

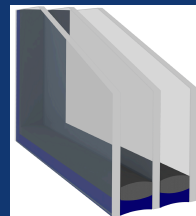


Environmental Product Declaration

IN ACCORDANCE WITH ISO 14025:2006 AND EN 15804+A2:2019/AC:2021

Program Operator: Smart EPD®

www.smartepd.com



H.B. Fuller KOMMERLING

SmartEPD-2024-030-0155-02

GD 116

Date of Issue

Aug 14, 2025

Expiration date

Aug 14, 2030

Last updated

Aug 25, 2026



Refer to the EPD Library at www.smartepd.com for the latest EPD listing information

General Information

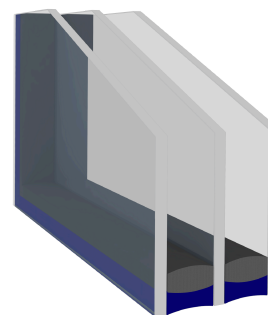
H.B. Fuller Company

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✉ sustainability@hbfuller.com

🌐 hbfuller.com



Product Name:	GD 116
Declared Unit:	1 linear meter
Declaration Number:	SmartEPD-2024-030-0155-02
Date of Issue:	August 14, 2025
Expiration:	August 14, 2030
Last updated:	August 25, 2026
EPD Scope:	Cradle to gate with other options A1 - A3, C1 - C4, D

Market(s) of Applicability:

General Organization Information

At H.B Fuller | Kömmerling (H.B. Fuller) sustainability is a core pillar of the business growth strategy aiming to generate value for all the stakeholders through innovation and high-performance solutions combined with a reduced environmental footprint and operational excellence. The company actively optimizes its processes to reduce resource usage, and engage employees to be knowledgeable about and accountable for reaching sustainability targets. H.B. Fuller monitors its environmental footprint and continuously innovates for improved sustainability in their products and manufacturing practices. H.B. Fuller also collaborates with customers to create adhesive solutions that allow them to meet their sustainability goals. H.B. Fuller adhesives help customers save energy, reduce waste, and enable recycling and reuse.

Further information can be found at: <https://www.hbfuller.com/en/brands/kommerling>

Limitations, Liability and Ownership

Environmental declarations from different programs, even if well in accordance with ISO 14025, may not be comparable. Comparison of the environmental performance of products using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the whole building life cycle. EPD comparability is only possible when all stages of a life cycle have been considered. However, variations and deviations are possible. Example of variations: Different LCA software and background LCI datasets may lead to differences results for upstream or downstream of the life cycle stages declared. The EPD owner has sole ownership, liability, and responsibility for the EPD.

Reference Standards

Standard(s):	ISO 14025:2006 and EN 15804+A2:2019/AC:2021
Core PCR:	Smart EPD® Part A Product Category Rules for Building and Construction Products and Services, 1000, v1.2

Date of issue: March 14, 2025

Valid until: March 14, 2030

Sub-category PCR review panel:

📄 Contact Smart EPD for more information.

General Program Instructions:

📄 Smart EPD General Program Instructions v.1.0, November 2022

Verification Information

LCA Author/Creator:

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EPD Program Operator:

📄 Smart EPD

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Verification:

Independent critical review of the LCA and data, according to ISO 14044 and ISO 14071:

External

🌐 Lucas Pedro Berman | 📄 Senda - Consultoria Ambiental & Energetica

✉️ info@sendaconsultorias.com

Independent external verification of EPD, according to ISO 14025 and reference PCR(s):

External

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Product Information

Declared Unit:

1 linear meter

Mass:

0.0638 kg

Product Specificity:

✗ Product Average

✓ Product Specific

Product Description

GD116, a 2-part sealant based on polysulfide, is used as secondary seal or outer seal in insulating glass units due to its excellent air and moisture resistance, low gas permeability, and good adhesion to glass and metal. GD 116 is particularly suitable for applications that require a low-maintenance, long-lasting seal, such as residential windows and doors. The declared unit is 1 linear meter of GD 116 applied with a sealing depth of 3 mm and air space of 12 mm. These dimensions were used as a typical value for reference. To obtain the environmental impacts for the same product, applied with different nozzles and widths, please refer to the tables in the "Further Information" section at the end of the document and multiply the results by the corresponding multiplication factor, as indicated.

