+02	5.98E+02	3.58E+02	6.09E+02	6.09E+02	5.81E-02	5.37E-02	6.35E-02	1.42E-01	8.30E-02	6.84E-02	7.08E-02	3.76E-02	1.37E-01	5.37E-02	9.28E-02	9.28E-02
Weight of products transported (if gross density not reported) (kg)	1.52E-04	1.50E-04	1.96E-04	2.29E-04	2.03E-04	4.83E-04	6.35E-04	2.29E-04	2.29E-04	1.50E-04	1.52E-04	1.52E-04	1	1	1	1	1	1	1	1	1	1	1	1
Volume of products transported (if gross density not reported) (m³)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Capacity utilization volume factor (factor: =1 or <1 or ≥ 1 for compressed or nested packaging products)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

† EcoTransIT. World. Ecological Transport Information Tool for Worldwide Transports Methodology and Data - Update 4th December 2014. (https://www.ecotransit.org/download/EcoTransIT_World_Methodology_Report_2014-12-04.pdf)



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 5. Installation into the building (A5)

	Thermafiber® Heavy Density Mineral Wool Insulation (1 m ² , Rs _i -1)	Thermafiber® Light Density Mineral Wool Insulation (1 m ² , Rs _i -1)	
Ancillary materials	0.00E+00	0.00E+00	kg
Net freshwater consumption specified by water source and fate (amount evaporated, amount disposed to sewer)	0.00E+00	0.00E+00	m ³
Other resources	0.00E+00	0.00E+00	kg
Electricity consumption	0.00E+00	0.00E+00	kWh
Other energy carriers	0.00E+00	0.00E+00	MJ
Product loss per functional unit	0.00E+00	0.00E+00	kg
Waste materials at the construction site before waste processing, generated by product installation	1.60E-02	4.30E-02	kg
Output materials resulting from on-site waste processing (specified by route; e.g. for recycling, energy recovery and/or disposal)	0.00E+00	0.00E+00	kg
Biogenic carbon contained in packaging	0.00E+00	0.00E+00	kg CO ₂
Direct emissions to ambient air, soil and water	0.00E+00	0.00E+00	kg
VOC content [‡]	0.00E+00	0.00E+00	µg/m ³

[‡] VOC content determined in accordance to "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers - version 1.2." CA Specification 01350.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 6. Reference Service Life

RSL	75 years
Declared product properties (at the gate) and finishes, etc.	Not applicable (Insulation properties require installation into a building.)
Design application parameters (if instructed by the manufacturer), including references to the appropriate practices and application codes)	Install per instructions
An assumed quality of work, when installed in accordance with the manufacturer's instructions	Will meet R-value (Installer should install per manufacturer instructions)
Outdoor environment, (if relevant for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	Not applicable (Indoor or covered in outdoor applications)
Indoor environment, (if relevant for indoor applications), e.g. temperature, moisture, chemical exposure)	Product should be kept dry
Use conditions, e.g. frequency of use, mechanical exposure.	Not applicable (Insulation is a passive product which is not used directly during life)
Maintenance, e.g. required frequency, type and quality of replacement components	None needed (Insulation does not need maintenance during its use)

Table 7. End-of-life, Transport (C2)

		Thermafiber® Heavy Density Mineral Wool Insulation (1 m ² , R _{SI} -1)	Thermafiber® Light Density Mineral Wool Insulation (1 m ² , R _{SI} -1)	F-1400XX Facing Addon (1 m ²)	
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Although reuse and recycling of mineral wool insulation at its end of life is possible, there are no formal programs for collection and transport. It is assumed that all product is sent to landfill at end of life.			
Collection process (specified by type)	Collected separately	0.00E+00	0.00E+00	[0.00E+00]	kg
	Collected with mixed construction waste	3.49E+00	1.68E+00	[‡]	kg
Recovery (specified by type)	Reuse	0.00E+00	0.00E+00	[0.00E+00]	kg
	Recycling	0.00E+00	0.00E+00	[0.00E+00]	kg
	Landfill	0.00E+00	0.00E+00	[0.00E+00]	kg
	Incineration	0.00E+00	0.00E+00	[0.00E+00]	kg
	Incineration with energy recovery	0.00E+00	0.00E+00	[0.00E+00]	kg
	Energy conversion efficiency rate	0.00E+00	0.00E+00	[0.00E+00]	
Disposal (specified by type)	Product or material for final deposition	0.00E+00	0.00E+00	[0.00E+00]	kg
Removals of biogenic carbon (excluding packaging)		0.00E+00	0.00E+00	[0.00E+00]	kg CO ₂

‡ Value [kg] for F-1400XX Facing Addon (1 m²) can be found in **Table 4** in row values for "Weight of products transported"

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 8. End-of-life, Disposal (C4)

		Thermafiber® Heavy Density Mineral Wool Insulation (1 m ² , R _{sr} -1)	Thermafiber® Light Density Mineral Wool Insulation (1 m ² , R _{sr} -1)	F-1400XX Facing Addon (1 m ²)	
Assumptions for scenario development (description of deconstruction, collection, recovery, disposal method and transportation)		Although reuse and recycling of mineral wool insulation at its end of life is possible, there are no formal programs for collection and transport. It is assumed that all product is sent to landfill at end of life.			
Collection process (specified by type)	Collected separately	0.00E+00	0.00E+00	[0.00E+00]	kg
	Collected with mixed construction waste	0.00E+00	0.00E+00	[0.00E+00]	kg
Recovery (specified by type)	Reuse	0.00E+00	0.00E+00	[0.00E+00]	kg
	Recycling	0.00E+00	0.00E+00	[0.00E+00]	kg
	Landfill	0.00E+00	0.00E+00	[0.00E+00]	kg
	Incineration	0.00E+00	0.00E+00	[0.00E+00]	kg
	Incineration with energy recovery	0.00E+00	0.00E+00	[0.00E+00]	kg
	Energy conversion efficiency rate	0.00E+00	0.00E+00	[0.00E+00]	
Disposal (specified by type)	Product or material for final deposition	3.49E+00	1.68E+00	[‡]	kg
Removals of biogenic carbon (excluding packaging)		0.00E+00	0.00E+00	[0.00E+00]	kg CO ₂

‡ Value [kg] for F-1400XX Facing Addon (1 m²) can be found in **Table 4** in row values for "Weight of products transported"

