ENVIRONMENTAL PRODUCT DECLARATION

EIFS MESH

SAINT-GOBAIN ADFORS
FAÇADE CLADDING REINFORCEMENT MESH

Our façade cladding mesh promotes system performance via optimum impact and crack resistance and enhanced coatings for flame retardant and alkali resistance. ADFORS mesh is also designed with a pliable coating which maintains flexibility for ease of application and a stronger bond.

Focused on the construction and industrial markets, ADFORS offers solutions based on a complete range of textile and coating technologies using fiberglass yarns and synthetic fibers. ADFORS is the reliable and innovative global leader in technical textiles, offering the most adapted solutions to meet your needs.

ADFORS belongs to the Saint-Gobain group, the world's largest building materials company. Saint-Gobain has been creating and delivering innovative and high performance solutions to enhance habitat and daily life for over 350 years.

Saint-Gobain is committed to providing sustainable products and to limiting our impacts on the environment while doing so. (See our CSR at https://www.saint-gobain.com/en/commitments/saint-gobains-csr-commitments.)

For more information, visit:

www.ADFORS.com

ENVIRONMENTAL PRODUCT DECLARATION

EIFS Mesh: Façade Cladding Reinforcement Mesh

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

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

PROGRAM OPERATOR	UL Environment
DECLARATION HOLDER	Adfors-Saint Gobain
DECLARATION NUMBER	4789078351.101
DECLARED PRODUCT	EIFS Mesh: Façade Cladding Reinforcement Mesh
REFERENCE PCR	Institut Bauen und Umwelt e.V. (IBU) Part B: Requirements on the EPD for Glass Reinforcement Mesh v.1.6, November 2017
REFERENCE PCR STANDARD	x EN 15804 (2012) ☐ ISO 21930 (2007) x ISO 21930 (2017)
DATE OF ISSUE	July 1, 2020
PERIOD OF VALIDITY	5 Years
CONTENTS OF THE DECLARATION	Product definition and information about building physics Information about basic material and the material's origin Description of the product's manufacture Indication of product processing Information about the in-use conditions Life cycle assessment results Testing results and verifications

The PCR review was conducted by:	Institut Bauen und Umwelt e.V. (IBU) PCR Review Panel-SVR
This declaration was independently verified in accordance with ISO 14025 by Underwriters Laboratories ☐ INTERNAL ☒ EXTERNAL	Grant R. Martin 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 Thomas P. Gloria, Industrial Ecology Consultants

ENVIRONMENTAL PRODUCT DECLARATION

EIFS Mesh: Façade Cladding Reinforcement Mesh

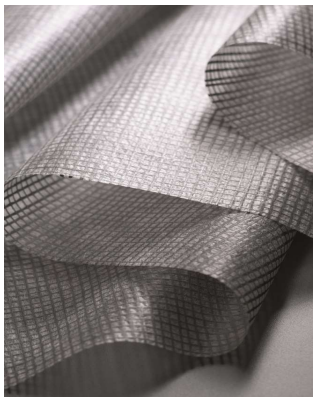
According to ISO 14025

Product Documentation

Product Description

EIFS Mesh is a reinforced technical textile used in façade cladding. A base of fiberglass or polyester yarn is woven and then coated with a proprietary blend coating for a strong yet pliable textile. The coated textiles provide a range of attributes including adhesion, impact resistance, fire retardancy, heat sealability, water resistance, temperature resistance, mold resistance, stiffness, and more. EIFS Mesh is designed for greater flexibility and drapability, especially valuable when covering complex shapes. The new formula provides a superior yarn-to-yarn bond strength and resist fraying when cutting.

EIFS Mesh



XP 403 Fabric

ADFORS EIFS Mesh products are available in several styles. The Standard Mesh, Detail Mesh, PM Systems Mesh, Extra Standard Mesh, Intermediate Mesh, High Impact Resistance 15 Mesh, and High Impact Resistance 20 Mesh are manufactured with a fiberglass yarn base. The XP 403 Fabric is manufactured with a polyester yarn base. This EPD includes all products in the ADFORS EIFS Mesh product line manufactured in North America.

