

ENVIRONMENTAL PRODUCT DECLARATION

as per /ISO 14025/ and /EN 15804/




Owner of the Declaration	GUTEX Holzfaserplattenwerk H. Henselmann GmbH + Co KG
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
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Wood Fibre Insulating Boards
GUTEX Holzfaserplattenwerk
H. Henselmann GmbH + Co KG

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



1. General Information

<p>GUTEX Holzfaserplattenwerk</p> <hr/> <p>Programme holder IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany</p> <hr/> <p>Declaration number EPD-GTX-20140222-IBC2-EN</p> <hr/> <p>This Declaration is based on the Product Category Rules: Betonzusatzmittel, 07.2014 (PCR tested and approved by the SVR)</p> <hr/> <p>Issue date 17.02.2015</p> <hr/> <p>Valid to 16.08.2020</p> <hr/> <p></p> <hr/> <p>Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)</p> <hr/> <p></p> <hr/> <p>Dr. Burkhard Lehmann (Managing Director IBU)</p>	<p>Wood Fibre Insulating Boards</p> <hr/> <p>Owner of the Declaration GUTEX Holzfaserplattenwerk H. Henselmann GmbH + Co KG Gutenberg 5 79761 Waldshut-Tiengen</p> <hr/> <p>Declared product / Declared unit This Declaration refers to 1 m³ wood fibre insulating board manufactured in a dry process with an average weighted density of 173 kg/m³. For all other densities, the results can be calculated using the formula indicated in section 5.</p> <hr/> <p>Scope: This Declaration applies for wood fibre insulating board manufactured in a dry process by GUTEX at its location in Waldshut-Tiengen. This document is translated from the German Environmental Product Declaration into English. It is based on the German original version EPD-GTX-20140222-IBC2-DE. The verifier has no influence on the quality of the translation. 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.</p> <hr/> <p>Verification</p> <p>The CEN Norm /EN 15804/ serves as the core PCR</p> <p>Independent verification of the declaration according to /ISO 14025/</p> <p><input type="checkbox"/> internally <input checked="" type="checkbox"/> externally</p> <hr/> <p></p> <hr/> <p>Patricia Wolf (Independent verifier appointed by SVR)</p>
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2. Product

2.1 Product description / Product definition

GUTEX wood fibre insulating boards are board-shaped wood-based materials manufactured from wood fibres in accordance with /DIN EN 13171/. By adding low quantities of PUR resin, insulating boards are manufactured from wood fibres in a dry process. They are then cut online, and profiled and finished where necessary. Water-repellent and non-water-repellent single-layer insulation panels can be manufactured to a thickness of 240 mm.

Directive (EU) No.305/2011 dated 9 March 2011 applies for placing the product on the market in the EU/EFTA (with the exception of Switzerland). The products require a Declaration of Performance taking consideration of the /DIN EN 13171/ ("Thermal insulation products for buildings - Factory-made wood fibre (WF) products - Specification"), and CE marking. The respective national guidelines apply for use; in Germany, these are /DIN 4108-10/ ("Thermal insulation an energy economy in buildings - Part 10: Application-related requirements for thermal insulation materials - Factory-made products"/, /DIN EN 14964/

("Rigid underlays for discontinuous roofing - Definitions and characteristics") and the General Technical Approval: /Z-23.15-1404/ of the Deutsches Institut für Bautechnik, Berlin.

2.2 Application

GUTEX insulating materials can be used in both old and new buildings: as a thermal insulation composite system for the entire building facade, wall insulation for back-ventilated facades, on-roof and/or cavity insulation plus false ceilings, insulating ceilings between floors, interior insulation of external walls, insulation of installation levels and impact sound insulation for floors.

2.3 Technical Data

The following technical (construction) data is of relevance for GUTEX wood fibre insulating boards on delivery.