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

4. Life Cycle Assessment Results

Table 9. Description of the system boundary modules

	PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY	
	A1 Raw material supply	A2 Transport	A3 Manufacturing	A4 Transport from gate to site	A5 Assembly/Install	B1 Use	B2 Maintenance	B3 Repair	B4 Replacement	B5 Refurbishment	B6 Building Operational Energy Use During Product Use	B7 Building Operational Water Use During Product Use	C1 Deconstruction	C2 Transport	C3 Waste processing	C4 Disposal		
Thermafiber® Mineral Wool Insulation (1 m², R _{SI} -1)	x	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	x	MND	x	MND	75 years
F-1400XX Facing Addon for Faced Thermafiber® Mineral Wool Insulation (1 m²)	x	x	x	x	MND	MND	MND	MND	MND	MND	MND	MND	MND	x	MND	x	MND	75 years
EPD Type: Cradle to installation with end of life	Required				Optional (Based on scenarios)							Required				Required		

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

4.1. Life Cycle Impact Assessment Results

Table 10 LCIA Results for North America (TRACI) for Thermafiber® Heavy Density Mineral Wool Insulation (1 m², R_{SI}-1)

Thermafiber® Heavy Density Mineral Wool Insulation (1 m ² , R _{SI} -1)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	9.71E+00	1.00E+00	1.15E-03	MND	MND	9.22E-02	MND	1.83E-02
ODP [kg CFC-11 eq]	1.14E-06	2.47E-07	6.19E-11	MND	MND	2.28E-08	MND	8.85E-09
AP [kg SO ₂ eq]	6.95E-02	6.23E-03	1.86E-06	MND	MND	5.74E-04	MND	1.60E-04
EP [kg N eq]	2.61E-02	1.24E-03	5.09E-05	MND	MND	1.15E-04	MND	3.42E-05
POCP [kg O ₃ eq]	7.65E-01	1.69E-01	4.92E-05	MND	MND	1.56E-02	MND	3.81E-03
ADP _{fossil} [MJ, LHV]	1.17E+01	2.22E+00	5.62E-04	MND	MND	2.05E-01	MND	8.22E-02

[GWP 100 - Global Warming Potential]; [ODP - Ozone Depletion Potential]; [AP - Acidification Potential]; [EP - Eutrophication Potential];
[POCP - Smog Formation Potential]; [ADP_{fossil} - Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources]

Table 11 LCIA Results for North America (TRACI) for Thermafiber® Light Density Mineral Wool Insulation (1 m², R_{SI}-1)

Thermafiber® Light Density Mineral Wool Insulation (1 m ² , R _{SI} -1)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	4.77E+00	4.88E-01	3.07E-03	MND	MND	4.45E-02	MND	8.84E-03
ODP [kg CFC-11 eq]	4.28E-07	1.20E-07	1.66E-10	MND	MND	1.10E-08	MND	4.27E-09
AP [kg SO ₂ eq]	2.99E-02	3.04E-03	4.99E-06	MND	MND	2.77E-04	MND	7.74E-05
EP [kg N eq]	1.29E-02	6.06E-04	1.36E-04	MND	MND	5.52E-05	MND	1.65E-05
POCP [kg O ₃ eq]	2.92E-01	8.23E-02	1.32E-04	MND	MND	7.51E-03	MND	1.84E-03
ADP _{fossil} [MJ, LHV]	4.67E+00	1.08E+00	1.51E-03	MND	MND	9.88E-02	MND	3.97E-02

[GWP 100 - Global Warming Potential]; [ODP - Ozone Depletion Potential]; [AP - Acidification Potential]; [EP - Eutrophication Potential];
[POCP - Smog Formation Potential]; [ADP_{fossil} - Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources]

Table 12 LCIA Results for North America (TRACI) for F-1400XX Facing Addon (1 m²), Cradle-to-Grave (A1-C4)

TRACI v2.1 Cradle-to-Grave (A1-C4)		GWP 100 [kg CO ₂ eq]	ODP [kg CFC-11 eq]	AP [kg SO ₂ eq]	EP [kg N eq]	POCP [kg O ₃ eq]	ADP _{fossil} [MJ, LHV]
F-1400XX Facing Addon (1 m ²)	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4
F-140001, 5225T-White	4.65E-01	2.79E-08	2.61E-03	1.26E-03	3.43E-02	4.13E-01	
F-140011, 5225T Printed	4.49E-01	2.67E-08	2.54E-03	1.22E-03	3.33E-02	3.80E-01	
F-140012, 5263 Printed 5x5	4.81E-01	2.85E-08	2.68E-03	1.26E-03	3.55E-02	4.97E-01	
F-140021, 30J	6.41E-01	4.89E-08	3.62E-03	2.20E-03	5.24E-02	7.04E-01	
F-140024, WMP-VR	1.90E-01	2.16E-08	1.11E-03	9.43E-04	1.94E-02	3.56E-01	
F-140031, 3114B	1.91E-01	2.07E-08	1.19E-03	4.86E-04	1.95E-02	3.22E-01	
F-140041, 7503	2.01E-01	2.14E-08	1.27E-03	5.09E-04	2.07E-02	3.29E-01	
F-140042, G/47499	1.25E-01	1.42E-08	5.37E-04	7.27E-04	8.46E-03	3.20E-01	
F-140071, 3035/PE 2.0	6.48E-01	4.38E-08	3.48E-03	1.61E-03	4.95E-02	9.86E-01	
F-140081, 5225T	4.49E-01	2.67E-08	2.54E-03	1.22E-03	3.33E-02	3.80E-01	
F-140091, 5229	9.40E-01	4.82E-08	5.22E-03	2.51E-03	6.57E-02	7.97E-01	
F-140095, 5229 Printed	9.40E-01	4.82E-08	5.22E-03	2.51E-03	6.57E-02	7.97E-01	

[GWP 100 - Global Warming Potential]; [ODP - Ozone Depletion Potential]; [AP - Acidification Potential]; [EP - Eutrophication Potential];
[POCP - Smog Formation Potential]; [ADP_{fossil} - Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources]

Results by life cycle module, the aggregate of which are shown in **Table 12**, can be found in **Appendix A**.



