ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A1*

Owner of the Declaration	Simpson Strong-Tie Europe
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SST-20200280-CBA1-EN
Issue date	2021-03-23
Valid to	2026-03-22

S&P Glasphalt® G (0.64 kg/m²)

Simpson Strong-Tie Europe / S&P Clever Reinforcement

Institut Bauen und Umwelt e.V.

ECO PLATFORM EPD EN 15804 VERIFIED

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General Information

Simpson Strong-Tie Europe / S&P Clever Reinforcement

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

Declaration number
EPD-SST-20200280-CBA1-EN

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)

Issue date
2021-03-23

Valid to
2026-03-22

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

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

S&P Glasphalt® G

Owner of the declaration
Simpson Strong-Tie Europe
Le Moulin des Ardillers
85400 Sainte Gemme La Plaine
France

Declared product / declared unit
1 m² of S&P Glasphalt® G with the grammage of 0.64 kg/m².

Scope:
This document refers to the manufacture, transport and end-of-life stages of S&P Glasphalt® G for asphalt reinforcement by Simpson Strong-Tie Europe / S&P Clever Reinforcement. This product is produced at the manufacturing plant S&P Polska Sp. z. o.o. in Malbork for the S&P Group. The production data was recorded for the year 2019. This EPD declares the life cycle analysis (LCA) for a specific product from the manufacturer's plant.

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.

The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard *EN 15804* serves as the core PCR
Independent verification of the declaration and data according to *ISO 14025:2010*
☐ internally ☒ externally

Angela Schindler
(Independent verifier)

Product

Information about the enterprise
S&P Clever Reinforcement Company AG emerged from Scherer & Partner Bausysteme in 1995 in Brunnen, Switzerland. The company develops, produces and sells products that reinforce structures. S&P moved into a new administration building with a large warehouse in Seewen/SZ in 2010. S&P also has a branch in western Switzerland and companies in the Netherlands, France, Germany, Poland, Portugal, Spain, Denmark and Sweden.

S&P focuses on the strengthening of structures and the development of reinforcement solutions. Our products are manufactured at S&P production facilities and are sold directly to end-users. The core competence of the company lies in the static consulting of the systems that are sold. S&P also offers design programs for the static design of the reinforcement systems.

S&P is part of the Simpson Manufacturing Co., Inc., headquartered in Pleasanton, California, through its subsidiary, Simpson Strong-Tie Company Inc., designs, engineers and is a leading manufacturer of wood construction products, including connectors, fastening systems, fasteners and shearwalls, as well as concrete construction products, including adhesives, specialty chemicals, mechanical anchors, powder actuated tools and reinforcing fibre materials. The Company's common stock trades on the New York Stock Exchange under the symbol "SSD".

Product description/Product definition
S&P Glasphalt® G is a pre-bituminised asphalt reinforcement grid made of glass fibres for local and/or full surface reinforcement of bituminous surfaces.

WHERE TO USE

- Used against cracking
- Prevents crack reflection
- Increases the durability of asphalt surfaces
- The pre-bituminisation guarantees the required layer bonding between old and new road surfaces

PERFORMANCE FEATURES

- Minimises crack formation and prevents crack reflection
- Reduces fatigue and thermal cracks
- Lower consumption of tack coat thanks to the pre-bituminised grid
- Grid structure freely moveable through heat application (no fixed knots)
- Local application on existing cracks/joints or complete surface application
- No waiting time – immediate road surface construction possible
- Easy and efficient application with unrolling equipment (also in curves)
- Effectiveness at a cover layer of min. 4 cm
- Can be milled and recycled without problems

Products according to the CPR based on an ETA

For the placing on the market of the product in the European Union/European Free Trade Association (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,* Geotextiles and geotextile-related products – Characteristics required for use in pavements and asphalt overlays and the CE-marking.
For the application and use the respective national provisions apply.

Application

- Apply S&P Glasphalt® G on dry surface, either by machine or manually, and if possible, immediately before the installation of the road surface.
- Apply at temperatures > 3 °C. Observe relevant norms for application of layers.
- Ensure overlapping lengths of 10–20 cm are observed.
- Overlapping of the reinforcement mesh should be optimised, according to the nature and location of joints/cracks, as well as wheel loading.
- If the mesh is applied only on local areas, it shall be covered manually with an asphalt layer. This prevents debonding caused by passing vehicles.
- Minimum covering of 4 cm above S&P Glasphalt® G.

Technical Data

S&P Glasphalt® G meets the requirements of *EN 15381* and is a glass fibre open grid which is fully penetrated and impregnated with bitumen to ensure an optimal bond between asphalt layers.