Technical construction data

Name	Value	Unit
Rohdichte nach /DIN EN 13171/	80 - 250	kg/m ³
Materialfeuchte bei Auslieferung	8	%

Zugfestigkeit rechtwinklig	5 - 30	N/mm ²
Wärmeleitfähigkeit (nominal) to /DIN EN 13171/	0,037 - 0,05	W/(mK)
Wasserdampfdiffusionswiderstandszahl to /DIN EN 13171/	3	-
Reaction to fire as per /DIN EN 13501-1/	E	
Specific thermal capacity	2100	J/(kgK)
Compressive stress at 10% contraction to /DIN EN 13171/	40-200	kPa

2.4 Delivery status

GUTEX insulating boards are supplied in thicknesses of 20 mm to 240 mm. The dimensions of each product can be viewed on www.gutex.de.

2.5 Base materials / Ancillary materials

Name	Value	Unit
Coniferous wood: fir / spruce	ca. 94,5	%
PUR resin	max. 4,0	%
Paraffin	max. 1,5	%

2.6 Manufacture

The manufacturing process is broken down into the following process steps:

1. Delivering the wood chips
2. Defibering the wood chips using the defibrator process
3. Hydrophobing the fibres with paraffin
4. Drying the fibres with PUR resin
5. Glueing the fibres with PUR resin
6. Scattering the fibres on the forming belt to form a mat
7. Curing the mat in the calibration and hardening unit
8. Dividing up, profiling and assembling

The location is certified to /DIN EN ISO 9001:2008/.

2.7 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 employee 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 emissions: 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 14001:2004/and /EMAS III/I/.

2.8 Product processing/Installation

Wood-processing machinery such as conventional portable circular saws and jigsaws are suitable for processing GUTEX wood fibre boards.

Industrial and environmental protection:

The guidelines provided by the professional liability associations must be maintained during processing of wood fibre insulating boards. No environmental pollution is incurred by processing/installing the wood fibre boards. No special measures need to be taken to protect the environment.

2.9 Packaging

Disposable pallets made of wood, cardboard, PE straps and PE stretch foil are used for packaging and can be directed to the recycling process.

2.10 Condition of use

The contents comply with those of the base material composition in section 2.5.

2.11 Environment and health during use

No environmental pollution or damage to health can be anticipated if GUTEX wood fibre boards are used as designated. The insulating board components are not referred to in the list of candidates in Annex IV of the /REACH/ Directive. Pollutants of health relevance are not emitted by the boards.

2.12 Reference service life

When used as designated, the useful life of GUTEX insulating boards complies with at least the useful life of the respective building. No Reference Service Life is declared on account of the multiple application possibilities.

2.13 Extraordinary effects

Fire

All of the insulating boards listed comply with Euro class E in accordance with /DIN EN 13501-1/. The same combustion gases arise as when burning fir and/or spruce wood.

Fire protection

Name	Value
Baustoffklasse	E

Water

No ingredients are washed out which could be hazardous to water.

Mechanical destruction

GUTEX insulating boards can be damaged when exposed to too high mechanical stresses (pressure and traction). The boards display an inconsistent appearance when fractured or damaged.

No damage is incurred for the environment even when subject to unforeseen destruction.

2.14 Re-use phase

Provided they are untreated and undamaged, GUTEX wood fibre boards can be easily segregated and re-used for the same application when converting or completing the usage phase of a building.

GUTEX wood fibre boards can be recycled in the plant provided that they have not been contaminated.

2.15 Disposal

Owing to the high calorific value (approx. 18 MJ/kg), energetic utilisation for the generation of process energy and electricity in waste wood incineration plants is recommended.

Waste wood category A2; waste keys in accordance with /AVV/ 170201 or 030105.

2.16 Further information

Further Information: "www.gutex.de".

3. LCA: Calculation rules

3.1 Declared Unit

The unit taken as a basis for the Declaration is one cubic metre (1 m³) wood fibre insulating board with an average weighted density of 173 kg/m³ by production volume (m³/year).

Details on declared unit

Name	Value	Unit
Deklarierte Einheit	1	m ³
Umrechnungsfaktor zu 1 kg	0,0058	-
Massebezug (weighted average value)	173	kg/m ³

3.2 System boundary

EPD type: cradle to gate – with options

This Environmental Product Declaration refers to the product stage (Modules A1-A3, including provision of raw materials, transport, manufacture and packaging materials). Furthermore, an *end-of-life* scenario (Module D) was also calculated: incineration in a biomass power plant with energy recovery. The utilisation of packaging materials is not taken into consideration as Module A5 is not declared.

