

Environmental Product Declaration (EPD)
According to ISO 14025 and EN 15804+A2



Flat Roof Access Hatch Comfort

(Solo, Duo, Square, Swing)



Solo



Duo



Square



Swing

Registration number:	EPD-Kiwa-EE-000449-EN
Issue date:	04-09-2025
Valid until:	04-09-2030
Declaration owner:	LAMILUX Heinrich Strunz GmbH
Publisher:	Kiwa-Ecobility Experts
Program operator:	Kiwa-Ecobility Experts

1 General information

1.1 PRODUCT

Flat Roof Access Hatch Comfort (Solo, Duo, Square, Swing).

Product provides access to the flat roof and can also be used for room ventilation and natural daylighting

1.2 REGISTRATION NUMBER

EPD-Kiwa-EE-000449-EN

1.3 VALIDITY

Issue date: 04-09-2025

Valid until: 04-09-2030

1.4 PROGRAM OPERATOR

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1.5 OWNER OF THE DECLARATION

Declaration owner: LAMILUX Heinrich Strunz GmbH

Address: Zehstraße. 2, 95111 Rehau, Germany

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Website: www.lamilux.de

Production location: Zehstraße. 2, 95111 Rehau, Germany

Address production location: Zehstraße. 2, 95111 Rehau, Germany

1.6 VERIFICATION OF THE DECLARATION

The independent verification is in accordance with the ISO 14025:2011. The LCA is in compliance with ISO 14040:2006 and ISO 14044:2006. The EN 15804:2012+A2:2019 serves as the core PCR.

☐ Internal ☒ External



Lucas Pedro Berman – Senda
Environmental and Energy Consulting

(Third party verifier)

1.7 STATEMENTS

The owner of this EPD shall be liable for the underlying information and evidence. The program operator Kiwa-Ecobility Experts shall not be liable with respect to manufacturer data, life cycle assessment data and evidence.

1.8 PRODUCT CATEGORY RULES

Kiwa-EE GPI R.3.0

Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, Program EE 1201 (27.02.2025)

Kiwa-EE GPI R.3.0 Annex B1

Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, Program EE 1203 (27.02.2025)

DIN EN 17213 Windows and doors - Environmental Product Declarations - Product category rules for windows and pedestrian doorsets (2020-09)

1.9 COMPARABILITY

In principle, a comparison or assessment of the environmental impacts of different products is only possible if they have been prepared in accordance with EN 15804. For the evaluation of the comparability, the following aspects have to be considered in particular: PCR used, functional or declared unit, geographical reference, the definition of the system boundary, declared modules, data selection (primary or secondary data, background database, data quality), scenarios used for use and disposal phases, and the life cycle inventory (data collection, calculation methods, allocations, validity period). PCRs and general program instructions of different EPDs programs may differ. Comparability needs to be evaluated. For further guidance, see EN 15804+A2 (5.3 Comparability of EPD for construction products) and ISO 14025 (6.7.2 Requirements for comparability).

1.10 CALCULATION BASIS

LCA method: Ecobility Experts | EN15804+A2

LCA software: Simapro 9.6

Characterization method: Characterization method EF 3.1

LCA database profiles: ecoinvent version 3.9.1

Version database: v3.19 (20250306)

1.11 PROJECT REPORT

This EPD is generated on the basis of the following report: LCA background report
“Flat Roof Access Hatch Comfort Solo/Duo/Square/Swing”

2 Product

2.1 PRODUCT DESCRIPTION

With maximum glass surface and high-quality materials, Flat Roof Access Hatches become the high-light on the roof of any building.

In addition to optimized thermal insulation values and proven durability, the focus is primarily on architectural standards and comfort.

We offer flat roof access hatches in various sizes and opening variants to ensure the ideal solution on your roof. Our elements also meet individual requirements in terms of glazing and can be freely configured with thermal insulation or special solar protection glazing.

In addition, these products can be designed as a blind system with external shade systems to reduce the amount of heat entering the building in summer.

The product is manufactured by LAMILUX Heinrich Strunz GmbH in Rehau, Germany.

Flat Roof Access Hatch Comfort Solo:



Flat Roof Access Hatch Comfort Duo:



Flat Roof Access Hatch Comfort Square:



Flat Roof Access Hatch Comfort Swing:



Product specification

The composition of the product is described in the following table:

Materials, %	Solo	Duo	Square	Swing
Aluminum	18.48	41.56	20.00	45.01
Glass	55.39	47.02	50.54	24.37
Steel	21.48	5.56	22.30	22.16
Plastics	3.88	5.58	2.45	4.45
Other	0.77	0.27	4.71	4.01

Weight of GRP per 1m² product:

Component, kg	Solo	Duo	Square	Swing
GRP	22.93	17.98	15.37	9.72

Weight of packaging per 1m² product:

Materials, %	Solo	Duo	Square	Swing
Wood	35.38	41.27	25.30	45.54
Steel	0.55	0.64	0.23	0.77

2.2 APPLICATION (INTENDED USE OF THE PRODUCT)

The Flat Roof Access Hatch Comfort is used for convenient access to the roof of the building.

The Flat Roof Access Hatch Comfort can be used on roofs to provide daylight and ventilate a building.

2.3 REFERENCE SERVICE LIFE (RSL)

RSL PRODUCT

According to the PCR, a reference service life of 30 years can be assumed without documentation. The prerequisite for this is that the manufacturer's guidelines are followed when installing, servicing and maintaining the product.

USED RSL (YR) IN THIS CALCULATION

30 years

2.4 TECHNICAL DATA

Characteristic	Solo	Duo	Square	Swing
Heat transmission (Ug), W/(m²K)	0.6	1.0-1.1	0.6	0.6
Light transmission, %	31-72	36-80	31-72	31-72
Total energy transmission, %	24-51	32-62	24-51	24-51
Snow load, kN/m²	0.68	0.68	0.68	0.68
Fall protection	fall-through-proof (according to GS BAU 18)			
Building material class, GRP	E (according EN 13501-1)			
Building material class, glazing	A1 (according EN 13501-1)			
Hail resistance class	HW5 (according VKF-Standard)			
Product standard	EN 1873-2			

2.5 SUBSTANCES OF VERY HIGH CONCERN

No substance presents in the product with a contribution of more than 0.1 % of the total weight is present on the "List of Potentially Hazardous Substances" (SVHC) that are candidates for authorization under REACH legislation.

2.6 DESCRIPTION PRODUCTION PROCESS

The Flat Roof Access Hatch Comfort is manufactured in four different stages.

First, the raw materials and components are supplied. Then there are two different production processes. First, the frame is manufactured. For this, the profiles are cut and welded. Aluminium sheets are cut and bent. Then the GRP is manufactured. Finally, all the components are assembled. The glass is mounted in a metal frame, and they are attached together to the GRP. At this stage, the hydraulic system for opening and closing the product and the electrical components are also installed.

The product is transported to the construction site in finished form and installed there.

2.7 CONSTRUCTION DESCRIPTION

The Flat Roof Access Hatch Comfort is delivered to the construction site in assembled form.

The installation of the Flat Roof Access Hatch Comfort should only be carried out by qualified personnel in accordance with the manufacturer's instructions.

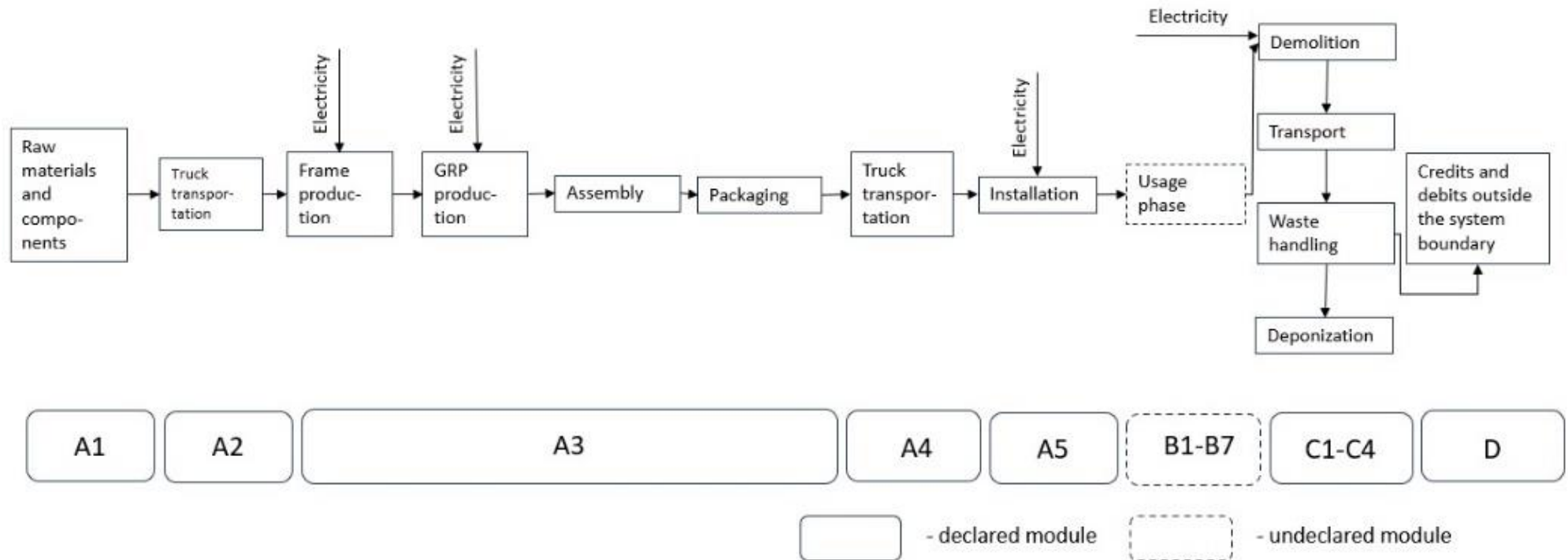


Figure 1: Graphic schematic process flow diagram for life cycle

3 Calculation rules

3.1 [DECLARED UNIT or FUNCTIONAL UNIT]

The declared unit is one square meter Flat Roof Access Hatch Comfort – 1 m² Flat Roof Access Hatch Comfort.

Reference unit: square meter (m²).

3.2 CONVERSION FACTORS

Description	Solo	Duo	Square	Swing
Reference unit, m ²	1	1	1	1
Weight per reference unit, kg	92.608	71.951	120.178	154.798
Conversion factor to 1 kg	0.010798	0.013898	0.008321	0.006460

3.3 SCOPE OF DECLARATION AND SYSTEM BOUNDARIES

This Environmental Product Declaration (EPD) covers the product group “Flat Roof Access Hatch Comfort” for the product variations Solo, Duo, Square and Swing. In accordance with prEN 15941:2022, Clause 5.4, this is a product-specific EPD, representing the environmental performance of the declared products manufactured by LAMILUX Heinrich Strunz GmbH. The results are based on product-specific data and reflect the average environmental impacts of the included product variations.