EIFS Mesh Products					
Product	**Weight**	**Width**	**Roll Length**	**Coverage**	**Base Yarn Material**
Standard Mesh	143 g/m^2 (4.3 oz/yd^2) 143 g/m^2 (4.3 oz/yd^2)	97 cm (38 in) 122 cm (48 in)	45.7 m (50 yds) 45.7 m (50 yds)	44 m^2 (475 ft^2) 55.7 m^2 (600 ft^2)	Fiberglass
Detail Mesh	143 g/m^2 (4.3 oz/yd^2)	24 cm (9.25 in)	45.7 m (50 yds)	11 m^2 (118 ft^2)	Fiberglass
PM Systems Mesh	152 g/m^2 (4.5 oz/yd^2)	97 cm (38 in)	45.7 m (50 yds)	44 m^2 (475 ft^2)	Fiberglass
Extra Standard Mesh	200 g/m^2 (6 oz/yd^2)	97 cm (38 in)	45.7 m (50 yds)	44 m^2 (475 ft^2)	Fiberglass
Intermediate Mesh	370 g/m^2 (11 oz/yd^2)	97 cm (38 in)	22.8 m (25 yds)	22.1 m^2 (238 ft^2)	Fiberglass
High Impact Resistant Mesh 15	500 g/m^2 (15 oz/yd^2)	97 cm (38 in)	22.8 m (25 yds)	22.1 m^2 (238 ft^2)	Fiberglass
High Impact Resistant Mesh 20	700 g/m^2 (20 oz/yd^2)	100 cm (39.4 in)	22.8 m (25 yds)	22.8 m^2 (246 ft^2)	Fiberglass
XP 403 Fabric	35 g/m^2 (1 oz/yd^2)	4.4 – 91.4 cm (1.75 – 36 in)	54.9 m (60 yds)	Varies	Polyester

Table 1: ADFORS EIFS Mesh Products

Application

EIFS Mesh products are intended for use as structural reinforcement for many construction system applications.

Technical Data

EIFS Mesh	
CSI Code	07 24 00
UNSPSC Code	11162105
Product	**Impact Range per EIMA Test Method & Standard 101.86**
Standard Mesh	25-35 Standard Impact
Detail Mesh	25-35 Standard Impact
PM Systems Mesh	25-35 Standard Impact
Extra Standard Mesh	35-49 Standard Impact
Intermediate Mesh	50-89 Medium Impact
High Impact Resistant Mesh 15	90-150 High Impact
High Impact Resistant Mesh 20	> 150 Ultra High Impact
XP 403 Fabric	N/A

Table 2: Technical Data for EIFS Mesh Products

Delivery Status

EIFS Mesh products are packaged and delivered as rolls according to the dimensions listed in Table 1.

Base Materials

EIFS Mesh Products – Fiberglass Base		EIFS Mesh Products – Polyester Base	
Material	**Average Product Composition**	**Material**	**Average Product Composition**
Fiberglass Yarn	79%	Polyester Yarn	38%
Proprietary Coating Blend	17%	Proprietary Coating Blend	59%
Decabromo Powder	2%	Additional Additives	3%
Additional Additives	2%		
Total kg/m²:	**0.158**	**Total kg/m²:**	**0.035**

Table 3: EIFS Mesh Material Content

Manufacturing Location

All ADFORS EIFS Mesh fiberglass base products are manufactured at the Midland, ON manufacturing location in Canada and the ADFORS EIFS Mesh polyester base products are manufactured at the Albion, NY manufacturing location in the United States.

Manufacturing

The manufacturing process begins with the weaving of the yarn. The woven yarn is then accumulated around a core and prepared for coating application. The raw material components of the coatings are mixed in batches according to the specific product being made. The woven yarn is fed through a coating machine with coating troughs and drying ovens. Edge material is trimmed and depending on the product, the coated material is cut to the specified width. Finished coated fabrics are then accumulated on a core and then packaged for shipment.