3.3 Estimates and assumptions

At the EoL, thermal utilisation is assumed with a pallet recycling rate of 100%. Within the framework of this study, no further approximations or estimates of data sets are necessary. Background data sets are available in the GaBi data base (/GaBi 6D/) for all basic materials.

3.4 Cut-off criteria

All operating data, i.e. all of the starting materials used, thermal energy, internal fuel consumption and electricity consumption, all direct production waste as well as all emission measurements available, is taken into consideration in the analysis. Furthermore, data is recorded and taken into consideration for all inputs. Material and energy flows accounting for less than one per cent are also taken into consideration and the cut-off criteria are maintained in accordance with the IBU /PCR, Part A/. It can be assumed that the total of all neglected processes does not exceed 5% in the effective categories. The inclusion of biogenic elements of relevance for the impact categories, e.g. CO₂ in the form of C, is taken into consideration within the framework of this Life Cycle Analysis.

3.5 Background data

All background data used is taken from the /GaBi 6/ software data bases. The data was last revised in 2013. The consistent data sets contained in the GaBi data base are documented in the online GaBi documentation /GaBi 6D/.

3.6 Data quality

The GaBi 6 background data used was last revised in 2013. The quality and representativity of GaBi data as well as the data recorded by GUTEX can be regarded as high.

3.7 Period under review

The data used refers to the production processes of financial year 2013 at the GUTEX wood fibre board plant. The Life Cycle Assessment is modelled for Germany as a reference area.

3.8 Allocation

Allocation of the plant data in the insulating material plant (production energy, raw materials, additives and auxiliaries, waste etc.), which could not be clearly allocated to the specific products on the basis of the processes or via a formula, was based on mass. *Closed-loop* recycling: Redirecting cut-offs, trimmings and waste from sorting insulating material. Leftovers are directed to the shredder where they are combined with fresh wood chips and re-used in the production process.

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.

4. LCA: Scenarios and additional technical information

The scenario calculated includes a recycling rate of 100% for wood fibre insulating boards (optional scenario for EOL), whereby 271.1 kg CO₂ equiv. stored in the wood of the soft fibre board leave the product system in Module C3 (see /DIN EN 16485/). Once the product has achieved *end-of-waste* status, it is assumed that the product is directed to biomass incineration (R1>0.6) which produces thermal energy and electricity. The ensuing effects and credits are declared in Module D. It is assumed that the product has not been treated with chemicals during use; for this reason, biomass incineration was assumed to be suitable. It is assumed that the product can be recycled energetically with a calorific value >18 J/kg after use.

5. LCA: Results

The results of the Life Cycle Assessment for wood fibre insulating boards with a balanced density of 173 kg/m³ are summarised below.

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

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

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: 1 m³ wood fibre insulating board

Parameter	Unit	A1-A3	C3	D
Global warming potential	[kg CO ₂ -Eq.]	-1,64E+2	2,71E+2	-2,26E+2
Depletion potential of the stratospheric ozone layer	[kg CFC11-Eq.]	8,75E-10	IND	-1,56E-8
Acidification potential of land and water	[kg SO ₂ -Eq.]	1,96E-1	IND	-2,35E-1
Eutrophication potential	[kg (PO ₄) ³ -Eq.]	3,16E-2	IND	-1,79E-2
Formation potential of tropospheric ozone photochemical oxidants	[kg ethene-Eq.]	2,81E-2	IND	-6,39E-3
Abiotic depletion potential for non-fossil resources	[kg Sb-Eq.]	1,14E-4	IND	-3,29E-5
Abiotic depletion potential for fossil resources	[MJ]	2,05E+3	IND	-2,50E+3

RESULTS OF THE LCA - RESOURCE USE: 1 m³ wood fibre insulating board

Parameter	Unit	A1-A3	C3	D
Renewable primary energy as energy carrier	[MJ]	3,83E+2	IND	IND
Renewable primary energy resources as material utilization	[MJ]	2,96E+3	-2,96E+3	IND
Total use of renewable primary energy resources	[MJ]	3,34E+3	IND	-5,04E+2
Non-renewable primary energy as energy carrier	[MJ]	1,83E+3	IND	IND
Non-renewable primary energy as material utilization	[MJ]	2,54E+2	-2,54E+2	IND
Total use of non-renewable primary energy resources	[MJ]	2,08E+3	IND	-3,21E+3
Use of secondary material	[kg]	0,00	IND	0,00
Use of renewable secondary fuels	[MJ]	0,00E+0	IND	2,96E+3
Use of non-renewable secondary fuels	[MJ]	0,00E+0	IND	2,54E+2
Use of net fresh water	[m ³]	5,05E-1	IND	-2,53E-1

