ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	STEICO SE
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-STE-20210139-IBC1-EN
Issue date	27.09.2021
Valid to	26.09.2026

Cellulose blow-in insulation STEICOfloc and STEICOfloc NB

STEICO SE

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1. General Information

STEICO SE	STEICOfloc and STEICOfloc NB
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the Declaration** STEICO SE Otto-Lilienthal-Ring 30 85622 Feldkirchen Germany
Declaration number EPD-STE-20210139-IBC1-EN	**Declared product / Declared unit** 1 kg cellulose blow-in insulation
This Declaration is based on the Product Category Rules: Blow-in insulation materials made from cellulose and wood fibres, 12.2017 (PCR checked and approved by the independent SVR)	**Scope:** This Environmental Product Declaration is valid for STEICOfloc and STEICOfloc NB cellulose blow-in insulation manufactured in the following plant: STEICO Sp. z o.o. ul. Przemysłowa 2 64700 Czarnków
Issue date 27.09.2021	
Valid to 26.09.2021	The owner of the Declaration shall be liable for the underlying information and evidence; IBU shall not be liable with respect to manufacturer information, Life Cycle Assessment data, and evidence. This EPD was drawn up in accordance with the specifications of the *EN 15804+A1*. The standard is referred to as *EN 15804* hereinafter.
	Verification The *EN 15804* European standard serves as the core PCR. Independent verification of the Declaration and information provided in accordance with *ISO 14025:2010* ☐ internally ☒ externally
Dipl.-Ing. Hans Peters (President of Institut Bauen und Umwelt e.V.)	
Dr Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.)	Prof. Dr. Birgit Grahl (Independent verifier)

2. Product

2.1 Description of the company

The STEICO Group develops, produces and sells ecological construction products made from renewable raw materials, whereby STEICO is a European market leader in the wood fibre insulation sector and is the only manufacturer in the sector to offer an integrated timber construction system which is supplemented by insulation and constructive building elements.

2.2 Product description / Product definition

STEICOfloc is a loose cellulose blow-in insulation material made from natural cellulose fibres and is also available in a boron-free variant as STEICOfloc NB. The products serve towards fast machine processing of insulating cavities of all sizes and thicknesses; the result is free of joins and offcuts. Furthermore, STEICOfloc can also be used in open blow-in form for insulating the top ceiling.
STEICO blow-in insulation is suitable for both individual buildings and prefabrication. Thanks to particularly long paper fibres and the comparably low volumes of materials used, a permanent ability to settle without sinking can be achieved from an average density of 38 kg per cubic metre.

Directive (EU) No. 305/2011 (*CPR*) applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The product requires a Declaration of Performance taking consideration of the *ETA-16/0141, 16.05.2017, STEICOfloc, STEICOfloc NB thermal insulation material made from loose, unbound cellulose fibres* and CE-marking.

The following Declaration of Performance is available for STEICOfloc and STEICOfloc NB: STEICOfloc / STEICOfloc NB *DOP No. 05-0002-02*.

The respective national regulations apply for usage.

2.3 Application

STEICOfloc / STEICOfloc NB is suitable as insulation material for industrial prefabrication (e.g. of entire wall elements) and for refurbishments in new builds, old buildings, half-timbered buildings and timber structures. The insulation layer is achieved by blowing the fibre material under high pressure into the self-contained compartments. The material adapts exactly to the adjacent components and fills out all of the cavities. Installation elements in the compartments are also sealed in full by blowing the material in and without requiring any laborious manual work. It does not matter, therefore, if the compartments are coordinated to standard sizes of insulation material; STEICOfloc / STEICOfloc NB achieve a homogeneous and join-free filling, even in the most complicated constructions.
Apart from blow-in insulation, STEICOfloc / STEICOfloc NB can also be used as exposed insulation. The open blow-in process is applied when STEICOfloc / STEICOfloc NB is open blown-in as an exposed thermal insulation material on horizontal, curved or moderately inclined areas between binders or beams in roof structures.

2.4 Technical data

The following dimensions refer to the STEICOfloc / STEICOfloc NB product on delivery.