This is a Cradle to gate with options, modules C1-C4 and module D EPD.

The life cycle stages included are as shown below:

(X = module declared, ND = module not declared)

A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

The modules of the EN15804+A2 contain the following:

Module A1 = Raw material supply	Module B5 = Refurbishment
Module A2 = Transport	Module B6 = Operational energy use
Module A3 = Manufacturing	Module B7 = Operational water use
Module A4 = Transport	Module C1 = De-construction / Demolition
Module A5 = Construction - Installation process	Module C2 = Transport
Module B1 = Use	Module C3 = Waste Processing
Module B2 = Maintenance	Module C4 = Disposal
Module B3 = Repair	Module D = Benefits and loads beyond the product system boundaries
Module B4 = Replacement	

3.4 REPRESENTATIVENESS

This EPD is representative for Flat Roof Access Hatches Comfort (Solo, Duo, Square, Swing), a product of LAMILUX Heinrich Strunz GmbH.

Type of EPD with respect to their scope in accordance with EN 15941, ch. 5.4 Types of EPD: Manufacturer specific EPD - Specific product / Manufacturer specific EPD.

The results of this EPD are representative for Germany.

3.5 CUT-OFF CRITERIA

In the Life cycle assessment the following cut-off criteria are applied:

PRODUCT STAGE (A1-A3)

All input flows (e.g. raw materials, transportation, energy use, packaging, etc.) and output

flows (e.g. production waste) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

CONSTRUCTION PROCESS STAGE (A4-A5)

All input flows (e.g. transportation to the construction site, additional raw material use for construction, installation energy (use) of energy use for assembly, etc.) and output flows (e.g. construction waste, packaging waste, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

END OF LIFE STAGE (C1-C4)

All input flows (e.g. energy use for demolition or disassembly, transport to waste processing, etc.) and output flows (e.g. end-of-life waste processing of the product, etc.) are considered in this LCA. The total neglected input flows do therefore not exceed the limit of 5% of energy use and mass.

BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

All benefits and loads beyond the system boundary resulting from reusable products, recyclable materials and/or useful energy carriers leaving the product system are considered in this LCA.

3.6 ALLOCATION

Allocations were avoided.

3.7 DATA COLLECTION & REFERENCE TIME PERIOD

Primary data including all raw materials, packaging materials, energy consumption and ancillary materials was comprehensively collected for the reference year from 2023-01-01 to 2023-12-31.

3.8 ESTIMATES AND ASSUMPTIONS

The Flat Roof Access Hatch Comfort can be made in different versions - Solo, Duo, Square and Swing.

Description	Dimensions, m	Area, m ²
Solo	1.2x3.5	4.2
Duo	1.2x3.0	3.6
Square	2.0x2.0	4.0
Swing	1.0x3.0	3.0
	1.0x3.5	3.5

For this EPD, data was collected and calculated for the available sizes of the corresponding products.

For the Flat Roof Access Hatch Comfort Swing a product has been selected with a width of 3,00 m and a height of 1,00 m.

These products have a surface area 3,0 to 4,2 m², but since the functional unit should be 1 m² according to the PCR, all inputs have been recalculated to 1 m².

The results can be calculated for the full Flat Roof Access Hatch Comfort by multiplying the results by the area of a specific product.

For module A4 (transportation to the customer or construction site), both customers inside and outside Germany were taken into account. In 2023, 71,6% of revenue is attributable to domestic sales (i.e. within Germany) and 28,4% to international sales. This was taken into account when calculating the transportation distance for module A4.

Transportation to domestic customers is carried out in small batches via distributors and consists of 2 parts, namely a longer route with a large truck (40 t) and a shorter route with a smaller truck (7.5 t). Here, a deviation has been made from the PCR (DIN EN 17213), because an internal calculation could be made.

How the Flat Roof Access Hatch Comfort modular is assembled and disassembled depends largely on the customer. As it is a large product with glass, this LCA assumes that the product must be installed and dismantled using a crane. Therefore, the electricity consumption for modules A5 (assembly) and C1 (disassembly) was taken into account. The electricity consumption for this crane was calculated in kWh per m² and the environmental profile of the European electricity standard (low voltage) was applied to take account of Lamilux's international clientele. The same scenario was assumed for modules A5 and C1.

The scenarios modelled for these modules are currently in use and are representative for the most likely scenarios.

3.9 DATA QUALITY

The quality of the data used for this EPD can be divided into three categories according to the criteria of the United Nations Global Environmental Guidelines for the development of an LCA database (as described in EN 15804+A2).

Results of the "Assessment of data quality of generic and specific data" according to EN 15804+A2, Annex E:

Quality requirement	Specific requirement	Data quality level	Notes
Time-related coverage	Age of data and minimum time period for data collection.	Very Good	Less than 3 years difference between the reference year according to the documentation and the period for which the data are representative
Geographical coverage	Upstream: Unit process for raw material should be collected for respective geographic region	Good	Average data from a larger area that includes the area under study
	Core: Unit process for production should represent the real site.	Good	Average data from a larger area that includes the area under study
	Downstream: End-of-life disposal should represent the region of disposal.	Very Good	Data from the area under investigation
Technical representativeness	Qualitative assessment of the degree to which the data set reflects the true population of interest (technology)	Good	Data from the processes and products under investigation (with similar technology). Indications of deviations from the state of the art.

The "market-based approach" was taken into account for this LCA, so invoices from the electricity provider have been made available.

The following dataset was used as the data source for production (A3):

[E3910093] (ei3.9.1) Electricity (DE) - medium voltage (1kV - 24kV) (ecoinvent 3.9.1, 2022).

The GWP value of the electricity used (in kg CO₂ per kWh) is 0.470.

The following dataset was used as the data source for Construction/installation and Deconstruction (A5, C1):

[E3910014] (ei3.9.1) Electricity (DE) - low voltage (max 1kV) (ecoinvent 3.9.1, 2022).

The GWP value of the electricity used (in kg CO₂ per kWh) is 0.439.

3.10 POWER MIX

Only electrical energy is used in production.

4 Scenarios and additional technical information

4.1 TRANSPORT TO CONSTRUCTION SITE (A4)

For the transport from production place to assembly/user, the following scenario is assumed for module A4 of this EPD.

Value and unit	
Vehicle type used for transport	Module A4 Lamilux (option 2)
Fuel type and consumption of vehicle	Transport, freight, lorry >32 metric ton, EURO6 Cut-off, U; transport, freight, lorry 3.5-7.5 metric ton, EURO6 Cut-off, U
Distance	398 km
Capacity utilization (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilization factor	1

4.2 ASSEMBLY (A5)

The following information describes the scenarios for flows entering the system and flows leaving the system at module A5.

FLOWS ENTERING THE SYSTEM

For flows entering the system at A5 the following scenario is assumed for module A5

	Value	Unit
Energy consumption for installation/assembly		
(ei3.9.1) Electricity (DE) - low voltage (max 1kV)	1.5	kWh

FLOWS LEAVING THE SYSTEM

The following output flows leaving the system at module A5 are assumed.

Description	Solo	Duo	Square	Swing
Output materials as result of loss during construction, %	0	0	0	0
Output materials as result of waste processing of materials used for installation/assembly at the building site, kg	0.00	0.00	0.00	0.00
Output materials as result of waste processing of used packaging, kg	35.924	41.909	25.530	46.307

4.3 DE-CONSTRUCTION, DEMOLITION (C1)

The following information describes the scenario for demolition at the end of life.

	Value	Unit
Energy consumption for demolition		
(ei3.9.1) Electricity (DE) - low voltage (max 1kV)	1.5	kWh

4.4 TRANSPORT END-OF-LIFE (C2)

The following distances and transport conveyance are assumed for transportation during end of life for the different types of waste processing.

Waste Scenario	Transport conveyance	Not removed (stays in work) [km]	Landfill [km]	Incineration [km]	Recycling [km]	Re-use [km]
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.6) plastics, via residue (NMD ID 43)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) PVC, pipes (NMD ID 64)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0

(ei3.9.1) plastics, via residue (NMD ID 43)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) rock wool (insulation) (NMD ID 78)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) bitumen (i.a. roofing material) (NMD ID 16)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0
(ei3.9.1) Steel, construction profiles (NMD ID 70)	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)	0	100	150	50	0

The transport conveyance(s) used in the scenario(s) for transport during end of life has the following characteristics.

Value and unit	
Vehicle type used for transport	(ei3.9.1) Lorry (Truck), unspecified (default) market group for (GLO)
Fuel type and consumption of vehicle	not available
Capacity utilization (including empty returns)	50 % (loaded up and return empty)
Bulk density of transported products	inapplicable
Volume capacity utilization factor	1

4.5 END OF LIFE (C3, C4)

The scenario(s) assumed for end of life of the product are given in the following tables. First the assumed percentages per type of waste processing are displayed, followed by the assumed amounts.

Waste Scenario	Region	Not removed (stays in)	Landfill	Incineration	Recycling	Re-use
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		work) [%]	[%]	[%]	[%]	[%]
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	NL	0	3	3	94	0
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	NL	0	10	85	5	0
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	NL	0	30	0	70	0
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	NL	0	10	85	5	0
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	NL	0	0	100	0	0
(ei3.9.1) plastics, via residue (NMD ID 43)	NL	0	20	80	0	0
(ei3.9.1) PVC, pipes (NMD ID 64)	NL	0	10	20	70	0
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	NL	0	5	5	90	0
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	NL	0	5	0	95	0
(ei3.9.1) plastics, via residue (NMD ID 43)	NL	0	20	80	0	0
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	NL	0	0	100	0	0
(ei3.9.1) rock wool (insulation) (NMD ID 78)	NL	0	85	5	10	0
(ei3.9.1) bitumen (i.a. roofing material) (NMD ID 16)	NL	0	5	90	5	0
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	NL	0	5	0	95	0
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	NL	0	0	35	65	0
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	NL	0	5	0	95	0
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	NL	0	5	5	90	0
(ei3.9.1) Steel, construction profiles (NMD ID 70)	NL	0	1	0	94	5

The following table shows the actual amount of materials (C3, C4) for Flat Roof Access Hatch Comfort Solo.

Waste Scenario	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	0.000	0.386	0.386	12.110	0.000
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.000	0.020	0.171	0.010	0.000
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	0.000	11.586	0.000	27.035	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.023	0.194	0.01	0.000

(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	0.000	3.274	0.000	0.000
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	1.833	7.332	0.00	0.000
(ei3.9.1) PVC, pipes (NMD ID 64)	0.000	0.077	0.155	0.542	0.000
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	0.000	0.006	0.006	0.109	0.000
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	0.000	0.820	0.000	15.578	0.000
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	0.000	10.942	0.000	0.000
Total	0.000	14.752	22.460	55.396	0.000

The following table shows the actual amount of materials (C3, C4) for Flat Roof Access Hatch Comfort Duo.