RESULTS OF THE LCA – OUTPUT FLOWS AND WASTE CATEGORIES:

1 m³ wood fibre insulating board

Parameter	Unit	A1-A3	C3	D
Hazardous waste disposed	[kg]	3,61E-2	IND	-7,22E-1
Non-hazardous waste disposed	[kg]	6,05E-1	IND	3,19E-1
Radioactive waste disposed	[kg]	1,43E-2	IND	-2,84E-1
Components for re-use	[kg]	0,00	IND	IND
Materials for recycling	[kg]	0,00	IND	IND
Materials for energy recovery	[kg]	IND	1,73E+2	IND
Exported electrical energy	[MJ]	IND	IND	IND
Exported thermal energy	[MJ]	IND	IND	IND

As there is a linear connection between the results of the LCA and the density of the wood fibre insulating boards, the following formula can be used for obtaining the results of other densities:

$$P(y) = [P(x)/x] * y$$

P(y): LCA indicator for the wood fibre insulating board to be re-calculated

P(x): Indicator of the declared wood fibre insulating board (e.g. Global Warming Potential (GWP))

x: Density of the declared wood fibre insulating board [kg/m³] (here 173 kg/m³)

y: Density of the wood fibre insulating board to be re-calculated [kg/m³] (e.g. 250 kg/m³)

6. LCA: Interpretation

Life cycle inventory analysis:

The greatest contribution to **total use of non-renewable primary energy (PENRT)** is attributable to production, in particular the generation of thermal energy from natural gas, followed by PUR resin. Electricity consumption does not play a role here as exclusively green electricity is used in production in the GUTEX plant in Waldshut-Tiengen.

The greatest share of **total regenerative primary energy (PERT)** is accounted for by the wood chips used.

Environmental impacts:

The **Global Warming Potential (GWP)** has a particular significance in terms of wood products: by absorbing carbon dioxide during photosynthesis, a negative GWP is achieved during manufacturing of the auxiliaries and product despite CO₂ emissions. The

bound carbon dioxide is not released until thermal utilisation at the End of Life, whereby the credit for energy is so high that the CO₂ emissions display a lower value during combustion. The primary effect of the global warming potential is caused by carbon dioxide.

The **Ozone Depletion Potential (ODP)** in production (A1-A3) is primarily influenced by the positive contribution made by the manufacture of PUR resin and the negative contribution accounted for by the electricity credit for the incineration of production waste.

Where the **Acidification Potential (AP)** is concerned, it is apparent that the emissions arising during

production and contributing towards acidification are primarily accounted for by the generation of thermal energy from natural gas.

In terms of the **Photochemical Ozone Creation Potential (POCP)**, the greatest impacts are accounted for the manufacture of PUR resin and the generation of thermal energy from natural gas.

Elementary abiotic depletion of resources (ADP elementary, ADPE) during production is primarily incurred by the additive PUR resin.

In **Fossil abiotic depletion of resources (ADP fossil, ADPF)** for manufacturing, the generation of thermal energy the provision of PUR resin is the primary cause.

7. Requisite evidence

7.1 Formaldehyde

The following test is representative for all of the products declared.

Measuring agency: eco-Institut GmbH, akkreditiertes Institut für Produktprüfung, Zertifizierung und Qualitätssicherung, Cologne, Germany

Test report, date: /Test report no. 35541-001/ dated 14.05.2012, Thermowall

Result: The test concerning formaldehyde content was performed in accordance with /DIN EN 717-1/. Test chamber air concentration: 12 µg/m³

7.2 MDI

The following test is representative for all of the products declared.

