

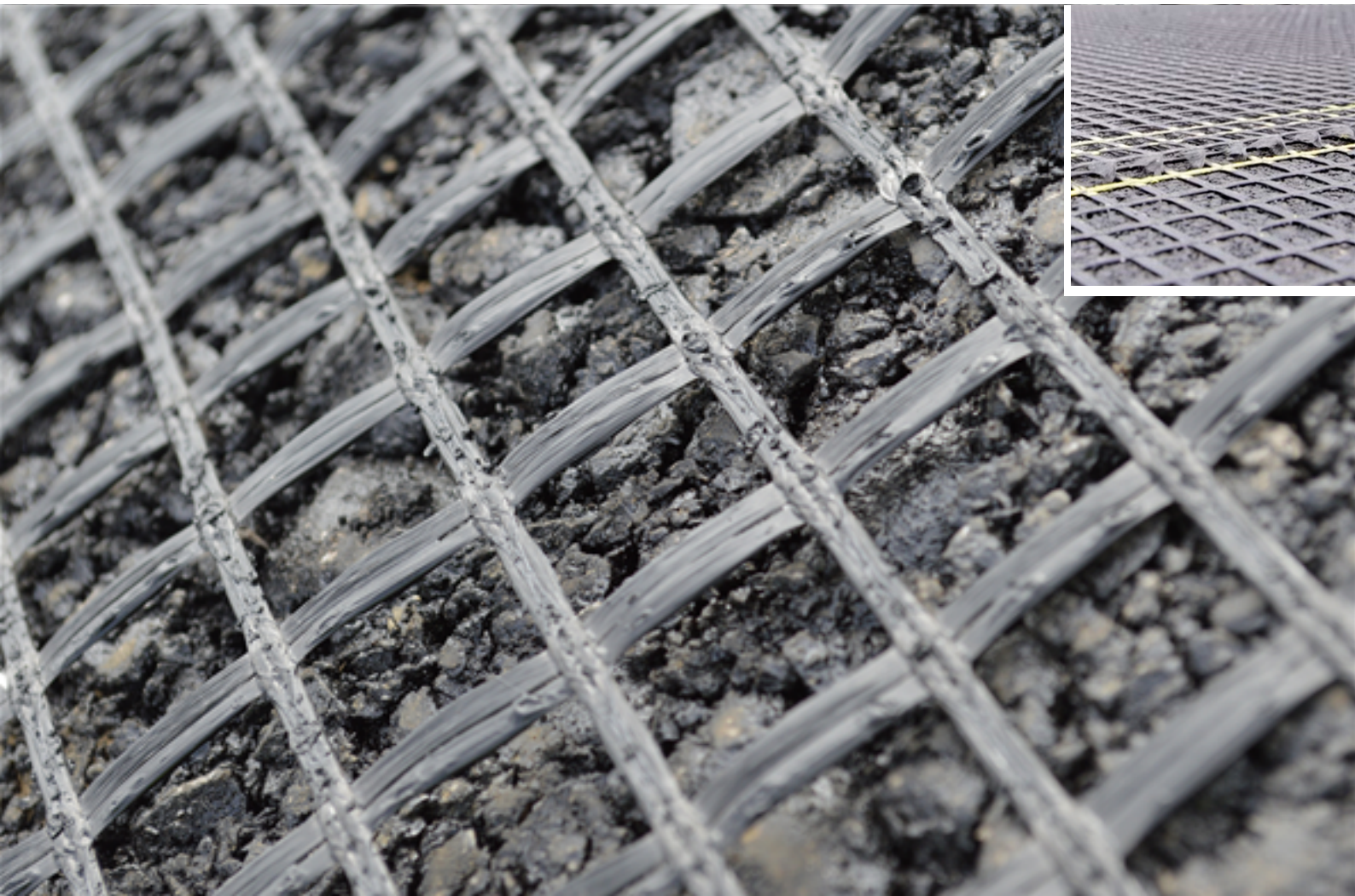
ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/




Owner of the Declaration	SAINT-GOBAIN ADFORS CZ, s.r.o
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SGA-20190026-CBA1-EN
Issue date	25/06/2019
Valid to	24/06/2024

ADFORS GlasGrid® (0,30 kg/m²)
SAINT-GOBAIN ADFORS CZ, s.r.o.