Construction data

Description	Value	Unit
Slump test acc. to ISO 18393-1, Method A – Slump test after impact excitation	< 10	%
Slump test acc. to ISO 18393-1, Method C – Slump test after vibration	≤ 1	%
Water vapour diffusion resistance factor μ (related to the density indicated)	1 – 2	-
Flow resistance acc. to EN 29053 at 30 kg/m³	≥ 5	kPa/m²
Thermal conductivity nominal value in blow-in process (related to the density indicated)	0.038	W/(mK)
Reaction to fire classification acc. to EN 13501-1	E	-
Resistance to biological impact acc. to Annex C of the CUAP	0	Class
Moisture conversion factor Fm^2 of thermal conductivity (23 °C, 50% rel. humidity – 23 °C, 80% relative humidity)	1.01	-
Density range depending on the area of application	30 – 60	-
Vertical: Outer wall and interwall cavities	47 – 57	kg/m³
Inclined: Blow-in insulation in cavities under roof sealing > 10° pitch	43 – 51	kg/m³
Horizontal: Blow-in insulation in flat roof ceiling cavities	38 – 48	kg/m³
Horizontal: Exposed blow-in insulation not fit for walking on ceiling constructions	30 – 34	kg/m³

The product's performance values correspond with the Declaration of Performance in terms of its essential properties in accordance with *ETA-16/0141*.

2.5 Delivery status

STEICOfloc / STEICOfloc NB is offered in foil bags or stacked on pallets:

- individual 15-kg bags, 21 bags per pallet: standard or boron-free
- 350-Kg bales (industrial packaging): standard or boron-free

Other forms of delivery are available on request.

2.6 Base materials / Auxiliaries

The main component of STEICOfloc / STEICOfloc NB is sorted recycled daily newspapers. A low percentage of inorganic mineral salts and boric acid (STEICOfloc) or inorganic mineral salts (STEICOfloc NB) guarantees permanent material durability and safe fire protection. The product composition is broken down into the following ingredients:

STEICOfloc:
Cellulose: approx. 84%
Water: approx. 8%
Flame retardant (inorganic mineral salts, boric acid): approx. 8%

STEICOfloc NB:
Cellulose: approx. 84%
Water: approx. 8%
Flame retardant (inorganic mineral salts): approx. 8%

STEICOfloc: The product contains substances on the *ECHA List of Candidates* for including substances of very high concern in Annex XIV of the *REACH Directive* (last revised: 07.01.2019) exceeding 0.1% by mass: ≤ 2.4% boric acid by mass (CAS no. 10043-35-3).

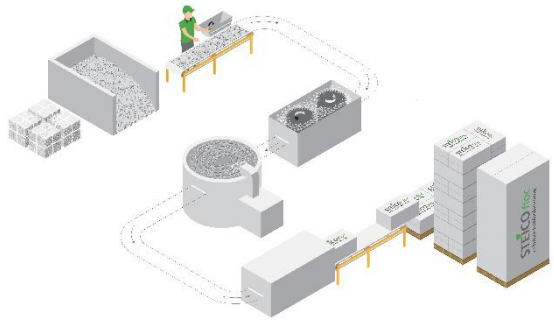
STEICOfloc NB: The product contains substances on the *ECHA List of Candidates* for including substances of very high concern in Annex XIV of the *REACH Directive* (last revised: 07.01.2019) exceeding 0.1% by mass: no

STEICOfloc / STEICOfloc NB: The product contains other CMR substances in categories 1A or 1B which are not on the *ECHA List of Candidates* exceeding 0.1% by mass in at least one partial product: no

STEICOfloc / STEICOfloc NB: 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

2.7 Manufacture

STEICOfloc / STEICOfloc NB is manufactured from sorted waste paper using a modern eddy current mill in the following steps:



- Raw material store and incoming goods inspection
- Loosening the pressed waste paper bales, incl. mixture for high homogeneous quality
- Visual inspection of quality and elimination of impurities
- Rough grinding of the waste paper in the shredder
- Eddy current mill: defibration of the raw material into high-quality cellulose fibres
- Addition of fire protection agents, both for standard quality (STEICOfloc) and the boron-free variant (STEICOfloc NB)
- Fully-automatic bagging plant
- Fully-automatic palleting

All of the residual products incurred during production are directed to an internal energy recovery process.

Quality assurance systems:

- Quality management system acc. to *ISO 9001*
- Environment management system acc. to *ISO 14001*
- CE marking in acc. with *ETA-16&0141*, MPA North Rhine-Westphalia, Germany
- FSC certificate *CU-COC-841217*
- PEFC certificate *CU-PEFC-841217*

2.8 Health and environment factors during manufacturing

On account of the manufacturing conditions, no health protection measures extending beyond the statutory and other specifications need to be taken.