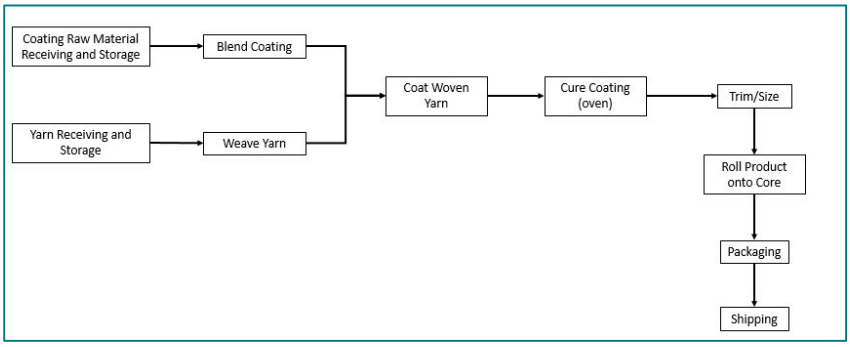


Figure 1: EIFS Mesh Process Flow

Environment and Health During Manufacture

Saint-Gobain has well-established Environmental, Health, and Safety (EHS) and product stewardship programs, which help to enforce proper evaluation and monitoring of chemicals and raw materials chosen to manufacture products. These programs ensure that all environmental and OSHA requirements are met or exceeded to ensure the health and safety of all employees and contractors.

The Midland, ON and Albion, NY manufacturing facilities operate integrated Environmental, Health, and Safety Management Systems that align with the ISO 14001 and ISO 45001 standards.

Product Processing/Installation

EIFS Mesh is used in conjunction with other materials as a reinforcement mesh in façade cladding systems. Product processing or installation will vary among façade cladding manufactures.

Packaging

Packaging of the final product after production is included in the life cycle assessment. Packaging material includes the cardboard cores the material is wound on, plastic bags, tape, and pallets.

Condition of Use

There are no known changes in material composition over the service life of the EIFS Mesh products.

Environment and Health During Use

There are no known harmful substances or emissions during the use of EIFS Mesh products.

Extraordinary Effects

Fire, Water, and Mechanical Destruction

EIFS Mesh products have no known extraordinary effects concerning fire, water, or mechanical destruction.

Re-Use Phase

At this time there are no recycling scenarios for EIFS Mesh at the end of its service life.

Disposal

At this time, there are no known scenarios for separating the mesh from the structure with which it was installed. The product's end-of-life is assumed to be inert in a landfill. Disposal in a municipal landfill or in commercial incineration facilities is permissible and should be done in accordance with local, provincial, and federal regulations.

Further Information

www.adfors.com

LCA Calculation Rules

Declared Unit

Declared Unit		
Name	**Value**	**Unit**
Declared unit	1	m^2
Weight	0.151	kg/m^2
Conversion to 1 kg	6.618	-

Table 4: Declared Unit Information

System Boundary

The life cycle analysis performed for this EPD is classified as a “cradle-to-gate w/options” study. The system boundary includes raw material supply, manufacture, and transport; the EIFS Mesh products manufactured in Midland, ON and Albion, NY, and packaging; and product end-of-life.

Description of the System Boundary (X=included in LCA: MND=module not declared)																
Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits & Loads Beyond System Boundaries
Raw Material Supply	Transport	Manufacturing	Transport from the gate to the site	Installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational Energy Use	Operational Water Use	De-construction demolition	Transport	Waste Processing	Disposal	Reuse-Recover-Recycling Potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	MND	X	MND

Table 5: System Boundary

Estimates and Assumptions

Estimates and assumptions are required in life cycle analysis to constrain the project boundary or model when little or not data is available. In this study of EIFS Mesh products, estimates or assumptions were made regarding the background dataset for some of the chemicals contained in the proprietary blend coating as specific datasets were not available in the software. All estmates and assumptions are appropriately noted in the report.

Cut-Off Criteria

The cut-off criteria established for the study include materials, energy, and emissions data. For the purposes of this study, the crtieria are as follows:

- Mass – Chemicals with a combined weight less than 1% of the mass of the modeled product may be excluded, providing its environmental relevance is not a concern.
- Human activity factors were not included in the scope of this study.
- Capital equipment factors were not includd in the scope of this study.

Background Data

GaBi version 8.2 software system was used for modeling the life cycle of the EIFS Mesh products. Each background dataset was taken from the GaBi Thinkstep US Ecoinvent, USLCI databases, or Ecoinvent v3.

Data Quality

Wherever secondary data is used, the study adopts critically reviewed data for consistency, precision, and reproducibility to limit uncertainty. The data sources used are complete and representative of North America and Europe (depending on the material source) in terms of the geographic and technological coverage and are less than 10 years old. Any deviations from these initial data quality requirements for secondary data are documented in the report. Overall, the primary data from the manufacturing location is of very high quality, being directly tracked and measured by facility personel. Secondary data sets are of fair-to-good quality.

