

Environmental Product Declaration

In accordance with ISO14025:2006 and EN15804:2012+A2:2019

Alterna Shower Enclosure



Owner of the declaration:
Brødrene Dahl AS Norway

Product name:
Alterna Shower Enclosure

Declared unit:
1 piece

This EPD declares multiple products and the results represents the worst-case.

Product category /PCR:
PCR 2019:14 for Construction products

Program holder and publisher:
The Norwegian EPD foundation

Declaration number:
NEPD-7179-6514-EN

Registration number:
NEPD-7179-6514-EN

Issue date: 06.08.2024

Valid to: 06.08.2029

General information

Product:

Alterna Shower Enclosure

Program operator:

The Norwegian EPD Foundation
Post Box 5250 Majorstuen, 0303 Oslo, Norway
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Declaration number:

NEPD-7179-6514-EN

This declaration is based on Product

Category Rules:

EN 15084+A2:2019, PCR 2019:14 for
Construction products.

Statement of liability:

The owner of the declaration shall be liable for the
underlying information and evidence. EPD
Norway shall not be liable with respect to
manufacturer, life cycle assessment data and
evidences.

Functional unit:

1 piece of Alterna Shower Enclosure.

Verification:

Independent verification of the declaration and
data, according to ISO14025:2010

internal ☐

external



Stephen Forson

Independent verifier approved by EPD Norway

Owner of the declaration:

Brødrene Dahl AS Norway
Brynsengveien 5, 0667 Oslo
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Manufacturer:

Brødrene Dahl AS Norway
Brynsengveien 5, 0667 Oslo
Phone: +47 22 72 55 00
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Place of production:

China

Management system:

ISO 9001 and ISO 14001

Organisation no:

945 757 280

Issue date:

06.08.2024

Valid to:

06.08.2029

Year of study:

2023

Comparability:

EPD of construction products may not be able to
compare if they do not comply with EN 15804 and
are seen in a building context.

The EPD has been worked out by:

Fanni Végvári, CarbonZero AB

Approved



Manager of EPD Norway

Company

Company information:

Brødrene Dahl AS works and distributes products within the segments HVAC, civil engineering, industry, marine, hydropower (Hywer), aquaculture and traffic. Brødrene Dahl AS has built up a nationwide organization with closeness to customers as the most important principle. It has more than 50 service centers and approx. 1000 employees spread across the country. Brødrene Dahl AS is part of Saint-Gobain Distribution Norway, which is owned by the international industrial group Saint-Gobain.

Product

Product description:

Alterna shower enclosures are mainly made of tempered glass, metal frames and plastic details and are intended for use in bathrooms. The two products included in this study is of the same model but two different sizes. The table below shows the product specifications. The EPD declares the worst-case product, the bigger of the two products.

Product specification:

Alterna shower enclosures are mainly made of tempered glass, metal frames and plastic details.

Materials (product)	kg	%
Tempered glass	46,6	91,27
Aluminium	3,7606	7,37
Stainless steel	0,0722	0,14
PA66	0,04	0,08
PVC	0,5183	1,02
ABS	0,0619	0,12
Steel	0,005	0,01
Total	51,058	100
Materials (packaging)	kg	Weight-% versus product
Polyethylene	0,012	0,024
Oriented polypropylene	0,05304	0,104
LDPE	0,0171	0,033
PP	0,0862	0,169
Polystyrene	1,1418	2,236
Carton	3,8059	7,454
Pallet	30	58,757

Technical data:

The following products are covered by the EPD. The results shows the worst-case of the two products (the biggest one). They have the same material composition and production process, but different sizes and therefore different weights. The products cleanability, load resistance and durability are in line in accordance to the standard EN 14428:2004+A1:2008.

Article number	Article name	Dimensions	Weight
6310769	Alterna Prosjekt 90 cm dusjhjørne krom	90 x 195 cm	51,058
6310768	Alterna Prosjekt 80 cm dusjhjørne krom	80 x 195 cm	44,233

Market:

Norway.

Reference service life, product:

The Reference Service Life (RSL) is not relevant in this study.