Waste Scenario	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	0.000	0.673	0.673	21.095	0.000
(ei3.6) plastics, via residue (NMD ID 43)	0.000	1.216	4.864	0.000	0.000
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.000	0.117	0.999	0.059	0.000
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	0.000	7.616	0.000	17.772	0.000
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.000	0.001	0.000	0.010	0.000
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	0.000	0.000	0.041	0.076	0.000
(ei3.9.1) PVC, pipes (NMD ID 64)	0.000	0.111	0.222	0.778	0.000
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	0.000	2.611	0.000	0.000
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	0.000	0.150	0.000	2.855	0.000
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	0.000	9.835	0.000	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.018	0.149	0.009	0.000
Total	0.000	9.903	19.394	42.654	0.000

The following table shows the actual amount of materials (C3, C4) for Flat Roof Access Hatch Comfort Square.

Waste Scenario	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
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	work) [%]				
(ei3.9.1) rock wool (insulation) (NMD ID 78)	0.000	3.200	0.188	0.377	0.000
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	0.000	0.629	0.629	19.711	0.000
(ei3.9.1) bitumen (i.a. roofing material) (NMD ID 16)	0.000	0.021	0.369	0.021	0.000
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.000	0.092	0.785	0.046	0.000
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	0.000	15.900	0.000	37.100	0.000
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	0.709	2.838	0.000	0.000
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.000	0.015	0.000	0.284	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.029	0.247	0.015	0.000
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	0.000	0.000	0.175	0.325	0.000
(ei3.9.1) PVC, pipes (NMD ID 64)	0.000	0.057	0.114	0.398	0.000
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	0.000	3.142	0.000	0.000
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	0.000	1.170	0.000	22.232	0.000
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	0.000	0.002	0.000	0.033	0.000
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	0.000	9.325	0.000	0.000
Total	0.000	21.824	17.812	80.541	0.000

The following table shows the actual amount of materials (C3, C4) for Flat Roof Access Hatch Comfort Swing.

Waste Scenario	Not removed (stays in work) [%]	Landfill [%]	Incineration [%]	Recycling [%]	Re-use [%]
(ei3.9.1) rock wool (insulation) (NMD ID 78)	0.000	3.188	0.188	0.375	0.000
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	0.000	0.802	0.802	25.134	0.000
(ei3.9.1) Steel, construction profiles (NMD ID 70)	0.000	0.287	0.000	26.947	0.000
(ei3.9.1) bitumen (i.a. roofing material) (NMD ID 16)	0.000	0.027	0.491	0.027	0.000

(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.000	0.118	1.006	0.059	0.000
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	0.000	8.032	0.000	0.000
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	0.000	15.600	0.000	36.400	0.000
(ei3.6) plastics, via residue (NMD ID 43)	0.000	0.544	2.175	0.000	0.000
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.000	0.001	0.000	0.013	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.000	0.024	0.206	0.012	0.000
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	0.000	0.000	0.233	0.434	0.000
(ei3.9.1) PVC, pipes (NMD ID 64)	0.000	0.047	0.093	0.327	0.000
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	0.000	2.408	0.000	0.000
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	0.000	1.365	0.000	25.930	0.000
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	0.000	0.002	0.000	0.045	0.000
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	0.000	0.001	0.001	0.021	0.000
Total	0.000	22.006	15.635	115.724	0.000

4.6 BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARY (D)

The presented Benefits and loads beyond the system boundary in this EPD are based on the following calculated Net output flows in kilograms and Energy recovery displayed in MJ Lower Heating Value.

The following table shows the Benefits and loads beyond the system boundary (D) for Flat Roof Access Hatch Comfort Solo.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	2.601	0.000
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.010	3.004
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	27.035	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.011	6.534
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	12.524
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	91.298
(ei3.9.1) PVC, pipes (NMD ID 64)	0.542	3.334
(ei3.9.1) Metals, mixed (via residue (NMD ID 49)	0.086	0.000
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	15.578	0.000

(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	336.904
Total	45.864	453.599

The following table shows the Benefits and loads beyond the system boundary (D) for Flat Roof Access Hatch Comfort Duo.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	4.531	0.000
(ei3.6) plastics, via residue (NMD ID 43)	0.000	65.428
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.059	25.677
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	17.772	0.000
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.010	0.000
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	0.076	1.319
(ei3.9.1) PVC, pipes (NMD ID 64)	0.778	4.784
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	3.698
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	2.855	0.000
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	302.820
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.009	6.317
Total	26.090	410.042

The following table shows the Benefits and loads beyond the system boundary (D) for Flat Roof Access Hatch Comfort Square.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) rock wool (insulation) (NMD ID 78)	0.377	0.000
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	4.234	0.000
(ei3.9.1) bitumen (i.a. roofing material) (NMD ID 16)	0.021	11.092
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.046	20.015
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	37.100	0.000
(ei3.9.1) plastics, via residue (NMD ID 43)	0.000	8.531
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.284	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.015	6.091
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	0.325	5.635

(ei3.9.1) PVC, pipes (NMD ID 64)	0.398	2.448
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	11.828
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	22.232	0.000
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	0.033	0.000
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	287.117
Total	65.064	352.757

The following table shows the Benefits and loads beyond the system boundary (D) for Flat Roof Access Hatch Comfort Swing.

Waste Scenario	Net output flow [kg]	Energy recovery [MJ]
(ei3.9.1) rock wool (insulation) (NMD ID 78)	0.375	0.000
(ei3.9.1) aluminium, cast alloy for buildings (i.a. profiles, sheets, pipes) (NMD ID 4)	5.398	0.000
(ei3.9.1) Steel, construction profiles (NMD ID 70)	21.462	0.000
(ei3.9.1) bitumen (i.a. roofing material) (NMD ID 16)	0.027	14.771
(ei3.9.1) elastomeres (i.a. epdm) (i.a. roofing, foils) (NMD ID 20)	0.059	26.532
(ei3.9.1) plastics, reinforced (i.a. profiles, sheets, pipes) (NMD ID 46)	0.000	247.305
(ei3.9.1) glass (i.a. flat glass) (NMD ID 28)	36.400	0.000
(ei3.6) plastics, via residue (NMD ID 43)	0.000	18.503
(ei3.9.1) copper (i.a. sheets, pipes) (NMD ID 41)	0.013	0.000
(ei3.9.1) polyolefines (i.a. pe,pp) (i.a. pipes, foils) (NMD ID 57)	0.012	5.185
(ei3.9.1) EPS insulation since 2016 (HBCDD-free EPS i.a. insulation) (NMD ID 24)	0.434	7.517
(ei3.9.1) PVC, pipes (NMD ID 64)	0.327	2.009
(ei3.9.1) finishes (adhered to wood, plastic, metal) (NMD ID 2)	0.000	15.770
(ei3.9.1) Galvanised steel (i.a. profiles, sheets) (NMD ID 75)	25.930	0.000
(ei3.9.1) Zinc / zinc coating galvanised steel (i.a. profiles, sheets, zinc coating) (NMD ID 75)	0.045	0.000
(ei3.9.1) Metals, others (i.a. fasteners, fittings) (NMD ID 50)	0.010	0.000
Total	90.493	337.594

5 Results

For the impact assessment, the characterization factors of the LCIA method EN 15804 +A2 Method v1.0 are used. Long-term emissions (>100 years) are not considered in the impact assessment. The results of the impact assessment are only relative statements that do not make any statements about endpoints of the impact categories, exceedance of threshold values, safety margins or risks.

The following tables show the results of the impact assessment indicators, resource use, waste and other output streams. The results presented here refer to the declared product.

Disclaimer on ADP-e, ADP-f, WDP, ETP-fw, HTP-c, HTP-nc, SQP: The results of these environmental impact indicators must be used with caution, as the uncertainties in these results are high or as there is limited experience with the indicator.

Disclaimer on IR: This impact category mainly addresses the potential effect of low dose ionizing radiation on human health in the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents and occupational exposures, nor does it consider radioactive waste disposal in underground facilities. Potential ionizing radiation from soil, radon, and some building materials is also not measured by this indicator.

5.1 ENVIRONMENTAL IMPACT INDICATORS PER 1 m²

Flat Roof Access Hatch Comfort Duo

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eqv.	5.67E+2	2.13E+0	-3.99E+1	5.29E+2	5.69E+0	7.10E+1	6.61E-1	8.99E-1	5.65E+1	2.31E-1	-4.06E+2
GWP-f	kg CO2 eqv.	5.63E+2	2.13E+0	2.83E+1	5.93E+2	5.69E+0	1.90E+0	6.51E-1	8.95E-1	5.64E+1	2.31E-1	-4.04E+2
GWP-b	kg CO2 eqv.	2.86E+0	7.12E-4	-6.84E+1	-6.55E+1	3.68E-3	6.91E+1	9.38E-3	2.92E-4	8.30E-2	1.87E-4	-4.18E-1
GWP-luluc	kg CO2 eqv.	1.35E+0	1.04E-3	1.26E-1	1.47E+0	2.26E-3	4.33E-3	1.09E-3	3.19E-3	1.02E-2	5.06E-5	-1.15E+0
ODP	kg CFC 11 eqv.	1.01E-5	4.83E-8	4.21E-7	1.06E-5	1.33E-6	5.30E-8	7.55E-9	1.59E-8	1.24E-6	2.25E-9	-5.49E-6
AP	mol H+ eqv.	3.70E+0	5.27E-3	1.15E-1	3.83E+0	1.77E-2	1.73E-2	1.89E-3	4.29E-3	4.55E-2	5.84E-4	-2.67E+0
EP-fw	kg P eqv.	1.90E-2	1.78E-5	3.89E-3	2.29E-2	5.21E-5	1.16E-4	9.86E-5	8.91E-6	2.56E-4	1.39E-6	-1.23E-2
EP-m	kg N eqv.	5.87E-1	1.40E-3	2.92E-2	6.17E-1	3.62E-3	7.22E-3	2.98E-4	1.63E-3	1.03E-2	2.74E-4	-4.16E-1
EP-T	mol N eqv.	6.52E+0	1.47E-2	3.35E-1	6.87E+0	4.06E-2	8.04E-2	3.77E-3	1.74E-2	1.15E-1	2.31E-3	-4.73E+0