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

4.2. Life Cycle Inventory Results

Table 13 Resource Use for Thermafiber® Heavy Density Mineral Wool Insulation (1 m², R_{SI}-1)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	2.29E+00	1.52E-01	3.77E-05	MND	MND	1.40E-02	MND	4.64E-03
RPRM [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	1.14E+02	1.55E+01	3.92E-03	MND	MND	1.43E+00	MND	5.67E-01
NRPRM [MJ, LHV]	1.02E+01	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	4.23E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	3.59E-02	2.76E-03	1.42E-06	MND	MND	2.54E-04	MND	5.91E-04

[RPRE - Renewable primary energy used as energy carrier (fuel)]; [RPRM - Renewable primary resources with energy content used as material]; [NRPRE - Non-renewable primary resources used as an energy carrier (fuel)]; [NRPRM - Non-renewable primary resources with energy content used as material]; [SM - Secondary materials]; [RSF - Renewable secondary fuels]; [NRSF - Non-renewable secondary fuels]; [RE - Recovered energy]; [FW - Use of net fresh water resources]

Table 14 Resource Use for Thermafiber® Light Density Mineral Wool Insulation (1 m², R_{SI}-1)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	1.28E+00	7.42E-02	1.01E-04	MND	MND	6.76E-03	MND	2.24E-03
RPRM [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	4.91E+01	7.56E+00	1.05E-02	MND	MND	6.89E-01	MND	2.73E-01
NRPRM [MJ, LHV]	6.12E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	2.19E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	1.44E-02	1.35E-03	3.81E-06	MND	MND	1.23E-04	MND	2.85E-04

[RPRE - Renewable primary energy used as energy carrier (fuel)]; [RPRM - Renewable primary resources with energy content used as material]; [NRPRE - Non-renewable primary resources used as an energy carrier (fuel)]; [NRPRM - Non-renewable primary resources with energy content used as material]; [SM - Secondary materials]; [RSF - Renewable secondary fuels]; [NRSF - Non-renewable secondary fuels]; [RE - Recovered energy]; [FW - Use of net fresh water resources]

Table 15 Resource Use for F-1400XX Facing Addon (1 m²), Cradle-to-Grave (A1-C4)

	RPRE [MJ, LHV]	RPRM [MJ, LHV]	NRPRE [MJ, LHV]	NRPRM [MJ, LHV]	SM [kg]	RSF [MJ, LHV]	NRSF [MJ, LHV]	RE [MJ, LHV]	FW [m3]
	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4
Facing Addon	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4	Å1-C4
F-140001, 5225T-White	4.71E-01	0.00E+00	5.26E+00	6.56E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.23E-03
F-140011, 5225T Printed	4.64E-01	0.00E+00	5.00E+00	5.18E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.08E-03
F-140012, 5263 Printed 5x5	4.97E-01	0.00E+00	5.89E+00	1.48E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.49E-03
F-140021, 30J	5.63E+00	2.59E+00	7.75E+00	7.40E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.05E-03
F-140024, WMP-VR	2.07E+00	1.73E+00	3.05E+00	1.07E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.56E-03
F-140031, 3114B	1.21E-01	0.00E+00	2.82E+00	9.44E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.62E-03
F-140041, 7503	1.27E-01	0.00E+00	2.90E+00	7.82E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.63E-03
F-140042, G/47499	8.49E-02	3.75E-01	2.44E+00	1.81E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.82E-03
F-140071, 3035/PE 2.0	2.59E+00	1.73E+00	9.76E+00	4.82E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.21E-03
F-140081, 5225T	4.64E-01	0.00E+00	5.00E+00	5.18E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.08E-03
F-140091, 5229	9.85E-01	0.00E+00	1.07E+01	2.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-03
F-140095, 5229 Printed	9.85E-01	0.00E+00	1.07E+01	2.10E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.39E-03

[RPRE - Renewable primary energy used as energy carrier (fuel)]; [RPRM - Renewable primary resources with energy content used as material]; [NRPRE - Non-renewable primary resources used as an energy carrier (fuel)]; [NRPRM - Non-renewable primary resources with energy content used as material]; [SM - Secondary materials]; [RSF - Renewable secondary fuels]; [NRSF - Non-renewable secondary fuels]; [RE - Recovered energy]; [FW - Use of net fresh water resources]

Results by life cycle module, the aggregate of which are shown in **Table 15**, can be found in **Appendix B**.



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 16 Output Flows and Waste Categories for Thermafiber® Heavy Density Mineral Wool Insulation (1 m², R_{SI}-1)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	2.73E+00	0.00E+00	4.95E-03	MND	MND	0.00E+00	MND	3.49E+00
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	5.06E-01	0.00E+00	1.24E-03	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	1.09E-03	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00

[HWD - Hazardous waste disposed]; [NHWD - Non-hazardous waste disposed]; [HLRW - High-level radioactive waste, conditioned, to final repository]; [ILLRW - Intermediate- and low-level radioactive waste, conditioned, to final repository]; [CRU - Components for re-use]; [MR - Materials for recycling]; [MER - Materials for energy recovery]; [EE - Exported energy];

Table 17 Output Flows and Waste Categories for Thermafiber® Light Density Mineral Wool Insulation (1 m², R_{SI}-1)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	1.22E+00	0.00E+00	1.33E-02	MND	MND	0.00E+00	MND	1.68E+00
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	3.98E-01	0.00E+00	3.32E-03	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	2.93E-03	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00

[HWD - Hazardous waste disposed]; [NHWD - Non-hazardous waste disposed]; [HLRW - High-level radioactive waste, conditioned, to final repository]; [ILLRW - Intermediate- and low-level radioactive waste, conditioned, to final repository]; [CRU - Components for re-use]; [MR - Materials for recycling]; [MER - Materials for energy recovery]; [EE - Exported energy];

Table 18 Output Flows and Waste Categories for F-1400XX Facing Addon (1 m²), Cradle-to-Grave (A1-C4)

	HWD [kg]	NHWD [kg]	HLRW [kg] or [m ³]	ILLRW [kg] or [m ³]	CRU [kg]	MR [kg]	MER [kg]	EE [MJ, LHV]
Facing Addon	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4
F-140001, 5225T-White	0.00E+00	5.81E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140011, 5225T Printed	0.00E+00	5.37E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140012, 5263 Printed 5x5	0.00E+00	6.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140021, 30J	0.00E+00	1.42E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140024, WMP-VR	0.00E+00	8.30E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140031, 3114B	0.00E+00	6.84E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140041, 7503	0.00E+00	7.08E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140042, G/47499	0.00E+00	3.76E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140071, 3035/PE 2.0	0.00E+00	1.37E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140081, 5225T	0.00E+00	5.37E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140091, 5229	0.00E+00	9.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140095, 5229 Printed	0.00E+00	9.28E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[HWD - Hazardous waste disposed]; [NHWD - Non-hazardous waste disposed]; [HLRW - High-level radioactive waste, conditioned, to final repository]; [ILLRW - Intermediate- and low-level radioactive waste, conditioned, to final repository]; [CRU - Components for re-use]; [MR - Materials for recycling]; [MER - Materials for energy recovery]; [EE - Exported energy];

Results by life cycle module, the aggregate of which are shown in **Table 18**, can be found in **Appendix C**.