Product Specifications

Product SKU(s):
Product Classification Codes:

GD 116 Part A and Part B as shipped (including packaging)
EC3 - Openings -> Glazing -> FenestrationParts -> FenestrationAccessories

Material Composition

Material/Component Category	Origin	% Mass
Polysulfide	GLO	26-30
In process recycled content	GLO	0-2
Filler	GLO	56-60
Diluents, emulsifiers	GLO	10-13
Other	GLO	0-2

Packaging Material	Origin	kg Mass
Steel	RER	0.00254
Wood (pallet)	RER	0.00153

Biogenic Carbon Content	kg C per linear meter
Biogenic carbon content in product	0
Biogenic carbon content in accompanying packaging	0.000673

Hazardous Materials
manganese dioxide (CAS 1313-13-9)
Disulfiram (CAS 97-77-8)
Zinc bis(diethyldithiocarbamate) (CAS 14324-55-1)

EPD Data Specificity

Primary Data Year:
Manufacturing Specificity:

FY 2023
✗ Industry Average
✗ Manufacturer Average
✓ Facility Specific

Averaging:

Averaging was not conducted for this EPD.

System Boundary

Production	A1	Raw material supply	✓
	A2	Transport	✓
	A3	Manufacturing	✓
Construction	A4	Transport to site	ND
	A5	Assembly / Install	ND
Use	B1	Use	ND
	B2	Maintenance	ND
	B3	Repair	ND
	B4	Replacement	ND
	B5	Refurbishment	ND
	B6	Operational Energy Use	ND
	B7	Operational Water Use	ND
End of Life	C1	Deconstruction	✓
	C2	Transport	✓
	C3	Waste Processing	✓
	C4	Disposal	✓
Benefits & Loads Beyond System Boundary	D	Recycling, Reuse Recovery Potential	✓

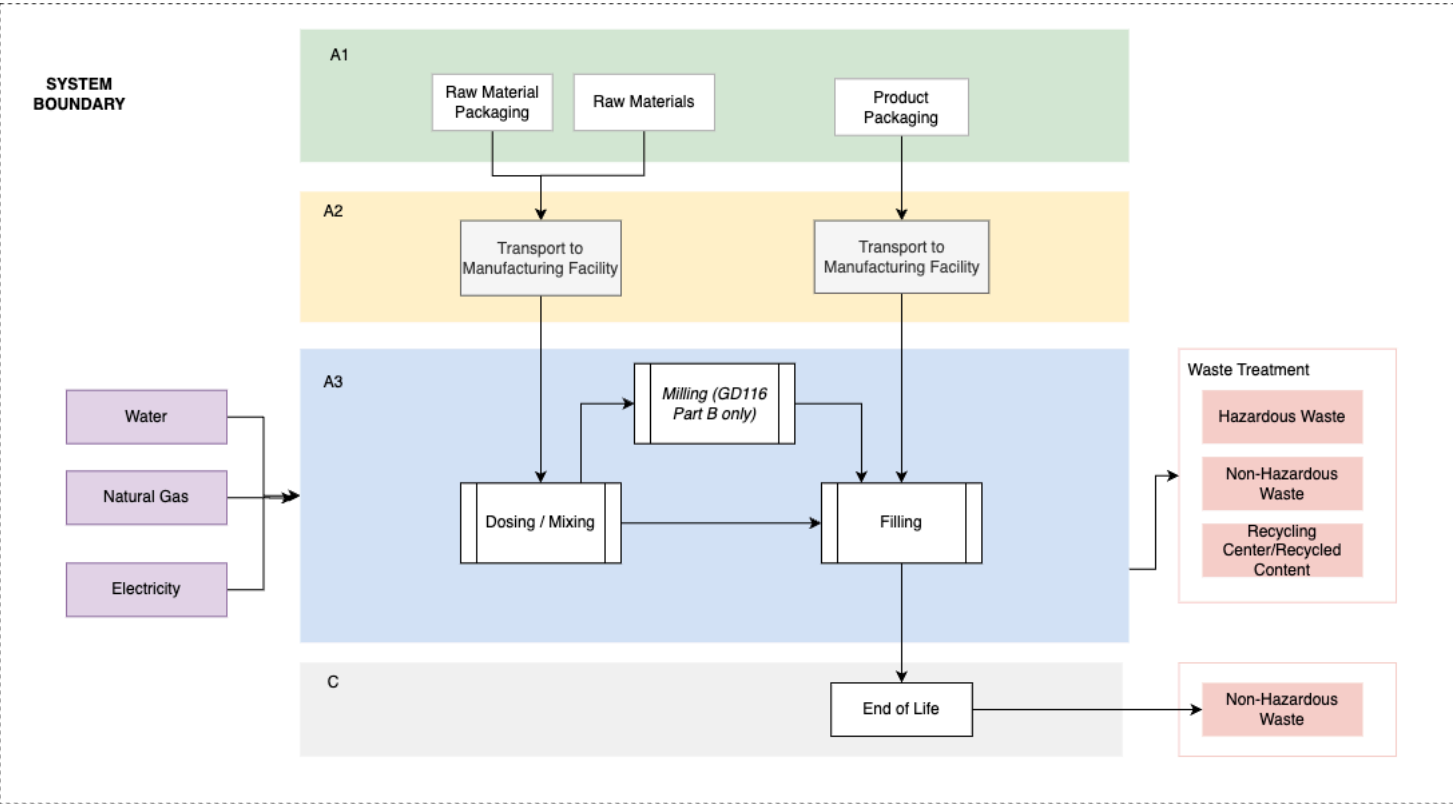
Note:

ND = Module not declared

Plants

- Langelsheim Kommerling Chem. Fabrik G, Innerstetal, Langelsheim, Germany
- Pirmasens Kömmerling Chemische Fabrik GmbH, Zweibrücker Straße, Pirmasens, Germany

Product Flow Diagram



Software And Database

- LCA Software:
-  SimaPro v. 9.5
- LCI Foreground Database(s):
-  Ecoinvent v. 3.9.1
- LCI Background Database(s):
-  Ecoinvent v. 3.9.1

A foreground LCI database is the database used to model the primary, site-specific data collected for this EPD. A background LCI database is the database used to model generic or non-specific data.

Data Quality

The inventory data used in this study were either directly measured, calculated, or estimated based on primary data sources, ensuring high precision. Background data from ecoinvent v3.9.1 database also has documented precision to the extent available. The product system's mass balance and inventory completeness were thoroughly checked. Some exclusions were made in line with the PCR requirements. However, no data was intentionally omitted. Primary data were collected with a similar level of detail, while background data came from the ecoinvent v3.9.1 database. The modelling approach and other methodological choices were applied consistently throughout the model. Reproducibility: This study ensures reproducibility by providing comprehensive disclosure of input-output data, dataset choices, and modelling approaches. A knowledgeable third party should be able to approximate the results using the same data and modelling methods. Primary data were collected for the Fiscal year of 2023, from December 2022 to November 2023 to ensure representativeness. Secondary data from the ecoinvent v3.9.1 database is typically representative of recent years. Primary data represent H.B. Fuller's

production facilities. The use of country-specific data ensures high geographical representativeness, and proxy data were only used when country-specific data were unavailable. Both primary and secondary data were tailored to the specific technologies studied, ensuring high technological representativeness.

Life Cycle Module Description

The raw materials are shipped via ground freight (truck) and/or ship to the H.B. Fuller site at Pirmasens and Langelsheim in Germany. Once the raw materials are received, they are stored in a warehouse. Blending or mixing components that require blending is done in mixing vats. Ingredients are dosed either mechanically (automatically) or measured and added by hand (manually.) Mixing is carried out in a semi-automated process by horizontal and planetary mixers (GD 116). Production of GD 116 Part B has an additional milling stage between mixing stages.

H.B. Fuller tracks energy usage on all major equipment. Power usage is based on reports from their system. The impact of infrastructure and capital goods was excluded from the LCA, as it is explicitly accepted in the PCR. Once the ingredients have been blended according to standard operating procedures, the intermediate product is filled into tins, drums and pails. Power usage and cooling water per mass of product is based on reports from their system. Other inputs such as propane fuel used in forklifts, and diesel consumption are monitored for the entire facility and mass-allocated to the product. The impact of infrastructure and capital goods was excluded from the LCA, as it is explicitly accepted in the PCR. Non hazardous waste at all facilities consisted of uncontaminated packaging material. This stream was assumed, as per information provided by H.B. Fuller, to be sent 100% to recycling to facilities located at 60 km (Pirmasens) and 10 km (Langelsheim) using heavy-duty trucks. Hazardous waste (mainly contaminated packaging) is sent to facilities located at 60 km in Pirmasens and 110 km in Langelsheim.

