Environmental Product Declaration

Declaration Code: EPD-HMZ-GB-55.0

Hodapp GmbH und Co. KG

Doors

HoSta Multi-purpose door system

Basis:

DIN EN ISO 14025
EN15804

Company EPD
Environmental
Product **D**eclaration

Publication date:
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Practitioner of the LCA	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 D-83026 Rosenheim		
Declaration holder	Hodapp GmbH und Co. KG Großweierer Str. 77 D-77855 Achern		
Declaration code	EPD-HMZ-GB-55.0		
Designation of declared product	HoSta Multi-purpose door system		
Scope	Multi-functional door, security door and smoke control and fire resistant assembly with optional performance characteristics.		
Basis	This EPD was prepared on the basis of EN ISO 14025:2011 and DIN EN 15804:2012+A2:2019. In addition, the “Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen” (Guidance on preparing Type III Environmental Product Declarations) applies. The Declaration is based on the PCR documents EN 17213 “PCR for windows and doors, “PCR Part A” PCR-A-0.3:2018, “Doors” PCR TT-2.3:2018.		
Validity	Publication date: 23.05.2022	Last revision: 23.05.2022	Next revision: 23.05.2027
	This verified Company Environmental Product Declaration (company EPD) applies solely to the specified products and is valid for a period of five years from the date of publication in accordance with DIN EN 15804.		
LCA basis	The LCA was prepared in accordance with DIN EN ISO 14040 and DIN EN ISO 14044. The base data includes both the data collected at the production site of Hodapp GmbH und Co. KG and the generic data derived from the “GaBi 10” database. LCA calculations were carried out for the "cradle to gate“ life cycle with options (cradle to gate with options) including all upstream chains (e.g. raw material extraction, etc.).		
Notes	The “Conditions and Guidance on the Use of ift Test Documents” apply. The declaration holder assumes full liability for the underlying data, certificates and verifications.		

Christian Kehrer Head of Certification and Surveillance Body	Dr. Torsten Mielecke Chairman of Expert Committee ift-EPD and PCR	Patrick Wortner External verifier

1 General product information

Product definition

The EPD relates to the product group "Doors" and applies to:

1 m² of multi-functional door, security door, smoke control/fire resistant assembly made by Hodapp GmbH und Co. KG.

They are subdivided into the following product groups:

Product group	Designation	Declared unit
Multi-functional door	**Air tightness/water tightness/ wind load with infill panel** Multi-purpose with infill panel	1 m²
Security door	**Burglar resistance RC-4/ bullet resistance FB-4 with infill panel** Sound insulation with infill panel (≤40dB) Sound insulation with infill panel (> 40dB) Burglar resistance RC-2 with infill panel Burglar resistance RC-3 with infill panel	1 m²
Smoke control and/or fire resistant assembly	**Fire safety $EL_2$120 with infill panel** Smoke control with infill panel Fire safety $EL_2$30 without infill panel Fire safety $EL_2$90 with infill panel	1 m²

Table 1: Product groups

The declared unit is obtained by summing up:

Assessed product	Surface area of reference product	Weight per unit area
Multi-functional door	2.68 m²	70.01 kg/m²
Security door	2.68 m²	98.14 kg/m²
Smoke control and/or fire resistant assembly	2.68 m²	111.18 kg/m²

Table 2: Functional unit per reference product

The average unit is declared as follows:
Directly used material flows are determined in accordance with EN 17213 using standard sizes (1.23 m x 2.18 m) and and assigned to the declared unit. All other inputs and outputs in the production were scaled to the declared unit in their entirety because no direct assignment to the standard sizes is possible. The reference period is the year 2021.

The validity of the EPD is restricted to the following series:

- HoSta Multi-purpose door system

Product description

Multi-functional door, security door, as well as smoke control and fire resistant assembly with optional performance characteristics (each thermal insulation, air tightness, watertightness, wind load, sound insulation). For security door or smoke control and fire resistant assembly, additional bullet and burglar resistance. For smoke control and fire resistant assembly, additional mechanical resistance, smoke control and fire resistance.
The multi-functional doors, security doors as well as smoke control and fire resistant assemblies are based on double-wall full-leaf steel systems and are suitable as single leaf and double leaf versions for indoor and outdoor use.