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



General Information

SAINT-GOBAIN ADFORS CZ, s.r.o.	ADFORS GlasGrid®
Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	Owner of the declaration SAINT-GOBAIN ADFORS CZ, s.r.o. Sokolovská 106 Litomyšl 570 01 Czech Republic
Declaration number EPD-SGA-20190026-CBA1-EN	Declared product / declared unit 1 m ² of ADFORS GlasGrid® for asphalt reinforcement with the grammage of 0,30 kg/m ² .
Declaration number EPD-SGA-20190026-CBA1-EN	This EPD declares a specific product from the manufacturer's plant.
This declaration is based on the product category rules: Reinforcing and securing systems made from glass fibre composite materials, 04.2018 (PCR checked and approved by the SVR)	Scope: This document refers to the manufacture of GlasGrid® for asphalt reinforcement by SAINT-GOBAIN ADFORS CZ s.r.o. This product is produced in the manufacturing plant in Litomyšl in the Czech Republic, in which the production data for 2017 was recorded. This EPD declares the life cycle analysis (LCA) for a specific product.
Issue date 25/06/2019	The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.
Valid to 24/06/2024	Verification The standard /EN 15804/ serves as the core PCR Independent verification of the declaration and data according to /ISO 14025:2010/ <input type="checkbox"/> internally <input checked="" type="checkbox"/> externally
	
Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)	Vito D'Incognito (Independent verifier appointed by SVR)
	
Dr. Alexander Röder (Managing Director IBU)	

Product

Product description / Product definition

ADFORS GlasGrid® Full Lane Width Pavement Reinforcement System is a high strength, open fiberglass grid custom knitted in a stable construction and coated with a patented elastomeric polymer and self-adhesive glue. Every component of the matrix shall be stabilized against ultraviolet degradation and inert to chemicals normally found in a natural soil environment.

For the placing on the market of the product in the EU/EFTA (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration /EN 15381:2008/, and the CE-marking. For the application and use the respective national provisions apply.

Application

The ADFORS GlasGrid® product line offers several styles of pavement reinforcement grids designed to reinforce asphalt concrete overlays. They retard

reflective cracking by a factor of 2 to 3 times by turning crack stresses horizontally to dissipate the stress. The grid configuration features fiberglass strands coated with an elastomeric polymer. Each strand has a high tensile strength, as well as a high modulus of elasticity at low elongation – making ADFORS GlasGrid® stronger than steel by weight. ADFORS GlasGrid® has been proven effective in all climates and geographic areas, performing equally well in desert conditions and in near arctic regions that are subject to intense cold and seasonal temperature fluctuations.

Technical Data

ADFORS GlasGrid® GG Full Lane Width Pavement Reinforcement meets the requirements of /EN 15381/. ADFORS GlasGrid® is a high strength, open fiberglass grid custom knitted in a stable construction and coated with a patented elastomeric polymer and self-adhesive glue. Every component of the matrix shall be stabilized

against ultraviolet degradation and inert to chemicals normally found in a natural soil environment.

Constructional Data

Name	Value	Unit
Ultimate strength (MD / CMD) (/EN-ISO 10319/)	115 / 115	kN/m
Ultimate tensile elongation (MD) (/EN-ISO 10319/)	2,5 / 2,5	%
Tensile resistance @ 2% strain (/EN-ISO 10319/)	95 / 95	kN/m
Secant stiffness EA @ 1% strain (/EN-ISO 10319/)	4600 / 4600	N/mm
Young's Modulus E	73	GPa
Melting point of coating (/EN-ISO 3146/)	>232	°C
Melting point of glass Standard Test Method for Softening Point of glass /(ASTM C338/)	>820	°C

The product complies with /EN 15381:2008/ and has the declaration of performance. performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to /EN 15381:2008/.