Time representativeness:

Year 2023. Specific data has been collected by the manufacturer and represents the production year of 2023 (January 2023 to January 2024). Generic data used from datasets and specific EPDs represent the last 5 years as the oldest data is from 2019.

Time Database(s) and LCA software used:

Experts LCA software (v.10.7.1.28). The study mostly relies on Sphera and Ecoinvent (Ecoinvent v.3.8) datasets.

LCA: Calculation rules

Declared unit:

1 piece of Alterna shower enclosure that weighs 51,058 kg. The conversion factor is shown in the table below.

Article number	Article name	Conversion factor
6310769	Alterna Prosjekt 90 cm dusjhjørne krom	1
6310768	Alterna Prosjekt 80 cm dusjhjørne krom	0,87

Cut-off criteria:

The following procedures were followed for the exclusion of inputs and output.

- All input and output flows in a unit process were considered i.e., taking into account the value of all flows in the unit process and the corresponding LCI where data was available.
- Data gaps were filled by conservative assumptions with average or generic data. Any assumptions in such cases were documented.

- The use of cut-off criterion on mass inputs and primary energy at the unit process level (1%) and at the information module level (5%).

All hazardous and toxic materials and substances are included in the inventory and the cut-off rules do not apply.

Allocation:

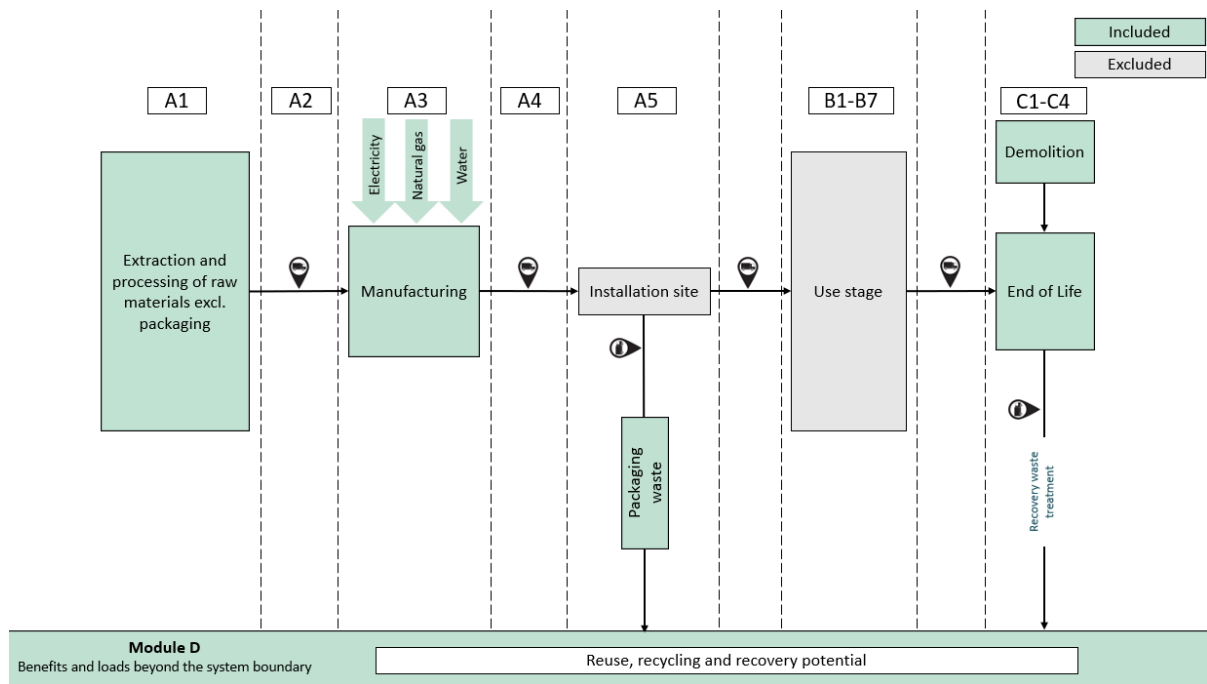
Allocation criteria is based on mass. The inputs in the factory are allocated per weight of produced shower enclosure.