LCA Discussion

Allocation Procedure

Allocation of co-products was avoided, to the extent it was possible, based on the guidance given in ISO 14044:2006, 4.3. and in EN 15804+A2.

At the Pirmasens (Germany) facility, where GD 116 Part B is produced, process (grid) electricity came from direct metering of specific consumption per mass of product. Mass allocation was performed only for the following joint production processes: Packaging waste transported to a recycling plant, hazardous waste transported to an incineration facility, propane use (forklift and foil shrinking station), diesel consumption and cooling water.

At the Langelsheim facility, where GD 116 Part A is produced, specific consumption values per mass of product were provided by H.B. Fuller based on direct metering for cooling water withdrawal out of local creek and electricity from a natural gas generator.. According to the data provided, all raw materials for GD 116 Part A production were delivered in bulk to the facility so there is no packaging waste allocated to the product. Mass allocation was performed at the facility level for the following joint production processes: packaging waste transported to a recycling plant, hazardous waste transported to an incineration facility, propane use (forklift and foil shrinking station), and diesel consumption.

Cut-off Procedure

A cut-off rule of 1% was applied to all raw materials, packaging materials, energy, water and waste flows.

Renewable Electricity

Energy Attribute Certificates (EACs) such as
Renewable Energy Certificates (RECs) or Power
Purchase Agreements (PPAs) are included in the
baseline reported results:

✓ Yes

Electricity Source:	Offsite
Renewable type(s):	wind, solar, biomass, hydro
Percent of EPD Owner's product-related electricity covered:	6.01 %
Grid type used to model remaining electricity:	Consumption grid (Pirmasens) and natural gas (Langelsheim)
Commitment pledged for entire EPD validity period:	✓ Yes
Electricity accounting methodology:	Location-based

Scenarios

End of Life (C1 - C4)

C1 - C4 Modules

Collection Process

Collected Separately:	0.0690 kg
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Recovery

Recycling:	0.0061 kg
Incineration:	0.0629 kg

Reuse, Recovery and / or Recycling Potentials & Relevant Scenario Information (D)

D Module

Further assumptions for scenario development:	Recycling of of material recovered during installation was not declared in this module as it reenters the system boundaries at modules. A1-A3. Recycling of packaging material was also not declared in module D following the conservative approach recommended in section 6.4.3.3 of EN 15804 +A2 and following the "additionality" principle, given the high rates of industrial packaging recycling in Germany.
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Results

Environmental Impact Assessment Results

EF 3.1

per 1 linear meter of product.

LCIA results are relative expressions and do not predict impacts on category endpoints, the exceeding of thresholds, safety margins or risks.

1 linear meter of applied product (sealing depth 3 mm / 12 mm air space)

Impact Category	Unit	Method	A1 - A3	C1	C2	C3	C4	D
GWP-total	kg CO2 eq	EF 3.1	8.56e-2	0	1.17e-3	0	8.05e-2	0
GWP-biogenic	kg CO2 eq	EF 3.1	-3.42e-3	0	0	0	3.42e-3	0
GWP-fossil	kg CO2 eq	EF 3.1	8.89e-2	0	1.17e-3	0	3.30e-2	0
GWP-luluc	kg CO2 eq	EF 3.1	7.88e-5	0	5.77e-7	0	6.85e-7	0
ODP	kg CFC11 eq	EF 3.1	4.11e-9	0	2.55e-11	0	9.47e-11	0
AP	mol H+ eq	EF 3.1	4.28e-2	0	2.56e-6	0	1.88e-5	0
EP-freshwater	kg P eq	EF 3.1	7.38e-4	0	8.31e-8	0	2.44e-6	0
EP-marine	kg N eq	EF 3.1	1.17e-4	0	6.45e-7	0	1.02e-5	0
EP-terrestrial	mol N eq	EF 3.1	1.18e-3	0	6.55e-6	0	8.65e-5	0
POCP	kg NMVOC eq	EF 3.1	8.56e-2	0	3.97e-6	0	2.27e-5	0
ADP-minerals&metals	kg Sb eq	EF 3.1	1.03e-6	0	3.82e-9	0	4.07e-9	0
ADP-fossil	MJ	EF 3.1	1.10e+0	0	1.66e-2	0	2.08e-2	0
WDP	m3 world eq	EF 3.1	1.26e-1	0	6.84e-5	0	3.92e-4	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