Specifications of the components

Components
Door leaf and door frame

Door leaf, each consisting of
- folded sheet metal lid and tray (structural steel or stainless steel; door rebate - thick or thin rebate)
- insulation gasket (details depending on performance characteristics)
- coating: wet paint
- various reinforcements (details and arrangement depending on performance characteristics and relevant specifications)
- hardware (door lock, door hinges, door closers)
- glass panel (optional)
- ventilation grille (optional)

Door frame, each consisting of
- folded frame profile (structural steel or stainless steel)
- coating: wet paint
- frame gasket
- fasteners: anchors/plugs, screws/nuts

For a detailed product description refer to the manufacturer specifications or the product specifications of the respective offer/quotation.

Product manufacture

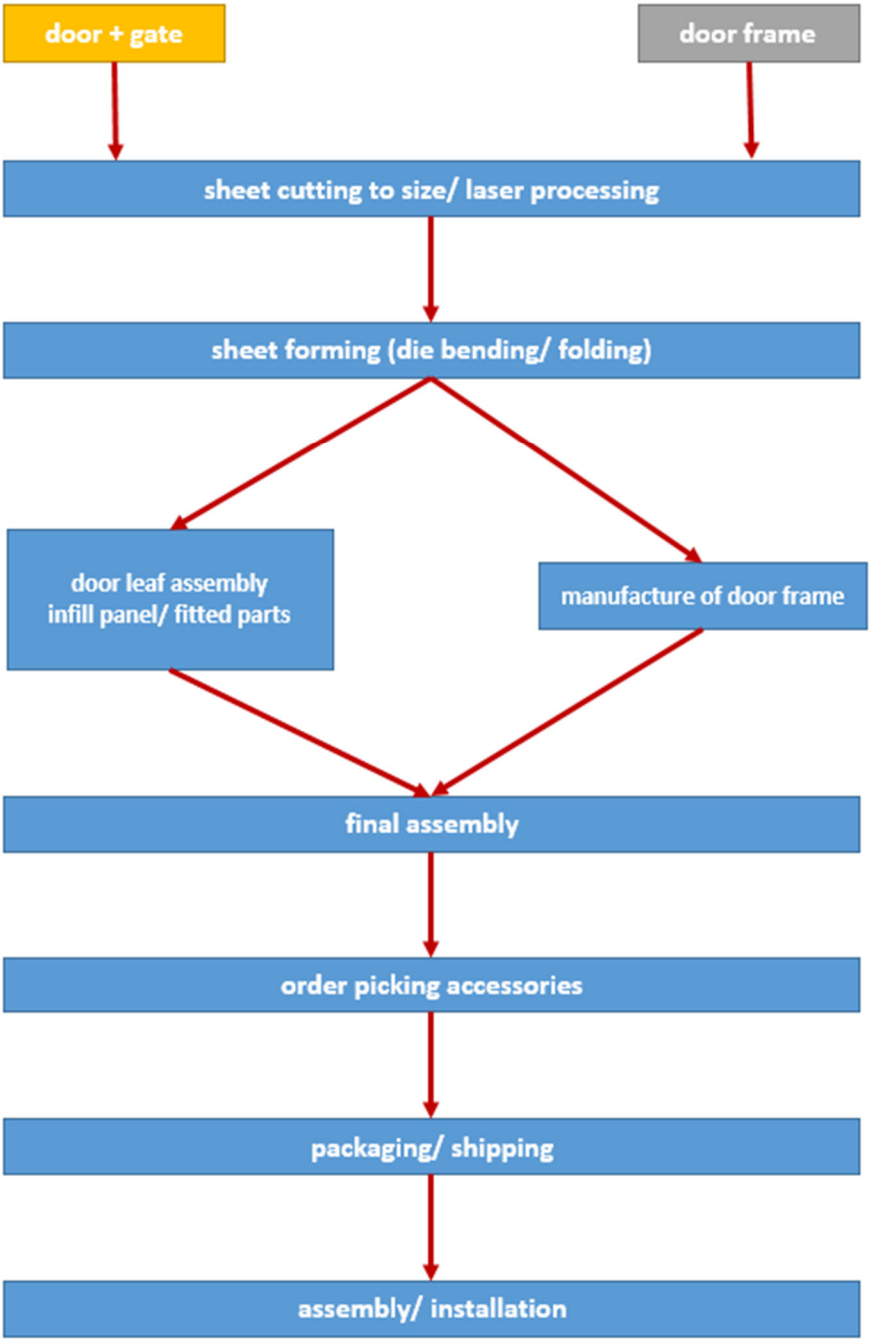


Figure 1: Product manufacture

Scope

Single leaf and double leaf multi-functional door, security door, smoke control and fire resistant assembly for indoor and outdoor use, with optional performance characteristics for thermal insulation, air tightness, watertightness, wind load and sound insulation.