POCP	kg NMVOC eqv.	2.07E+0	8.60E-3	1.18E-1	2.19E+0	1.58E-2	2.28E-2	1.07E-3	5.93E-3	3.53E-2	8.95E-4	-1.44E+0
ADP-mm	kg Sb-eqv.	4.25E-3	5.95E-6	2.35E-4	4.49E-3	1.67E-4	1.08E-5	7.24E-6	2.80E-6	1.62E-4	1.39E-7	1.66E-3
ADP-f	MJ	6.15E+3	3.23E+1	4.05E+2	6.59E+3	8.94E+1	2.67E+1	9.73E+0	1.28E+1	8.19E+1	1.88E+0	-3.94E+3
WDP	m3 world eqv.	9.80E+1	1.54E-1	3.35E+0	1.01E+2	3.00E-1	2.57E-1	4.84E-2	7.00E-2	2.56E+0	2.97E-2	-3.72E+1

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease incidence	4.48E-5	2.10E-7	3.19E-6	4.82E-5	4.14E-7	1.89E-7	8.53E-9	8.84E-8	6.03E-7	1.25E-8	-3.37E-5
IR	kBq U235 eqv.	6.67E+0	1.55E-2	1.44E+0	8.13E+0	3.91E-1	5.17E-2	3.61E-2	5.00E-3	2.38E-1	1.33E-3	-2.12E+0
ETP-fw	CTUe	3.02E+3	1.55E+1	1.67E+2	3.20E+3	7.48E+1	1.67E+1	2.68E+0	9.46E+0	5.33E+2	8.83E+0	-7.01E+2
HTP-c	CTUh	6.95E-7	9.46E-10	2.77E-8	7.24E-7	2.11E-9	1.11E-8	2.40E-10	4.74E-10	1.97E-8	5.07E-11	-4.67E-7
HTP-nc	CTUh	1.07E-5	2.31E-8	3.50E-7	1.10E-5	7.92E-8	4.13E-8	1.03E-8	1.03E-8	2.71E-7	9.98E-10	-6.57E-6
SQP	Pt	1.18E+3	3.28E+1	7.76E+3	8.98E+3	8.21E+1	1.56E+1	2.39E+0	1.01E+1	5.49E+1	3.66E+0	-1.92E+3

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2

Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
Potential Comparative Toxic Unit for humans (HTP-c)	2
Potential Comparative Toxic Unit for humans (HTP-nc)	2
Potential Soil quality index (SQP)	2

Disclaimer 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.

Disclaimer 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.

5.2 INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI) PER 1 m²

Flat Roof Access Hatch Comfort Duo

PARAMETERS DESCRIBING RESOURCE USE

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	5.74E+2	4.72E-1	9.10E+2	1.48E+3	1.40E+0	3.23E+0	2.80E+0	1.81E-1	9.04E+0	5.67E-2	-7.10E+2
PERM	MJ	0.00E+0	0.00E+0	5.77E+2	5.77E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	5.74E+2	4.72E-1	1.49E+3	2.06E+3	1.40E+0	3.23E+0	2.80E+0	1.81E-1	9.04E+0	5.67E-2	-7.10E+2
PENRE	MJ	5.70E+3	3.23E+1	4.04E+2	6.14E+3	9.49E+1	2.67E+1	9.73E+0	1.28E+1	8.19E+1	1.88E+0	-3.92E+3
PENRM	MJ	4.54E+2	0.00E+0	1.02E+0	4.55E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.53E+1
PENRT	MJ	6.15E+3	3.23E+1	4.05E+2	6.59E+3	9.49E+1	2.67E+1	9.73E+0	1.28E+1	8.19E+1	1.88E+0	-3.94E+3
SM	kg	3.04E+0	0.00E+0	5.51E-1	3.59E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.24E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m ³	3.64E+0	5.07E-3	2.08E-1	3.85E+0	1.10E-2	2.60E-2	4.83E-3	3.10E-3	9.08E-2	1.99E-3	-1.81E+0

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	1.84E-2	2.01E-4	2.35E-2	4.21E-2	2.28E-4	1.22E-4	2.41E-5	8.18E-5	1.40E-1	8.62E-6	1.59E-1
NHWD	kg	9.64E+1	2.83E+0	4.97E+0	1.04E+2	6.01E+0	4.03E+1	5.47E-2	8.48E-1	2.27E+1	9.91E+0	-7.03E+1
RWD	kg	4.71E-3	9.84E-6	1.51E-3	6.23E-3	6.04E-4	5.89E-5	4.50E-5	2.93E-6	1.75E-4	7.97E-7	-1.43E-3

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	3.19E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	kg	0.00E+0	0.00E+0	1.68E+0	1.68E+0	0.00E+0	2.66E+0	0.00E+0	0.00E+0	4.27E+1	0.00E+0	0.00E+0
MER	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	1.19E-1	1.19E-1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.79E+2
EEE	MJ	0.00E+0	0.00E+0	6.89E-2	6.89E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.62E+2

5.3 INFORMATION ON BIOGENIC CARBON CONTENT PER square meter

The following information describes the **biogenic carbon content** in (the main parts of) the product at the factory gate per square meter:

Biogenic carbon content, kg C	Solo	Duo	Square	Swing
Biogenic carbon content in the product	0	0	0	0
Biogenic carbon content in accompanying packaging	16.08	18.76	11.5	20.7

UPTAKE OF BIOGENIC CARBON DIOXIDE

The following amount carbon dioxide uptake is taken into account. Related uptake and release of carbon dioxide in downstream processes are not taken into account in this number although they do appear in the presented results. One kilogram of biogenic carbon content is equivalent to 44/12 kg of biogenic carbon dioxide uptake.

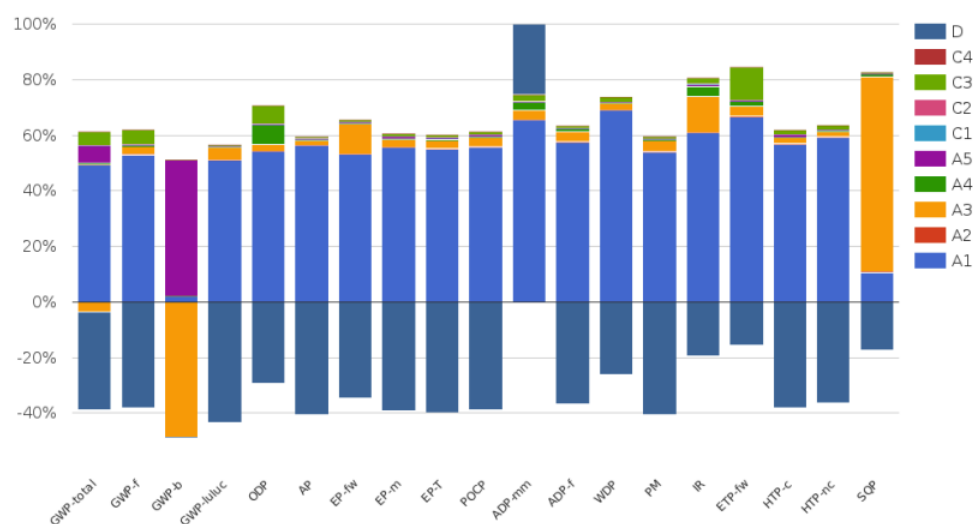
Uptake biogenic carbon dioxide, kg CO2 (biogenic)	Solo	Duo	Square	Swing
Product	0.00	0.00	0.00	0.00
Packaging	58.96	68.78	42.17	75.9

6 Interpretation of results

6.1 CONTRIBUTION ANALYSIS

CONTRIBUTION ANALYSIS OF THE MODULES

Flat Roof Access Hatch Comfort Duo:

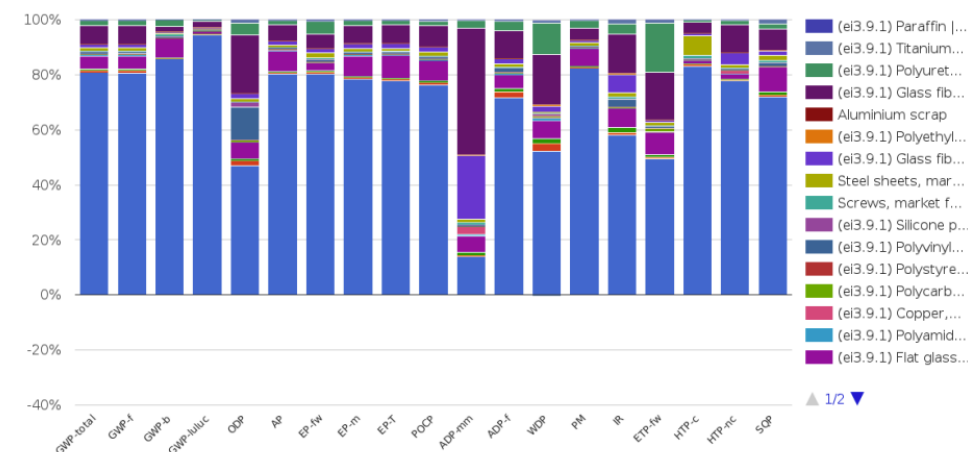


As can be seen in the graphs, module A1 has the largest influence on almost all environmental im-pact categories. After that, module D has the biggest influence. The greatest impact on GWP-b is modules A3 and A5, namely packaging recycling. The production stage (module A3) has greatest impact on the SQP. The other modules all have a relatively low influence on the categories.

The big influence of both modules A1 and module D on the results can be attributed to the aluminium consisting of primary material used in the product. Aluminium has a large impact on all categories and simultaneously has a high value as a secondary material. The high value as a secondary material has a large impact on module D and leads to the high benefits that can be seen in the graphs.

CONTRIBUTION ANALYSIS OF THE RAW MATERIALS (A1)

Flat Roof Access Hatch Comfort Duo:

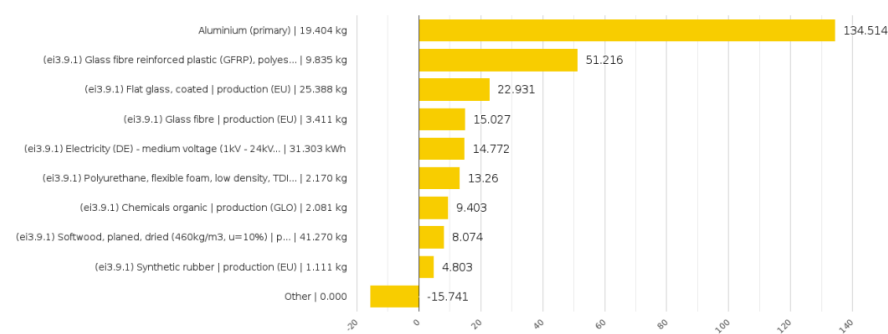


Aluminium (primary) has the highest influence on module A1. After that, glass fiber reinforced plastic, and steel also have a high impact.