System boundaries (X=included, MND=module not declared, MNR=module not relevant)

	Product stage			Assembly stage		Use stage							End of life stage				Benefits & loads beyond system boundary
	Raw materials	Transport	Manufacturing	Transport	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Modules	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	CN	CN	CN	GLO	NO								NO	NO	NO	NO	NO
Specific data used	27%																
Variation products	15%																
Variation sites	0%																

System boundary:

The system boundaries are set to cradle to gate with options but excludes module B and module A5 only considers the waste management of the packaging that arises on the installation site. The manufacturer buys manufactured components (A1) which are transported (A2) to the factory and then assembled. The manufacturing factory uses electricity, natural gas and water during the assembly (A3). The products are then transported from China to Brødrene Dahl AS Norway's distribution center. The transportation out to the final customer is also accounted for (A4). The installation is excluded from this study, however the waste management of the packaging is included (A5). The use phase is excluded from this study (B). The waste management of the product is assumed to be in accordance with the Norwegian standards as the waste management occurs in Norway (C + D).



LCA: Scenarios and additional technical information

The following information describes the scenarios in the different modules of the EPD.

Product stage (A1-A3)

Material	Dataset	Database	Regional coverage	Time reference
Tempered glass	market for glass fibre	ecoinvent 3.8	GLO	2021
Aluminium	Aluminium sheet	Sphera	CN	2023
Stainless steel	Stainless steel sheet (EN15804 A1-A3)	Sphera	RER	2022
PA66	Polyamide 6.6 fibres (PA 6.6)	Sphera	RER	2022
PVC	Plastic Film (PE, PP, PVC)	Sphera	GLO	2023
ABS	acrylonitrile-butadiene-styrene copolymer production	ecoinvent 3.8	RoW	2021
Steel	Steel finished cold rolled coil	Worldsteel 2022	Asia	2022
Polyethylene	market for polyethylene, high density, granulate	ecoinvent 3.8	GLO	2021
Oriented polypropylene	market for polypropylene, granulate	ecoinvent 3.8	GLO	2021
LDPE	Polyethylene linear low density granulate (LLDPE/PE-LLD)	Sphera	CN	2023
PP	market for polypropylene, granulate	ecoinvent 3.8	GLO	2021
Polystyrene	Expanded Polystyrene (EPS) Foam (20 kg/m ³)	Sphera	CN	2023
Carton	market for carton board box production, with offset printing	ecoinvent 3.8	GLO	2021
Pallet	market for EUR-flat pallet	Ecoinvent 3.8	RoW	2021

Transport from production place to assembly/user (A4)

Transport from production place to assembly/user (A4)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption
Truck	61	350	0,0247 l/tkm diesel
Ship	70	20 000	0,00277 kg/tkm HFO

Deconstruction (C1)

Dataset	Database	Regional coverage	Time reference
Excavator, 100 kW, construction	Sphera	GLO	2022

Transport to waste processing (C2)

Transport from production place to assembly/user (C2)	Capacity utilisation (incl. return) %	Distance (km)	Fuel/Energy consumption
Truck	61	50	0,0247 l/tkm diesel

End of Life (C3, C4)

The data about waste rates from Norway has been used as these are the largest markets for this product. Statistics Norway was used as the market for the product is Norway and therefore the majority of the material will be waste managed in Norway.

Material	Waste category	Value	Unit
Glass	Recycling	95	%
	Incineration*	0	%
	Landfill	5	%
Metal	Recycling	95	%
	Incineration*	5	%
	Landfill	0	%
Plastic	Recycling	50	%
	Incineration*	50	%
	Landfill	0	%

*Note that the incineration includes energy recovery in module D.

LCA: Results, per declared unit of 1 pce

Results are based on EN 15804:2012+A2:2019 EF3.1.

