ENVIRONMENTAL PRODUCT DECLARATION

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

Owner of the Declaration	GUTEX Holzfaserplattenwerk H. Henselmann GmbH + Co KG
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-GTX-20180071-IBA1-EN
Issue date	28.06.2018
Valid to	27.08.2023

Flexible woodfibre cavity insulation
GUTEX Thermoflex

Institut Bauen und Umwelt e.V.

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1. General Information

GUTEX Holzfaserplattenwerk	GUTEX Thermoflex
Programme holder IBU – Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany	**Owner of the declaration** GUTEX Holzfaserplattenwerk H. Henselmann GmbH + CoKG Gutenburg 5 79761 Waldshut-Tiengen Germany
Declaration number EPD-GTX-20180071-IBA1-EN	**Declared product / declared unit** 1 m³ wood fibre insulation board
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 is valid for GUTEX Thermoflex wood fibre insulation boards produced in the Gutenburg plant (see manufacturer's address).
Issue date 28.06.2018	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 27.08.2023	The EPD was created according to the specifications of *EN 15804+A1*. In the following, the standard will be simplified as *EN 15804*.
Prof. Dr.-Ing. Horst J. Bossenmayer (chairman of Institut Bauen und Umwelt e.V.)	**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 (Managing Director Institut Bauen und Umwelt e.V.))	Patricia Wolf (Independent verifier)

2. Product

2.1 Information about the enterprise

The ecological wood fiber insulation materials from GUTEX are used both in new buildings and in the renovation of old buildings. The insulation boards as well as the wood fiber blown insulation cover all areas of application throughout the house

2.2 Product description/Product definition

GUTEX Thermoflex are flexible, single-layer wood fibre insulation boards which are manufactured in a dry process in accordance with /DIN EN 13171/ with the addition of bi-component fibres. The thickness range of these insulating products is 30-240 mm; the material gross density is approx. 50 kg/m³.

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 /DIN EN 13171/ (Thermal insulation products for buildings – Factory-made wood fibre (WF) products), and the corresponding CE marking. Use is governed by the respective national regulations.

2.3 Application

Flexible GUTEX Thermoflex wood fibre insulation boards are used as cavity insulation between rafters, ceiling beams, wall struts or similar timber frame constructions, whereby the areas of application in accordance with /DIN 4108-10/ must be taken into consideration.

2.4 Technical Data

The technical construction data outlined below applies for GUTEX Thermoflex insulating boards as delivered from the factory. More extensive data can be taken from the technical data sheet at www.gutex.de (download section).

Technical construction data

Name	Value	Unit
Gross density to /DIN EN 1602/	approx. 50	kg/m³
Material dampness at delivery nach /DIN EN 13171/	ca. 6,5	%
Tensile strength rectangular nach /EN 13171/	0.001	N/mm²
Thermal conductivity (Nennwert) nach /DIN EN 13171/	0.036	W/(mK)
Water vapour diffusion resistance factor nach /EN 12086/	2	-
Formaldehyde emissions acc. to EN 717-1	-	µg/m³
Reaction to fire to /DIN EN 13501/	E	

nach /DIN EN 13501/		
Specific thermal capacity	2100	J/(kgK)
Flow resistance to /EN 29053/ nach /EN 29053/	5	kPa*s/m²

The product's performance values correspond with the Declaration of Performance in terms of its essential properties in accordance with /DIN EN 13171/.

2.5 Delivery status
GUTEX Thermoflex insulating boards are offered as follows:

Thickness range: 40 - 240 mm
Format: 575 x 1350 mm

Special formats on request. The exact package sizes are indicated in the current price list or data sheet (www.gutex.de).

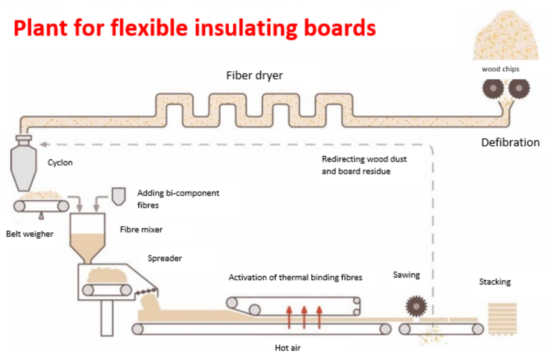
2.6 Base materials/Ancillary materials
Apart from dried wood fibres (regional coniferous wood from sustainable forestry), GUTEX Thermoflex with a gross density of approx. 50 kg/m³ in accordance with /DIN EN 1602/ comprises the following aggregates:

approx. 82.5% regional coniferous wood
approx. 6.5% water
approx. 5.0% textile binding fibres
approx. 6.0% ammonium salts

Substances on the /ECHA List of Candidates/ for including substances of very high concern in Annex XIV of the /REACH Directive/ (last revised: 15.01.2018) are not included.

