ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	STEICO SE
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-STE-20200001-IBA1-DE
Issue date	19.05.2020
Valid to	18.05.2025

STEICO flex F flexible wood fibre compartment insulation

STEICO SE

Institut Bauen und Umwelt e.V.

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1. General Information

STEICO SE	STEICOflex F
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** STEICO SE Otto-Lilienthal-Ring 30 D-85622 Feldkirchen
Declaration number EPD-STE-20200001-IBA1-DE	**Declared product / declared unit** 1 m³ wood fibre insulating material.
This declaration is based on the product category rules: Wood based panels, 12.2018 (PCR checked and approved by the SVR)	**Scope:** This Environmental Product Declaration applies to the flexible wood fibre insulation boards STEICOflex F 036/038, which are manufactured in the following plant: STEICO Casteljaloux SAS 30 rue de Belloc 47700 Casteljaloux
Issue date 19.05.2020	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*.
Valid to 18.05.2025	**Verification** The standard *EN 15804* serves as the core PCR Independent verification of the declaration and data according to *ISO 14025:2010* ☐ internally ☒ externally
 Dipl. Ing. Hans Peters (chairman of Institut Bauen und Umwelt e.V.)	
 Dr. Alexander Röder (Managing Director Institut Bauen und Umwelt e.V.))	 Dr.-Ing. Wolfram Trinius (Independent verifier appointed by SVR)

2. Product

2.1 Product description/Product definition

STEICOflex F are flexible wood fibre insulation boards produced in a dry process. To achieve the flexibility of the product, a small amount of textile binding fibre must be added.

For placing the product on the market in the EU/EFTA (with the exception of Switzerland), Regulation (EU) No. 305/2011 (CPR) applies. The product requires a declaration of performance in accordance with /DIN EN 13171:2012/ and CE marking.

The following declarations of performance are available for STEICOflex F:

STEICO flex F 036 /DOP Nr. 01-0048-01/

STEICO flex F 038 /DOP Nr. 01-0023-06/

For use, the respective national regulations apply.

2.2 Application

The flexible wood fibre thermal insulation STEICOflex F is used as compartment insulation in roof, wall and ceiling constructions, as well as cavity insulation for partition walls, facing shells and installation levels.

2.3 Technical Data

The following information refers to the product STEICOflex F as delivered.

Further data is available for download at www.steico.com.

Construction data

Name	Value	Unit
Bulk density	50 - 60	kg/m³
Material moisture on delivery	4	%
Tensile strength perpendicular to face	0.01	N/mm²
Thermal conductivity	0.036 and 0.038	W/(mK)
Water vapour diffusion resistance factor	2	-
Specific heat capacity c	2100	J/(kg*K)
Air flow resistivity	>= 5	(kPa*s)/m

The performance values of the product shall be in conformity with the declaration of performance in relation to its essential characteristics in accordance with /DIN EN 13171:2012/.

2.4 Delivery status

STEICOflex F is available in the following standard dimensions:
Board thickness: 30-240 mm
Format: 1220 x 575 mm
Special formats from 300 to 3100 mm are available on request.

2.5 Base materials/Ancillary materials

The main component of STEICOflex F is wood fibre from regional sustainable forestry. The product composition is divided into the different ingredients as follows:

Wood fibre:	approx. 90%
Water:	approx. 2 %
Bi-component fibre:	approx. 3 %
Ammonium salts:	approx. 5 %

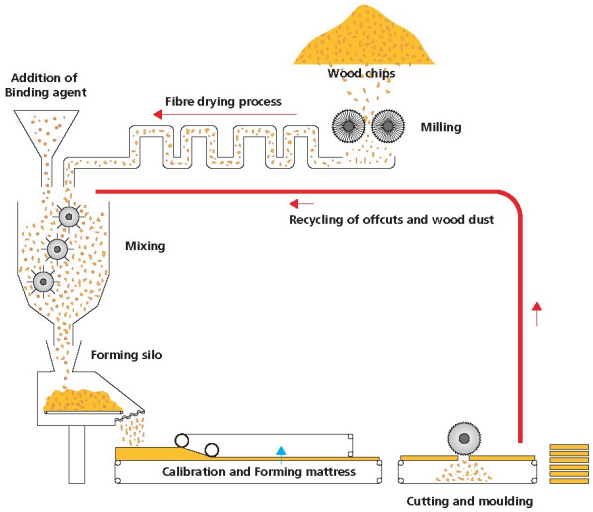
The product STEICOflex F contains substances of the /ECHA Candidate List / for the inclusion of substances of very high concern in Annex XIV of the /REACH Regulation/ (Status: 07.01.2019) above 0.1 mass%: no.