Period Under Review

Data for this LCA was collected for the 2018 calendar year.

Allocation

The Midland, ON is the only location that produces EIFS Mesh and Albion, NY is the only location that produces the XP 403 EIFS Fabric in North America for Saint-Gobain Adfors. However, the EIFS mesh products are not the only products produced at these locations. Allocation was conducted based on the square meter production data provided by the facilities as a percentage of the overall square meter production at each facility.

Each facility was modelled separately in order to help Saint-Gobain Adfors to understand the range of inputs and impacts across the product line and the facilities. The combined product line was then modelled as an allocation between the two facilities based on the square meter production data of the product line at Midland and Albion, as a percentage of the overall square meter production of the entire product line. This allocation resulted in 94.4% of the EIFS Mesh product line being produced at the Midland facility and 5.6% produced at the Albion facility.

The results of the individual products included in the study are shown in the Appendix.

Comparability

Comparison of the environmental performance of building and construction products using EPD information shall be based on the product's use and impacts at the building level. In general, EPDs may not be used for comparability purposes when not considered in a building context. Given the PCR ensures products meet the same functional requirements, comparablity is permissible provided the information given for such comparison is transparent and the limitations of comparability are explained.

LCA Technical Information and Scenarios

Packaging

Although the Installation Module (A5) is not declared for this study, the PCR requires the EPD to report the amount of packaging waste that could be expected at the time of installation.

Packaging Waste on Install		
Name	**Value**	**Unit**
Packaging Material	0.002	kg

Table 6: Packaging Waste Information

End of Life

End of Life			
Parameter		**Value**	**Unit**
Assumptions for scenario development		Disposal inert in landfill transported by truck	-
Collection Process	Collected separately	0.000	kg
	Collected with mixed construction waste	0.151	kg
Recovery	Reuse	0.000	kg
	Recycling	0.000	kg
	Landfill	0.000	kg
	Incineration	0.000	kg
	Incinerations with energy recovery	0.000	kg
	Energy conversion efficiency rate	0.000	kg
Disposal	Product or material for final deposition	0.151	kg

Table 7: End-of-Life Technical Scenario

LCA Results

Environmental Impacts – North America

EIFS Mesh – TRACI Environmental Impacts						
	Global Warming Potential	*Ozone Depletion Potential*	*Acidification Potential*	*Eutrophication Potential*	*Smog Creation Potential*	*Abiotic Depletion Potential (fossil)*
	kg CO_2 eq	*kg CFC 11 eq*	*kg SO_2 eq*	*kg N eq*	*kg O_3 eq*	*MJ*
Raw Materials (A1)	5.53E-01	1.63E-09	2.90E-03	3.17E-03	2.74E-02	1.21E+00
Raw Material Transport (A2)	5.41E-02	4.77E-13	2.51E-04	2.06E-05	8.30E-03	1.02E-01
Manufacture (A3)	2.43E-01	2.36E-11	3.61E-04	3.74E-05	6.56E-03	5.89E-01
Total A1-A3:	**8.50E-01**	**1.65E-09**	**3.51E-03**	**3.23E-03**	**4.23E-02**	**1.90E+00**
Waste Transport (C2)	1.82E-03	1.60E-14	8.42E-06	6.93E-07	2.79E-04	3.44E-03
Final Disposal (C4)	6.61E-03	1.03E-13	3.09E-05	1.57E-06	6.09E-04	1.33E-02
Total Cradle-to-Gate w/Options:	**8.58E-01**	**1.65E-09**	**3.55E-03**	**3.23E-03**	**4.32E-02**	**1.92E+00**