2.7 Manufacture

Fig.1: Schematic layout of the GUTEX Thermoflex manufacturing process



Schematic repesentation of the Gutex Thermoflex manufactuing process.

- Raw timber is crushed as wood chips.
- The wood chips are softened by adding moisture and heat and then defibred.
- The fibres are dried during further transport, dust particles are segregated and bi-component fibres added.
- The fibre mixture is spread as a mat for the requisite material strength.
- The binding fibres are activated in a thermal process giving rise to a flexible, cohesive mat structure.
- The mat thus produced is then cut to size, packed and transported to the warehouse.

Both internal and external quality monitoring are performed for the production of GUTEX Thermoflex insulating boards (/DIN EN ISO 9001/ and CE marking in accordance with /DIN EN 13171/ with voluntary KEYMARK certification).

2.8 Environment and health during manufacturing
Health protection during the manufacturing process: Owing to the manufacturing conditions, no special statutory or regulatory measures are required as regards health protection. The statutory limit values are fallen short of.
Environmental protection during the manufacturing process:
Used air: Emissions are significantly lower than the limit values specified by the immission protection approval.
Waste water: The production process does not involve waste water.
Noise: Measured values are below the permissible values of the immission protection approval thanks to sound protection measures.
The location is certified to /DIN EN ISO 14001:2015/ and /EMAS III/.

2.9 Product processing/Installation
An electric all-purpose saw or a jigsaw or similar with a serrated edge is recommended for processing GUTEX Thermoflex.
More detailed processing information is available at www.gutex.de.

2.10 Packaging
Finished units are wrapped in PE foil on disposable wooden pallets. The packaging materials used can be directed to regular recycling.

2.11 Condition of use
When used as designated, no material product changes are to be anticipated during the use phase.

2.12 Environment and health during use
When used as designated, no impacts on the environment or health are to be anticipated during the period in which GUTEX Thermoflex is used.

2.13 Reference service life
When installed correctly, the product service life for GUTEX Thermoflex is in the range of the service life of the building. A conservative estimate of the reference service life can be assumed as approx. 50 years for central European climate conditions.

When used in accordance with the rules of technology, including consideration of /DIN 4108-10/, there is no essential influence on product ageing.

2.14 Extraordinary effects

Fire
The GUTEX Thermoflex insulating product can be allocated to European building material class E in accordance with /DIN EN 13501-1/.

Fire protection

Name	Value
Building material class nach /DIN EN 13501-1/	E

Water
On intensive exposure to water (outside the designated area of application), the product does not leach any components which are hazardous to water.

Mechanical destruction
Unforeseen mechanical destruction does not result in any negative impacts on the environment.

2.15 Re-use phase
GUTEX Thermoflex products can be reused for the same application as cavity insulation if they remain undamaged after deconstruction.
Insofar as the product is not contaminated, the material can be reused by returning it to the production process.

2.16 Disposal
Segregated insulation materials (waste material) and deconstructed materials can be redirected to the production process. Energetic recycling in a waste incineration plant or a biomass thermal power station is also possible. During energetic recycling, the requirements outlined in the /Federal Immission Control Act (BImSchG)/ must be maintained. In accordance with Annex III of the /Waste Wood Act (AltholzV)/ dated 15.02.2002, GUTEX Thermoflex is allocated to waste wood class 2 under waste code keys 17 02 01 or 03 01 05 of the /AVV/.
Segregated packaging material can be directed to recycling or also recycled thermally.

2.17 Further information
More information on GUTEX Thermoflex and other GUTEX wood fibre insulating boards is available on the manufacturer's website at www.gutex.de.

3. LCA: Calculation rules

3.1 Declared Unit
The declared unit in the LCA is the provision of 1 m³ Gutex Thermoflex with a density of 50 kg/m³, 7.83% wood moisture, 6.5% water content and 10.5% additives. All details on additives used were calculated on the basis of specific data.

