Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

SpreeGips Plasterboard Liner

from

Hamburger Containerboard GmbH

Programme:	The International EPD® System, www.environdec.com
Programme operator:	EPD International AB
EPD registration number:	S-P-12187
Publication date:	2024-02-05
Valid until:	2029-02-05

An EPD should provide current information and may be updated if conditions change. The stated validity is therefore subject to the continued registration and publication at www.environdec.com EPD of identical products manufactured at different sites, based on the average results of the product group.

General information

Programme information

Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	info@environdec.com

Accountabilities for PCR, LCA and independent, third-party verification
Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): *PCR 2019:14 Construction products (EN 15804:2012+A2:2019/AC:2021) (1.3.2)*
PCR review was conducted by: The Technical Committee of the International EPD® System. See www.environdec.com/TC for a list of members. Review chair: Claudia A. Peña, University of Concepción, Chile. The review panel may be contacted via the Secretariat www.environdec.com/contact
Life Cycle Assessment (LCA)
LCA accountability: Ashrakat Hamed and Loay Radwan*, GreenDelta GmbH*
Third-party verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via: ☒ EPD verification by individual verifier Third-party verifier: *Elisabet Amat, GREENIZE Projects* Approved by: The International EPD® System
Procedure for follow-up of data during EPD validity involves third party verifier: ☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but registered in different EPD programmes, or not compliant with EN 15804, may not be comparable. For two EPDs to be comparable, they must be based on the same PCR (including the same version number) or be based on fully-aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have equivalent system boundaries and descriptions of data; apply equivalent data quality requirements, methods of data collection, and allocation methods; apply identical cut-off rules and impact assessment methods (including the same version of characterisation factors); have equivalent content declarations; and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

Company information

Owner of the EPD: Hamburger Containerboard GmbH
Contact: Christoph Hauser, Christoph.Hauser@hamburger-containerboard.com
Description of the organisation:
Hamburger Containerboard is a member of the Austrian Prinzhorn Group and offers its partners throughout Europe a full programme of high-quality corrugated case material products, as well as plasterboard liner and paperboard. The company's success is ensured by a high level of product know-how, the latest technology and the constant further development of its employees.

With approximately 2700 employees and with production based in Germany, Austria, Hungary and Turkey, Hamburger Containerboard division produces advanced recycled Containerboard to exceed customer expectation and is the regional market leader in central and eastern Europe.

With a modern approach, a long tradition and a clear goal for the future, Prinzhorn Group stands for sustainability, reliability and passion as main core values.

This EPD comprises the complete product range of the SpreeGips product portfolio produced in 2022 at the sites in Spremberg and Gelsenkirchen.

Product-related or management system-related certifications: ISO 9001, ISO14001, ISO 50001, FSC and ISEGA certification for both production sites.
Name and location of production site(s):

Manufacturing Site 1 Gelsenkirchen: Hamburger Rieger Gelsenkirchen GmbH & Co. KG, Alfred-Zingler-Straße 15, 45881 Gelsenkirchen, Germany

Manufacturing Site 2 Spremberg: Hamburger Rieger GmbH, An der Heide B5, 03130 Spremberg, Germany

Production site in Spremberg, Germany

Product information

Product name: SpreeGips Plasterboard Liner
Product description and application:

The SpreeGips Plasterboard Liners used in the gypsum industry are well known for their excellent runability as well as the uniform, smooth and even surface on the finished plasterboards. The multisite strategy of Hamburger Containerboard, which enables us to offer shorter lead times and ensure a high security of supply, is also highly valued by our customers.

Standard grades like SpreeGips Ivory and Grey for the face and backside of the plasterboard, as well
as Specialties like SpreeGips Green, Pink and Silent-Board for moisture-, fire- and noise protection are produced and covered in this average EPD.

Supported by a continuous investment and growth strategy Hamburger Containerboard are well established as the long-term partner for a growing industry.

This EPD comprises the complete product range of the SpreeGips product portfolio produced in 2022 at the sites in Spremberg and Gelsenkirchen.