Table 8: EIFS Mesh Results for North America, TRACI 2.1 Environmental Impacts

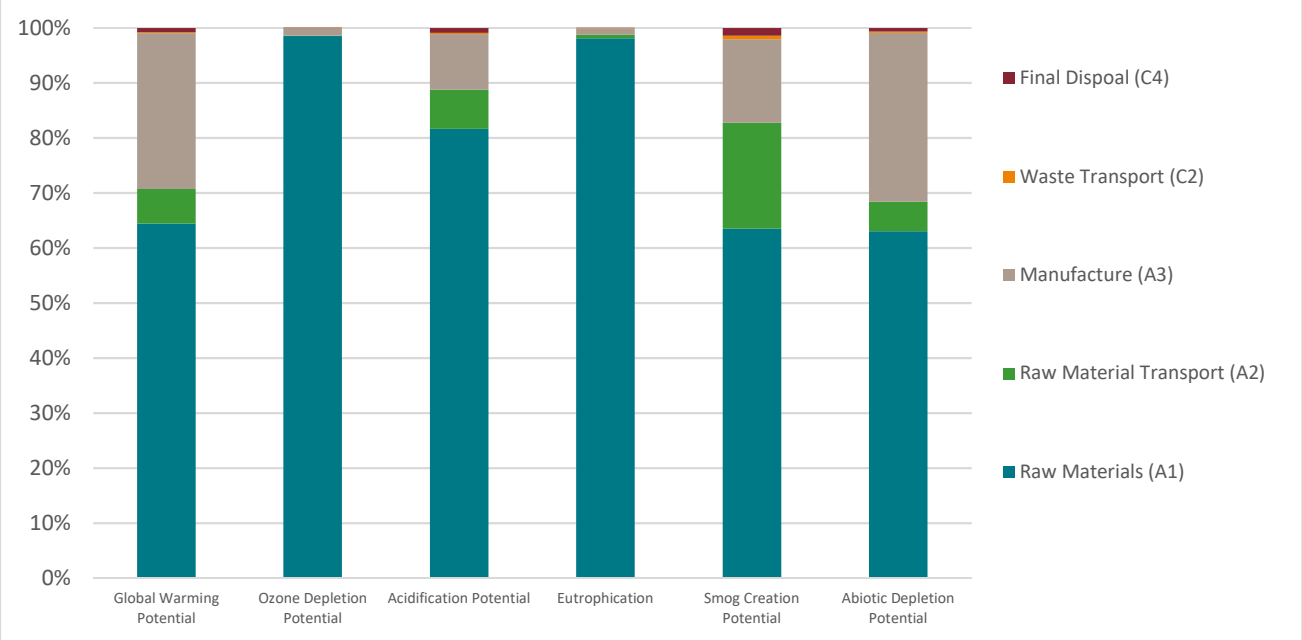


Figure 2: EIFS Mesh Results for North America, TRACI 2.1 Environmental Impacts

Environmental Impacts – Europe

EIFS Mesh – CML Environmental Impacts							
	Global Warming Potential	*Ozone Depletion Potential*	*Acidification Potential*	*Eutrophication Potential*	*Smog Creation Potential*	*Abiotic Depletion Potential (fossil)*	*Abiotic Depletion Potential (element)*
	kg CO2 eq	*kg R 11 eq*	*kg SO2 eq*	*kg phosphate eq*	*kg ethane eq*	*MJ*	*kg Sb eq*
Raw Materials (A1)	5.53E-01	1.42E-09	2.93E-03	1.49E-03	1.98E-04	9.53E+00	4.23E-07
Raw Material Transport (A2)	5.41E-02	4.48E-13	1.87E-04	4.63E-05	1.92E-05	7.61E-01	8.85E-09
Manufacture (A3)	2.43E-01	2.22E-11	3.25E-04	5.52E-05	3.17E-05	4.12E+00	8.77E-08
Total A1-A3:	**8.50E-01**	**1.44E-09**	**3.44E-03**	**1.59E-03**	**2.48E-04**	**1.44E+01**	**5.19E-07**
Waste Transport (C2)	1.82E-03	1.50E-14	6.26E-06	1.55E-06	6.43E-07	2.55E-02	2.97E-10
Final Disposal (C4)	6.61E-03	9.71E-14	2.83E-05	3.42E-06	2.44E-06	1.03E-01	1.47E-09
Total Cradle-to-Gate w/Options:	**8.58E-01**	**1.44E-09**	**3.47E-03**	**1.59E-03**	**2.52E-04**	**1.45E+01**	**5.21E-07**