Environmental protection
Air: The waste air incurred during production is cleaned according to statutory regulations.
Water/Soil: No direct pollution of water or soil is caused by the production process. Production-related waste water is treated internally and redirected to production.

2.9 Product processing / Installation

STEICOfloc / STEICOfloc NB is delivered in compressed form. The compressed fibre material is prepared in special blow-in machines and blown to the processing site through flexible pipes.
STEICOfloc / STEICOfloc NB is applied exclusively by trained partners and licensed firms (in accordance with building inspection certification).

2.10 Packaging

For the packaging of STEICO insulation materials, foils made of polyethylene (PE), paper, cardboard and wood are used. All packing materials are recyclable if unmixed, and/or can be recovered as energy.

2.11 Condition of use

When used professionally and as designated, no material product changes are to be anticipated during the use phase.

2.12 Environment and health during use

Environment: When STEICO insulation materials are used as designated, there is currently no hazard potential for water, air and soil.

Health: When STEICO insulation materials are installed as designated, no impairments to health or other damage are to be anticipated.

It is possible that small quantities of product substances may escape. Furthermore, no emissions of health relevance have been detected.

In order to guarantee overfulfilment of the statutory limit values as regards emissions, radioactivity, VOC etc., STEICO insulation materials are examined externally.

2.13 Reference service life

When used as designated, infinite durability can be anticipated for STEICO insulation materials. Accordingly, the average service life of the product correlates with that of the building it is installed in. Under central European conditions, 50 years can be assumed as a conservative estimate of the service life.

There are no known or anticipated influences on ageing when the products are applied in accordance with the generally accepted rules of technology.

2.14 Extraordinary loads

Fire
Information in acc. with *DIN EN 13501-1*

Fire protection

Description	Value
Fire class	E
Burning droplets	-
Smoke gas development	-

Water
STEICO insulation materials have no soluble ingredients that are hazardous to water. Cellulose fibre insulation materials are not permanently resistant to standing water. Depending on the damage symptoms, damaged areas must be replaced, either partially or extensively.

Mechanical destruction
Mechanical destruction of STEICOfloc blow-in insulation does not have any negative impact on the environment.

2.15 Reuse phase

When dismantled without damage, STEICOfloc / STEICOfloc NB may be reused for the same application after the end of utilisation, or may be reused in the same application spectrum in an

alternative location.
Insofar as the insulation materials are not contaminated, the raw material can easily be materially recycled and recovered (e.g. readmission to the production process).

2.16 Disposal
Single-variety residual insulation material without impurities can be recycled in the production process. As renewable energy sources in thermal recycling, STEICO insulation materials achieve a calorific value of approx. 15 MJ per kg insulation material (product moisture = 8%), e.g. in refuse incineration plants, whereby process energy as well as electricity can be generated.

Waste key in accordance with the European Waste Catalogue (EWC): 170604 / 170904

2.17 Further information
Detailed information on STEICOfloc / STEICOfloc NB and other insulation material products manufactured by STEICO SE (processing, parameters, approvals) is available at www.steico.com.

3. LCA: Calculation rules

3.1 Declared unit
The declared unit is 1 kg blow-in insulation made of cellulose. This EPD outlines a production mass-weighted average of factory-made cellulose blow-in insulation materials which only differ with regard to the composition of the flame retardant used.
Note:Depending on the respective application, various densities can be assumed for modelling at building level (see section 2.4. Technical data).
In accordance with 5.2.1c in the *PCR part A*, this is a “Declaration of an average product from a manufacturing plant”.

Declared unit

Description	Value	Unit
Declared unit	1	kg
Conversion factor to 1 kg	1	-
Density (in terms of the thermal conductivity indicated)	40	kg/m^3

3.2 System boundary
The Declaration complies with an EPD "from cradle to plant gate, with options". It includes the production stage, i.e. from provision of the raw materials through to production (“cradle to gate”, Modules A1 to A3), Module A5, and parts of the end-of-life stage (Modules C2 and C3). It also contains an analysis of the potential benefits and loads over and beyond the product's entire life cycle (Module D).