Measuring agency: eco-Institut GmbH, akkreditiertes Institut für Produktprüfung, Zertifizierung und Qualitätssicherung, Cologne, Germany

Test report, date: /Test report no. 35541-001/ dated 14.05.2012, Thermowall

Result: MDI emissions fall below the detection limit

7.3 Pretreatment of substances used

no waste wood is used in the manufacture of GUTEX wood fibre insulating boards.

7.5 VOC emissions

the following test is representative for all of the products declared.

Measuring agency: eco-Institut GmbH, akkreditiertes Institut für Produktprüfung, Zertifizierung und Qualitätssicherung, Cologne, Germany

Test report, date: /Test report no. 35541-001/ dated 14.05.2012, Thermowall

AgBB overview of results (28 days)

Name	Value	Unit
TVOC (C6 - C16)	187	µg/m ³
Summe SVOC (C16 - C22)	*	µg/m ³
R (dimensionslos)	0,46	-
VOC ohne NIK	10	µg/m ³
Kanzerogene	*	µg/m ³

*=not detectable

7.6 Lindane/PCP

No additives containing pesticides are used in the manufacture of GUTEX wood fibre insulating boards.

The following test is representative for all of the products declared.

Measuring agency: eco-Institut GmbH, akkreditiertes Institut für Produktprüfung, Zertifizierung und Qualitätssicherung, Cologne, Germany

Test report, date: /Test report no. 35541-001/ dated 14.05.2012, Thermowall

Result: below the detection limit of 0.1 mg/kg

8. References

Institut Bauen und Umwelt

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

General Principles

for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013/04
www.ibu-epd.de

/ISO 14025/

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

/EN 15804/

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

PCR, Part A

Calculation rules for the Life Cycle Assessment and requirements on the Background Report, version 1.2, 2013

PCR, Part B

Wood-based materials, 07.2014, Institut Bauen und Umwelt e.V., 2014

GaBi 6

PE INTERNATIONAL AG: Software system and data base for comprehensive analysis; copyright, TM Stuttgart, Leinfelden-Echterdingen, 1992-2013 [WP1]

GaBi 6D

GaBi 6 data base documentation: data sets from the data base for comprehensive analysis; copyright, TM Stuttgart, Leinfelden-Echterdingen, 1992-2013, <http://documentation.gabi-software.com/>

AVV

Ordinance governing the European List of Wastes (List of Wastes – AVV) dated 10.10.2001

EMAS III

EMAS Directive (EC) No. 1221/2009 on voluntary participation by organisations in a common system for environmental management and audit scheme (ABI. EC No. L 342, p. 1, dated 22 December 2009)

DIN EN 717-1

DIN EN 717-1, Wood materials; Determining formaldehyde emissions – Part 1: Formaldehyde emissions in accordance with the test chamber method; German version EN 717-1:2004

DIN EN ISO 9001

ISO 9001, Quality Management Systems – Requirements; Version in 3 languages DIN EN ISO 9001:2008

DIN EN 13171

DIN EN 13171, Thermal insulating products for buildings – Factory -made wood fibre (WF) products – Specification; German version DIN EN 13171:2012

DIN EN 13501-1

DIN EN 13501-1:2010, Classification of construction products and methods by reaction to fire – Part 1: Classification with the results of tests on Reaction to Fire by construction products; German version EN 13501-1:2007+A1:2009

DIN EN ISO 14001

ISO 14001, Environmental management systems – Requirements with guidance for use; German and English version, DIN EN ISO 14001:2005-06

DIN EN 16485:2014-07, Round and sawn timber – Environmental Product Declarations – Product

category rules for wood and wood-based products for use in construction; German version EN 16485:2014

Test report no. 35541-001

Test report no. 35541-001 “Laboratory test for GUTEX” dated 14.05.2012; eco-Institut GmbH, akkreditiertes Institut für Produktprüfung, Zertifizierung und Qualitätssicherung, Cologne, Germany

REACH

Directive (EC) No. 1907/2006 of the European Parliament and Council of 18 December 2006 on the Registration, Evaluation, Authorisation of Chemicals (REACH) for establishing a European Chemicals Agency

Z-23.15-1404

Construction Inspection Approval: Z-23.15-1404 issued by the Deutsches Institut für Bautechnik, Berlin

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