Table 9: EIFS Mesh Results for Europe, CML Environmental Impacts

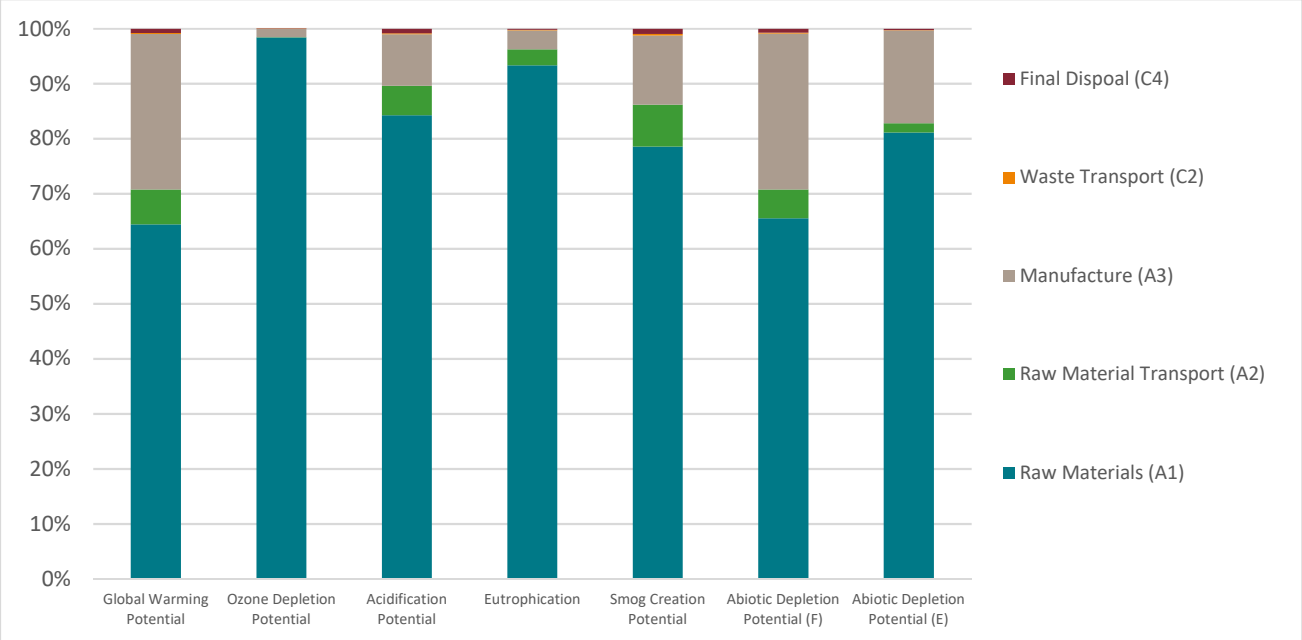


Figure 3: EIFS Mesh Results for Europe, CML Environmental Impacts

Resource Use

EIFS Mesh – Use of Primary Resources				
	RPR_E: *Renewable primary energy used as energy carrier (fuel)*	**RPR_M:** *Renewable primary resources with energy content used as material*	**$NRPR_E$:** *Non-renewable primary resources used as an energy carrier (fuel)*	**$NRPR_M$:** *Non-renewable primary resources with energy content used as material*
	MJ	*MJ*	*MJ*	*MJ*
Raw Materials (A1)	4.08E-01	5.66E-03	1.02E+01	6.15E-05
Raw Material Transport (A2)	1.90E-02	2.49E-14	7.65E-01	1.43E-05
Manufacture (A3)	5.05E-01	3.13E-03	4.37E+00	1.62E-05
Total A1-A3:	**9.32E-01**	**8.79E-03**	**1.53E+01**	**9.20E-05**
Waste Transport (C2)	6.37E-04	8.35E-16	0.025663055	4.79E-07
Final Disposal (C4)	7.26E-03	2.03E-13	0.105991085	1.95E-06
Total Cradle-to-Gate w/Options:	**9.40E-01**	**8.79E-03**	**1.54E+01**	**9.44E-05**

Table 10: EIFS Mesh, Use of Primary Resources

EIFS Mesh– Use of Secondary Resources					
	SM: *Secondary materials*	**RSF:** *Renewable secondary fuels*	**NRSF:** *Non-renewable secondary fuels*	**RE:** *Recovered energy*	**FW:** *Use of net fresh water resources*
	kg	*MJ*	*MJ*	*MJ*	*m^3*
Raw Materials (A1)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.00E-01
Raw Material Transport (A2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.77E-03
Manufacture (A3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.90E-01
Total A1-A3:	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**6.91E-01**
Waste Transport (C2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.92E-05
Final Disposal (C4)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.10E-03
Total Cradle-to-Gate w/Options:	**0.00E+00**	**0.00E+00**	**0.00E+00**	**0.00E+00**	**6.94E-01**