Constructional Data

Name	Value	Unit
E-Modulus (Longitudinal Glass Fibres)	≥73000	N/mm²
Elongation (Longitudinal Glass Fibres)	3 (±0.3)	%
Tensile Force (Longitudinal Glass Fibres)	120	kN/m
Fibre Cross Section (Longitudinal Glass Fibres)	46 (51 Fibre Strands)	mm²/m
E-Modulus (Transverse Glass Fibres)	≥73000	N/mm²
Elongation (Transverse Glass Fibres)	3 (±0.3)	%
Tensile Force (Transverse Glass Fibres)	120	kN/m
Fibre Cross Section (Transverse Glass Fibres)	47 (52 Fibre Strands)	mm²/m

(CE-marking according to *EN 15381:2008*)

Performance data of the product in accordance with the declaration of performance with respect to its essential characteristics according to *EN 15381:2008,* Geotextiles and geotextile-related products – Characteristics required for use in pavements and asphalt overlays.

Base materials/Ancillary materials

- Glass fibres ~ 38 %
- Bitumen ~ 41 %
- Quartz sand ~ 19 %
- Other ~ 2 %

(percentages by weight)

S&P Glasphalt® G is manufactured with glass fibres in both the longitudinal and transverse direction totalling 0.24 kg/m². The grids are manufactured with no fixed-knots, therefore making them freely moveable when heated up.
Following the manufacture of the grids, they are fully penetrated and impregnated with bitumen at a rate of approximately 0.26 kg/m². A sprinkling of quartz sand at a rate of approximately 0.12 kg/m² is applied onto the wet bitumen to reduce the risk of vehicle tyres bonding to the grid during the application process.

1) “This product contains substances listed in the *candidate list* (25.06.2020) exceeding 0.1 percentage by mass: "**No**”
2) “This product contains other carcinogenic, mutagenic, reprotoxic (CMR) substances in categories 1A or 1B which are not on the *candidate list*, exceeding 0.1 percentage by mass: "**No**”

3) “Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the *(EU) Ordinance on Biocide Products No. 528/2012)*: "**No**”

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 S&P Glasphalt® G reinforcement grid with a grammage of 0.64 kg/m².

Declared unit

Name	Value	Unit
Declared unit	1	m²
Grammage	0.64	kg/m²
Conversion factor to 1 kg	0.64	-

It is a specific EPD.

System boundary
It is a cradle to gate EPD with options wherein module A1-A5, C1-C4 and D life cycle stages are considered.

Production
A1-A3: Extraction and manufacturing of all raw materials (basic and auxiliary) including packaging material followed by the transportation of raw materials and energy consumption from grid electricity and natural gas within manufacturing plant and landfill of wastes generated during manufacturing are considered in the scope of this module.

Transport to manufacturing site
A4: Average distance considered for the transport from the manufacturing plant to various construction sites

Installation
A5: It is estimated that there are no wastes disposed of during implementation as the waste generated are used as overlaps. Therefore, no losses are declared. The use of packaging material for the product is declared in EPDs in Module A1-A3 which is sent to waste incineration plant during installation stage (Module A5). Subsequent energy recovery credits are declared in module D.

End-of-life Scenario: Recycling
C1: Dismantling / Demolition - As the products are used under pavements, they are collected as mixed construction waste for recycling after the end-of -life of the surface structures.

C2: Transport to treatment/disposal site - Average transport distance from demolition site to waste treatment (recycling) site.

C3: Waste processing for reuse, recovery or recycling - Processing of construction waste to recycled material. The wastes are 100% recyclable according to an investigation commissioned by S&P *(Report No.: 14-7974-01)*.

C4: Disposal - Since the products are recycled and reused in asphalt layers, there are no disposals.

Benefits and loads beyond the product system boundary
D: The potential benefits from packaging material in module A5 are declared. For waste incineration, combustion in a waste incineration plant (R1 > 0.6) with energy recuperation is considered. Recycling credits after the end-of-life of the product are considered.

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

GaBi software serves as background database for the calculation..

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
Amount of fuel	0.001088	kg/100km
Transport distance	500	km
Capacity utilisation (including empty runs)	61	%

Installation (A5)

The following packaging materials are considered on construction site:

Name	Value	Unit
Wooden pallet for packaging	0.01	Kg/m²

Installation of the product is done manually. Hence, no additional energy or material is required. Waste generated from offcuts during installation, is used again as overlaps. The packaging wooden pallet goes into incineration after installation of the product. The impacts of incineration are considered in A5 module and subsequent credits of energy recovery from packaging wooden pallet are considered in module D.

End of life (C1-C4)

Name	Value	Unit
Collected as mixed construction waste	0.64	kg
Recycling (100% Scenario)	0.64	kg
Transport (To Waste processing Site)	100	km
Amount of fuel (For transport to Waste processing Site)	0.00124	kg/100km
Capacity utilisation of Trucks (including empty runs)	50	%

According to an investigation commissioned by S&P (*Report No.: 14-7974-01*), milled material with reinforcement residues of S&P Glasphalt® G can be easily recycled and reused in asphalt layers according to the *German Recycling Management Act*.

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

The potential benefits from packaging material in module A5 are declared. For waste incineration, combustion in a waste incineration plant (R1 > 0.6) with energy recuperation is considered. Recycling credits after the end-of-life of the product are considered.

LCA: Results

The following table depicts the results of the indicators with the associated magnitude of impact, use of resources as well as waste and other output flows in relation to 1 m² of S&P Glasphalt® G with the grammage of 0.64 kg/m².