Declared Unit

Name	Value	Unit
Declared unit	1	m³
Gross density	50	kg/m³
Conversion factor to 1 kg (kg/m³)	50	-
Water content in relation to overall mass	6,5	%
Additives in relation to overall mass	10,5	%

3.2 System boundary
The Declaration complies with an EPD "from cradle to 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), disposal of product packaging in Module A5, and parts of the end-of-life stage (Modules C2 to C4). It also contains an analysis of the potential benefits and loads over and beyond the product's entire life cycle (Module D).
The provision of wood as a raw material in the form of wood chips from forestry and the provision of additives are analysed in Module A1. Transport of these substances is considered in Module A2. Module A3 comprises the provision of fuels, resources and electricity as well as the production processes on site. These are essentially defibring, fibre drying, compressing and cutting to size as well as packing the products.
Module A5 exclusively concerns the disposal of packaging materials.
Module C2 considers transport to the disposal company and Module C3 is concerned with preparing and sorting waste wood.
In accordance with /EN 16485/, Module C3 also includes as outflows the CO2 equivalents of the carbon inherent in the product and packaging as well as the renewable and non-renewable primary energy (PERM and PENRM) contained in the product and its packaging. The loads and potentials arising from thermal recycling of the product at its end of life and the potential benefits by substituting fossil fuels in the course of generating energy during thermal recycling of the product packaging are analysed in Module D.

3.3 Estimates and assumptions
All of the material and energy flows for the processes required by production were established using questionnaires. Estimates were not necessary.
The basis for the calculated application of fresh water resources is depicted by blue water consumption.

3.4 Cut-off criteria
No known material or energy flows were ignored, including those which fell below the limit of 1%. Accordingly, the total sum of input flows ignored is certainly less than 5% of the energy and mass applied. This also safeguards against the possibility of any material or energy flows being ignored which display a particular potential for significant influences in terms of environmental indicators.

3.5 Background data
Most of the background data was taken from version 6.115 of the /GaBi professional data base/.
The remaining background data is based on scientific literary sources and is documented in /S. Rüter, S. Diederichs: 2012/.

3.6 Data quality
Validation of the primary data required for 2017 was on the basis of mass and in accordance with plausibility criteria as well as by means of a plant inspection. With the exception of forest wood, the background data used for wood materials for energy purposes originates from 2008 to 2012. The provision of forest wood was taken from a 2008 publication which is essentially based on information from 1994 to 1997. All other information was taken from version 6.115 of the /GaBi

professional data base/ and is not more than 5 years old. Considering the topicality of the primary data used as well as the use of the GaBi Professional database and exclusively scientific literature for background data used, the data quality can generally be regarded as good.

3.7 Period under review

The data acquired for the primary system refers to 2017. All information, therefore, is based on averaged data for 12 consecutive months.

3.8 Allocation

The allocations performed correspond with the requirements of /EN 15804:2012/ and /EN 16485:2014/ and primarily occur in Module A1 in the provision of wood chips.
The properties inherent to the material (biogenic carbon and primary energy contained therein) are allocated in accordance with the physical criterion of mass.
The products manufactured in the plant do not involve combined co-productions. Accordingly, as per /EN 16485:2014/, data solely available for production as a whole is allocated to the products on the basis of the respective production volume (mass).
The processes in the upstream forest chain involve combined co-productions of the logs (primary product) and industrial wood (co-product) products. The corresponding expenses associated with this upstream chain were allocated on the basis of the prices for logs and industrial wood.
Using the same grounds, the expenses associated with sawn timber (primary product) and sawmill by-products (wood chips, co-product) applied in the upstream sawmill chain were also allocated on the basis of their prices.

The credits achieved by the disposal of production waste are offset on the basis of a system extension. Heat and electricity generated are credited to the system by means of substitution processes, whereby it is alleged that the thermal energy is generated from natural gas and the substituted electricity complies with the German power mix for 2017. The credits achieved here account for significantly less than 1% of overall expenses.
The potential benefits through substitution of fossil fuels in the course of generating energy through thermal recycling of product packaging as well as the product at its end of life are analysed in Module D, whereby a system extension under the assumptions outlined above is applied for calculating 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.

The LCA was conducted using the /Gabi ts 2017/ software. Version 6.115 of the /Gabi professional data base/ was applied as the background report..

4. LCA: Scenarios and additional technical information

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

Construction installation process (A5)

The information in Module A5 exclusively refers to the disposal of packaging materials. No information is provided on installation of the product. The volumes of packaging material 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 table below.

Name	Value	Unit
Solid wood (wood moisture = 20%) from packaging material for thermal waste processing	4,91	kg
PE foil from packaging material for thermal waste processing	0,96	kg
Paper from packaging material for thermal waste processing	0,0062	kg
Biogenic carbon contained in solid timber packagingackung	7,49	kg CO2-Äqv.

A lower calorific value of 18 MJ/kg and an overall efficiency of thermal waste processing accounting for 38% for solid wood from the product packaging in a waste incineration plant are assumed /GaBi Professional database/. The plastic content of 36 MJ/kg and overall efficiency of thermal waste processing accounting for 44% are taken into consideration /GaBi Professional database/. In total, 33.54 MJ thermal and 13.85 MJ electrical energy is generated by thermal waste processing of the product packaging which is then integrated as exported energy in the calculations for substitution potentials in Module D.