Table 11: EIFS Mesh, Use of Secondary Resources

Output Flows and Waste Categories

EIFS Mesh – Waste Flows				
	Hazardous waste disposed	*Non-hazardous waste disposed*	*High level radioactive waste, conditioned*	*Intermediate and low level radioactive waste*
	kg	*kg*	*kg*	*kg*
Raw Materials (A1)	1.25E-06	3.73E-02	2.97E-07	7.78E-06
Raw Material Transport (A2)	6.25E-09	2.82E-05	2.02E-09	5.41E-08
Manufacture (A3)	1.23E-09	2.12E-02	1.22E-07	3.16E-06
Total A1-A3:	**1.26E-06**	**5.85E-02**	**4.21E-07**	**1.10E-05**
Waste Transport (C2)	2.10E-10	9.47E-07	6.78E-11	1.81E-09
Final Disposal (C4)	3.79E-10	1.51E-01	1.31E-09	3.29E-08
Total Cradle-to-Gate w/Options:	**1.26E-06**	**2.10E-01**	**4.22E-07**	**1.10E-05**

Table 12: EIFS Mesh, Waste Flows

EIFS Mesh – Output Material Flows				
	Components for reuse	*Materials for recycling*	*Materials for energy recovery*	*Recovered energy exported*
	kg	*kg*	*kg*	*kg*
Raw Materials (A1)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Raw Material Transport (A2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Manufacture (A3)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total A1-A3:	***0.00E+00***	***0.00E+00***	***0.00E+00***	***0.00E+00***
Waste Transport (C2)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Final Disposal (C4)	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Cradle-to-Gate w/Options:	***0.00E+00***	***0.00E+00***	***0.00E+00***	***0.00E+00***

Table 13: EIFS Mesh, Output Material Flows

Biogenic Carbon

Output flows of biogenic carbon are reported if the total mass of the biogenic carbon containing materials is greater than 5%. Considering the inorganic nature of the materials used in the Saint-Gobain Adfors EIFS Mesh products, any biogenic carbon flows are assumed to be negligible and therefore not required to be reported by ISO 21930.

LCA Interpretation

Based on the results from the life cycle assessment, the life cycle impacts are strongly driven by the raw materials. The impacts of the raw materials are primarily attributed to the coatings applied to the fiberglass or polyester yarn, which combined account for 80% or more of the impacts in each environmental impact category. The proprietary blend coating account for the largest contributors to those impacts.

The manufacturing stage of the life cycle only accounts for up to 30% of the environmental impacts potentials; however, those impacts are strongly driven by natural gas and electricity usage. Increasing energy efficiency would help to reduce the overall environmental impacts for both sites.

LCA Development

This EPD and the corresponding LCA were prepared by Saint-Gobain Corporation North America in Malvern, Pennslyvania.

References

- Product Category Rules for Building-Related Product and Services: Part A – Life Cycle Assessment Calculation Rules and Report Requirements, Version 3.2 2018. UL Environment
- UL General Program Rules, Version 2.4, July 2018. UL Environment
- Product Category Rule Guidance for Building-Related Products and Services: Part B – Requirements on the EPD for Glass Reinforcement Mesh. Version 1.6 2017. IBU: Institut Bauen and Umwelt
- ISO 14040: 2006 Series – Environmental Management-Life Cycle Assessment
- ISO 14025 – Environmental labels and declarations – Type III environmental declarations – Principles and procedures
- ISO 14044 – Environmental management – Life cycle assessment – Requirements and guidelines
- EN 15804 – Sustainability of construction works – Environmental Product Declarations – Core rules for the product category of construction products
- ISO 21930: 2017 – Sustainability in building construction – Environmental declaration of building products
- Adfors Saint-Gobain EIFS Mesh Life Cycle Assessment Report, January 2020. Saint-Gobain North America EHS&S Department
- Adfors Website: www.adfors.com/