As End of life scenario (EoL) of 100% recycling is considered and subsequent credits are considered in stage D.

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".

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

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 m² S&P Glasphalt® G

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP	[kg CO_2-Eq.]	6.60E-1	1.91E-2	1.82E-2	1.74E-4	4.36E-3	1.66E-3	0.00E+0	-1.47E-2
ODP	[kg CFC11-Eq.]	8.38E-15	3.13E-18	2.95E-18	2.42E-20	7.12E-19	9.67E-18	0.00E+0	-3.73E-16
AP	[kg SO_2-Eq.]	3.37E-3	1.50E-5	1.75E-6	1.63E-6	3.51E-6	1.11E-5	0.00E+0	-2.12E-5
EP	[kg $(PO_4)^3$-Eq.]	2.12E-4	3.13E-6	3.73E-7	3.51E-7	7.42E-7	2.71E-6	0.00E+0	-3.65E-6
POCP	[kg ethene-Eq.]	2.44E-4	-6.42E-8	1.43E-7	1.76E-7	-5.42E-8	1.21E-6	0.00E+0	-1.10E-6
ADPE	[kg Sb-Eq.]	2.18E-5	1.58E-9	1.71E-10	5.39E-12	3.60E-10	1.89E-9	0.00E+0	-4.15E-9
ADPF	[MJ]	1.92E+1	2.59E-1	3.34E-3	2.43E-3	5.90E-2	3.15E-2	0.00E+0	-1.78E-1

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

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m² S&P Glasphalt® G

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	[MJ]	1.60E+0	1.46E-2	1.51E-1	7.69E-6	3.33E-3	2.70E-3	0.00E+0	-7.44E-2
PERM	[MJ]	1.50E-1	0.00E+0	-1.50E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	1.75E+0	1.46E-2	7.27E-4	7.69E-6	3.33E-3	2.70E-3	0.00E+0	-7.44E-2
PENRE	[MJ]	1.04E+1	2.60E-1	3.91E-3	2.44E-3	5.92E-2	9.49E+0	0.00E+0	-2.16E-1
PENRM	[MJ]	9.46E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-9.46E+0	0.00E+0	0.00E+0
PENRT	[MJ]	1.98E+1	2.60E-1	3.91E-3	2.44E-3	5.92E-2	3.21E-2	0.00E+0	-2.16E-1
SM	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m³]	2.07E-3	1.69E-5	4.41E-5	1.38E-8	3.85E-6	8.41E-6	0.00E+0	-8.63E-5

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

RESULTS OF THE LCA – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m² S&P Glasphalt® G

Parameter	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	[kg]	1.36E-8	1.21E-8	2.72E-12	2.37E-13	2.76E-9	6.76E-10	0.00E+0	-9.11E-10
NHWD	[kg]	5.34E-2	3.98E-5	1.30E-4	2.50E-7	9.06E-6	9.67E-6	0.00E+0	-1.21E-4
RWD	[kg]	2.35E-4	3.22E-7	2.23E-7	2.62E-9	7.33E-8	2.58E-7	0.00E+0	-1.52E-5
CRU	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.40E-1	0.00E+0	0.00E+0
MER	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	2.62E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	4.70E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0

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

References

EN 15381
EN 15381: 2008, Geotextiles and geotextile-related products – Characteristics required for use in pavements and asphalt overlays

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

ISO 15686
ISO 15686:2011-05, Buildings and constructed assets - Service life planning

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

IBU
Institut Bauen und Umwelt e.V.: General Programme Instructions for the Preparation of EPDs at the Institut Bauen und Umwelt e.V. Version 1.1, Berlin: Institut Bauen und Umwelt e.V., 2016.
www.ibu-epd.com

Candidate list
List of those eligible for approval substances of very high concern to the European Chemicals Agency, as of June 25, 2020.

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

(EU) Ordinance on Biocide Products No. 528/2012
Regulation (EU) No 528/2012 of the European Parliament and of the Council of 22 May 2012 concerning the making available on the market and use of biocidal products Text with EEA relevance.

GaBi Software
Software & Documentation (Service Pack 40), 2019 Sphera solutions GmbH,
Documentation of GaBi data sets
http://www.gabi-software.com/international/databases/

German Recycling Management Act
Kreislaufwirtschaftsgesetz (KrWG), German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU), 2012

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

PCR - Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report, version 1.8, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2019

PCR – Part B: Requirements of the EPD Reinforcing and securing systems made from glass fibre composite materials, version 1.6, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2017

REACH Regulation
(EC) No. 1907/2006 of the European Parliament and Council of December 18, 2006 for Registration, evaluation, admission and Restriction of chemical substances. List of those eligible for approval substances of very high concern to the European Chemicals Agency, as of June 25, 2020.

Report No.: 14-7974-01
Gogolin, D., Wirkung und Nachhaltigkeit von Asphaltarmierungen, An investigation report commissioned by S&P Clever Reinforcement GmbH, 2015

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