End of life (C1-C4)

A redistribution transport distance of 20 km is assumed in Module C2. R1 > 0.6 is assumed for energy recovery by Thermoflex in C3.

Name	Value	Unit
Waste wood for energy recovery	50	kg

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

Name	Value	Unit
Electricity generated (per tonne of bone-dry waste wood)	968,37	kWh
Waste heat used (per tonne of bone-dry waste wood)	7053,19	MJ

The product is recycled in the form of waste wood in the same composition as the declared unit at the end-of-life stage. Thermal recovery in a biomass power station with an overall degree of efficiency of 54.69%

and electrical efficiency of 18.09% is assumed, whereby incineration of 1 tonne wood (bone dry) generates approx. 968.37 kWh electricity and 7053.19 MJ useful heat. Approx. 18% wood moisture is considered in this degree of efficiency. The exported energy substitutes fuels from fossil sources, whereby it is alleged that the thermal energy is generated from natural gas and the substituted electricity complies with the German power mix for 2017.

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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 Gutex Thermoflex

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
GWP	[kg CO_2-Eq.]	-6.75E+1	3.14E-1	2.93E+1	1.00E+1	4.58E-2	8.07E+1	-4.26E+1
ODP	[kg CFC11-Eq.]	2.89E-11	1.62E-13	1.47E-11	7.15E-13	2.36E-14	1.75E-11	-1.13E-10
AP	[kg SO_2-Eq.]	2.13E-2	1.32E-3	2.79E-2	1.29E-3	1.93E-4	6.90E-3	-5.31E-2
EP	[kg $(PO_4)^{3-}$-Eq.]	3.73E-3	3.30E-4	4.11E-3	2.04E-4	4.82E-5	1.10E-3	-8.22E-3
POCP	[kg ethene-Eq.]	1.80E-3	-5.39E-4	4.84E-3	7.10E-5	-7.87E-5	4.78E-4	-5.57E-3
ADPE	[kg Sb-Eq.]	2.63E-6	1.94E-8	7.13E-6	2.58E-7	2.84E-9	2.34E-6	-1.51E-5
ADPF	[MJ]	2.26E+2	4.39E+0	6.22E+2	2.31E+0	6.41E-1	4.52E+1	-6.96E+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 - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A1: 1 m³ Gutex Thermoflex

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
PERE	[MJ]	1.02E+1	2.08E-1	5.47E+1	7.94E+1	3.04E-2	2.54E+1	6.32E+2
PERM	[MJ]	8.00E+2	0.00E+0	7.89E+1	-7.89E+1	0.00E+0	-8.00E+2	0.00E+0
PERT	[MJ]	8.10E+2	2.08E-1	1.34E+2	4.53E-1	3.04E-2	-7.74E+2	6.32E+2
PENRE	[MJ]	1.81E+2	4.40E+0	6.28E+2	3.72E+1	6.43E-1	5.88E+1	-7.34E+2
PENRM	[MJ]	5.25E+1	0.00E+0	3.46E+1	-3.46E+1	0.00E+0	-5.25E+1	0.00E+0
PENRT	[MJ]	2.34E+2	4.40E+0	6.63E+2	2.58E+0	6.43E-1	6.34E+0	-7.34E+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	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.00E+2
NRSF	[MJ]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	5.25E+1
FW	[m³]	7.36E-2	4.09E-4	2.10E-1	2.39E-2	5.97E-5	1.72E-2	9.75E-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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A1: 1 m³ Gutex Thermoflex

Parameter	Unit	A1	A2	A3	A5	C2	C3	D
HWD	[kg]	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NHWD	[kg]	0.00E+0	0.00E+0	1.92E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0
RWD	[kg]	2.95E-3	6.02E-6	2.14E-3	1.07E-4	8.79E-7	5.41E-3	-3.57E-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	5.00E+1	0.00E+0
EEE	[MJ]	0.00E+0	0.00E+0	0.00E+0	1.39E+1	0.00E+0	0.00E+0	0.00E+0
EET	[MJ]	0.00E+0	0.00E+0	0.00E+0	3.35E+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 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/non-renewable primary energy (PERE, PENRE). Accordingly, the most important factors for the respective categories are listed below.