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 19 Carbon Emissions and Removals for Thermafiber® Heavy Density Mineral Wool Insulation (1 m², R_{SI}-1)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00

[BCRP - Biogenic Carbon Removal from Product]; [BCEP - Biogenic Carbon Emission from Product]; [BCRK - Biogenic Carbon Removal from Packaging];
[BCEK - Biogenic Carbon Emission from Packaging]; [BCEW - Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes]; [CCE - Calcination Carbon Emissions]; [CCR - Carbonation Carbon Removals]; [CWNR - Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes]

Table 20 Carbon Emissions and Removals for Thermafiber® Light Density Mineral Wool Insulation (1 m², R_{SI}-1)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	0.00E+00	MND	MND	0.00E+00	MND	0.00E+00

[BCRP - Biogenic Carbon Removal from Product]; [BCEP - Biogenic Carbon Emission from Product]; [BCRK - Biogenic Carbon Removal from Packaging];
[BCEK - Biogenic Carbon Emission from Packaging]; [BCEW - Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes]; [CCE - Calcination Carbon Emissions]; [CCR - Carbonation Carbon Removals]; [CWNR - Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes]

Table 21 Carbon Emissions and Removals for F-1400XX Facing Addon (1 m²), Cradle-to-Grave (A1-C4)

	BCRP [kg CO ₂]	BCEP [kg CO ₂]	BCRK [kg CO ₂]	BCEK [kg CO ₂]	BCEW [kg CO ₂]	CCE [kg CO ₂]	CCR [kg CO ₂]	CWNR [kg CO ₂]
Facing Addon	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4	A1-C4
F-140001, 5225T-White	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140011, 5225T Printed	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140012, 5263 Printed 5x5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140021, 30J	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140024, WMP-VR	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140031, 3114B	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140041, 7503	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140042, G/47499	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140071, 3035/PE 2.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140081, 5225T	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140091, 5229	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
F-140095, 5229 Printed	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

[BCRP - Biogenic Carbon Removal from Product]; [BCEP - Biogenic Carbon Emission from Product]; [BCRK - Biogenic Carbon Removal from Packaging];
[BCEK - Biogenic Carbon Emission from Packaging]; [BCEW - Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes]; [CCE - Calcination Carbon Emissions]; [CCR - Carbonation Carbon Removals]; [CWNR - Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes]

Results by life cycle module, the aggregate of which are shown in **Table 21**, can be found in **Appendix D**.



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation



According to ISO 14025,
EN 15804 and ISO 21930:2017

4.3. Calculating Impact Category Results for Products with Specific Performance Properties

The environmental impact assessment results have been calculated for both light and heavy density mineral wool insulation. These results, found in [Table 11](#) and [Table 10](#), respectively, are for the functional unit, which has a surface area of 1 m² and a thermal resistance of R_{SI} = 1. In Imperial units, this thermal resistance, or R-value, is equivalent to 5.68 hr·ft²·°F/BTU (i.e., R_{IP} = 5.68 or R = 5.68). However, Thermafiber® Mineral Insulation, however, is manufactured in a variety of thicknesses and has a wide array of facing material options. In order to calculate impact values for Thermafiber® Mineral Wool Insulation having a specific thickness (in) with or without a specific facing material, the following equation can be used:

$$\text{Impact} = \boxed{\text{Impact of Functional unit}^a} \times \boxed{\text{Density Scaling Factor (in}^{-1})^b} \times \boxed{\text{Thickness (in)}} + \boxed{\text{Impact of Facing material}^c}$$

Notes:

- a. For light density products (≤ 4 PCF), impact values can be found in [Table 11](#).
For heavy density products (> 4 PCF), impact values can be found in [Table 10](#).
- b. *Density Scaling Factor* = 0.732 in⁻¹ for light density products (≤ 4 PCF) and = 0.750 in⁻¹ for heavy density products (> 4 PCF).
- c. Impact values for 1 m² of various facing materials can be found in [Table 23](#) through [Table 34](#). If product is unfaced, impact value is 0.

5. LCA Interpretation

The underlying LCA upon which this EPD is based considered the following six environmental impact categories: Global Warming Potential (GWP 100); Ozone Depletion Potential (ODP); Acidification Potential (AP); Eutrophication Potential (EP); Smog Formation Potential (POCP); and Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources (ADP_{fossil}). The impact assessment results indicate that among the life cycle modules declared for Thermafiber® Mineral Wool Insulation, the *Manufacturing* (A3) life cycle module accounted for the majority of the potential environmental impact of each of these six impact categories.

Although the intended application of mineral wool is for building envelope thermal insulation, the affected reductions in a building's energy consumption when the mineral wool is used for this purpose were not included in the *Use* life cycle stage.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation



According to ISO 14025,
EN 15804 and ISO 21930:2017

6. Additional Environmental Information

6.1. Environment and Health During Manufacturing

Owens Corning manufacturing facilities of Thermafiber® Mineral Wool Insulation maintain quality management systems.

6.2. Environment and Health During Installation

This product is considered an article. 29 CFR 1910.1200(c) definition of an article is 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 WHMIS Regulatory Status This product is considered an article per the Canadian Hazardous Products Regulation SOR/2015-17.

Manufactured articles which 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. The product's Safe Use Instruction Sheet includes exposure guidelines, engineering controls and individual protection measures.

6.3. Extraordinary Effects

No extraordinary effects or environmental impacts are expected due to destruction of the product by fire, water or mechanical means.

6.4. Delayed Emissions

No delayed emissions are expected from this product.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

6.5. Environmental Activities and Certifications

The material recycled content of Thermafiber® Mineral Wool Insulation has been verified by ICC-ES. The amounts and type of recycled content for Thermafiber® Mineral Wool Insulation products can be found in **Table 22** below.