CONTRIBUTION ANALYSIS OF THE INPUTS

The following diagrams show the contribution of the inputs, expressed in the Global warming potential - total. The results per input are the sum of all declared modules including module D.

Flat Roof Access Hatch Comfort Duo:



6.2 SENSITIVITY ANALYSES

No sensitivity analysis was performed

7 Annex A

Results for Flat Roof Access Hatch Comfort Solo, Flat Roof Access Hatch Comfort Square, Flat Roof Access Hatch Comfort Swing

ENVIRONMENTAL IMPACT INDICATORS PER 1 m2

Flat Roof Access Hatch Comfort Solo

CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eqv.	4.09E+2	2.15E+0	-4.23E+1	3.69E+2	6.42E+0	6.09E+1	6.61E-1	1.13E+0	6.17E+1	2.95E-1	-2.57E+2
GWP-f	kg CO2 eqv.	4.06E+2	2.15E+0	1.64E+1	4.25E+2	6.42E+0	1.72E+0	6.51E-1	1.13E+0	6.16E+1	2.94E-1	-2.56E+2
GWP-b	kg CO2 eqv.	1.97E+0	7.19E-4	-5.88E+1	-5.68E+1	4.15E-3	5.92E+1	9.38E-3	3.67E-4	1.02E-1	2.02E-4	-2.63E-1
GWP-luluc	kg CO2 eqv.	7.73E-1	1.05E-3	9.16E-2	8.66E-1	2.55E-3	3.87E-3	1.09E-3	4.02E-3	8.62E-3	4.85E-5	-6.50E-1
ODP	kg CFC 11 eqv.	1.05E-5	4.87E-8	2.35E-7	1.07E-5	1.50E-6	4.65E-8	7.55E-9	2.01E-8	1.42E-6	3.22E-9	-4.30E-6
AP	mol H+ eqv.	2.71E+0	5.31E-3	6.70E-2	2.78E+0	2.00E-2	1.51E-2	1.89E-3	5.40E-3	3.79E-2	7.40E-4	-1.56E+0
EP-fw	kg P eqv.	1.53E-2	1.80E-5	2.70E-3	1.80E-2	5.88E-5	1.14E-4	9.86E-5	1.12E-5	2.24E-4	1.29E-6	-6.15E-3
EP-m	kg N eqv.	4.38E-1	1.42E-3	1.99E-2	4.59E-1	4.09E-3	6.23E-3	2.98E-4	2.05E-3	9.36E-3	3.72E-4	-2.50E-1
EP-T	mol N eqv.	4.91E+0	1.49E-2	2.26E-1	5.15E+0	4.58E-2	6.95E-2	3.77E-3	2.19E-2	1.04E-1	3.14E-3	-2.95E+0
POCP	kg NMVOC eqv.	1.60E+0	8.67E-3	8.27E-2	1.69E+0	1.79E-2	1.97E-2	1.07E-3	7.47E-3	3.13E-2	1.24E-3	-9.32E-1
ADP-mm	kg Sb-eqv.	5.71E-3	6.00E-6	1.27E-4	5.84E-3	1.89E-4	1.03E-5	7.24E-6	3.53E-6	1.05E-4	1.68E-7	1.32E-3
ADP-f	MJ	4.82E+3	3.26E+1	2.48E+2	5.10E+3	1.01E+2	2.43E+1	9.73E+0	1.61E+1	6.79E+1	2.56E+0	-2.55E+3
WDP	m3 world eqv.	9.55E+1	1.56E-1	1.09E+0	9.67E+1	3.39E-1	2.27E-1	4.84E-2	8.81E-2	2.71E+0	3.28E	-4.07E+1

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease incidence	3.30E-5	2.12E-7	2.44E-6	3.56E-5	4.68E-7	1.63E-7	8.53E-9	1.11E-7	4.60E-7	1.69E-8	-2.06E-5
IR	kBq U235 eqv.	5.99E+0	1.57E-2	9.54E-1	6.96E+0	4.41E-1	4.95E-2	3.61E-2	6.30E-3	2.05E-1	1.57E-3	-1.14E+0
ETP-fw	CTUe	3.37E+3	1.57E+1	1.08E+2	3.50E+3	8.44E+1	1.47E+1	2.68E+0	1.19E+1	6.09E+2	1.28E+1	-3.26E+2
HTP-c	CTUh	6.89E-7	9.54E-10	3.74E-8	7.27E-7	2.38E-9	9.53E-9	2.40E-10	5.97E-10	2.16E-8	5.86E-11	-1.20E-7
HTP-nc	CTUh	8.56E-6	2.33E-8	2.65E-7	8.85E-6	8.94E-8	3.69E-8	1.03E-8	1.30E-8	2.22E-7	1.64E-9	-2.24E-6
SQP	Pt	9.93E+2	3.31E+1	6.63E+3	7.66E+3	9.27E+1	1.37E+1	2.39E+0	1.27E+1	3.90E+1	5.27E+0	-1.52E+3

Flat Roof Access Hatch Comfort Square
CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eqv.	4.72E+2	3.61E+0	-2.94E+1	4.46E+2	7.28E+0	4.38E+1	6.61E-1	1.32E+0	5.16E+1	2.48E-1	-3.69E+2
GWP-f	kg CO2 eqv.	4.69E+2	3.61E+0	1.24E+1	4.85E+2	7.28E+0	1.41E+0	6.51E-1	1.32E+0	5.14E+1	2.47E-1	-3.67E+2
GWP-b	kg CO2 eqv.	2.22E+0	1.21E-3	-4.19E+1	-3.97E+1	4.71E-3	4.24E+1	9.38E-3	4.29E-4	1.38E-1	2.00E-4	-3.59E-1
GWP-luluc	kg CO2 eqv.	9.21E-1	1.76E-3	5.93E-2	9.82E-1	2.89E-3	3.07E-3	1.09E-3	4.70E-3	9.44E-3	6.73E-5	-9.77E-1
ODP	kg CFC 11 eqv.	1.33E-5	8.20E-8	1.86E-7	1.35E-5	1.70E-6	3.54E-8	7.55E-9	2.35E-8	1.03E-6	4.58E-9	-5.07E-6
AP	mol H+ eqv.	3.34E+0	8.94E-3	3.93E-2	3.39E+0	2.26E-2	1.13E-2	1.89E-3	6.31E-3	4.19E-2	1.05E-3	-2.54E+0
EP-fw	kg P eqv.	1.79E-2	3.03E-5	2.32E-3	2.02E-2	6.67E-5	1.09E-4	9.86E-5	1.31E-5	2.31E-4	1.78E-6	-9.74E-3
EP-m	kg N eqv.	5.21E-1	2.39E-3	1.41E-2	5.38E-1	4.64E-3	4.54E-3	2.98E-4	2.40E-3	9.60E-3	4.49E-4	-3.67E-1
EP-T	mol N eqv.	5.93E+0	2.50E-2	1.57E-1	6.12E+0	5.19E-2	5.07E-2	3.77E-3	2.56E-2	1.07E-1	4.44E-3	-4.27E+0
POCP	kg NMVOC eqv.	1.94E+0	1.46E-2	5.76E-2	2.01E+0	2.03E-2	1.44E-2	1.07E-3	8.73E-3	3.29E-2	1.70E-3	-1.37E+0
ADP-mm	kg Sb-eqv.	1.46E-2	1.01E-5	2.63E-4	1.49E-2	2.14E-4	9.42E-6	7.24E-6	4.13E-6	1.50E-4	2.25E-7	-9.23E-4
ADP-f	MJ	5.26E+3	5.48E+1	2.01E+2	5.51E+3	1.14E+2	2.01E+1	9.73E+0	1.89E+1	7.57E+1	3.64E+0	-3.55E+3

WDP	m3 world eqv.	8.44E+1	2.62E-1	4.53E-1	8.51E+1	3.84E-1	1.76E-1	4.84E-2	1.03E-1	2.27E+0	4.99E-2	-5.57E+1
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ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease incidence	3.78E-5	3.57E-7	1.60E-6	3.97E-5	5.30E-7	1.19E-7	8.53E-9	1.30E-7	5.69E-7	2.39E-8	-3.08E-5
IR	kBq U235 eqv.	6.54E+0	2.64E-2	8.70E-1	7.44E+0	5.00E-1	4.57E-2	3.61E-2	7.37E-3	2.17E-1	2.16E-3	-1.64E+0
ETP-fw	CTUe	2.96E+3	2.64E+1	1.38E+2	3.13E+3	9.57E+1	1.13E+1	2.68E+0	1.39E+1	4.44E+2	1.74E+1	-5.62E+2
HTP-c	CTUh	9.06E-7	1.61E-9	5.17E-8	9.59E-7	2.70E-9	6.88E-9	2.40E-10	6.98E-10	2.03E-8	8.07E-11	-2.34E-7
HTP-nc	CTUh	1.20E-5	3.92E-8	3.29E-7	1.24E-5	1.01E-7	2.93E-8	1.03E-8	1.52E-8	2.55E-7	2.01E-9	-7.01E-6
SQP	Pt	1.26E+3	5.56E+1	4.77E+3	6.08E+3	1.05E+2	1.05E+1	2.39E+0	1.49E+1	5.26E+1	7.33E+0	-1.39E+3

Flat Roof Access Hatch Comfort Swing
CORE ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO2 eqv.	6.00E+2	3.69E+0	-4.86E+1	5.55E+2	1.01E+1	7.83E+1	6.61E-1	1.54E+0	4.73E+1	2.41E-1	-4.77E+2
GWP-f	kg CO2 eqv.	5.96E+2	3.69E+0	2.68E+1	6.27E+2	1.00E+1	2.03E+0	6.51E-1	1.53E+0	4.71E+1	2.41E-1	-4.75E+2
GWP-b	kg CO2 eqv.	2.63E+0	1.24E-3	-7.55E+1	-7.29E+1	6.50E-3	7.62E+1	9.38E-3	5.00E-4	1.42E-1	2.12E-4	-3.81E-1
GWP-luluc	kg CO2 eqv.	1.14E+0	1.80E-3	1.16E-1	1.26E+0	3.99E-3	4.67E-3	1.09E-3	5.47E-3	1.04E-2	7.44E-5	-1.23E+0
ODP	kg CFC 11 eqv.	1.42E-5	8.37E-8	3.62E-7	1.47E-5	2.35E-6	5.77E-8	7.55E-9	2.73E-8	8.94E-7	4.67E-9	-6.78E-6
AP	mol H+ eqv.	3.80E+0	9.13E-3	8.79E-2	3.90E+0	3.12E-2	1.89E-2	1.89E-3	7.34E-3	4.63E-2	1.09E-3	-3.02E+0
EP-fw	kg P eqv.	2.29E-2	3.09E-5	4.64E-3	2.76E-2	9.20E-5	1.18E-4	9.86E-5	1.53E-5	2.49E-4	2.00E-6	-1.03E-2
EP-m	kg N eqv.	6.35E-1	2.44E-3	2.82E-2	6.66E-1	6.40E-3	7.93E-3	2.98E-4	2.79E-3	1.01E-2	4.54E-4	-4.69E-1
EP-T	mol N eqv.	7.18E+0	2.55E-2	3.15E-1	7.52E+0	7.17E-2	8.84E-2	3.77E-3	2.98E-2	1.13E-1	4.56E-3	-5.52E+0
POCP	kg NMVOC eqv.	2.46E+0	1.49E-2	1.17E-1	2.59E+0	2.80E-2	2.50E-2	1.07E-3	1.02E-2	3.53E-2	1.74E-3	-1.82E+0