The product STEICOflex F contains further CMR substances of category 1A or 1B, which are not on the /ECHA-Candidate List/ above 0.1 mass%, in at least one part product: no.

Biocide products have been added to the present construction product STEICOflex F or it has been treated with biocide products (it is a treated product in the sense of the /Biocide Products Regulation/ ((EU) No. 528/2012): no.

2.6 Manufacture

STEICOflex F is produced in a dry process:



- Processing of the raw wood into wood chips
- Heating the wood chips under steam pressure
- Defibration of the wood chips by means of a defibration process
- Drying the fibres in a cyclone dryer
- Addition of the bi-component fibre
- Feeding the batch to the production line
- Heating and pressing of the mixture to form an insulating mat
- Cutting the wood fibre insulation
- Stacking, packaging

All residual materials arising during production are either returned to production or internally recycled for energy recovery.

Quality assurance systems:

- CE marking according to /DIN EN 13171/MPA North Rhine-Westphalia, D
- /PEFC/10-34-76/

2.7 Environment and health during manufacturing

Health protection
Due to the manufacturing conditions, no health protection measures beyond the legal and other regulations are to be taken.

Environmental protection
Air: The exhaust air generated during production is cleaned in accordance with the legal regulations.

Water/soil: There is no direct contamination of water and soil as a result of the production. Waste water from production is treated internally and returned to production.

2.8 Product processing/Installation

STEICO wood fibre insulating materials can be processed with common wood processing tools (foxtail, insulating knife, circular saw, band saw, etc.). If the processing is carried out without extraction, the use of breathing protection is recommended. Neither the processing nor the installation of STEICO wood fibre insulating materials causes environmental pollution. No additional measures are necessary with regard to environmental protection.

2.9 Packaging

Polyethylene (PE) films, stickers and wood are used to pack STEICO wood fibre insulating materials. All packaging materials unmixed are recyclable or can be used for energy recovery.

2.10 Condition of use

When used properly and in accordance with the intended purpose, no material changes to the product are to be expected during the use phase.

2.11 Environment and health during use

When used properly and in accordance with the intended purpose, no material changes to the product are to be expected during the use phase.

2.12 Reference service life

When used as intended, no reduction of stability is known or expected. Thus the average service life of the product is in the order of magnitude of the service life of the building.
Under Central European climate conditions, a conservatively estimated service life of 50 years can be assumed.

Influences on product ageing when used according to the rules of technology are not known or expected.

2.13 Extraordinary effects

Fire

Specifications according to /DIN EN 13501-1/

Fire protection

Name	Value
Building material class	E
Flaming droplets	d0
Smoke production	s1

Water
STEICO wood fibre insulating materials do not have any washable, water-polluting ingredients. Wood fibre insulating materials are not permanently resistant to standing water. Damaged areas must be replaced partially or over a large area, depending on the type of damage.

Mechanical destruction
Depending on the insulation material used, there is a mechanical load capacity with regard to compression and tension. Mechanical destruction does not result in any adverse effects on the environment.

2.14 Re-use phase
STEICO wood fibre insulating materials can be re-used for the same application after the end of use, or can be re-used at an alternative location in the same range of applications, if the deconstruction has been completed without damage. As long as there is no contamination of the wood fibre insulation materials, the raw material can be recycled and returned to the production process without any problems (e.g. reintroduction into the production process).

2.15 Disposal
Insulation material residues without contamination (cuttings and demolition material) can be recycled in the production process.
In the case of thermal recycling, STEICO wood fibre insulating materials as renewable energy sources achieve a calorific value of approx. 19.3 MJ per kg of insulating material (u=35%), e.g. for firing as biomass or in waste incineration plants. Both process energy and electricity can be generated.

2.16 Further information
Detailed information on STEICOflex F and other STEICO SE products (processing, characteristic values, approvals) is available at www.steico.com.

3. LCA: Calculation rules

3.1 Declared Unit
The declared unit is 1 m³ wood fibre insulation material with an average gross density of 51.7 kg with a water content of 2%. The proportion of additives is 8.7%.