Module A1 comprises the provision of waste paper as well as the provision of additives. Waste paper as a raw material is a secondary material which means it is available unencumbered. Transport of the raw materials and additives is considered in Module A2. Module A3 includes the expenses associated with manufacturing the product, such as the provision of energy and resources, as well as product packaging. Module A5 exclusively covers the disposal of product packaging which includes the disposal of biogenic carbon and primary energy (PERM and PENRM). Module C2 considers transport to the disposal company and Module C3 models thermal utilisation of the product at its end of life.
Module D contains the ensuing potential benefits and loads in the form of a system extension.

3.3 Estimates and assumptions
As a general rule, all material and energy flows for the processes required by production are established on the basis of questionnaires.

3.4 Cut-off criteria
No known material or energy flows were ignored, not even those which fall below the 1% limit. Accordingly, the total sum of input flows ignored is certainly less than 5% of the energy and mass applied. Furthermore, this ensures that no material and energy flows were ignored which represent a particular potential for significant influences with regard to the environmental indicators.

3.5 Background data
All background information was taken from the *GaBi Professional Database 2020 Edition*.

3.6 Data quality
The primary data surveyed for 2019 was validated on the basis of mass and in accordance with plausibility criteria.
All other information was taken from the *GaBi Professional Database 2020 Edition*. The overall data quality can be regarded as good.

3.7 Period under review
The data recorded for the primary system refers to 2019. All information is therefore based on averaged data for 12 consecutive months.

3.8 Allocation
The allocations carried out correspond with the requirements of *EN 15804* and essentially comprise the following items:

Module A1
The waste paper used enters the system as a secondary raw material which means it is available without environmental loads. The product properties inherent in the material (biogenic carbon) are allocated in accordance with the physical criterion of mass.

Module A3
The factory-made products are not co-productions. Accordingly, data which is only available for production as a whole is allocated to the products on the basis of the production volume (mass).
Energy generated from external disposal of waste incurred in production is credited to the system in the form of substitution processes. It is assumed that the substituted thermal energy would have been generated from natural gas and the substituted electricity corresponds with the Polish power mix. The credits achieved here account for significantly less than 1% of overall expenses.

Module D
The potential benefit through substitution of fossil fuels in the course of energy generation with thermal utilisation of the product packaging and the product at its end of life is modelled in Module D. It was assumed

in the system extension that the substituted thermal energy is generated from natural gas and the substituted electricity corresponds with the German power mix.

3.9 Comparability

As a general rule, EPD data can only be compared or evaluated when all of the data records to be compared have been drawn up in accordance with *EN 15804* and the building context and/or product-specific characteristics are taken into consideration.

The LCA modelling was done using version 10.0 of the *GaBi ts 2020* software. All background data was taken from the *GaBi Professional Database 2020 Edition* or literary sources.

4. LCA: Scenarios and additional technical information

The scenarios on which the LCA is based are described in more detail below.

Construction installation process (A5)

The information in Module A5 exclusively refers to disposal of the packaging materials. No details are provided on installation of the product. The volume of packaging materials incurred per declared unit in Module A5 and directed to thermal waste processing as well as other details on the scenario are listed in the following table:

Description	Value	Unit
Solid timber (wood moisture = 40%) as packaging material for thermal waste processing	0.1	kg
PE foil as packaging material for thermal waste processing	1.7E-2	kg
Paper as packaging material for thermal waste processing	1.2E-4	kg
Biogenic carbon contained in the solid timber share of packaging	3.6E-2	kg
Total exported electric energy	0.57	kWh
Total exported thermal energy	4.76	MJ

A transport distance of 20 km is assumed for disposal of the product packaging.

End of life (C2–C3)

A redistribution transport distance of 50 km is assumed in Module C2.

Description	Value	Unit
For energy recovery (waste paper flakes)	1	kg

A collection rate of 100% is assumed for the scenario of thermal utilisation with energy recovery.

Reuse, recovery and recycling potential (D), relevant scenario details

Description	Value	Unit
Electricity generated (per declared unit)	0.49	kWh
Waste heat generated (per declared unit)	4.07	MJ

The product is recycled in the same composition as the declared unit at the end-of-life stage. Thermal utilisation in a refuse incineration plant with an R1 value > 0.6 is assumed. The exported energy substitutes fuels from fossil sources, whereby it is assumed that the thermal energy is generated from natural gas and the substituted electricity corresponds to the German power mix.