Table 22 Thermafiber® Mineral Wool Insulation Material Recycled Content by Weight

Product Name	% Pre-Consumer Recycled Content		% Post-Consumer Recycled Content	% Total Recycled Content
	Standard Fiber	EPA Choice Fiber		
Thermafiber® SAFB™ Sound Control Insulation	70	75	0	70 – 75 ¹
Thermafiber® Safing™ Insulation		75	0	75
Thermafiber® FireSpan® 40 and 90 Curtain Wall Insulation		75	0	75
Thermafiber® UltraBatt™ Exterior Wall Insulation	70	N/A	0	70
Thermafiber® RainBarrier® 45 and HD Continuous Insulation	70	75	0	70 – 75 ¹
Thermafiber® TopStop® Head-of-Wall Insulation		75	0	75
Thermafiber® VersaBoard® Commercial Insulation	70	75	0	70 – 75 ¹

1. The values represent the minimum and maximum range of available recycled content for the product. The actual recycled content amount for the product provided to the end user depends on the product formulation requested by the customer.



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Made with Wind Energy and Reduced Carbon Footprint

Thermafiber® Mineral Wool Insulation products are available upon request carrying SCS Global Services certification for "Made with Wind Energy" and "Reduced Carbon Footprint". Impact category results when electricity used during manufacturing is matched with wind energy produced as part of Owens Corning's Power Purchase Agreement can be found in the tables below. Cradle-to-gate (A1 - A3) values shown are based on the results from this EPD, which reflect the 2018 production year and are based on NERC regional grid values from the ecoinvent 3.5 LCI database implemented in SimaPro. Dataset and other methodological differences introduce a degree of variability leading to the reduction values shown below to differ from those that appear on certificates.

Thermafiber® Heavy Density Mineral Wool Insulation (1 m ² , R _{SI} -1)			
TRACI v2.1	A1 - A3 STANDARD PRODUCT	A1 - A3 CERTIFIED PRODUCT	% CHANGE
GWP 100 [kg CO ₂ eq]	9.71E+00	8.35E+00	-14%
ODP [kg CFC-11 eq]	1.14E-06	1.06E-06	-7%
AP [kg SO ₂ eq]	6.95E-02	6.51E-02	-6%
EP [kg N eq]	2.61E-02	1.40E-02	-47%
POCP [kg O ₃ eq]	7.65E-01	7.29E-01	-5%
ADP _{fossil} [MJ, LHV]	1.17E+01	1.10E+01	-6%

Thermafiber® Light Density Mineral Wool Insulation (1 m ² , R _{SI} -1)			
TRACI v2.1	A1 - A3 STANDARD PRODUCT	A1 - A3 CERTIFIED PRODUCT	% CHANGE
GWP 100 [kg CO ₂ eq]	4.77E+00	4.04E+00	-15%
ODP [kg CFC-11 eq]	4.28E-07	3.87E-07	-10%
AP [kg SO ₂ eq]	2.99E-02	2.78E-02	-7%
EP [kg N eq]	1.29E-02	6.51E-03	-50%
POCP [kg O ₃ eq]	2.92E-01	2.72E-01	-7%
ADP _{fossil} [MJ, LHV]	4.67E+00	4.27E+00	-9%

6.6. Further Information

Additional information may be found at www.owenscorning.com

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation



According to ISO 14025,
EN 15804 and ISO 21930:2017

7. References

Product Category Rules (PCR) Guidance for Building-Related Products and Services - Part B: Building Envelope Thermal Insulation EPD Requirements, UL 10010-1 Version 2.0, Second Edition, UL Environment, April 10, 2018.

Product Category Rules for Building Related Products and Services - Part A: Life Cycle Assessment Calculation Rules and Report Requirements, UL 10010 Version 3.2, Fifth Edition, UL Environment, December 12, 2018.

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

ISO 14040:2006(E), Environmental management - Life cycle assessment - Principles and framework

ISO 14044:2006(E), Environmental management - Life cycle assessment - Requirements and guidelines

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

ISO 21930:2017(E), Sustainability in buildings and civil engineering works - Core rules for environmental product declarations of construction products and services

PRé Consultants: SimaPro 9.0.0.35 LCA Software. 2019. The Netherlands.

ASTM C518-18: Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus

ASTM C665-18: Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing

Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources using Environmental Chambers - version 1.2, CA Specification 01350, January 2017.

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

8. Appendices

8.1. Appendix A

Table 23 LCIA Results for North America (TRACI) for F-140001, 5225T-White (1 m²)

F-140001, 5225T-White (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	4.46E-01	1.69E-02	MND	MND	MND	1.54E-03	MND	3.05E-04
ODP [kg CFC-11 eq]	2.32E-08	4.16E-09	MND	MND	MND	3.81E-10	MND	1.47E-10
AP [kg SO ₂ eq]	2.49E-03	1.05E-04	MND	MND	MND	9.61E-06	MND	2.67E-06
EP [kg N eq]	1.24E-03	2.10E-05	MND	MND	MND	1.92E-06	MND	5.69E-07
POCP [kg O ₃ eq]	3.11E-02	2.85E-03	MND	MND	MND	2.61E-04	MND	6.34E-05
ADP _{fossil} [MJ, LHV]	3.71E-01	3.75E-02	MND	MND	MND	3.43E-03	MND	1.37E-03

[GWP 100 - Global Warming Potential]; [ODP - Ozone Depletion Potential]; [AP - Acidification Potential]; [EP - Eutrophication Potential];
[POCP - Smog Formation Potential]; [ADP_{fossil} - Abiotic Resource Depletion Potential of Non-renewable (fossil) energy resources]

Table 24 LCIA Results for North America (TRACI) for F-140011, 5225T Printed (1 m²)

F-140011, 5225T Printed (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	4.32E-01	1.56E-02	MND	MND	MND	1.43E-03	MND	2.82E-04
ODP [kg CFC-11 eq]	2.23E-08	3.85E-09	MND	MND	MND	3.52E-10	MND	1.36E-10
AP [kg SO ₂ eq]	2.43E-03	9.71E-05	MND	MND	MND	8.88E-06	MND	2.47E-06
EP [kg N eq]	1.20E-03	1.94E-05	MND	MND	MND	1.77E-06	MND	5.26E-07
POCP [kg O ₃ eq]	3.04E-02	2.63E-03	MND	MND	MND	2.41E-04	MND	5.86E-05
ADP _{fossil} [MJ, LHV]	3.41E-01	3.46E-02	MND	MND	MND	3.17E-03	MND	1.26E-03