Core environmental impact indicators

Indicator	Unit	Results per 1 pce							
		A1-A3	A4	A5	C1	C2	C3	C4	D
GWP - total	kg CO ₂ eq	2,61E+02	3,22E+01	4,38E+01	3,10E-02	5,88E-03	8,80E-01	3,92E-02	-9,74E+01
GWP - fossil	kg CO ₂ eq	3,03E+02	3,22E+01	7,53E-01	3,10E-02	5,88E-03	8,74E-01	3,88E-02	-9,68E+01
GWP - biogenic	kg CO ₂ eq	-4,29E+01	2,66E-02	4,31E+01	2,74E-06	3,04E-06	6,34E-03	1,24E-04	-1,85E-01
GWP - luluc	kg CO ₂ eq	3,97E-01	1,09E-03	-1,37E-02	1,72E-06	5,57E-07	1,04E-04	2,27E-04	-4,10E-01
ODP	kg CFC11 eq	9,17E-06	2,99E-07	1,87E-09	7,13E-09	8,97E-10	9,88E-10	1,06E-13	-2,14E-11
AP	molc H ⁺ eq	1,52E+00	1,04E+00	-6,57E-03	1,89E-04	6,61E-05	1,70E-03	2,73E-04	-4,78E-01
EP- freshwater	kg P eq	3,76E-02	2,19E-05	-1,61E-05	3,26E-07	5,22E-08	1,67E-05	8,74E-08	-1,03E-04
EP -marine	kg N eq	3,22E-01	2,44E-01	-2,90E-03	7,63E-05	1,68E-05	8,13E-04	6,98E-05	-2,07E-01
EP - terrestrial	molc N eq	3,43E+00	2,67E+00	-2,92E-02	8,35E-04	1,83E-04	8,42E-03	7,68E-04	-2,38E+00
POCP	kg NMVOC eq	9,88E-01	6,98E-01	-8,52E-03	2,21E-04	4,66E-05	2,12E-03	2,14E-04	-5,47E-01
ADP-M&M ²	kg Sb-Eq	1,82E-03	9,08E-07	7,55E-08	5,53E-09	1,12E-09	4,34E-07	2,53E-09	-4,01E-05
ADP-fossil ²	MJ	3,78E+03	3,82E+02	-1,86E+01	4,35E-01	1,21E-01	2,74E+00	5,26E-01	-1,42E+03
WDP ²	m ³	5,97E+01	7,58E-02	-3,64E-02	4,59E-04	5,60E-04	1,06E-01	4,48E-03	-5,63E+00

GWP-total: Global Warming Potential; **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; See "additional Norwegian requirements" for indicator given as PO4 eq. **EP-marine:** Eutrophication potential, fraction of nutrients reaching freshwater end compartment; **EP-terrestrial:** Eutrophication potential, Accumulated Exceedance; **POCP:** Formation potential of tropospheric ozone; **ADP-M&M:** Abiotic depletion potential for non-fossil resources (minerals and metals); **ADP-fossil:** Abiotic depletion potential for fossil resources; **WDP:** Water deprivation potential, deprivation weighted water consumption

Reading example: 9,0 E-03 = 9,0*10⁻³ = 0,009

¹ This impact category deals mainly with the eventual impact of low dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

² The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced 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 CO₂ is set to zero.

Voluntary environmental impact indicators

Indicator	Unit	Results per 1 pce							
		A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ³	kg CO ₂ eq	3,04E+02	3,22E+01	9,11E-01	3,10E-02	5,88E-03	8,80E-01	3,92E-02	-9,73E+01

Additional environmental impact indicators

Indicator	Unit	Results per 1 pce							
		A1-A3	A4	A5	C1	C2	C3	C4	D
PM	Disease incidence	1,58E-05	1,81E-05	-9,35E-08	1,89E-09	9,94E-10	2,38E-08	3,40E-09	-3,76E-06
IRP ¹	kBq U235 eq.	1,37E+01	1,42E-01	-1,41E-01	1,97E-03	2,18E-03	3,08E-02	6,81E-04	-6,22E-01
ETP-fw ²	CTUe	1,67E+03	2,74E+02	-7,10E+00	1,17E-01	3,04E-02	1,13E+00	3,05E-01	-1,89E+03
HTP-c ²	CTUh	2,27E-02	4,94E-09	1,40E-10	1,87E-12	1,94E-12	2,73E-10	7,13E-12	-1,14E-08
HTP-nc ²	CTUh	7,47E-06	1,56E-07	-1,18E-08	3,44E-11	1,92E-11	1,84E-09	2,73E-10	-1,07E-06
SQP ²	Dimensionless	6,36E+03	3,56E+00	-6,22E+02	5,32E-02	3,97E-02	1,38E+00	1,39E-01	-1,33E+03