5. LCA: Results

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

Product stage			Building construction stage		Use stage							End-of-life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacture	Transport from manufacturer to site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction / Demolition	Transport	Waste processing	Disposal	Reuse, recovery or recycling potential
A1	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
X	X	X	MND	X	MND	MND	MNR	MNR	MNR	MND	MND	MND	X	X	MND	X

RESULTS OF THE LCA – ENVIRONMENTAL IMPACT according to EN 15804+A1: 1 kg cellulose blow-in insulation

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
GWP	[kg CO_2 equiv.]	-1.46E+0	3.92E-2	9.75E-2	1.77E-1	2.90E-3	1.56E+0	-6.36E-1
ODP	[kg CFC11 equiv.]	2.61E-16	6.53E-18	1.87E-15	6.89E-17	4.83E-19	6.03E-16	-1.33E-14
AP	[kg SO_2 equiv.]	3.49E-4	1.64E-4	4.29E-4	3.20E-5	1.22E-5	3.22E-4	-6.06E-4
EP	[kg $(PO_4)^3$ equiv.]	4.91E-5	4.14E-5	6.29E-5	5.75E-6	3.06E-6	6.52E-5	-1.08E-4
POCP	[kg ethene equiv.]	1.89E-5	-6.91E-5	2.04E-4	1.50E-6	-5.11E-6	1.97E-5	-5.46E-5
ADPE	[kg Sb equiv.]	2.80E-5	3.30E-9	5.16E-8	5.09E-9	2.44E-10	4.62E-8	-1.52E-7
ADPF	[MJ]	7.59E-1	5.42E-1	2.52E+0	5.70E-2	4.01E-2	4.45E-1	-8.39E+0

Legend	GWP = Global warming potential; ODP = Ozone depletion potential; AP = Acidification potential of soil and water; EP = Eutrophication potential; POCP = Photochemical ozone creation potential; ADPE = Abiotic depletion potential – non-fossil resources (ADP substances); ADPF = Abiotic depletion potential – fossil fuels (ADP fossil fuels)

RESULTS OF THE LCA – INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 kg cellulose blow-in insulation

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
(PERE)	[MJ]	4.97E-2	3.05E-2	3.35E-1	1.27E-2	2.26E-3	1.07E-1	-2.34E+0
PERM	[MJ]	0.00E+0	0.00E+0	1.38E+0	-1.38E+0	0.00E+0	0.00E+0	0.00E+0
PERT	[MJ]	4.97E-2	3.05E-2	1.71E+0	-1.37E+0	2.26E-3	1.07E-1	-2.34E+0
PENRE	[MJ]	7.87E-1	5.43E-1	2.00E+0	6.69E-1	4.02E-2	4.84E-1	-9.25E+0
PENRM	[MJ]	0.00E+0	0.00E+0	6.07E-1	-6.07E-1	0.00E+0	0.00E+0	0.00E+0
PENRT	[MJ]	7.87E-1	5.43E-1	2.60E+0	6.21E-2	4.02E-2	4.84E-1	-9.25E+0
SM	[kg]	9.20E-1	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
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	[m^3]	1.70E-4	3.53E-5	1.53E-3	5.44E-4	2.61E-6	4.12E-3	-1.28E+0

Legend	PERE = Renewable primary energy as primary energy carrier; PERM = Renewable primary energy resources as material utilisation; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy as energy carrier; PENRM = Non-renewable primary energy as material utilisation; PENRT = Total use of non-renewable primary energy resources; SM = Use of secondary materials; 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 kg cellulose blow-in insulation

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
HWD	[kg]	1.39E-9	2.53E-8	7.88E-9	2.08E-10	1.87E-9	7.61E-10	-4.87E-9
NHWD	[kg]	2.89E-2	8.31E-5	1.37E-3	5.31E-3	6.15E-6	2.98E-2	-4.38E-3
RWD	[kg]	1.01E-5	6.72E-7	3.33E-5	2.02E-6	4.97E-8	1.54E-5	-3.39E-4
CRU	[kg]	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	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
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	3.15E-1	0.00E+0	1.75E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	6.88E-1	0.00E+0	4.07E+0	0.00E+0

Legend	HWD = Hazardous waste for disposal; NHWD = Non-hazardous waste for disposal; RWD = Radioactive waste for disposal; CRU = Components for reuse; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported electrical energy; EET = Exported thermal energy

No primary energy inherent in the material (PERM/PENRM) enters the product system for the waste paper used in Module A1 (Use of secondary materials – SM). The lower calorific value of the product is based on the energy contained in waste paper and accounts for 14.5 MJ/kg. It forms the basis for energy generation in the thermal utilisation of the product in Module C3.