Table 25 LCIA Results for North America (TRACI) for F-140012, 5263 Printed 5x5 (1 m²)

F-140012, 5263 Printed 5x5 (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	4.61E-01	1.84E-02	MND	MND	MND	1.69E-03	MND	3.33E-04
ODP [kg CFC-11 eq]	2.33E-08	4.55E-09	MND	MND	MND	4.16E-10	MND	1.61E-10
AP [kg SO ₂ eq]	2.55E-03	1.15E-04	MND	MND	MND	1.05E-05	MND	2.92E-06
EP [kg N eq]	1.24E-03	2.29E-05	MND	MND	MND	2.09E-06	MND	6.22E-07
POCP [kg O ₃ eq]	3.20E-02	3.11E-03	MND	MND	MND	2.85E-04	MND	6.93E-05
ADP _{fossil} [MJ, LHV]	4.51E-01	4.10E-02	MND	MND	MND	3.75E-03	MND	1.50E-03

Table 26 LCIA Results for North America (TRACI) for F-140021, 30J (1 m²)

F-140021, 30J (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	5.95E-01	4.11E-02	MND	MND	MND	3.76E-03	MND	7.43E-04
ODP [kg CFC-11 eq]	3.75E-08	1.02E-08	MND	MND	MND	9.28E-10	MND	3.59E-10
AP [kg SO ₂ eq]	3.34E-03	2.56E-04	MND	MND	MND	2.34E-05	MND	6.51E-06
EP [kg N eq]	2.14E-03	5.11E-05	MND	MND	MND	4.67E-06	MND	1.39E-06
POCP [kg O ₃ eq]	4.47E-02	6.94E-03	MND	MND	MND	6.35E-04	MND	1.55E-04
ADP _{fossil} [MJ, LHV]	6.01E-01	9.13E-02	MND	MND	MND	8.35E-03	MND	3.33E-03



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 27 LCIA Results for North America (TRACI) for F-140024, WMP-VR (1 m²)

F-140024, WMP-VR (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	1.63E-01	2.41E-02	MND	MND	MND	2.20E-03	MND	4.35E-04
ODP [kg CFC-11 eq]	1.49E-08	5.95E-09	MND	MND	MND	5.44E-10	MND	2.10E-10
AP [kg SO ₂ eq]	9.38E-04	1.50E-04	MND	MND	MND	1.37E-05	MND	3.81E-06
EP [kg N eq]	9.09E-04	2.99E-05	MND	MND	MND	2.74E-06	MND	8.13E-07
POCP [kg O ₃ eq]	1.48E-02	4.07E-03	MND	MND	MND	3.72E-04	MND	9.06E-05
ADP _{fossil} [MJ, LHV]	2.95E-01	5.35E-02	MND	MND	MND	4.90E-03	MND	1.95E-03

Table 28 LCIA Results for North America (TRACI) for F-140031, 3114B (1 m²)

F-140031, 3114B (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	1.69E-01	1.99E-02	MND	MND	MND	1.82E-03	MND	3.59E-04
ODP [kg CFC-11 eq]	1.52E-08	4.90E-09	MND	MND	MND	4.48E-10	MND	1.73E-10
AP [kg SO ₂ eq]	1.05E-03	1.24E-04	MND	MND	MND	1.13E-05	MND	3.14E-06
EP [kg N eq]	4.59E-04	2.47E-05	MND	MND	MND	2.26E-06	MND	6.70E-07
POCP [kg O ₃ eq]	1.58E-02	3.35E-03	MND	MND	MND	3.07E-04	MND	7.47E-05
ADP _{fossil} [MJ, LHV]	2.72E-01	4.41E-02	MND	MND	MND	4.03E-03	MND	1.61E-03

Table 29 LCIA Results for North America (TRACI) for F-140041, 7503 (1 m²)

F-140041, 7503 (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	1.78E-01	2.06E-02	MND	MND	MND	1.88E-03	MND	3.71E-04
ODP [kg CFC-11 eq]	1.57E-08	5.08E-09	MND	MND	MND	4.64E-10	MND	1.80E-10
AP [kg SO ₂ eq]	1.12E-03	1.28E-04	MND	MND	MND	1.17E-05	MND	3.25E-06
EP [kg N eq]	4.80E-04	2.55E-05	MND	MND	MND	2.34E-06	MND	6.94E-07
POCP [kg O ₃ eq]	1.68E-02	3.47E-03	MND	MND	MND	3.17E-04	MND	7.73E-05
ADP _{fossil} [MJ, LHV]	2.77E-01	4.57E-02	MND	MND	MND	4.18E-03	MND	1.67E-03

Table 30 LCIA Results for North America (TRACI) for F-140042, G/47499 (1 m²)

F-140042, G/47499 (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	1.13E-01	1.09E-02	MND	MND	MND	9.98E-04	MND	1.97E-04
ODP [kg CFC-11 eq]	1.11E-08	2.70E-09	MND	MND	MND	2.46E-10	MND	9.53E-11
AP [kg SO ₂ eq]	4.61E-04	6.80E-05	MND	MND	MND	6.22E-06	MND	1.73E-06
EP [kg N eq]	7.12E-04	1.36E-05	MND	MND	MND	1.24E-06	MND	3.68E-07
POCP [kg O ₃ eq]	6.40E-03	1.84E-03	MND	MND	MND	1.69E-04	MND	4.10E-05
ADP _{fossil} [MJ, LHV]	2.93E-01	2.43E-02	MND	MND	MND	2.22E-03	MND	8.85E-04



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 31 LCIA Results for North America (TRACI) for F-140071, 3035/PE 2.0 (1 m²)