Verifications

The applicable relevant product verifications (air tightness, watertightness, wind load, mechanical resistance test) are on request directly available from Hodapp GmbH & Co. KG.
For further and updated verifications (incl. other national approvals) refer to www.hodapp.de.

Quality assurance

Quality assurance verifications, if required, are on request directly available from Hodapp GmbH & Co. KG

Management systems

The following management systems are in place:

- Quality management system as per DIN EN ISO 9001:2015
- Environmental management as per DIN EN ISO 14001:2015
- Occupational health and safety management systems as per DIN ISO 45001:2018
- Energy management system as per DIN EN ISO 5001:2018

Additional information

For additional verification of applicability or conformity refer to the CE marking and the documents accompanying the product, if applicable.

2 Materials used

Primary materials

The primary materials used are listed in the LCA (see Section 7).

Declarable substances

The product contains no substances from the REACH candidate list (declaration dated 13 May 2022).

All relevant safety data sheets are available from Hodapp GmbH und Co. KG .

3 Construction process stage

Processing recommendations for installation

Observe the instructions for assembly/installation, operation, maintenance and disassembly, provided by the manufacturer. See www.hodapp.de.

4 Use stage

Emissions to the environment

No emissions to indoor air, water and soil are known. There may be VOC emissions.

Reference service life (RSL)

The RSL information was provided by the manufacturer. The RSL shall be specified under defined reference in-use conditions and shall refer to the declared technical and functional performance of the product within the building. It shall be established in accordance with any specific rules given in European product standards, or, if not available, in a c-PCR. It shall also take into account ISO 15686-1, -2, -7 and -8. Where European product standards or a c-PCR provide guidance on deriving the RSL, such guidance shall have priority.
If it is not possible to determine the service life as the RSL in accordance with ISO 15686, the BBSR table “Nutzungsdauer von Bauteilen zur Lebenszyklusanalyse nach BNB” (service life of building components for life cycle assessment in accordance with the sustainable construction evaluation system) can be used. For further information and explanations refer to www.nachhaltigesbauen.de.

For this EPD the following applies:
For a “cradle to gate with options” EPD with the Modules C1-C4 and Module D (A1-A3 + C + D and one or more additional modules from A4 to B7), the reference service life (RSL) can only be stated if the reference in-use conditions have been specified.
According to the BBSR table, an optional service life of 50 years has been specified multi-purpose doors of Hodapp GmbH und Co. KG

The service life is dependent on the characteristics of the product and in-use conditions. The in-use conditions described in the EPD are applicable, in particular the characteristics listed below:

- Outdoor environment: climatic influences may have a negative impact on the service life.
- Indoor environment: no impacts (e.g., humidity, temperature) known that may have a negative effect on the service life

The service life solely applies to the characteristics specified in this EPD or the corresponding references.
The reference service life (RSL) does not reflect the actual life span, which is usually determined by the service life and the refurbishment of a building. It does not give any information on the useful life, warranty referring to performance characteristics or guarantees.

5 End-of-life stage

Possible end-of-life stages

The products of the HoSta Multi-purpose door system are shipped to central collection points. There the products are usually shredded and sorted into their original constituents. The end-of-life stage depends on the site where the products are used and is therefore subject to the local regulations. Observe the locally applicable regulatory requirements.

This EPD shows the end-of-life modules according to the market situation.
Specific metal or glass parts are recycled. Residual fractions are sent to landfill. Most plastics are thermally recycled. Residual fractions are sent to landfill.

Disposal routes

The LCA includes the average disposal routes.

All life cycle scenarios are detailed in the Annex.

6 Life Cycle Assessment (LCA)

Environmental product declarations are based on life cycle assessments (LCAs) which use material and energy flows for the calculation and subsequent representation of environmental impacts.

Life cycle assessments prepared for multi-functional doors, security doors and smoke control and fire resistant assemblies form the basis for the EPD. The LCAs are in conformity with the requirements set out in DIN EN 15804 and the international standards DIN EN ISO 14040, DIN EN ISO 14044, ISO 21930 and EN ISO 14025.