6. LCA: Interpretation

The interpretation of results focuses on the production phase (Modules A1 to A3) as it is based on specific data provided by the company. The interpretation takes the form of a dominance analysis of the environmental impacts (GWP, ODP, AP, EP, POCP, ADPE, ADPF) and the use of renewable and/or non-renewable primary energy (PERE, PENRE). Accordingly, the most significant factors for the respective categories are listed below.

6.1 Global Warming Potential (GWP)

When considering the GWP, the CO_2 product system inputs and outputs inherent in the material are subject to separate consideration (biogenic carbon). A total of approx. 1.65 kg CO_2 enters the system in the form of carbon stored in the product and packaging. Around 0.13 kg CO_2 bound in the form of the packaging material are included in Module A3 and emitted again in Module A5. The carbon ultimately stored in the cellulose insulation material and accounting for around 1.52 kg CO2 equiv. leaves the product system as emissions following thermal utilisation in Module C3. 18% of the analysed fossil greenhouse gases are accounted for by the provision of raw materials (entire Module A1), 12% by transporting the raw materials (entire Module A2) and 70% by the manufacturing process for cellulose blow-in insulation material (entire Module A3).
The provision of additives accounting for 18% (Module A1), electricity consumption (34%) and in-plant emissions (19%) (both Module A3) of fossil greenhouse gas emissions represent essential variables.

6.2 Ozone Depletion Potential (ODP)

72% of emissions with an ozone depletion potential are attributable to the packaging materials for the product and 14% is accounted for by electricity consumption.

6.3 Acidification Potential (AP)

Essentially, the provision of additives for the product (37%, Module A1) and the electricity generation in the manufacturing process (25%, Module A3) are the relevant sources of emissions contributing to the acidification potential.

6.4 Eutrophication Potential (EP)

32% of the total EP is attributable to the additives (Module A1) and a further 26% is accounted for by transporting the waste paper (Module A2). The packaging material contributes 15% to the EP (Module A3).

6.5 Photochemical Ozone Creation Potential (POCP)

The primary contributions to POCP are accounted for by direct emissions inside the factory (84%, Module A3). Electricity consumption in the factory (also Module A3) accounts for another 9% of total POCP. The negative values recorded for the POCP in Modules A2 and C2 are attributable to the negative characterisation factor for nitrogen monoxide emissions in the standard-conformant CML IA version (2001 - April 2013) in combination with the *GaBi Professional Database 2020 Edition* truck transport process.

6.6 Abiotic Depletion Potential non-Fossil Resources (ADPE)

The essential contributions to ADPE arise through the provision of additives for the product (Module A1).

6.7 Abiotic Depletion Potential – fossil fuels (ADPF)

The packaging materials account for 37% of total ADPF and 29% is incurred by electricity consumption during the manufacturing process (both Module A3).

6.8 Renewable primary energy as energy carrier (PERE)

Most of PERE use (48%) is attributable to the renewable percentage of the power mix applied in the factory (Module A3). 31% is incurred by the packaging materials used (Module A3) and 12% by the provision of additives (Module A1).

6.9 Non-renewable primary energy as energy carrier (PERE)

Most of PENRE use is distributed across electricity consumption in the factory (34%, Module A3), provision of the product packaging (26%, Module A3), provision of the additives (24%, Module A1) and transporting the waste paper used to the factory (16%, Module A2).

6.10 Waste

Almost exclusively non-hazardous waste accumulated. This waste essentially arises in Module A1 in the course of provision of additives for the product.

Range of results

The results for the two products listed under 2.1 differ from the average results in the Environmental Product Declaration. The following table contains the maximum deviations from the results from section 5 for environmental impacts, energy use and fresh water requirements:

Parameter	Max. deviation [%]
GWP	+2/0
ODP	+3/0
AP	0/-12
EP	+1/-26
POCP	0/-5
ADPE	+3/-93
ADPF	0/-10
PERE	+1/0
PENRE	0/-10
FW	+1/0

The deviations are exclusively attributable to the various use of flame retardants which is offset in Module A1.