GWP = Global Warming Potential, 100 years (may also be denoted as GWP-total, GWP-fossil (fossil fuels), GWP-biogenic (biogenic sources), GWP-luluc (land use and land use change)), ODP = Ozone Depletion Potential, AP = Acidification Potential, EP = Eutrophication Potential, SFP = Smog Formation Potential, POCP = Photochemical oxidant creation potential, ADP-Fossil = Abiotic depletion potential for fossil resources, ADP-Minerals&Metals = Abiotic depletion potential for non-fossil resources, WDP = Water deprivation potential, PM = Particular Matter Emissions, IRP = Ionizing radiation, human health, ETP-fw = Eco-toxicity (freshwater), HTP-c = Human toxicity (cancer), HTP-nc = Human toxicity (non-cancer), SQP = Soil quality index.

Comparisons cannot be made between product-specific or industry average EPDs at the design stage of a project, before a building has been specified. Comparisons may be made between product-specific or industry average EPDs at the time of product purchase when product performance and specifications have been established and serve as a functional unit for comparison. Environmental impact results shall be converted to a functional unit basis before any comparison is attempted. Any comparison of EPDs shall be subject to the requirements of ISO 21930 or EN 15804. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries. EPDs are not comparative assertions and are either not comparable or have limited comparability when they have different system boundaries, are based on different product category rules or are missing relevant environmental impacts. Such comparison can be inaccurate, and could lead to erroneous selection of materials or products which are higher-impact, at least in some impact categories.

Resource Use Indicator

per 1 linear meter of product.

1 linear meter of applied product (sealing depth 3 mm / 12 mm air space)

Indicator	Unit	A1 - A3	C1	C2	C3	C4	D
PERE	MJ	1.54e-1	0	2.60e-4	0	7.12e-4	0
PERM	MJ	0	0	0	0	0	0
PERT	MJ	1.54e-1	0	2.60e-4	0	7.12e-4	0
PENRE	MJ	1.10e+0	0	1.66e-2	0	2.08e-2	0
PENRM	MJ	1.35e-4	0	8.34e-7	0	1.83e-6	0
PENRT	MJ	1.10e+0	0	1.66e-2	0	2.08e-2	0
SM	kg	4.62e-4	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0
FW	m3	3.10e-3	0	2.05e-6	0	7.06e-5	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

RPRE or PERE = Renewable primary resources used as energy carrier (fuel), RPRM or PERM = Renewable primary resources with energy content used as material, RPRT or PERT = Total use of renewable primary resources with energy content, NRPRE or PENRE = Non-renewable primary resources used as an energy carrier (fuel), NRPRM or PENRM = Non-renewable primary resources with energy content used as material, NRPRRT or PENRT = Total non-renewable primary resources with energy content, SM = Secondary materials, RSF = Renewable secondary fuels, NRSF = Non-renewable secondary fuels, RE = Recovered energy, ADPF = Abiotic depletion potential, FW = Use of net freshwater resources, VOCs = Volatile Organic Compounds.

Waste and Output Flow Indicators

per 1 linear meter of product.

1 linear meter of applied product (sealing depth 3 mm / 12 mm air space)

Indicator	Unit	A1 - A3	C1	C2	C3	C4	D
HWD	kg	9.71e-4	0	0	0	0	0
NHWD	kg	0	0	0	0	5.18e-2	0
RWD	kg	1.07e-6	0	4.89e-9	0	1.15e-8	0
CRU	kg	0	0	0	0	0	0
MFR	kg	2.28e-3	0	0	0	1.19e-2	0
MER	kg	0	0	0	0	0	0

Note:

Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

Abbreviations:

HWD = Hazardous waste disposed, NHWD = Non-hazardous waste disposed, RWD = Radioactive waste disposed, HLRW = High-level radioactive waste, ILLRW = Intermediate- and low-level radioactive waste, CRU = Components for re-use, MFR or MR = Materials for recycling, MER = Materials for energy recovery, MNER = Materials for incineration, no energy recovery, EE or EEE = Recovered energy exported from the product system, EET = Exported thermal energy.