Technical specifications of the SpreeGips Plasterboard Liners can be found here:
https://www.hamburger-containerboard.com/products-production/products/
UN CPC code: 37530 Articles of concrete, cement and plaster
Geographical scope:
A1- A3 (production phase): Germany
A4-A5 (transportation to building site and installation phase): Europe
C1-C4, D (end of life phase): Europe

LCA information

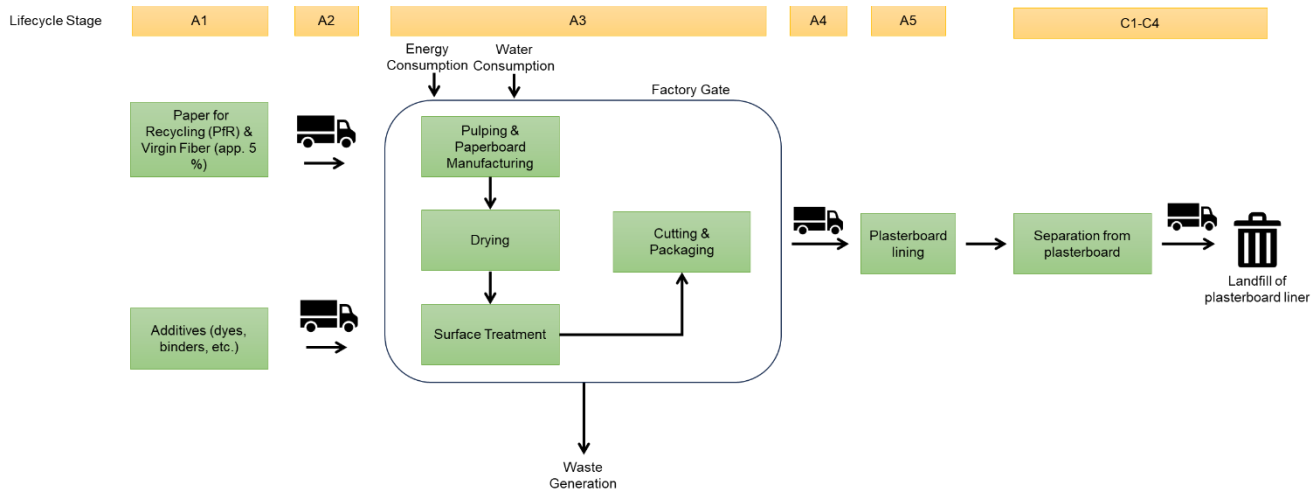
Functional unit / declared unit: 1 tonne of plasterboard liner (mass excluding packaging) (1000 kg)
Reference service life: N/A
Time representativeness: 2022 as the reference year
Database(s) and LCA software used: openLCA version 2.0 and Ecoinvent v3.9 + EN15804 add-on.
Description of system boundaries:
The scope of the EPD is cradle-to-gate (A1-A3) with options (A4-A5), module C1- C4, and module D.

System diagram:

The process starts with the collection of PfR (Paper for Recycling). The PfR is dissolved in pulpers. In the stock preparation the recycled fibres are cleaned, washed and refined. Furthermore virgin fibres (pulp) are added as raw materials in relatively small compared to the PfR. Chemicals like sizing agents are also added to the stock.

With a consistency of approximately 1% the paper fibres are going on the head box of the paper machine, where the pulp is formed into an endless sheet. If a colouring is needed the top layer is body coloured in front of the head box in the desired colour shade. On the forming belts and in the press section the fibres are dewatered and guided into the dry-end of the paper machine.

The dried paper may undergo surface treatment processes to enhance its properties. This includes adding dyes, surface starch, strength additives or other additives to improve the liner's performance in terms of moisture resistance, strength or various other end-product related characteristics. The finished plasterboard liners are cut to the desired reel dimensions. These liners are then packaged and prepared for transport to plasterboard manufacturing facilities.



LCA Practitioner

Ashrakat Hamed and Loay Radwan
radwan@greendelta.com
GreenDelta GmbH
Kaiserdamm 13 | 14057 Berlin, Germany
AG Charlottenburg | HRB 92350 | Geschäftsführer/Managing Director: Dr.-Ing. Andreas Ciroth
GREENDELTA

Modules declared, geographical scope, share of specific data (in GWP-GHG results) and data variation (in GWP-GHG results):

	Product stage			Construction process stage		Use stage							End of life stage				Resource recovery stage
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	**A1**	**A2**	**A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Modules declared	X	X	X	X	X	MND	MND	MND	MND	MND	MND	MND	X	X	X	X	X
Geography	DE	DE	DE	EU	EU	NA	NA	NA	NA	NA	NA	NA	EU	EU	EU	EU	EU
Specific data used	>90%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	15%*			0%	0%	-	-	-	-	-	-	-	-	-	-	-	-

*This is based on the difference between the declared results and the results of each of the included sites in terms of GWP-GHG.