ADP-mm	kg Sb-equiv.	1.35E-2	1.03E-5	3.57E-4	1.38E-2	2.95E-4	1.12E-5	7.24E-6	4.80E-6	1.83E-4	2.40E-7	2.70E-3
ADP-f	MJ	6.52E+3	5.60E+1	4.15E+2	6.99E+3	1.58E+2	2.85E+1	9.73E+0	2.20E+1	8.40E+1	3.75E+0	-4.55E+3
WDP	m3 world eqv.	1.08E+2	2.67E-1	1.11E+0	1.10E+2	5.30E-1	2.79E-1	4.84E-2	1.20E-1	2.17E+0	5.27E-2	-8.78E+1

ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS EN15804+A2

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PM	disease incidence	1.08E+2	2.67E-1	1.11E+0	1.10E+2	5.30E-1	2.79E-1	4.84E-2	1.20E-1	2.17E+0	5.27E-2	-8.78E+1
IR	kBq U235 eqv.	7.81E+0	2.69E-2	1.69E+0	9.53E+0	6.90E-1	5.33E-2	3.61E-2	8.57E-3	2.36E-1	2.36E-3	-1.59E+0
ETP-fw	CTUe	3.28E+3	2.69E+1	2.34E+2	3.54E+3	1.32E+2	1.82E+1	2.68E+0	1.62E+1	3.90E+2	2.02E+1	-2.84E+2
HTP-c	CTUh	1.35E-6	1.64E-9	1.11E-7	1.46E-6	3.73E-9	1.22E-8	2.40E-10	8.12E-10	1.82E-8	8.78E-11	-7.00E-8
HTP-nc	CTUh	1.02E-5	4.00E-8	6.24E-7	1.09E-5	1.40E-7	4.45E-8	1.03E-8	1.76E-8	2.81E-7	2.20E-9	-3.25E-6
SQP	Pt	1.47E+3	5.68E+1	8.57E+3	1.01E+4	1.45E+2	1.70E+1	2.39E+0	1.73E+1	6.23E+1	7.46E+0	-2.15E+3

CLASSIFICATION OF DISCLAIMERS TO THE DECLARATION OF CORE AND ADDITIONAL ENVIRONMENTAL IMPACT INDICATORS

ILCD classification	Indicator	Disclaimer
ILCD type / level 1	Global warming potential (GWP)	None
	Depletion potential of the stratospheric ozone layer (ODP)	None
	Potential incidence of disease due to PM emissions (PM)	None
ILCD type / level 2	Acidification potential, Accumulated Exceedance (AP)	None
	Eutrophication potential, Fraction of nutrients reaching freshwater end compartment (EP-freshwater)	None
	Eutrophication potential, Fraction of nutrients reaching marine end compartment (EP-marine)	None
	Eutrophication potential, Accumulated Exceedance (EP-terrestrial)	None
	Formation potential of tropospheric ozone (POCP)	None
	Potential Human exposure efficiency relative to U235 (IRP)	1
ILCD type / level 3	Abiotic depletion potential for non-fossil resources (ADP-minerals&metals)	2
	Abiotic depletion potential for fossil resources (ADP-fossil)	2
	Water (user) deprivation potential, deprivation-weighted water consumption (WDP)	2
	Potential Comparative Toxic Unit for ecosystems (ETP-fw)	2
	Potential Comparative Toxic Unit for humans (HTP-c)	2

Potential Comparative Toxic Unit for humans (HTP-nc)

2

Potential Soil quality index (SQP)

2

Disclaimer 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.

Disclaimer 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.

INDICATORS DESCRIBING RESOURCE USE AND ENVIRONMENTAL INFORMATION BASED ON LIFE CYCLE INVENTORY (LCI) PER 1 m²

Flat Roof Access Hatch Comfort Solo

PARAMETERS DESCRIBING RESOURCE USE

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	4.17E+2	4.76E-1	7.64E+2	1.18E+3	1.58E+0	3.17E+0	2.80E+0	2.28E-1	7.46E+0	7.02E-2	-4.96E+2
PERM	MJ	0.00E+0	0.00E+0	4.95E+2	4.95E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	4.17E+2	4.76E-1	1.26E+3	1.68E+3	1.58E+0	3.17E+0	2.80E+0	2.28E-1	7.46E+0	7.02E-2	-4.96E+2
PENRE	MJ	4.28E+3	3.26E+1	2.48E+2	4.56E+3	1.07E+2	2.43E+1	9.73E+0	1.62E+1	6.79E+1	2.57E+0	-2.53E+3
PENRM	MJ	5.39E+2	0.00E+0	2.55E-1	5.39E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	-1.60E+1
PENRT	MJ	4.82E+3	3.26E+1	2.48E+2	5.10E+3	1.07E+2	2.43E+1	9.73E+0	1.62E+1	6.79E+1	2.57E+0	-2.55E+3
SM	kg	2.86E+0	0.00E+0	5.05E-1	3.37E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.10E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m ³	3.15E+0	5.11E-3	1.09E-1	3.27E+0	1.25E-2	2.30E-2	4.83E-3	3.90E-3	8.87E-2	2.85E-3	-1.42E+0

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	1.48E-2	2.02E-4	9.97E-3	2.50E-2	2.57E-4	1.08E-4	2.41E-5	1.03E-4	8.02E-2	1.22E-5	9.11E-2
NHWD	kg	7.54E+1	2.85E+0	3.97E+0	8.23E+1	6.79E+0	3.46E+1	5.47E-2	1.07E+0	2.52E+1	1.47E+1	-3.74E+1

RWD	kg	4.29E-3	9.93E-6	9.72E-4	5.27E-3	6.82E-4	5.70E-5	4.50E-5	3.69E-6	1.49E-4	9.15E-7	-7.69E-4
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ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.74E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	kg	0.00E+0	0.00E+0	1.43E+0	1.43E+0	0.00E+0	2.28E+0	0.00E+0	0.00E+0	5.57E+1	0.00E+0	0.00E+0
MER	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	2.98E-2	2.98E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.81E+2
EEE	MJ	0.00E+0	0.00E+0	1.73E-2	1.73E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.63E+2

Flat Roof Access Hatch Comfort Square

PARAMETERS DESCRIBING RESOURCE USE

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	4.72E+2	8.02E-1	5.52E+2	1.02E+3	1.79E+0	3.06E+0	2.80E+0	2.67E-1	8.23E+0	9.69E-2	-5.31E+2
PERM	MJ	0.00E+0	0.00E+0	3.54E+2	3.54E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	4.72E+2	8.02E-1	9.06E+2	1.38E+3	1.79E+0	3.06E+0	2.80E+0	2.67E-1	8.23E+0	9.69E-2	-5.31E+2
PENRE	MJ	4.87E+3	5.48E+1	2.01E+2	5.13E+3	1.21E+2	2.01E+1	9.73E+0	1.89E+1	7.58E+1	3.64E+0	-3.54E+3
PENRM	MJ	3.81E+2	0.00E+0	2.38E-1	3.81E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.75E+1
PENRT	MJ	5.26E+3	5.48E+1	2.01E+2	5.51E+3	1.21E+2	2.01E+1	9.73E+0	1.89E+1	7.58E+1	3.64E+0	-3.55E+3
SM	kg	8.85E+0	0.00E+0	1.28E+0	1.01E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	6.54E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m³	3.08E+0	8.60E-3	8.42E-2	3.17E+0	1.41E-2	1.78E-2	4.83E-3	4.56E-3	8.14E-2	4.05E-3	-2.03E+0

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	1.96E-2	3.41E-4	2.47E-2	4.46E-2	2.91E-4	8.38E-5	2.41E-5	1.20E-4	1.30E-1	1.74E-5	1.61E-1
NHWD	kg	9.08E+1	4.80E+0	3.98E+0	9.96E+1	7.69E+0	2.47E+1	5.47E-2	1.25E+0	2.16E+1	2.18E+1	-5.69E+1

RWD	kg	4.60E-3	1.67E-5	8.68E-4	5.48E-3	7.73E-4	5.36E-5	4.50E-5	4.32E-6	1.60E-4	1.25E-6	-1.10E-3
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ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.15E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
MFR	kg	0.00E+0	0.00E+0	3.21E+0	3.21E+0	0.00E+0	1.48E+0	0.00E+0	0.00E+0	8.05E+1	0.00E+0	0.00E+0
MER	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	2.78E-2	2.78E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.03E+2
EEE	MJ	0.00E+0	0.00E+0	1.62E-2	1.62E-2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.18E+2

Flat Roof Access Hatch Comfort Swing

PARAMETERS DESCRIBING RESOURCE USE

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	5.66E+2	8.19E-1	1.00E+3	1.57E+3	2.47E+0	3.27E+0	2.80E+0	3.11E-1	9.14E+0	1.05E-1	-7.61E+2
PERM	MJ	0.00E+0	0.00E+0	6.37E+2	6.37E+2	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
PERT	MJ	5.66E+2	8.19E-1	1.64E+3	2.20E+3	2.47E+0	3.27E+0	2.80E+0	3.11E-1	9.14E+0	1.05E-1	-7.61E+2
PENRE	MJ	6.15E+3	5.60E+1	4.15E+2	6.62E+3	1.68E+2	2.85E+1	9.73E+0	2.20E+1	8.40E+1	3.75E+0	-4.53E+3
PENRM	MJ	3.71E+2	2.01E+1	2.01E+1	3.71E+2	2.01E+1	2.01E+1	2.01E+1	2.01E+1	2.01E+1	2.01E+1	2.01E+1
PENRT	MJ	6.52E+3	5.60E+1	4.15E+2	6.99E+3	1.68E+2	2.85E+1	9.73E+0	2.20E+1	8.40E+1	3.75E+0	-4.55E+3
SM	kg	1.73E+1	0.00E+0	2.22E+0	1.96E+1	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	8.53E+0
RSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
NRSF	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
FW	m ³	3.90E+0	8.79E-3	1.72E-1	4.08E+0	1.95E-2	2.82E-2	4.83E-3	5.31E-3	8.13E-2	4.13E-3	-2.90E+0