The LCA is representative of the products presented in the Declaration and the specified reference period.

6.1 Definition of goal and scope

Goal

The goal of the LCA is to demonstrate the environmental impacts of the products. In accordance with DIN EN 15804, the environmental impacts covered by this Environmental Product Declaration are presented for the entire product life cycle in the form of basic information. No other additional environmental impacts are specified.

Data quality, data availability and geographical and time-related system boundaries

The specific data originate exclusively from the fiscal year 2021. They were collected by the manufacturer on-site at the plant located in Achern and originate in parts from company records and partly from values directly obtained by measurement. Validity of the data was checked by the ift Rosenheim.

The generic data originate from the “GaBi 10” professional and building materials databases. The last update of both databases was in 2022. Data from before this date originate also from these databases and are not more than ten years old. No other generic data were used for the calculation.

Data gaps were either filled with comparable data or conservative assumptions, or the data were cut off in compliance with the 1% rule.

The life cycle was modelled using the sustainability software tool “GaBi ts” for the development of life cycle assessments.

Scope / system boundaries

The system boundaries refer to the supply of raw materials and purchased parts, manufacture/production, use and end-of-life stage of multi-functional doors, security doors and smoke control and fire resistant assemblies.
No additional data from pre-suppliers/subcontractors or other sites were taken into consideration.

Cut-off criteria

All company data collected, i.e. all commodities/input and raw materials used, the thermal energy and electricity consumption were taken into consideration.

The boundaries cover only the product-relevant data. Building sections/parts of facilities that are not relevant to the manufacture of the products, were excluded.

The transport distances of the pre-products were taken into consideration as a function of 100% of the mass of products.

The transport mix is composed as follows and originates from the research project "EPDs für transparente Bauelemente" (EPDs for transparent building components).

- Truck, 26 – 28 t total weight / 18.4 t payload, Euro 6, freight, 85% capacity used, 100 km;
- Truck-trailer, 28 – 34 t total weight / 22 t payload, Euro 6, 50% capacity used, 50 km;
- Freight train, electrical and diesel driven; D 60%, E 51% capacity used, 50 km
- Seagoing vessel, consumption mix, 50 km.

The criteria for the exclusion of inputs and outputs as set out in DIN EN 15804 are fulfilled. From the data analysis it can be assumed that the total of negligible processes per life cycle stage does not exceed 1% of the mass/primary energy. This way the total of negligible processes does not exceed 5 % of the energy and mass input. The life cycle calculation also includes material and energy flows that account for less than 1%.

6.2 Inventory analysis

Goal

All material and energy flows are described below. The processes covered are presented as input and output parameters and refer to the declared/functional units.

Life cycle stages

The life cycle from cradle to gate - with options of the multi-functional doors, security doors as well as smoke control and fire resistant assemblies is shown in the Annex. The product stage "A1 – A3", construction process stage" A4 – A5", use stage "B2 – B7", end-of-life stage "C1 – C4" and the benefits and loads beyond the system boundaries "D" are considered.

Benefits

The below benefits have been defined as per DIN EN 15804:

- Benefits from recycling
- Benefits (thermal and electrical) from incineration

Allocation of co-products

The manufacture of the product does not produce any allocations.

Allocations for re-use, recycling and recovery

If the products are reused/recycled and recovered during the product stage (rejects), the components are shredded, if necessary and then sorted into their single constituents. This is done by various process plants, e.g. magnetic separators.
The system boundaries were set following their disposal, reaching the end-of-waste status.

Allocations beyond life cycle boundaries

Use of recycled materials in the manufacturing process was based on the current market-specific situation. In parallel to this, a recycling potential was taken into consideration that reflects the economic value of the product after recycling (recyclate) .
The system boundary set for the recycled material refers to collection.

Secondary material

The use of secondary material in Module A3 by Hodapp GmbH und Co. KG was not considered. Secondary material is not used.

Inputs

The LCA covers the following production-relevant inputs per 1 m² of multi-functional door, security door or smoke control/fire resistant assembly:

Energy
The gas input material is based on “Erdgas Mix Deutschland” (Germany natural gas mix). Fuel oil is based on “Heizöl el ab Raffinerie” (EL fuel oil from refinery). The electricity mix is based on “Strommix Deutschland” (German electricity mix).

Water
No water is consumed by the individual process steps for the manufacture of the products.

Raw material / pre-products
The chart below shows the share of raw materials/pre-products in %.