Base materials / Ancillary materials

ADFORS GlasGrid® glass fibre grids (0,24 kg/m² **glassfibre knitted fabric** and 0,06 kg/m² **acrylic based coating**) are produced in three main phases:

- In the first phase, glass fibres are produced by melting of input materials followed by drawing and coiling. E (Eutal type) glass is used for the purpose of mesh fabric production in accordance with /DIN 1259-1/ -due to the strength characteristics maintained also following exposure to alkaline substances included in façade systems.

- The second production phase consists of glass-fibre knitting, where "greige fabrics" is produced.

- The third phase is the hardening process, in which a finishing layer is applied to the greige fabric. There are two purposes for the finish:

- 1) Fabric fixation for its easy use and workability.
- 2) Fabric compatibility with asphalt.

The fabric does not contain any substances of very high concern (SVHC).

Reference service life

The reference service life (RSL) is not declared. A calculation according to /ISO 15686/ is not applied.

LCA: Calculation rules

Declared Unit

This declaration refers to the production of 1 m² of Glasgrid® fiberglass grid with the grammage of 0,30 kg/m².

Declared unit

Name	Value	Unit
Declared unit	1	m ²
Grammage	0,30	kg/m ²
Conversion factor to 1 kg	3.33	-

System boundary

It represents a "cradle-to-gate" EPD with the options.

The following life cycle stages are considered:

Production

A1-A3 – Raw material supply, transport and manufacturing

Installation

A4 – Transport to building site
A5 – Initial installation into building (including packaging waste processing)

End-of-life

C2 – Transport to waste processing,
C4 – Disposal (landfilling)

Benefits and loads beyond the product system boundary

D - Reuse-, recovery- or recycling- potential

Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

. GaBi ts serves as background database for the calculation /GaBi ts/.

LCA: Scenarios and additional technical information

The following technical information is the basis for the declared modules.

Transport from the gate to the site (A4)

Name	Value	Unit
Litres of fuel	0.00171	l/100km
Transport distance	900	km
Capacity utilisation (including empty runs)	85	%

Installation in the building (A5)

The following packaging materials are considered on construction site:

Name	Value	Unit
PE stretch film (40 MJ/kg*)	0,001	kg/m ²
Wooden pallet (12 MJ/kg*)	0,01	kg/m ²

* Heating value

The amount of installation waste is not declared in this EPD. For calculation of the environmental impact of the product including installation waste, the values for

the production stage (A1-A3) and end of life (C4, D) have to be multiplied with the amount of waste (e.g. 2% installation waste, factor 1.02)

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	0.3	kg
Landfilling (100% scenario)	0.3	kg
Transport to End of life (C1)	50	km
Capacity utilisation (including empty runs)	85	%
Litres of fuel (per kg cargo)	0,00171	l/100 km

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

For module D the potential benefits given in module A5 are declared. For waste incineration combustion in a WIP (R1 > 0.6) with energy recuperation is considered.

LCA: Results

The following table depicts the results of the indicators concerning the estimated impact, use of resources as well as waste and other output flows in relation to 1 m² of Glasgrid ® with the grammage of 0,3 kg/m². As End of life scenario (EoL) landfilling is considered in C4.

In the table "Description of the system boundary", all declared modules are indicated with an "X"; all modules that are not declared are indicated with "MND". As default the modules B3, B4, B5 are marked as MNR – module not relevant.

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

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE							END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARIES
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	MND	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m² ADFORS GlasGrid® with the grammage of 0,3 kg/m² for asphalt reinforcement

Parameter	Unit	A1-A3	A4	A5	C2	C4	D
Global warming potential	[kg CO ₂ -Eq.]	1.18E+0	1.69E-2	2.14E-2	9.04E-4	4.46E-3	-7.59E-3
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	8.44E-15	4.23E-18	5.64E-18	2.27E-19	2.59E-17	-9.36E-17
Acidification potential of land and water	[kg SO ₂ -Eq.]	4.40E-3	7.07E-5	2.36E-6	3.79E-6	2.68E-5	-1.19E-5
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	3.26E-4	1.79E-5	5.19E-7	9.60E-7	3.03E-6	-1.32E-6
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	2.96E-4	-2.59E-5	1.67E-7	-1.39E-6	2.05E-6	-9.81E-7
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	2.22E-5	1.49E-9	2.36E-10	7.98E-11	1.64E-9	-1.26E-9
Abiotic depletion potential for fossil resources	[MJ]	1.83E+1	2.30E-1	4.26E-3	1.23E-2	6.25E-2	-1.10E-1