Specification of the declared unit

Name	Value	Unit
Declared unit	1	m^3
Declared unit	-	m^2
Conversion factor to 1 kg	0.0193	-
Ground reference	51.7	kg/m^3

3.2 System boundary
The declaration type corresponds to an EPD "Weight to factory gate - with options". Contents are the stage of production, i.e. from the provision of raw materials to the factory gate of production (*cradle to gate*, Modules A1 to A3), as well as Module A5 and parts of the end of the life cycle (Modules C2 and C3). In addition, the potential benefits and burdens beyond the life cycle of the product are considered (Module D).

Module A1 includes the provision of wood from the forest as well as the provision of additives. The transports of these substances are considered in Module A2. Module A3 includes the costs of manufacturing the product, such as the provision of fuels, operating materials and energy, as well as the packaging of the product. Waste wood purchased for the heat supply is available without environmental impact.
Module A5 covers only the disposal of the product packaging, which includes the output of the biogenic carbon and the primary energy contained (PERM and PENRM).
Module C2 considers the transport to the disposal company and Module C3 the processing and sorting of the waste wood. Due to a lack of data, the conservative assumption was made that the material is shredded, as would be the case with waste wood, before it is ready for re-use. In addition, in Module C3 according to /EN 16485/, the CO2 equivalents of the wood-inherent carbon contained in the product, as well as the renewable and non-renewable primary energy (PERM and PENRM) contained in the product, are recorded as disposals.
In Module D, the thermal utilization of the product at the end of its life cycle and the resulting potential benefits and burdens are balanced in the form of a system expansion.

3.3 Estimates and assumptions
In principle, all material and energy flows of the processes required for production were determined on the basis of questionnaires. However, the on-site emissions from incineration and other processes could only be estimated on the basis of literature data and are documented in detail in /Rüter, S.; Diederichs, S.: 2012/.

3.4 Cut-off criteria
No known material or energy flows have been neglected, including those below the 1% limit. The total sum of the neglected input flows is thus certainly below 5% of the energy and mass input. This also ensures that no material and energy flows have been neglected that have a particular potential for significant impacts in terms of environmental indicators.

3.5 Background data
All background data were taken from the /GaBi Professional Database 2019 Edition/ and the final report "Ecological balance assessment basic data for building products made of wood" /Rüter, S.; Diederichs, S.: 2012/.

3.6 Data quality
The validation of the requested foreground data for the year 2018 was carried out on the basis of mass and according to plausibility criteria.
The background data used for wood raw materials used for material and energy purposes, with the

exception of forest wood, are from the years 2008 to 2012. The provision of forest wood was taken from a publication from 2008, which is mainly based on data from the years 1994 to 1997. All other data were taken from the /GaBi Professional Database 2019 Edition/. The data quality can be described as good overall.

3.7 Period under review

The data collection for the foreground system shall cover the year 2018. Any information is therefore based on the average of 12 consecutive months.

3.8 Allocation

The allocations carried out meet the requirements of /EN 15804/ and /EN 16485/ and are explained in detail in /Rüter, S.; Diederichs, S.: 2012/ Essentially, the following system enhancements and allocations were carried out.

General

The material-inherent properties of the product (biogenic carbon as well as the included primary energy) are allocated according to the physical criterion of mass.

Module A1

In case of the processes in the forest supply chain, it involves related co-productions of the products log wood (main product) and industrial wood (co-product). The corresponding expenses of this upstream chain were allocated to trunk and industrial wood on the basis of prices.
For the same reason, in the sawmill upstream chain, the expenses for the products sawn timber (main product) and sawmill by-products (chips, co-product) were also allocated on the basis of their prices.

Module A3

However, the products manufactured in the plant are not related co-productions. Thus, according to /EN 16485/, data that are only available for total production are allocated to the products on the basis of production quantity (mass).
The credits obtained from the disposal of waste generated in production are credited on the basis of a system extension.
Generated heat and generated electricity are credited to the system through substitution processes, assuming that the thermal energy would be generated from natural gas and that the substituted electricity would correspond to the German electricity mix. The credits achieved here are well below 1% of total expenditure.

Module D

The potential benefits from the substitution of fossil fuels in the course of energy generation in the case of thermal recovery of the product packaging, as well as the product at the end of its life cycle, are balanced in Module D where a system extension under the assumptions described above is applied for the calculation of the substitutions.

3.9 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.

All background data were taken from the /GaBi Professional Database 2019 Edition/ or were taken from literature references..