Manufacturing and Packaging (A1-A3):

The environmental impacts considered for the product stage cover the manufacturing of raw materials used in the production as well as packaging materials and other ancillary materials. Transport concerns the delivery of raw materials from the supplier to the gate of the manufacturing plant. Also, fuels used by machines, and handling of waste formed in the production processes at the manufacturing facilities are included in this stage. The study also considers the air emissions, material losses occurring during the manufacturing processes as well as losses during electricity transmission. The following table represent the purchased electricity indicator.

Scenario parameter	Value
Electricity data source and quality	Ecoinvent 3.9.1 – Hamburger Containerboard GmbH Market for electricity, low voltage – DE Ecoinvent 3.9
Electricity kg CO2e / kWh	0.265
District heating data source and quality	steam production, as energy carrier, in chemical industry – Europe – Ecoinvent 3.9
District heating kg CO2e / kWh	111

Transport and Installation (A4-A5)

Transportation impacts occurred from final products delivery to construction site (A4) cover fuel direct exhaust emissions, environmental impacts of fuel production, as well as related infrastructure emissions. Only distribution to end customers is considered (A4). The distance is based on average market of transportation based in Germany which is adapted from Ecoinvent market datastet in

Germany which is 68.35 km. In the A5 stage, the handling of the packaging for the plasterboard liner was considered. It involved directing 100% of the packaging film for heat recovery and directing 100% of the core protector for recycling.

Product Use and Maintenance (B1-B7):

As plasterboard liner is an intermediate product that goes on to be integrated to the gypsum board, no other lifecycle phases are relevant to cover. Hence, the use and maintenance have not been studied. So, they are marked as “Modules Not Declared”.

Product end of Life (C1-C4, D):

For end-of-life modules, the C1 stage, relating to the de-installation has been omitted to the negligble energy required to separate the liner of the gypsum. For C2 stage, which is transport of waste, a market transport distance of 68 km was assumed which is based on the specific transport in Germany from Ecoinvent 3.9. C3 stage involves the processing of the waste which has been neglected as 100% of the product is directly landfilled. Accordingly, the C4 stage encomposes the impact behind sanitary landfilling of the plasterboard liner product. Finally, the D stage includes the benefits and loads of recycling and heat recovery of the packaging material and the waste generated from the manufacturing site.

Cut-Off Criteria

The study does not exclude any modules or processes which are stated mandatory in the EN 15804:2012+A2:2019 and the applied PCR. The study does not exclude any hazardous materials or substances.

The study includes all major raw material and energy consumption. All inputs and outputs of the unit processes, for which data is available for, are included in the calculation. There is no neglected unit process more than 1% of total mass or energy flows. The module specific total neglected input and output flows also do not exceed 5% of energy usage or mass.

Allocation, Estimates and Assumptions

Allocation is required if some material, energy, and waste data cannot be measured separately for the product under investigation.

In this study, as per EN 15804, allocation is conducted in the following order.

1. Allocation should be avoided.
2. Allocation should be based on physical properties (e.g. mass, volume) when the difference in revenue is small.
3. Allocation should be based on economic values.

The allocation could not be avoided for raw, ancillary material, energy consumption and waste production as some information was only measured on a factory level and in other cases some unit processes have more than one output flow. The inputs were physically allocated to the studied product based on annual production volume. Allocation used in Ecoinvent 3.9 environmental data sources follows the methodology ‘allocation, cut-off by classification’. This methodology is in line with the requirements of the EN 15804 -standard.

Content information

Product components	Weight, kg	Weight, kg	Post-consumer material, weight-%	Biogenic material, weight-%[1] and kg C/kg
	Gelsenkirchen Site	Spremberg Site		
Recycled paper	934.16	863.99	100	90 resp. 0.18
Pulp	29.57	78.85	0.0	5 resp. 0.44
Wheat Starch	16.91	26.00	0.0	2 resp. 0.51
Maize Starch	10.84	11.96	0.0	2 resp. 0.51
Sizing Agent	4.44	7.08	0.0	0.0
Flocculation agent	2.07	6.49	0.0	0.0
Biocide, passivation, cleaners	1.63	1.35	0.0	0.0
Defoamer	0.21	0.48	0.0	0.0
Dyes	0.06	0.11	0.0	0.0
Other chemicals	0.05	-	0.0	0.0
Commodity (Sodium Hydroxide 50% - Hydrochloric acid 31%)	0.03	0.04	0.0	0.0
Enzymes	0.03	0.03	0.0	0.0
Strength additive	-	0.02	0.0	0.0
Acetic Acid	-	0.06	0.0	0.0
Pigment/fillers	-	3.54	0.0	0.0
TOTAL	1000	1000	-	-