F-140071, 3035/PE 2.0 (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	6.04E-01	3.97E-02	MND	MND	MND	3.63E-03	MND	7.17E-04
ODP [kg CFC-11 eq]	3.27E-08	9.80E-09	MND	MND	MND	8.96E-10	MND	3.47E-10
AP [kg SO ₂ eq]	3.20E-03	2.47E-04	MND	MND	MND	2.26E-05	MND	6.28E-06
EP [kg N eq]	1.56E-03	4.93E-05	MND	MND	MND	4.51E-06	MND	1.34E-06
POCP [kg O ₃ eq]	4.20E-02	6.70E-03	MND	MND	MND	6.13E-04	MND	1.49E-04
ADP _{fossil} [MJ, LHV]	8.87E-01	8.82E-02	MND	MND	MND	8.06E-03	MND	3.22E-03

Table 32 LCIA Results for North America (TRACI) for F-140081, 5225T (1 m²)

F-140081, 5225T (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	4.32E-01	1.56E-02	MND	MND	MND	1.43E-03	MND	2.82E-04
ODP [kg CFC-11 eq]	2.23E-08	3.85E-09	MND	MND	MND	3.52E-10	MND	1.36E-10
AP [kg SO ₂ eq]	2.43E-03	9.71E-05	MND	MND	MND	8.88E-06	MND	2.47E-06
EP [kg N eq]	1.20E-03	1.94E-05	MND	MND	MND	1.77E-06	MND	5.26E-07
POCP [kg O ₃ eq]	3.04E-02	2.63E-03	MND	MND	MND	2.41E-04	MND	5.86E-05
ADP _{fossil} [MJ, LHV]	3.41E-01	3.46E-02	MND	MND	MND	3.17E-03	MND	1.26E-03

Table 33 LCIA Results for North America (TRACI) for F-140091, 5229 (1 m²)

F-140091, 5229 (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	9.10E-01	2.70E-02	MND	MND	MND	2.46E-03	MND	4.87E-04
ODP [kg CFC-11 eq]	4.07E-08	6.65E-09	MND	MND	MND	6.08E-10	MND	2.35E-10
AP [kg SO ₂ eq]	5.03E-03	1.68E-04	MND	MND	MND	1.53E-05	MND	4.26E-06
EP [kg N eq]	2.47E-03	3.35E-05	MND	MND	MND	3.06E-06	MND	9.09E-07
POCP [kg O ₃ eq]	6.06E-02	4.55E-03	MND	MND	MND	4.16E-04	MND	1.01E-04
ADP _{fossil} [MJ, LHV]	7.29E-01	5.99E-02	MND	MND	MND	5.47E-03	MND	2.19E-03

Table 34 LCIA Results for North America (TRACI) for F-140095, 5229 Printed (1 m²)

F-140095, 5229 Printed (1 m ²)								
TRACI v2.1	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
GWP 100 [kg CO ₂ eq]	9.10E-01	2.70E-02	MND	MND	MND	2.46E-03	MND	4.87E-04
ODP [kg CFC-11 eq]	4.07E-08	6.65E-09	MND	MND	MND	6.08E-10	MND	2.35E-10
AP [kg SO ₂ eq]	5.03E-03	1.68E-04	MND	MND	MND	1.53E-05	MND	4.26E-06
EP [kg N eq]	2.47E-03	3.35E-05	MND	MND	MND	3.06E-06	MND	9.09E-07
POCP [kg O ₃ eq]	6.06E-02	4.55E-03	MND	MND	MND	4.16E-04	MND	1.01E-04
ADP _{fossil} [MJ, LHV]	7.29E-01	5.99E-02	MND	MND	MND	5.47E-03	MND	2.19E-03



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

8.2. Appendix B

Table 35 Resource Use for F-140001, 5225T-White (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	4.68E-01	2.57E-03	MND	MND	MND	2.35E-04	MND	7.71E-05
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	4.96E+00	2.62E-01	MND	MND	MND	2.39E-02	MND	9.43E-03
NRPRM [MJ, LHV]	6.56E-01	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	3.17E-03	4.66E-05	MND	MND	MND	4.26E-06	MND	9.84E-06

[RPRE - Renewable primary energy used as energy carrier (fuel)]; [RPRM - Renewable primary resources with energy content used as material]; [NRPRE - Non-renewable primary resources used as an energy carrier (fuel)]; [NRPRM - Non-renewable primary resources with energy content used as material]; [SM - Secondary materials]; [RSF - Renewable secondary fuels]; [NRSF - Non-renewable secondary fuels]; [RE - Recovered energy]; [FW - Use of net fresh water resources]

Table 36 Resource Use for F-140011, 5225T Printed (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	4.61E-01	2.37E-03	MND	MND	MND	2.17E-04	MND	7.13E-05
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	4.73E+00	2.42E-01	MND	MND	MND	2.21E-02	MND	8.72E-03
NRPRM [MJ, LHV]	5.18E-01	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	3.03E-03	4.31E-05	MND	MND	MND	3.94E-06	MND	9.09E-06

Table 37 Resource Use for F-140012, 5263 Printed 5x5 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	4.94E-01	2.80E-03	MND	MND	MND	2.56E-04	MND	8.43E-05
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	5.57E+00	2.86E-01	MND	MND	MND	2.61E-02	MND	1.03E-02
NRPRM [MJ, LHV]	1.48E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	3.42E-03	5.09E-05	MND	MND	MND	4.66E-06	MND	1.08E-05

Table 38 Resource Use for F-140021, 30J (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	5.63E+00	6.25E-03	MND	MND	MND	5.72E-04	MND	1.88E-04
RPRM [MJ, LHV]	2.59E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	7.03E+00	6.37E-01	MND	MND	MND	5.83E-02	MND	2.30E-02
NRPRM [MJ, LHV]	7.40E-01	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	5.91E-03	1.14E-04	MND	MND	MND	1.04E-05	MND	2.40E-05

ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 39 Resource Use for F-140024, WMP-VR (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	2.06E+00	3.67E-03	MND	MND	MND	3.35E-04	MND	1.10E-04
RPRM [MJ, LHV]	1.73E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	2.62E+00	3.74E-01	MND	MND	MND	3.42E-02	MND	1.35E-02
NRPRM [MJ, LHV]	1.07E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	3.47E-03	6.65E-05	MND	MND	MND	6.09E-06	MND	1.41E-05

Table 40 Resource Use for F-140031, 3114B (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	1.17E-01	3.02E-03	MND	MND	MND	2.76E-04	MND	9.08E-05
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	2.47E+00	3.08E-01	MND	MND	MND	2.82E-02	MND	1.11E-02
NRPRM [MJ, LHV]	9.44E-01	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	1.55E-03	5.48E-05	MND	MND	MND	5.01E-06	MND	1.16E-05