4. LCA: Scenarios and additional technical information

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

Transport zu Baustelle (A4)

Name	Value	Unit
Litres of fuel	-	l/100km
Transport distance	-	km
Capacity utilisation (including empty runs)	-	%
Gross density of products transported	-	kg/m³
Capacity utilisation volume factor	-	-

Installation in buildings (A5)

The information in Module A5 refers exclusively to the disposal of packaging materials. No information is given on the installation of the product. The quantities of packaging material that accumulate in Module A5 per declared unit and are fed into a thermal waste treatment system, as well as further information on the scenario, and are listed in the following table.

Name	Value	Unit
Solid wood (wood moisture = 40%) as packaging material for thermal waste treatment	2.94	kg
PE film as packaging material for thermal waste treatment	0.87	kg
Paper as packaging material for thermal waste treatment	0.01	kg
Biogenic carbon contained in the solid wood part of the packaging	1.05	kg
Overall efficiency of thermal waste utilisation	38-44	%
Total electrical energy exported	3.2	kWh
Total thermal energy exported	23.9	MJ

Nutzung (B1) siehe Kap. 2.12 Nutzung

Name	Value	Unit

Instandhaltung (B2)

Name	Value	Unit
Information on maintenance	-	-
Maintenance cycle	-	Number/ RSL
Water consumption	-	m³
Auxiliary	-	kg
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Material loss	-	kg

Reparatur (B3)

Name	Value	Unit
Information on the repair process	-	-
Information on the inspection process	-	-
Repair cycle	-	Number/ RSL

Water consumption	-	m^3
Auxiliary	-	kg
Other resources	-	kg
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Material loss	-	kg

Erstatz (B4)/Umbau/Erneuerung (B5)

Name	Value	Unit
Replacement cycle	-	Number/ RSL
Electricity consumption	-	kWh
Litres of fuel	-	l/100km
Replacement of worn parts	-	kg

Referenz Nutzungsdauer

Name	Value	Unit
Reference service life (nach ISO 15686-1, -2, -7 und -8)	-	a
Life Span (nach BBSR)	-	a
Life Span (nach BBSR)	-	a
Declared product properties (at the gate) and finishes	-	-
Design application parameters (if instructed by the manufacturer), including the references to the appropriate practices and application codes	-	-
An assumed quality of work, when installed in accordance with the manufacturer's instructions	-	-
Outdoor environment, (for outdoor applications), e.g. weathering, pollutants, UV and wind exposure, building orientation, shading, temperature	-	-
Indoor environment (for indoor applications), e.g. temperature, moisture, chemical exposure	-	-
Usage conditions, e.g. frequency of use, mechanical exposure	-	-
Maintenance e.g. required frequency, type and quality and replacement of components	-	-

Betriebliche Energie (B6) und Wassereinsatz (B7)

Name	Value	Unit
Water consumption	-	m^3
Electricity consumption	-	kWh
Other energy carriers	-	MJ
Equipment output	-	kW

End of the life cycle (C1-C4)

A redistribution transport distance of 20 km is assumed in Module C2.

Name	Value	Unit
For energy recovery (waste wood)	51.7	kg

For the scenario of thermal recovery as secondary fuel, a collection rate of 100% without losses due to potential shredding of the material is assumed.

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

Name	Value	Unit
Generated electricity (per t atro waste wood)	968.37	kWh
Heat generated (per t atro waste wood)	7053.19	MJ
Electricity generated (per net flow of the declared unit)	40.2	kWh
Waste heat generated (per net flow of the declared unit)	286.7	MJ

The product is recycled in the form of waste wood in the same composition as the declared unit described at the end of its life cycle. Thermal recovery in a biomass power plant with an overall efficiency of 54.69% and an electrical efficiency of 18.09% is assumed. The combustion of 1 t of atro wood (mass in atro (atro = absolutely dry), however efficiency takes into account ~ 18% wood moisture content), generates about 968.37 kWh of electricity and 7053.19 MJ of usable heat. Converted to the net flow of the atro wood content entering Module D and taking into account the adhesive content in the waste wood, 40.2 kWh of electricity and 286.7 MJ of thermal energy are produced in Module D per declared unit.
The exported energy substitutes fuels from fossil sources, assuming that the thermal energy was generated from natural gas and that the substituted electricity corresponded to the German electricity mix.