Carbon Emissions and Removals

per 1 linear meter of product.

1 linear meter of applied product (sealing depth 3 mm / 12 mm air space)

Indicator	Unit	A1 - A3	C1	C2	C3	C4	D
BCRP	kg CO2	0	0	0	0	0	0
BCEP	kg CO2	0	0	0	0	0	0
BCRK	kg CO2	6.00e-3	0	0	0	0	0
BCEK	kg CO2	0	0	0	0	6.00e-3	0
BCEW	kg CO2	0	0	0	0	0	0
CCE	kg CO2	0	0	0	0	0	0
CCR	kg CO2	0	0	0	0	0	0
CWNR	kg CO2	0	0	0	0	0	0

Note:

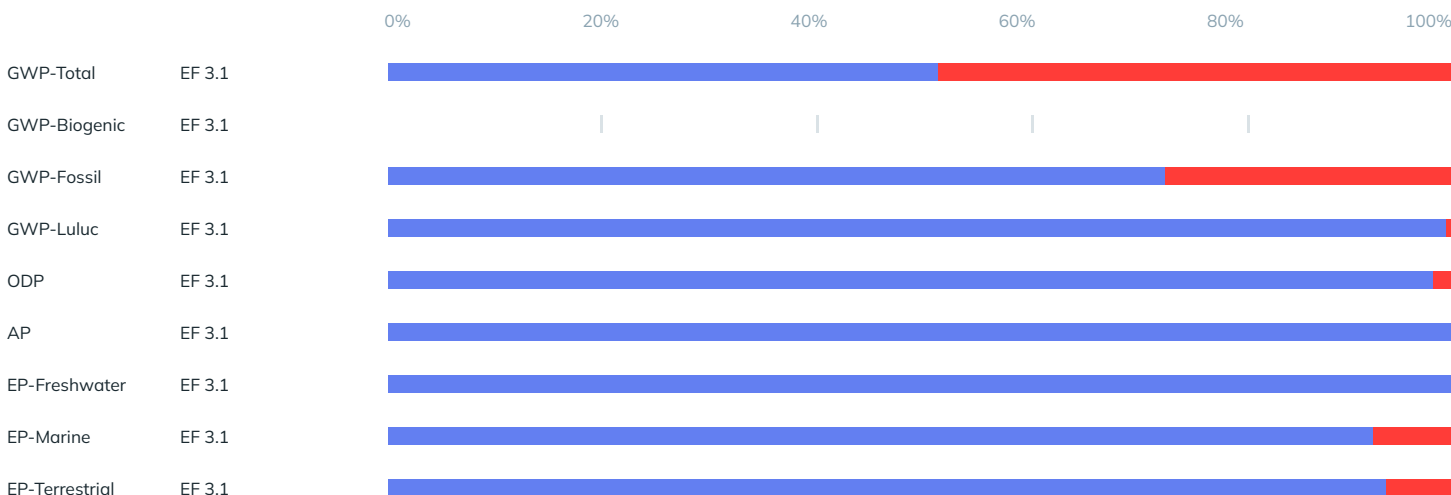
Not all abbreviated indicators listed below may be present in the results above. The inclusion of indicators varies based on PCR requirements.

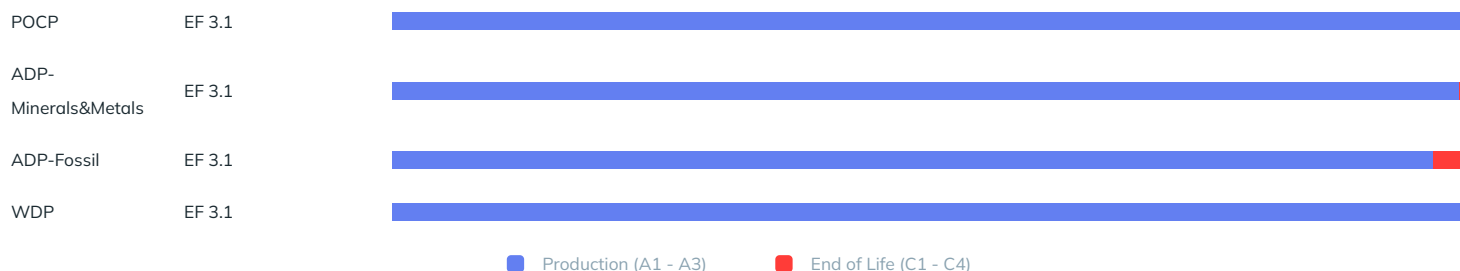
Abbreviations:

BCRP = Biogenic Carbon Removal from Product, BCEP = Biogenic Carbon Emission from Product, BCRK = Biogenic Carbon Removal from Packaging, BCEK = Biogenic Carbon Emission from Packaging, BCEW = Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes, CCE = Calcination Carbon Emissions, CCR = Carbonation Carbon Removals, CWNR = Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes, GWP-luc = Carbon Emissions from Land-use Change.

Interpretation

The module of raw material extraction and processing (A1) was the main driver of most environmental impacts, with particular influence of the upstream manufacture of resins, followed by the impact of the end-of-life incineration treatment. Biogenic carbon is removed from the atmosphere by product packaging and emitted at the end of life. The module of raw material extraction and processing (A1) was the main driver of most resource use indicators, except for the use of renewable energy, driven by the manufacturing stage use of grid electricity at Pirmasens (54% renewable). Use of SM and generation of MR results are driven by the circularity programs in place at H.B. Fuller, namely the recycling of packaging material and the use of "rework" or unused sealant collected from construction sites.





Additional Environmental Information

H.B. Fuller is committed to the protection of the environment. In keeping with this commitment, we continue to take actions — including implementing programs to reduce our demand for water, minimize the generation and disposal of waste and limit our emissions of air pollutants and greenhouse gases. Accountability and transparency are fundamental to the trust we build, therefore H.B. Fuller regularly reports to CDP Climate Change and CDP Water Security as well as completes EcoVadis sustainability assessment of our environmental, social, ethics and supply chain practices.

Recently, H.B. Fuller committed to set near-term company-wide reduction targets for our Scope 1, 2 and 3 greenhouse gas (GHG) emissions, in line with Science Based Target Initiative (SBTi) standards. When adopted and approved, these targets are expected to require ambitious reductions in our absolute GHG emissions levels, consistent with limiting global temperature rise to 1.5°C, using a 2025 baseline.

Further Information

Multiplication Factors per Declared Unit at 3 mm Sealing Depth

Air Space, mm	Consumption ml / linear m	Consumption g / linear m	Multiplication Factor
8	24	42.50	0.67
10	30	53.13	0.83
12	36	63.75	1.00*
14	42	74.38	1.17
16	48	85.00	1.33
18	54	95.63	1.50
20	60	106.25	1.67
22	67	118.65	1.83
24	72	127.51	2.00

* Declared Unit for this EPD is 1 linear meter applied with a sealing depth of 3 mm and air space of 12 mm.

Multiplication Factors per Declared Unit at 4 mm Sealing Depth

Air Space, mm	Consumption ml / linear m	Consumption g / linear m	Multiplication Factor
8	32	56.67	0.89
10	40	70.84	1.11
12	48	85.00	1.33
14	56	99.17	1.56

Air Space, mm	Consumption ml / linear m	Consumption g / linear m	Multiplication Factor
16	64	113.34	1.78
18	72	127.51	2.00
20	80	141.67	2.22
22	88	155.84	2.44
24	96	170.01	2.67

Multiplication Factors per Declared Unit at 5 mm Sealing Depth

Air Space, mm	Consumption ml / linear m	Consumption g / linear m	Multiplication Factor
8	40	70.84	1.11
10	50	88.55	1.39
12	60	106.25	1.67
14	70	123.96	1.94
16	80	141.67	2.22
18	90	159.38	2.50
20	100	177.09	2.78
22	110	194.80	3.06
24	120	212.51	3.33

References

- ISO 14040:2006, "Environmental management - Life cycle assessment - Principles and framework".
- ISO 14044:2006, "Environmental management - Life cycle assessment - Requirements and guidelines".
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- ecoinvent v3.9.1, December 2022, <https://ecoinvent.org/the-ecoinvent-database/data-releases/ecoinvent-3-9-1/>
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