6.1 Global Warming Potential (GWP)

When considering the GWP, the CO2 product system inputs and outputs inherent in wood require separate analysis. A total of approx. 83 kg CO2 enter the system in the form of carbon stored in the biomass. Around 7 kg of this CO2 bound in the form of the packaging material are included in Module A3 and emitted again in Module A5.
Accounting for approx. 76 kg CO2 equiv., the volume of carbon ultimately stored in the wood fibre insulating board is extracted from the system again when recycled in the form of waste wood.

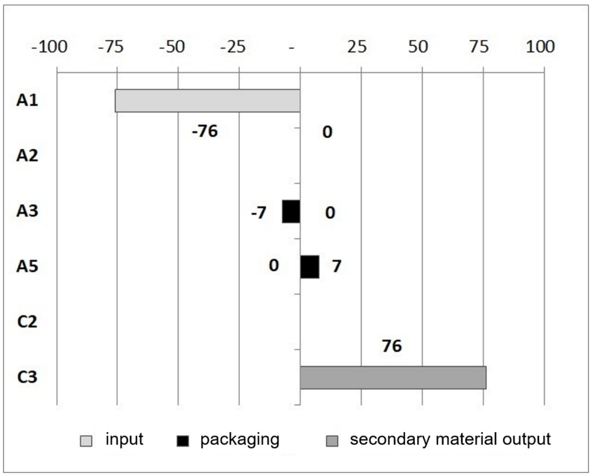

Fig. 2 CO2 product system inputs and outputs inherent in wood [kg CO2 equiv.]. The inverse indication suggested by inputs and outputs is in line with the LCO CO2 flow analysis in terms of the atmosphere.

19% of the analysed fossil greenhouse gases are accounted for by the provision of raw materials (entire Module A1), 1% by transporting the raw materials (entire Module A2), and 81% by the manufacturing process for cross-laminated timber (entire Module A3). Heat generation in the plant as part of Module A3 represents 67% and the provision of additives used as part of Module A1 accounts for 14% of fossil greenhouse gases, making them essential influential factors.

6.2 Ozone Depletion Potential (ODP)

61% of emissions with an ozone depletion potential are incurred by the provision of additives while only 5% of emissions are attributable to the provision of wood as a raw material (both Module A1). The consumables and packaging materials used contribute 31% to total ODP (Module A3).

6.3 Acidification Potential (AP)

Essentially, heat generation during the manufacturing process accounting for 40% (Module A3) and the provision of wood and additives, each accounting for 21% (both Module A1), represent the key sources for emissions contributing to the acidification potential.

6.4 Eutrophierungspotential (EP)

31% of the entire EP is attributable to the incinerating processes in the upstream chains for the provision of wood as a raw material and a further 15% is accounted for by the provision of additives (both Module A1). Heat generation for the manufacturing process contributes 38% to the EP (Module A3), while a further 8% is accounted for by the provision of product packaging (Module A3).

6.5 Photochemical Ozone Creation Potential (POCP)

60% of primary POCP contributions are attributable to heat generation during the manufacturing process (Module A3). The provision of additives (Module A1) accounts for another 30% of overall 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/ truck transport process used.

6.6 Abiotic Depletion Potential non-fossil resources (ADPE)

The essential contributions to ADPE are incurred by the consumables used and provision of packaging (Module A3) accounting for 36% as well as electricity consumption (21%) and heat generation during the manufacturing process (15%) (both Module A3). In addition, the provision of additives for the product accounts for 22% of overall ADPE (Module A1).

6.7 Abiotic Depletion Potential fossil fuels (ADPF)

Heat generation during the manufacturing process accounts for 57% and electricity consumption there accounts for 6% of total ADPF (both Module A3). A further 23% is attributable to the provision of additives for the product (Module A1).

6.8 Renewable primary energy as energy carrier (PERE)

7% of PERE is attributable to the provision of wood and 9% to the provision of additives for the product (both Module A1). But most of the contribution is accounted for by electricity consumption (71%) from hydropower during the manufacturing process and the consumables and packaging materials used (11%) (both Module A3).

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

PENRE is distributed across the provision of product additives (23%) (Module A1) as well as the manufacturing process (57%) for heat generation and (6%) for electricity consumption there (both Module A3). A further 10% of overall consumption is attributable to the consumables and packaging materials used (Module A3).

7. Requisite evidence

7.1 Formaldehyde
Apart from wood as a raw material, no additives emitting formaldehyde are used in the manufacturing process.

7.2 MDI
MDI is not used as a binding agent in the manufacturing process.

7.3 Waste wood
No waste wood is used in the manufacturing process.

7.4 VOC
Details on VOC emissions are not currently specified.

8. References

Institut Bauen und Umwelt e.V., Berlin (pub.): Generation of Environmental Product Declarations (EPDs)

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

/EN 15804/
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