RESULTS OF THE LCA - RESOURCE USE: 1 m² ADFORS GlasGrid® with the grammage of 0,3 kg/m² for asphalt reinforcement

Parameter	Unit	A1-A3	A4	A5	C2	C4	D
Renewable primary energy as energy carrier	[MJ]	1.68E+0	IND	1.21E-1	IND	8.19E-3	IND
Renewable primary energy resources as material utilization	[MJ]	1.20E-1	IND	-1.20E-1	IND	0.00E+0	IND
Total use of renewable primary energy resources	[MJ]	1.80E+0	1.38E-2	9.59E-4	7.37E-4	8.19E-3	-2.44E-2
Non-renewable primary energy as energy carrier	[MJ]	1.76E+1	IND	4.47E-2	IND	3.06E+0	IND
Non-renewable primary energy as material utilization	[MJ]	3.04E+0	IND	-4.00E-2	IND	-3.00E+0	IND
Total use of non-renewable primary energy resources	[MJ]	2.06E+1	2.32E-1	4.71E-3	1.24E-2	6.47E-2	-1.34E-1
Use of secondary material	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of non-renewable secondary fuels	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Use of net fresh water	[m ³]	3.68E-3	2.23E-5	5.06E-5	1.24E-6	1.63E-5	-2.87E-5

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m² ADFORS GlasGrid® with the grammage of 0,3 kg/m² for asphalt reinforcement

Parameter	Unit	A1-A3	A4	A5	C2	C4	D
Hazardous waste disposed	[kg]	1.23E-8	1.29E-8	4.49E-12	6.90E-10	1.10E-9	-5.43E-11
Non-hazardous waste disposed	[kg]	5.92E-2	1.95E-5	1.37E-4	1.05E-6	3.00E-1	-5.38E-5
Radioactive waste disposed	[kg]	9.32E-4	4.74E-7	1.80E-7	2.54E-8	8.67E-7	-9.72E-6
Components for re-use	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for recycling	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Materials for energy recovery	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
Exported electrical energy	[MJ]	0.00E+0	0.00E+0	2.88E-2	0.00E+0	0.00E+0	0.00E+0
Exported thermal energy	[MJ]	0.00E+0	0.00E+0	6.38E-2	0.00E+0	0.00E+0	0.00E+0

References

/ASTM C338/

Standard Test Method for Softening Point of Glass.

Geotextiles and geotextile-related products.

Characteristics required for use in pavements and asphalt overlays

/CPR/

Regulation (EU) No. 305/2011 Construction Product Rule (CPR)

/EN-ISO 10319/

Geosynthetics - Wide-width tensile test

/EN 15381:2008/

/EN-ISO 3146/

Plastics - Determination of melting behaviour (melting temperature or melting range) of semi-crystalline polymers by capillary tube and polarizing-microscope methods

/DIN 1259-1/

Terminology for glass types and groups

/IBU 2016/

IBU (2016): General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V., Version 1.1 Institut Bauen und Umwelt e.V., Berlin.

www.ibu-epd.de

/ISO 14025/

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

/EN 15804/

/EN 15804:2012-04+A1 2013/, Sustainability of construction works — Environmental Product

Declarations — Core rules for the product category of construction products

/PCR guideline texts for building-related products and services (PCR)/

Part A: Calculation rules for the Life Cycle Assessment and Requirements on the Background Report, Version 1.2, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2017

Part B: Requirements on the EPD for reinforcing and securing systems made from glass fibre composite materials, Version 1.6, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2017

/GaBi ts/

Software & Documentation

Data base for comprehensive analysis LBP, University of Stuttgart and thinkstep AG, Documentation of GaBi data sets

<http://www.gabisoftware.com/international/databases/>, 2018

**Publisher**

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