7. Evidence

7.1 VOC emissions

The VOC emissions for STEICOfloc and STEICOfloc NB were determined in accordance with AgBB. Tests were carried out at the Institut für Holztechnologie in Dresden; *Test report no. 2520607/1/A1*.

AgBB overview of results (28 days)

Description	Value	Unit
TVOC (C6 - C16)	1133	µg/m³
Total SVOC (C16 - C22)	0	µg/m³
R (dimensionless)	2.1	-
VOC without LCI	786	µg/m³
Carcinogens	0	µg/m³

8. References

Standards

EN 13171
DIN EN 13171:2012, Thermal insulation products for buildings – Factory-made wood fibre products (WF) – Specifications

EN 13501-1
DIN EN 13501-1:2019-05, Classification of construction products and methods by reaction to fire – Part 1: Classification with the results of tests on reaction to fire of construction products

EN 15804
EN 15804:2012-04+A1 2013, Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction products (meanwhile replaced with EN 15804:2020-03 but still applicable for this EPD during the transition phase)

EN 16485
EN:16485:2014-07, Round and sawn timber – Environmental product declarations – Product category rules for wood and wood-based products for use in construction

EN 29053
EN 29053:1993-05, Acoustic materials; Materials for acoustic applications; Determining the flow resistance (ISO 9053:1991)

ISO 14001
DIN EN ISO 14001:2015, Environment management systems – Requirements

ISO 14025
DIN EN ISO 14025:2011-10, Environmental designations and declarations – Type III Environmental Declarations – Basic principles and processes

ISO 18393-1
ISO 18393-1:2012-07, Thermal insulation products – Determination of ageing by settlement – Part 1: Blown loose-fill insulation for ventilated attics, cyclical humidity and temperature loads

ISO 9001
DIN EN ISO 9001:2015-11, Quality management systems – Requirements

ISO 9053
DIN EN ISO 9053-1: 2019-03, Acoustics – Determination of airflow resistance – Part 1: Static airflow method

Other literature

CML-IA 2013
L. van Oers: 2015, CMLIA database, characterisation and normalisation factors for midpoint impact category indicators; version (2011-April 2013)

CPR
Directive (EU) No. 305/2011 of the European Parliament and Council dated 9 March 2011 on specifying harmonised conditions for marketing building products and for repealing

CU-COC-841217
FSC certificate STEICO, 2020, available at https://info.fsc.org/certificate.php

CU-PEFC-841217
PEFC certificate STEICO, 2020, available at https://www.pefc.org/findcertified

DOP no. 05-0002-02
STEICOfloc / STEICOfloc NB Declaration of Performance no. 05-0002-02

EWC
European Waste Catalogue in accordance with the Ordinance governing the European List of Wastes (List of Wastes - AVV), 2016

ECHA List of Candidates
List of substances of very high concern requiring approval (last revised: 15.01.2018) in accordance with Article 59, paragraph 10 of the REACH Directive; European Chemicals Agency

ETA-16/0141
European Technical Approval ETA-16/0141, 16.05.2017, Deutsches Institut für Bautechnik, STEICOfloc, STEICOfloc NB insulation material made from loose, unbound cellulose fibres

GaBi Professional Database 2020 Edition
GaBi Professional Database, version 2020.1, SP40; sphera, 2020 [accessed on 22.12.2020]

GaBi ts 2020
GaBi ts software, version 10.0: software and database for comprehensive analysis; sphera, 2020 [accessed on 22.12.2020]

IBU 2016
Institut Bauen und Umwelt e.V.: General principles for the EPD range of Institut Bauen und Umwelt e.V. (IBU), version 1.1, Berlin: Institut Bauen und Umwelt e.V., 2016; www.ibu-epd.com

Test report no. 2520607/1/A1
EPH Dresden, test report no. 2520607/1, Determining the VOC and formaldehyde emissions from a blow-in insulation material in accordance with the AgBB scheme, 14.04.2021

PCR, Part A
Product Category Rules for building-related products and services, Part A: Calculation rules for the Life Cycle Assessment and requirements on the Background Report, 2019

PCR: Blow-in insulation materials made from cellulose and wood fibres
PCR guidelines for building-related products and services, Part B: Requirements on the EPD for blow-in insulation products made from cellulose and wood fibres, 2017

REACH Directive
(EC) Directive No. 1907/2006 of the European Parliament and Council dated 18 December 2006 on the registration, evaluation, approval and restriction of chemical substances (REACH); last revised: 07.01.2019

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