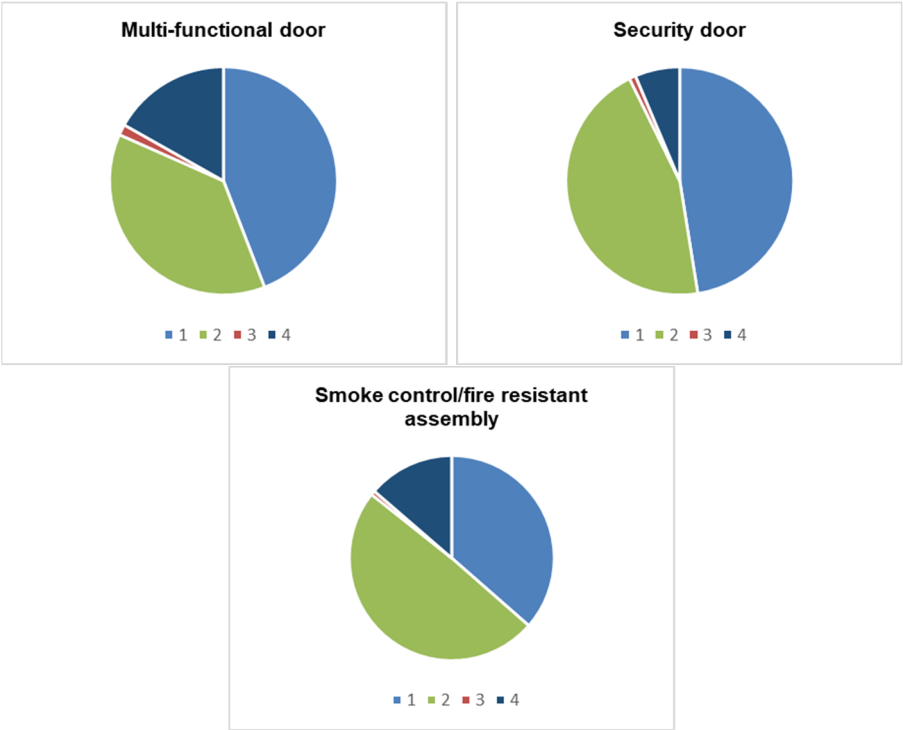


Figure 2: Percentage of individual materials per declared unit

No.	Material	Mass in %		
		Multi-functional door	Security door	Smoke control/fire resistant assembly
1	Metals	44.13	47.47	36.45
2	Glass	37.51	45.24	49.21
3	Plastics	1.52	0.93	0.67
4	Insulating material	16.84	6.36	13.67

Table 3: Percentage of individual materials per declared unit

Ancillary materials and consumables
The following amounts of ancillary materials and consumables are used.

- multi-functional doors: 118 g
- security doors: 281 g
- smoke control and fire resistant assemblies: 243 g

Product packaging
The amounts used for product packaging are as follows:

No.	Material	Mass in kg		
		Multi-functional door	Security door	Smoke control/ fire resistant assembly
1	Films and protective covers	0.04	0.08	0.07
2	Plastic containers	0.00	0.01	0.01
3	Wood	2.15	5.05	4.38
4	Cardboard	0.18	0.41	0.36

Table 4: Weight in kg of packaging per declared unit

Biogenic carbon content
Only the biogenic carbon content of the associated packaging is specified, as the total mass of substances containing biogenic carbon is less than 5% of the total mass of the product and associated packaging. According to EN 16449, packaging produces the following amounts of biogenic carbon :

No.	Component	Content in kg C		
		Multi-functional door	Security door	Smoke control/ fire resistant assembly
1	Packaging	-1.02	-2.40	-2.08

Table 5: Biogenic carbon content of packaging at gate

Outputs

The LCA covers the following production-relevant outputs per 1 m² of multi-functional door, security door as well as smoke control and fire resistant assembly:

Waste
Secondary raw materials were included in the benefits.
See Section 6.3 Impact assessment.

Waste water
The manufacture does not produce any waste water.