OTHER ENVIRONMENTAL INFORMATION DESCRIBING WASTE CATEGORIES

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
HWD	kg	2.81E-2	3.48E-4	3.17E-2	6.02E-2	4.02E-4	1.32E-4	2.41E-5	1.40E-4	1.66E-1	1.77E-5	2.03E-1
NHWD	kg	1.15E+2	4.91E+0	7.19E+0	1.27E+2	1.06E+1	4.45E+	1.547E-2	1.45E+0	1.98E+1	2.20E+1	-6.70E+1
RWD	kg	5.51E-3	1.71E-5	1.73E-3	7.26E-3	1.07E-3	6.04E-5	4.50E-5	5.03E-6	1.76E-4	1.37E-6	-1.07E-3

ENVIRONMENTAL INFORMATION DESCRIBING OUTPUT FLOWS

Abbreviation	Unit	A1	A2	A3	A1-A3	A4	A5	C1	C2	C3	C4	D
CRU	kg	0.00E+0	0.00E+0	1.15E-1	1.15E-1	0.00E+0	3.84E-2	0.00E+0	0.00E+0	1.43E+0	0.00E+0	0.00E+0
MFR	kg	0.00E+0	0.00E+0	5.99E+0	5.99E+0	0.00E+0	3.00E+0	0.00E+0	0.00E+0	1.16E+2	0.00E+0	0.00E+0
MER	kg	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0
EET	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	2.73E+2
EEE	MJ	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	0.00E+0	1.58E+2

Variability of results

For information purposes, the table below presents partial LCA results for the common product configurations covered by this EPD, together with an estimation of the associated variability, in accordance with the requirements of EN 15804+A2.

The variability of the LCA results for the reference environmental indicators is as follows:

Abbreviation	Unit	Duo (100%)	Solo		Square		Swing	
			Results (A1-A3)	Δ, %	Results (A1-A3)	Δ, %	Results (A1-A3)	Δ, %
GWP-total	kg CO2 eqv.	5.29E+2	3.69E+2	-30.25	4.46E+2	-15.69	5.55E+2	4.91
GWP-f	kg CO2 eqv.	5.93E+2	4.25E+2	-28.33	4.85E+2	-18.21	6.27E+2	5.73
GWP-b	kg CO2 eqv.	-6.55E+1	-5.68E+1	-13.28	-3.97E+1	-39.39	-7.29E+1	11.30
GWP-luluc	kg CO2 eqv.	1.47E+0	8.66E-1	-41.09	9.82E-1	-33.20	1.26E+0	-14.29
ODP	kg CFC 11 eqv.	1.06E-5	1.07E-5	0.94	1.35E-5	27.36	1.47E-5	38.68
AP	mol H+ eqv.	3.83E+0	2.78E+0	-27.42	3.39E+0	-11.49	3.90E+0	1.83
EP-fw	kg P eqv.	2.29E-2	1.80E-2	-21.40	2.02E-2	-11.79	2.76E-2	20.52
EP-m	kg N eqv.	6.17E-1	4.59E-1	-25.61	5.38E-1	-12.80	6.66E-1	7.94
EP-T	mol N eqv.	6.87E+0	5.15E+0	-25.04	6.12E+0	-10.92	7.52E+0	9.46
POCP	kg NMVOC eqv.	2.19E+0	1.69E+0	-22.83	2.01E+0	-8.22	2.59E+0	18.26

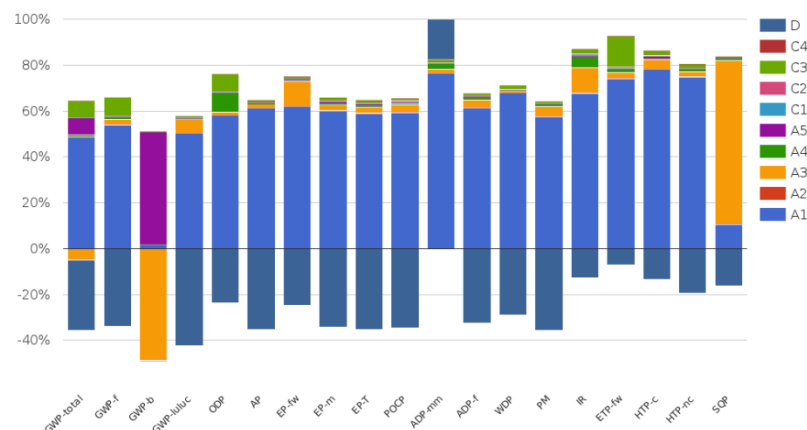
ADP-mm	kg Sb-equiv.	4.49E-3	5.84E-3	30.07	1.49E-2	231.85	1.38E-2	207.35
ADP-f	MJ	6.59E+3	5.10E+3	-22.61	5.51E+3	-16.39	6.99E+3	6.07
WDP		1.01E+2	9.67E+1	-4.26	8.51E+1	-15.74	1.10E+2	8.91
PM	disease incidence	4.82E-5	3.56E-5	-26.14	3.97E-5	-17.63	1.10E+2	22.82E+7
IR	kBq U235 eqv.	8.13E+0	6.96E+0	-14.39	7.44E+0	-8.49	9.53E+0	17.22
ETP-fw	CTUe	3.20E+3	3.50E+3	9.38	3.13E+3	-2.19	3.54E+3	10.63
HTP-c	CTUh	7.24E-7	7.27E-7	0.41	9.59E-7	32.46	1.46E-6	101.66
HTP-nc	CTUh	1.10E-5	8.85E-6	-19.55	1.24E-5	12.73	1.09E-5	-0.91
SQP	Pt	8.98E+3	7.66E+3	-14.70	6.08E+3	-32.29	1.01E+4	12.47
PERE	MJ	1.48E+3	1.18E+3	-20.27	1.02E+3	-31.08	1.57E+3	6.08
PERM	MJ	5.77E+2	4.95E+2	-14.21	3.54E+2	-38.65	6.37E+2	10.40
PERT	MJ	2.06E+3	1.68E+3	-18.45	1.38E+3	-33.01	2.20E+3	6.80
PENRE	MJ	6.14E+3	4.56E+3	-25.73	5.13E+3	-16.45	6.62E+3	7.82
PENRM	MJ	4.55E+2	5.39E+2	18.46	3.81E+2	-16.26	3.71E+2	-18.46
PENRT	MJ	6.59E+3	5.10E+3	-22.61	5.51E+3	-16.39	6.99E+3	6.07
SM	kg	3.59E+0	3.37E+0	-6.13	1.01E+1	181.34	1.96E+1	445.96
RSF	MJ	0.00E+0	0.00E+0	0.00	0.00E+0	0.00	0.00E+0	0.00
NRSF	MJ	0.00E+0	0.00E+0	0.00	0.00E+0	0.00	0.00E+0	0.00
FW	m³	3.85E+0	3.27E+0	-15.06	3.17E+0	-17.66	4.08E+0	5.97
HWD	kg	4.21E-2	2.50E-2	-40.62	4.46E-2	5.94	6.02E-2	42.99
NHWD	kg	1.04E+2	8.23E+1	-20.87	9.96E+1	-4.23	1.27E+2	22.12
RWD	kg	6.23E-3	5.27E-3	-15.41	5.48E-3	-12.04	7.26E-3	16.53
CRU	kg	0.00E+0	0.00E+0	0.00	0.00E+0	0.00	1.15E-1	0.00
MFR	kg	1.68E+0	1.43E+0	-14.88	3.21E+0	91.07	5.99E+0	256.55

MER	kg	0.00E+0	0.00E+0	0.00	0.00E+0	0.00	0.00E+0	0.00
EET	MJ	1.19E-1	2.98E-2	-74.96	2.78E-2	-76.64	0.00E+0	-100.00
EEE	MJ	6.89E-2	1.73E-2	-74.89	1.62E-2	-76.49	0.00E+0	-100.00

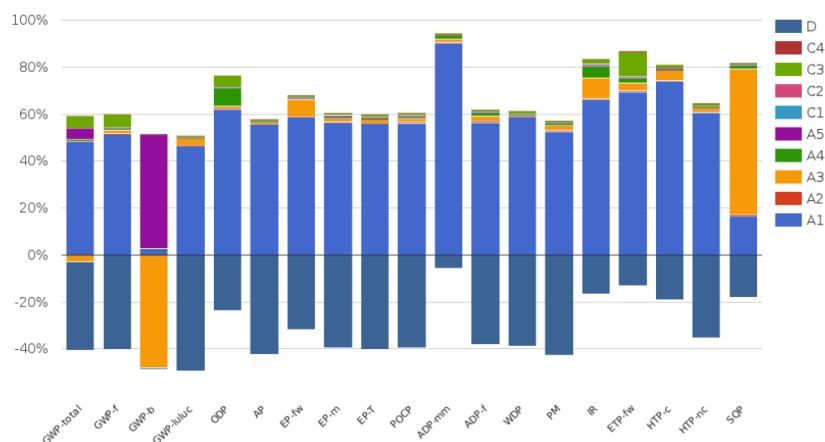


CONTRIBUTION ANALYSIS OF THE MODULES

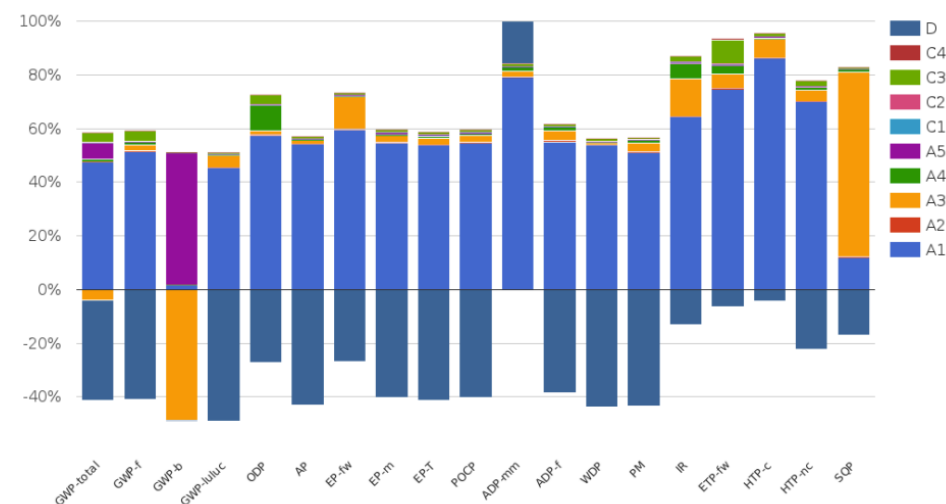
Flat Roof Access Hatch Comfort Solo:



Flat Roof Access Hatch Comfort Square:



Flat Roof Access Hatch Comfort Swing:

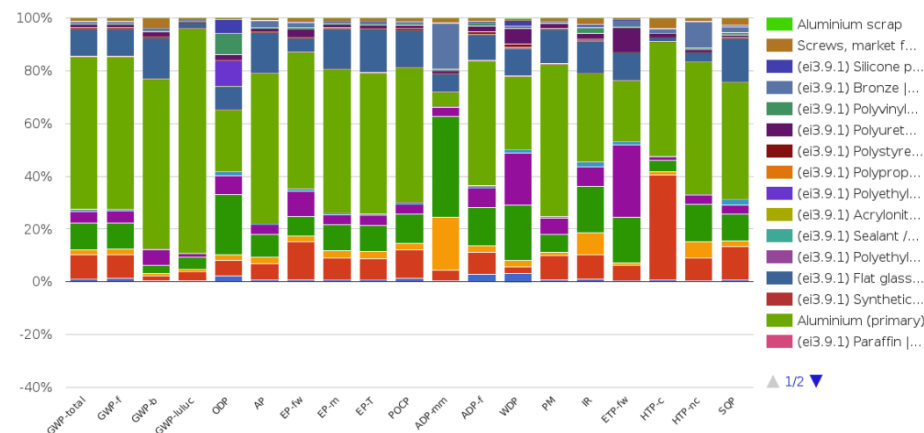


As can be seen in the graphs, module A1 has the largest influence on almost all environmental im-pact categories. After that, module D has the biggest influence. The greatest impact on GWP-b is modules A3 and A5, namely packaging recycling. The production stage (module A3) has greatest impact on the SQP. The other modules all have a relatively low influence on the categories.

The big influence of both modules A1 and module D on the results can be attributed to the aluminium consisting of primary material used in the product. Aluminium has a large impact on all categories and simultaneously has a high value as a secondary material. The high value as a secondary material has a large impact on module D and leads to the high benefits that can be seen in the graphs.

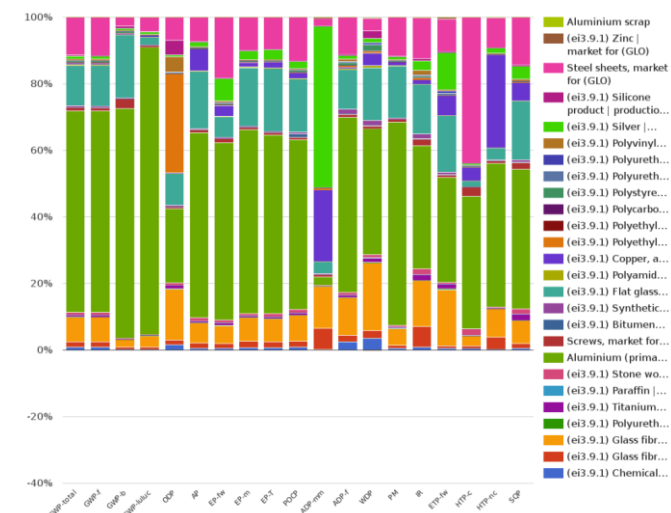
CONTRIBUTION ANALYSIS OF THE RAW MATERIALS (A1)

Flat Roof Access Hatch Comfort Solo:



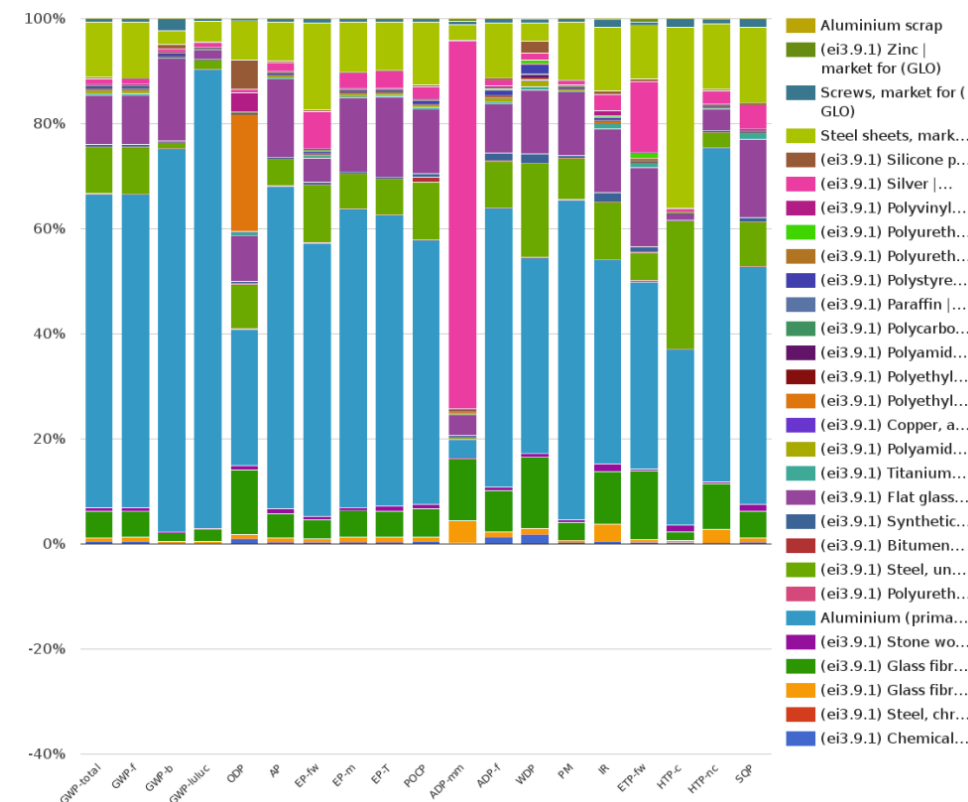
Aluminium (primary) has the highest influence on module A1. After that, flat glass and steel also have a high impact.

Flat Roof Access Hatch Comfort Square:



Aluminium (primary) has the highest influence on module A1. After that, steel sheets, flat glass, and glass fiber reinforced plastic also have a high impact.

Flat Roof Access Hatch Comfort Swing:

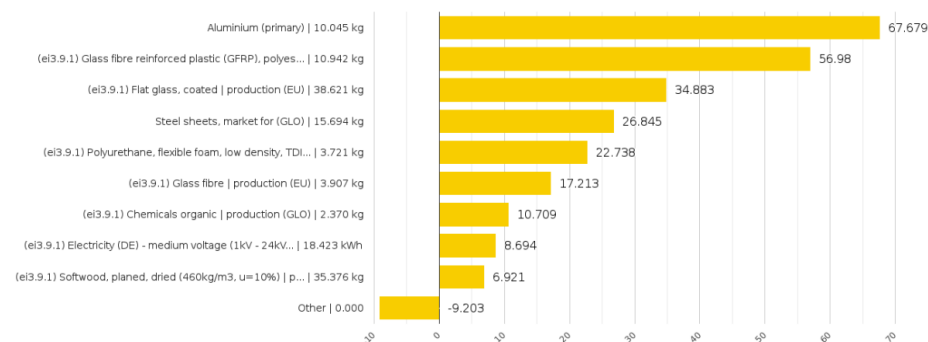


Aluminium (primary) has the highest influence on module A1. After that, steel sheets, flat glass, and glass fiber reinforced plastic also have a high impact.

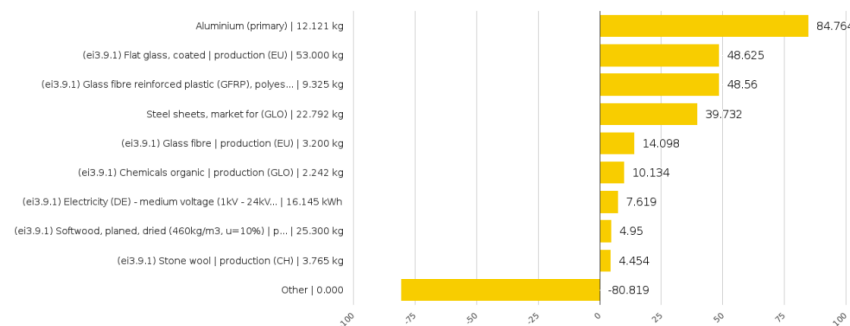
CONTRIBUTION ANALYSIS OF THE INPUTS

The following diagrams show the contribution of the inputs, expressed in the Global warming potential - total. The results per input are the sum of all declared modules including module D.

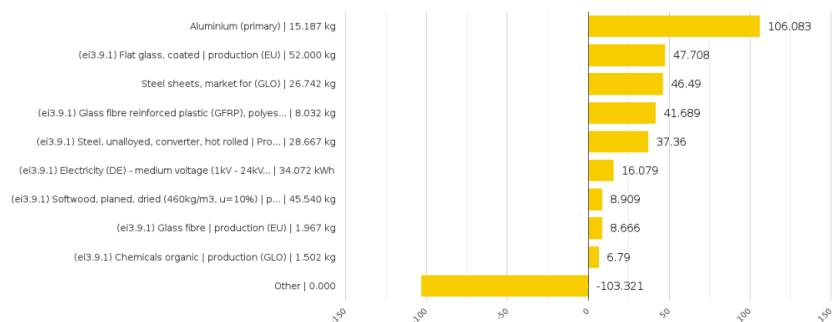
Flat Roof Access Hatch Comfort Solo:



Flat Roof Access Hatch Comfort Square:



Flat Roof Access Hatch Comfort Swing:



8 References

ISO 14040

ISO 14040:2006-10, Environmental management - Life cycle assessment - Principles and framework; EN ISO 14040:2006

ISO 14044

ISO 14044:2006-10, Environmental management - Life cycle assessment - Requirements and guidelines; EN ISO 14044:2006

ISO 14025

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

EN 15804+A2

EN 15804+A2: 2019: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

Kiwa-EE GPI R.3.0

Kiwa-Ecobility Experts, General Programme Instructions “Product Level”, Program EE 1201 (27.02.2025)

Kiwa-EE GPI R.3.0 Annex B1

Kiwa-Ecobility Experts, General Programme Instructions “Product Level” – Annex B1 Environmental Information Programme according to EN 15804 / ISO 21930, Program EE 1203 (27.02.2025)

Background database

ecoinvent version 3.9.1

NMD 2019

NMD STICHTING NATIONAL ENVIRONMENTAL DATABASE: Environmental Performance

Assessment Method for Construction; 1.1 (March 2022); Rijswijk

R<THiNK 2023

R<THiNK; Online-EPD-Tool by NIBE B.V.

SimaPro Software

Industry data LCA library; website: <https://simapro.com/databases/industry-data-lca-library/>

LCA background report

“Flat Roof Access Hatch Comfort Solo/Duo/Square/Swing”

LCA method

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