PM: Particulate matter emissions; **IRP:** Ionising radiation, human health; **ETP-fw:** Ecotoxicity (freshwater); **ETP-c:** Human toxicity, cancer effects; **HTP-nc:** Human toxicity, non-cancer effects; **SQP:** Land use related impacts / soil quality

Resource use

Parameter	Unit	Results per 1 pce							
		A1-A3	A4	A5	C1	C2	C3	C4	D
RPEE	MJ	1,06E+03	1,93E+00	-1,08E+02	1,14E-03	6,74E-02	8,55E-01	9,00E-02	-9,31E+01
RPEM	MJ	3,38E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TPE	MJ	1,10E+03	1,93E+00	-1,08E+02	1,14E-03	6,74E-02	8,55E-01	9,00E-02	-9,31E+01
NRPE	MJ	3,78E+03	3,82E+02	-1,86E+01	4,35E-01	1,21E-01	2,74E+00	5,26E-01	-1,42E+03
NRPM	MJ	1,93E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
TRPE	MJ	3,79E+03	3,82E+02	-1,86E+01	4,35E-01	1,21E-01	2,74E+00	5,26E-01	-1,42E+03
SM	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
RSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
W	m ³	1,39E+00	2,78E-03	-5,27E-03	1,07E-05	9,06E-05	2,75E-03	1,37E-04	-7,94E-01

RPEE Renewable primary energy resources used as energy carrier; **RPEM** Renewable primary energy resources used as raw materials; **TPE** Total use of renewable primary energy resources; **NRPE** Nonrenewable primary energy resources used as energy carrier; **NRPM** Nonrenewable primary energy resources used as materials; **TRPE** Total use of non-renewable primary energy resources; **SM** Use of secondary materials; **RSF** Use of renewable secondary fuels; **NRSF** Use of non-renewable secondary fuels; **W** Use of net fresh water.

End of life – Waste

Parameter	Unit	Results per 1 pce							
		A1-A3	A4	A5	C1	C2	C3	C4	D
HW	kg	4,57E-07	1,14E-08	-5,91E-07	0,00E+00	1,07E-10	3,77E-08	1,30E-10	-1,35E-06
NHW	kg	1,83E+01	3,50E-02	3,52E+01	0,00E+00	7,26E-05	4,86E+01	5,05E+00	-2,14E+00
RW	kg	1,86E-02	4,35E-04	-9,02E-04	0,00E+00	1,66E-05	1,73E-04	5,72E-06	-6,50E-03

HW Hazardous waste disposed; **NHW** Non-hazardous waste disposed; **RW** Radioactive waste disposed.

End of life – output flow

Parameter	Unit	Results per 1 pec							
		A1-A3	A4	A5	C1	C2	C3	C4	D
CR	kg	0,00E+00	0,00E+00	3,00E+01	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
MR	kg	1,19E+00	0,00E+00	4,27E+00	0,00E+00	0,00E+00	4,82E+01	0,00E+00	0,00E+00
MER	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
EEE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
ETE	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00

CR Components for reuse; **MR** Materials for recycling; **MER** Materials for energy recovery; **EEE** Exported electric energy; **ETE** Exported thermal energy.