Packaging materials	Weight, kg	Weight, kg	Weight-% (versus the product)	Weight biogenic carbon, kg C/kg
	Gelsenkirchen Site	Spremberg Site		
Polyethylene Film	0.32	0.32	0.03	0.08
Core Protector (wood based)	0.34	0.34	0.03	0.02
TOTAL	0.66	0.66	-	-

Products do not contain any REACH SVHC substances in amounts greater than 0,1% (1000 ppm).

[1] Average weight by mass between the two identical products

Results of the environmental performance indicators

The following results reflect the averaging over (normally) 1 year of production of the two manufacturing sites per declared unit.

Mandatory impact category indicators according to EN 15804

Indicator	Unit	A1-A3	A4	A5	C2	C4	D
GWP-fossil	kg CO_2 eq.	6.09E+02	6.21E+02	1.12E-01	6.89E+00	2.46E+01	-6.39E+00
GWP-biogenic	kg CO_2 eq.	-8.34E+02	2.43E-03	1.36E-01	3.84E-03	1.41E+03	2.23E-01
GWP-luluc	kg CO_2 eq.	1.08E+00	3.56E-03	9.61E-05	3.45E-03	3.11E-02	-5.45E-03
GWP-total	kg CO_2 eq.	-2.11E+02	6.95E+00	2.48E-01	6.90E+00	1.44E+03	-6.17E+00
ODP	kg CFC-11e	1.05E-05	1.18E-07	1.19E-09	1.37E-07	3.57E-07	-2.89E-07
AP	mol H+e	2.00E+00	1.90E-02	4.65E-04	1.80E-02	2.32E-01	-5.77E-03
EP-freshwater	kg Pe	2.07E-01	5.83E-04	1.89E-05	5.44E-04	8.08E-03	-2.88E-04
EP-marine	kg Ne	6.95E-01	5.01E-03	1.99E-04	4.81E-03	2.44E+00	-1.93E-03
EP-terrestrial	mol Ne	6.11E+00	5.18E-02	1.56E-03	4.96E-02	5.77E-01	-2.02E-02
POCP	kg NMVOCe	2.20E+00	2.74E-02	5.77E-04	2.75E-02	5.98E-01	-1.24E-02
ADP-minerals&metals[2]	kg Sbe	3.90E-03	1.99E-05	5.21E-07	1.98E-05	8.30E-05	-2.94E-06
ADP-fossil[2]	MJ	5.96E+03	1.06E+02	1.46E+00	1.05E+02	4.00E+02	-1.05E+02
WDP[2]	m^3e depr.	2.76E+02	5.30E-01	2.48E-02	5.34E-01	4.25E+00	-9.55E-01

GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment; EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

Additional mandatory and voluntary impact category indicators

Indicator	Unit	A1-A3	A4	A5	C2	C4	D
GWP-GHG[3]	kg CO_2 eq.	6.23E+02	6.95E+00	1.12E-01	6.90E+00	2.47E+01	-6.39E+00

[2] Disclaimer: The results of this environmental impact indicator shall be used with care as the uncertainties of these results are high or as there is limited experience with the indicator.

[3] This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO_2 is set to zero.

Particulate matter	Incidence	2.32E-05	6.85E-07	2.57E-08	6.82E-07	2.46E-06	-3.35E-08
Ionizing radiation	kBq U235e	3.50E+01	9.61E-02	3.39E-03	1.14E-01	1.84E+00	-1.38E-01
Ecotoxicity (freshwater)	CTUe	3.66E+03	5.56E+01	7.98E-01	5.28E+01	3.70E+03	-3.16E+00
Human toxicity, cancer	CTUh	2.25E-07	3.09E-09	2.25E-10	3.08E-09	1.87E-08	-8.94E-10
Human tox. non-cancer	CTUh	6.59E-06	7.65E-08	1.53E-09	7.57E-08	2.61E-06	-1.18E-08
Land use and land use change	-	1.86E+04	1.06E+02	9.71E-01	1.06E+02	6.07E+02	-2.30E+01