5. LCA: Results

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	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 m³ STEICOflex F

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
GWP	[kg CO_2-Eq.]	-7.90E+1	7.92E-1	1.71E+1	6.14E+0	1.51E-1	8.51E+1	-3.27E+1
ODP	[kg CFC11-Eq.]	7.76E-11	1.33E-16	2.10E-13	2.44E-15	2.53E-17	1.40E-16	-1.00E-12
AP	[kg SO_2-Eq.]	1.19E-2	3.34E-3	2.64E-2	1.18E-3	6.38E-4	3.74E-3	-3.93E-2
EP	[kg $(PO_4)^{3-}$-Eq.]	1.99E-3	8.51E-4	4.81E-3	1.87E-4	1.62E-4	8.09E-4	-6.45E-3
POCP	[kg ethene-Eq.]	2.27E-3	-1.38E-3	2.64E-3	5.27E-5	-2.63E-4	3.67E-4	-3.52E-3
ADPE	[kg Sb-Eq.]	1.43E-6	6.19E-8	7.19E-6	2.15E-7	1.18E-8	3.89E-8	-9.82E-6
ADPF	[MJ]	1.66E+2	1.09E+1	3.62E+2	2.00E+0	2.08E+0	5.50E+0	-5.54E+2

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 - RESOURCE USE according to EN 15804+A1: 1 m³ STEICOflex F

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
PERE	[MJ]	5.24E+0	6.34E-1	1.01E+2	4.33E-1	1.21E-1	3.36E-1	-1.66E+2
PERM	[MJ]	8.90E+2	0.00E+0	4.05E+1	-4.05E+1	0.00E+0	-8.90E+2	0.00E+0
PERT	[MJ]	8.95E+2	6.34E-1	1.42E+2	-4.01E+1	1.21E-1	-8.90E+2	-1.66E+2
PENRE	[MJ]	9.02E+0	1.09E+1	5.60E+2	2.22E+0	2.08E+0	5.51E+0	-6.27E+2
PENRM	[MJ]	1.61E+2	0.00E+0	3.14E+1	-3.14E+1	0.00E+0	-1.61E+2	0.00E+0
PENRT	[MJ]	1.70E+2	1.09E+1	5.91E+2	-2.92E+1	2.08E+0	-1.56E+2	-6.27E+2
SM	[kg]	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	2.58E+2	0.00E+0	0.00E+0	0.00E+0	8.90E+2
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.61E+2
FW	[m³]	7.02E-2	1.07E-3	3.82E-1	1.83E-2	2.04E-4	3.85E-4	8.99E-2

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 – OUTPUT FLOWS AND WASTE CATEGORIES according to EN 15804+A1: 1 m³ STEICOflex F

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
HWD	[kg]	5.31E-7	6.10E-7	1.18E-6	9.78E-9	1.16E-7	3.14E-7	-3.40E-7
NHWD	[kg]	3.17E-2	8.88E-4	3.48E-1	2.48E-1	1.69E-4	3.70E-4	1.15E+0
RWD	[kg]	1.58E-3	1.48E-5	8.67E-2	8.55E-5	2.83E-6	6.55E-6	-2.88E-2
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	5.17E+1	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	1.14E+1	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	2.40E+1	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

6. LCA: Interpretation

The focus of the results interpretation is on the production phase (Modules A1 to A3), as this is based on concrete information provided by the company. The interpretation is based on a dominance analysis of the environmental impacts (GWP, ODP, AP, EP, POCP, ADPE, ADPF) and the renewable/non-renewable primary energy inputs (PERE, PENRE).

The most important factors for the respective categories are therefore listed below.

6.1 Greenhouse gas potential (GWP)

With regard to the GWP, wood-inherent CO2 product system inputs and outputs deserve separate consideration. In total, about 88.5 kg CO2 enters the

system in the form of carbon stored in the biomass. About 3.8 kg of CO2 of this, which is bound in the form of packaging materials, enters Module A3 and are further emitted in Module A5.

The amount of carbon ultimately stored in the wood fibre insulation material - around 84.7 kg of CO2 - is extracted from the system again when it is recycled in the form of waste wood.