Information describing the biogenic carbon content at the factory gate

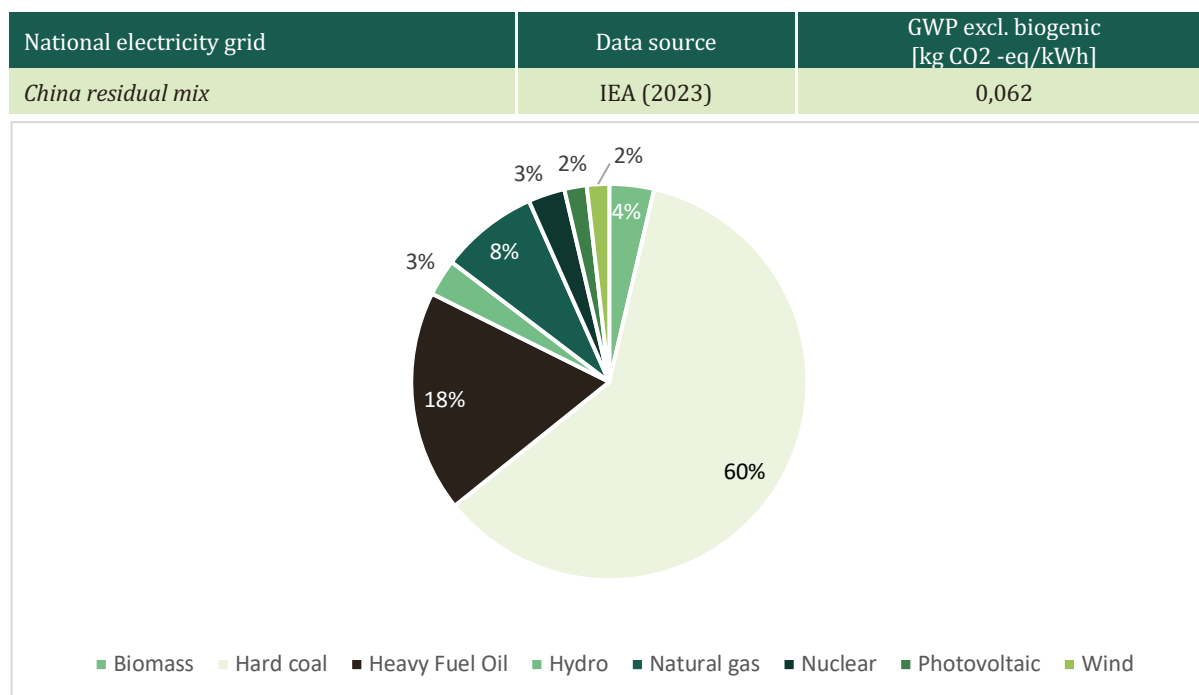
Biogenic carbon content*	Unit	Value
Biogenic carbon content in product	kg C	0
Biogenic carbon content in the accompanying packaging	kg C	1,40E+01

*44/12 is the ratio between the molecular mass of CO₂ and C molecules

Additional requirements

Location based electricity mix from the use of electricity in manufacturing

The manufacturing process has been modelled and calculated according to the Chinese national energy mix with data retrieved from the International Energy Agency (2023).



Hazardous substances

The declaration is based upon reference to threshold values and/or test results and/or material safety data sheets provided to EPD verifiers. Documentation available upon request to EPD owner.

- ☒ The product contains no substances given by the REACH Candidate list.
- ☐ The product contains substances given by the REACH Candidate list that are less than 0,1 % by weight.
- ☐ The product contains dangerous substances, more then 0,1% by weight, given by the REACH Candidate List, see table.
- ☐ The product is classified as hazardous waste, see table.

Bibliography

International Energy Agency	Energy System of China 2021 (2023) https://www.iea.org/countries/china (Retrieved 2024-03-20)
EN 15804:2012+A2:2019	Sustainability of construction works - Environmental product declaration - Core rules for the product category of construction products
ISO 14020:2000	Environmental labels and declarations — General principles
ISO 14025:2010	Environmental labels and declarations - Type III environmental declarations - Principles and procedures
ISO 14044:2006	Environmental management - Life cycle assessment - Requirements and guidelines
ISO 21930:2007	Sustainability in building construction - Environmental declaration of building products
NPCR Part A	Construction Products and Services Version 2.0
SSB	Statistics Norway. (2022) Waste account for Norway (1 000 tonnes), by treatment, contents, year and material. https://www.ssb.no/en/statbank/table/10513/ (Retrieved 2024-03-30)

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