Appendix: Individual Product Results for EIFS Mesh

EIFS Mesh Products									
Cradle-to-Gate w/Options		Standard Mesh	Detail Mesh	PM Systems Mesh	Extra Standard Mesh	Inter-mediate Mesh	High Impact Resistant Mesh 15	High Impact Resistant Mesh 20	XP 403 Fabric
TRACI 2.1 Impact Categories									
Global Warming Potential	kg CO^2 eq	7.96E-01	7.81E-01	7.86E-01	8.61E-01	1.41E+00	1.91E+00	1.97E+00	1.80E-01
Ozone Depletion Potential	kg CFC-11 eq	1.20E-09	1.20E-09	9.85E-10	9.30E-10	1.69E-09	3.24E-09	1.47E-09	1.87E-09
Acidification Potential	kg SO_2 eq	3.36E-03	3.32E-03	3.43E-03	4.01E-03	7.10E-03	9.82E-03	1.11E-02	6.20E-04
Eutrophication Potential	kg N eq	2.88E-03	2.90E-03	2.31E-03	2.20E-03	4.00E-03	7.54E-03	3.23E-03	2.61E-03
Smog Creation Potential	kg O3 eq	4.03E-02	3.98E-02	4.01E-02	4.53E-02	7.86E-02	1.11E-01	1.16E-01	1.01E-02
Abiotic Depletion Potential	MJ	1.75E+00	1.71E+00	1.69E+00	1.76E+00	2.83E+00	4.02E+00	3.59E+00	5.18E-01
CML Impact Categories									
Global Warming Potential	kg CO^2 eq	7.96E-01	7.81E-01	7.86E-01	8.61E-01	1.41E+00	1.91E+00	1.97E+00	1.80E-01
Ozone Depletion Potential	kg R-11 eq	1.02E-09	1.03E-09	8.45E-10	7.97E-10	1.45E-09	2.78E-09	1.28E-09	1.69E-09
Acidification Potential	kg SO_2 eq	3.29E-03	3.26E-03	3.39E-03	4.00E-03	7.10E-03	9.83E-03	1.13E-02	5.35E-04
Eutrophication Potential	kg phosphate eq	1.43E-03	1.43E-03	1.19E-03	1.17E-03	2.10E-03	3.77E-03	1.98E-03	1.15E-03
Smog Creation Potential	kg ethane eq	2.32E-04	2.28E-04	2.33E-04	2.65E-04	4.64E-04	6.54E-04	6.98E-04	6.46E-05
Abiotic Depletion Potential (fossil)	MJ	1.33E+01	1.30E+01	1.29E+01	1.36E+01	2.22E+01	3.14E+01	2.89E+01	3.88E+00
Abiotic Depletion Potential (element)	kg Sb eq	4.87E-07	4.82E-07	4.64E-07	4.96E-07	8.53E-07	1.24E-06	1.11E-06	1.54E-07
Use of Primary Resources									
Renewable primary energy used as energy carrier	MJ	7.73E-01	7.63E-01	7.82E-01	8.47E-01	1.23E+00	1.58E+00	1.73E+00	2.91E-01
Renewable primary resources with energy content used as material	MJ	8.04E-03	8.07E-03	7.04E-03	6.80E-03	9.81E-03	1.61E-02	8.28E-03	4.97E-03
Non-renewable primary resources used as an energy carrier	MJ	1.41E+01	1.38E+01	1.37E+01	1.45E+01	2.37E+01	3.34E+01	3.13E+01	4.18E+00
Non-renewable primary resources with energy content used as material	MJ	7.49E-05	7.30E-05	7.63E-05	8.71E-05	1.52E-04	2.42E-04	2.38E-04	3.62E-05
Use of Secondary Resources									
Secondary materials	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Non-renewable secondary fuels	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Use of net fresh water resources	m^3	6.14E-01	6.11E-01	5.95E-01	6.13E-01	8.22E-01	1.09E+00	9.70E-01	2.52E-01
Waste Flows									
Hazardous waste disposed	kg	2.49E-08	1.13E-08	1.18E-08	1.39E-08	2.48E-08	3.43E-08	3.98E-08	3.51E-06
Non-hazardous waste disposed	kg	1.94E-01	1.94E-01	2.10E-01	2.63E-01	4.80E-01	6.57E-01	8.68E-01	4.25E-02
High level radioactive waste	kg	3.63E-07	3.55E-07	3.75E-07	4.26E-07	7.01E-07	9.37E-07	1.09E-06	1.28E-07
Intermediate and low level radioactive waste	kg	9.68E-06	9.47E-06	1.00E-05	1.14E-05	1.88E-05	2.52E-05	2.94E-05	2.76E-06
Output Material Flows									
Components for reuse	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for recycling	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Materials for energy recovery	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Recovered energy exported	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 14: APP-Modified Asphalt Base and Cap Sheets Individual Results