Resource use indicators

Indicator	Unit	A1-A3	A4	A5	C2	C4	D
PENRE	MJ	5.64E+03	9.65E+01	1.34E+00	9.61E+01	3.88E+02	-1.00E+02
PENRM	MJ	3.22E+02	9.07E+00	1.14E-01	9.07E+00	1.23E+01	-4.96E+00
PENRT	MJ	5.96E+03	1.06E+02	1.46E+00	1.05E+02	4.00E+02	-1.05E+02
PERE	MJ	4.38E+03	1.33E+00	6.46E-02	1.42E+00	2.37E+01	-4.80E+00
PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PERT	MJ	4.38E+03	1.33E+00	6.46E-02	1.42E+00	2.37E+01	-4.80E+00
FW	m^3	7.52E+00	1.46E-02	3.84E-04	1.43E-02	3.35E-01	-2.27E-02
NRSF	MJ	1.74E+03	4.07E-02	1.50E-03	4.69E-02	2.98E-01	-4.41E-02
RSF	MJ	5.21E+01	1.10E-02	7.44E-04	1.83E-02	1.09E-01	-3.76E-02
SM	Kg	1.16E+03	8.00E-02	7.07E-01	9.24E-02	2.83E-01	-3.34E-01

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 re-sources; SM = Use of secondary material; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Use of net fresh water

Waste indicators

Indicator	Unit	A1-A3	A4	A5	C2	C4	D
Hazardous waste disposed	kg	1.82E+01	1.17E-01	6.58E-03	1.08E-01	5.12E-01	-8.32E-02

Non-hazardous waste disposed	kg	1.40E+02	9.01E+00	4.86E-02	9.01E+00	1.00E+03	-1.35E-01
Radioactive waste disposed	kg	1.02E-02	2.29E-05	8.46E-07	2.73E-05	4.49E-04	-3.52E-05

Output flow indicators

Indicator	Unit	A1-A3	A4	A5	C2	C4	D
Components for re-use	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material for recycling	kg	8.49E+01	6.64E-02	3.42E-01	7.83E-02	2.40E-01	-7.62E-02
Materials for energy recovery	kg	1.27E+02	0.00E+00	2.36E-01	0.00E+00	0.00E+00	0.00E+00
Exported energy, electricity	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Exported energy, thermal	MJ	1.11E+02	0.00E+00	0.00E+00	0.00E+00	1.41E+04	0.00E+00

Third-Party Verification Statement

I hereby confirm that, following detailed examination, I have not established any relevant deviations by the studied Environmental Product Declaration (EPD), its LCA and project report, in terms of

- the data collected and used in the LCA calculations,
- the way the LCA-based calculations have been carried out,
- the presentation of environmental data in the EPD, and
- other additional environmental information, as present

with respect to the procedural and methodological requirements in ISO 14025:2010 and EN 15804:2012+A2:2019.
I confirm that the company-specific data has been examined as regards plausibility and consistency; the declaration owner is responsible for its factual integrity and legal compliance.
I confirm that I have sufficient knowledge and experience of construction products, this specific product category, the construction industry, relevant standards, and the geographical area of the EPD to carry out this verification.
I confirm my independence in my role as verifier; I have not been involved in the execution of the LCA or in the development of the declaration and have no conflicts of interest regarding this verification.

Signature

References

General Programme Instructions of the International EPD® System. Version 4.0.

PCR 2019:14. Construction products (EN 15804:2012+A2:2019/AC:2021). (1.3.2)
ISO 14025:2010 Environmental labels and declarations – Type III environmental declarations Principles and procedures.

ISO 14040:2006 Environmental management. Life cycle assessment. Principles and frameworks.

ISO 14044:2006 Environmental management. Life cycle assessment. Requirements and guidelines.

EN 15804+A2 Sustainability in construction works – Environmental product declarations – Core rules for the product category of construction products.

Eriksson, Ola, and Göran Finnveden. "Energy Recovery from Waste Incineration−the Importance of Technology Data and System Boundaries on CO2 Emissions." Energies, vol. 10, no. 4, 15 Apr. 2017, p. 539, https://doi.org/10.3390/en10040539. Accessed 21 Feb. 2020.

SpreeGibs Plasterboard Liner, Hamburger Containerboard - Life Cycle Assessment Background Report, GreenDelta, January 2024

EPD®

www.environdec.com