Table 41 Resource Use for F-140041, 7503 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	1.23E-01	3.13E-03	MND	MND	MND	2.86E-04	MND	9.40E-05
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	2.55E+00	3.19E-01	MND	MND	MND	2.91E-02	MND	1.15E-02
NRPRM [MJ, LHV]	7.82E-01	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	1.56E-03	5.68E-05	MND	MND	MND	5.19E-06	MND	1.20E-05

Table 42 Resource Use for F-140042, G/47499 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	8.30E-02	1.66E-03	MND	MND	MND	1.52E-04	MND	4.99E-05
RPRM [MJ, LHV]	3.75E-01	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	2.25E+00	1.69E-01	MND	MND	MND	1.55E-02	MND	6.10E-03
NRPRM [MJ, LHV]	1.81E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	1.78E-03	3.01E-05	MND	MND	MND	2.76E-06	MND	6.37E-06



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 43 Resource Use for F-140071, 3035/PE 2.0 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	2.58E+00	6.04E-03	MND	MND	MND	5.52E-04	MND	1.82E-04
RPRM [MJ, LHV]	1.73E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	9.06E+00	6.15E-01	MND	MND	MND	5.63E-02	MND	2.22E-02
NRPRM [MJ, LHV]	4.82E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	7.07E-03	1.10E-04	MND	MND	MND	1.00E-05	MND	2.32E-05

Table 44 Resource Use for F-140081, 5225T (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	4.61E-01	2.37E-03	MND	MND	MND	2.17E-04	MND	7.13E-05
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	4.73E+00	2.42E-01	MND	MND	MND	2.21E-02	MND	8.72E-03
NRPRM [MJ, LHV]	5.18E-01	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	3.03E-03	4.31E-05	MND	MND	MND	3.94E-06	MND	9.09E-06

Table 45 Resource Use for F-140091, 5229 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	9.80E-01	4.10E-03	MND	MND	MND	3.75E-04	MND	1.23E-04
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	1.02E+01	4.18E-01	MND	MND	MND	3.82E-02	MND	1.51E-02
NRPRM [MJ, LHV]	2.10E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	6.30E-03	7.44E-05	MND	MND	MND	6.80E-06	MND	1.57E-05

Table 46 Resource Use for F-140095, 5229 Printed (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
RPRE [MJ, LHV]	9.80E-01	4.10E-03	MND	MND	MND	3.75E-04	MND	1.23E-04
RPRM [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRPRE [MJ, LHV]	1.02E+01	4.18E-01	MND	MND	MND	3.82E-02	MND	1.51E-02
NRPRM [MJ, LHV]	2.10E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
SM [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NRSF [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
RE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
FW [m3]	6.30E-03	7.44E-05	MND	MND	MND	6.80E-06	MND	1.57E-05



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

8.3. Appendix C

Table 47 Output Flows and Waste Categories for F-140001, 5225T-White (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	5.81E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

[HWD - Hazardous waste disposed]; [NHWD - Non-hazardous waste disposed]; [HLRW - High-level radioactive waste, conditioned, to final repository]; [ILLRW - Intermediate- and low-level radioactive waste, conditioned, to final repository]; [CRU - Components for re-use]; [MR - Materials for recycling]; [MER - Materials for energy recovery]; [EE - Exported energy];

Table 48 Output Flows and Waste Categories for F-140011, 5225T Printed (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	5.37E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 49 Output Flows and Waste Categories for F-140012, 5263 Printed 5x5 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	6.35E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 50 Output Flows and Waste Categories for F-140021, 30J (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	1.42E-01
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 51 Output Flows and Waste Categories for F-140024, WMP-VR (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	8.30E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 52 Output Flows and Waste Categories for F-140031, 3114B (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	6.84E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 53 Output Flows and Waste Categories for F-140041, 7503 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	7.08E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 54 Output Flows and Waste Categories for F-140042, G/47499 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	3.76E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 55 Output Flows and Waste Categories for F-140071, 3035/PE 2.0 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	1.37E-01
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 56 Output Flows and Waste Categories for F-140081, 5225T (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	5.37E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 57 Output Flows and Waste Categories for F-140091, 5229 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	9.28E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 58 Output Flows and Waste Categories for F-140095, 5229 Printed (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
HWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
NHWD [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	9.28E-02
HLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
ILLRW [kg] or [m ³]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CRU [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MR [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
MER [kg]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
EE [MJ, LHV]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

8.4. Appendix D

Table 59 Carbon Emissions and Removals for F-140001, 5225T-White (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

[BCRP - Biogenic Carbon Removal from Product]; [BCEP - Biogenic Carbon Emission from Product]; [BCRK - Biogenic Carbon Removal from Packaging];
[BCEK - Biogenic Carbon Emission from Packaging]; [BCEW - Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes]; [CCE - Calcination Carbon Emissions]; [CCR - Carbonation Carbon Removals]; [CWNR - Carbon Emissions from Combustion of Waste from Non- Renewable Sources used in Production Processes]

Table 60 Carbon Emissions and Removals for F-140011, 5225T Printed (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 61 Carbon Emissions and Removals for F-140012, 5263 Printed 5x5 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 62 Carbon Emissions and Removals for F-140021, 30J (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 63 Carbon Emissions and Removals for F-140024, WMP-VR (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 64 Carbon Emissions and Removals for F-140031, 3114B (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 65 Carbon Emissions and Removals for F-140041, 7503 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 66 Carbon Emissions and Removals for F-140042, G/47499 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00



ENVIRONMENTAL PRODUCT DECLARATION



Thermafiber® Mineral Wool
Light and Heavy Density Mineral Wool Insulation

According to ISO 14025,
EN 15804 and ISO 21930:2017

Table 67 Carbon Emissions and Removals for F-140071, 3035/PE 2.0 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 68 Carbon Emissions and Removals for F-140081, 5225T (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 69 Carbon Emissions and Removals for F-140091, 5229 (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

Table 70 Carbon Emissions and Removals for F-140095, 5229 Printed (1 m²)

Parameter	A1 - A3	A4	A5	B1 - B7	C1	C2	C3	C4
BCRP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEP [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCRK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEK [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
BCEW [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCE [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CCR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00
CWNR [kg CO ₂]	0.00E+00	0.00E+00	MND	MND	MND	0.00E+00	MND	0.00E+00