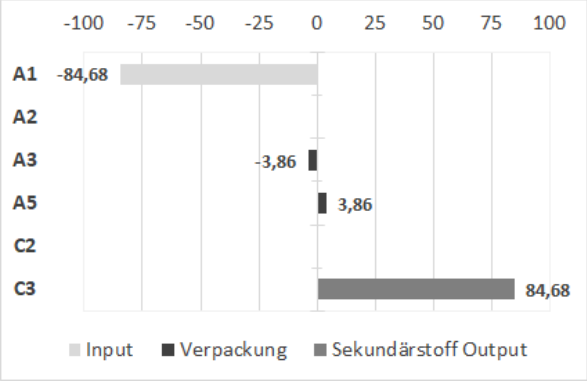


Fig. 2: Wood-immanent CO2 product system inputs and outputs. The inverse pre-characterisation of the inputs and outputs takes into account the ecological balance assessment of CO2 flow from the point of view of the atmosphere.

20% of the greenhouse gases are generated by the provision of raw materials (entire Module A1), 3% by the transport of raw materials (entire Module A2) and 77% by the production process of the wood fibre insulation material (entire Module A3).
In detail, the heat generation in the plant as part of Module A3 with 61% and the provision of the used additives as part of Module A1 with 17% of the fossil greenhouse gas emissions, are significant influencing factors.

6.2 Ozone Depletion Potential (ODP)
75% of the emissions with ozone depletion potential result from the provision of the wood raw material for the product (Module A1). The heat supply contributes 24% of the total ODP (Module A3).

6.3 Acidification Potential (AP)
The main sources of emissions contributing to the acidification potential are heat generation in the production process at 35% (Module A3) and operating materials and packaging at 20% (also Module A3).

6.4 Eutrophication Potential (EP)
12% of the total EP generated is due to the provision of the wood raw material and a further 11% to the provision of additives (both Module A1). Heat generation for the manufacturing process contributes 38% of the EP (Module A3). A further 21% is due to the provision of packaging and operating materials (Module A3).

6.5 Photochemical Ozone Creation Potential (POCP)
The main POCP contribution, at 42%, comes from heat generation in the manufacturing process (Module A3). The provision of additives (Module A1) accounts for a further 38% of the total POCP. The negative POCP values in Module A2 and Module C2 are due to the negative characterization factor for nitrogen monoxide emissions of the standard-compliant /CML-IA 2013/, in combination with the used truck transport process of the /GaBi Professional Database/.

6.6 Abiotic Depletion Potential non-fossil resources (ADPE)
The main contributions to the ADPE are made up of 46% from the operating resources used and the provision of packaging (Module A3), 23% from electricity consumption and 15% from heat generation in the manufacturing process (both Module A3). In addition, the provision of additives for the product accounts for 16% of the total ADPE (Module A1).

6.7 Abiotic Depletion Potential fossil fuels (ADPF)
Heat generation in the production process accounts for 50% of the total ADPF and electricity consumption in the production process accounts for 4% of the total ADPF (both Module A3). Packaging and operating materials (also Module A3) account for 14%. A further 29% is attributable to the provision of additives for the product (Module A1).

6.8 Renewable primary energy as energy source (PERE)
A large part of the total input is attributable to the operating and packaging materials used (51%) and to the consumption of electricity at the plant (39%) (both Module A3). The provision of additives accounts for 5% of the PERE indicator (Module A1).

6.9 Non-renewable primary energy as energy source (PENRE)
The PENRE input is distributed among the provision of product additives at 21% (Module A1), as well as heat generation at 36% and electricity consumption at 30% (both Module A3). A further 11% of the total consumption is attributable to the operating and packaging materials used (also Module A3).

7. Requisite evidence

7.1 Formaldehyde
STEICO wood fibre insulating materials using the dry process are produced without adhesives containing formaldehyde. The formaldehyde emissions correspond to those of natural wood.

7.2 MDI
No binders containing isocyanate are used in the production of STEICOflex F.

7.3 Testing for pre-treatment of the input materials
No waste wood is used as a material input for the production of STEICO wood fibre insulating materials. Only untreated fresh wood (softwood) is used.

7.4 VOC Emissions
VOC certificates are available for STEICO flex F wood fibre insulation boards. The measurements were

carried out at the MPA Eberswalde (/PB 31/16/2665/08/).

AgBB result overview (28 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	230	µg/m³
Sum SVOC (C16 - C22)	<0.005	µg/m³
R (dimensionless)	1	-
VOC without NIK	<0.005	µg/m³
Carcinogens	<1	µg/m³

AgBB result overview (7 days [µg/m³])

Name	Value	Unit
TVOC (C6 - C16)	430	µg/m³
Sum SVOC (C16 - C22)	<0,005	µg/m³
R (dimensionless)	2.1	-
VOC without NIK	<0,005	µg/m³
Carcinogens	<1	µg/m³

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