6.3 Impact assessment

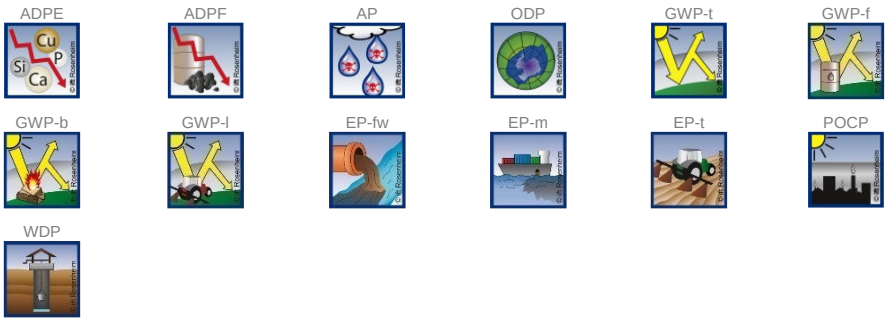
Goal

The impact assessment covers both inputs and outputs. The impact categories applied are named below:

Impact categories

The models for impact assessment were applied as described in DIN EN 15804-A2.
The impact categories presented in the EPD are as follows:

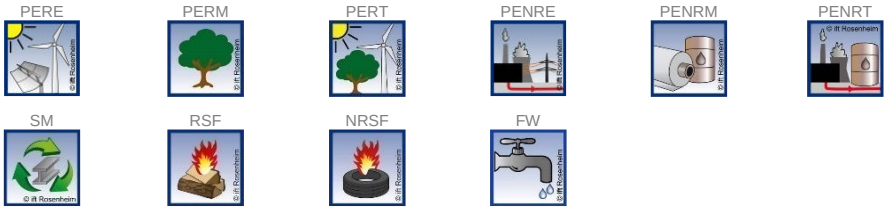
- depletion of abiotic resources – minerals and metals;
- depletion of abiotic resources– fossil fuels;
- acidification;
- ozone depletion;
- climate change - total
- climate change - fossil;
- climate change - biogenic;
- climate change – land use and land use change
- eutrophication aquatic fresh water;
- eutrophication aquatic marine;
- eutrophication terrestrial;
- photochemical ozone creation;
- water use.



Use of resources

The models for impact assessment were applied as described in DIN EN 15804-A2.
The EPD presents the following indicators for the use of resources:

- renewable primary energy as energy resource;
- renewable primary energy for material use;
- total use of renewable primary energy;
- non-renewable primary energy as energy resource;
- renewable primary energy for material use;
- total use of non-renewable primary energy;
- use of secondary materials;
- use of renewable secondary fuels;
- use of non-renewable secondary fuels;
- net use of fresh water resources.

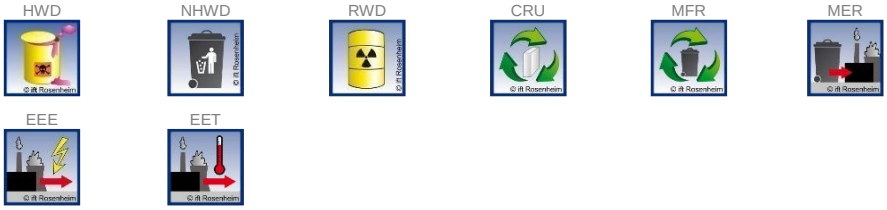


Waste

The waste generated during the production of 1 m² of multi-functional door, security door as well as smoke control and fire resistant assemblies is evaluated and shown separately for the fractions trade wastes, special wastes and radioactive wastes. Since waste handling is modelled within the system boundaries, the amounts shown refer to the deposited wastes. A portion of the waste indicated is generated during the manufacture of the pre-products.

The models for impact assessment were applied as described in DIN EN 15804-A2.
The waste categories and indicators for output material flows presented in the EPD are as follows:

- hazardous waste disposed;
- non-hazardous waste disposed;
- radioactive waste
- components for further use;
- materials for recycling;
- materials for energy recovery;
- exported electrical energy;
- exported thermal energy.



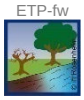
Additional environmental impact indicators

The models for impact assessment were applied as described in DIN EN 15804-A2.
The additional impact categories presented in the EPD are as follows:

- particulate matter emissions
- ionising radiation, human health
- ecotoxicity (fresh water)
- subcategory human toxicity - carcinogenic effect
- human toxicity - non-carcinogenic effect
- land use related impacts / soil quality

PM


IRP


ETP-fw


HTP-c


HTP-nc


SQP


	Results per 1 m² of multi-functional door															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 eq.	108.28	1.52	4.63	ND	0.29	48.00	0	0	0	0	0.00	0.12	5.04	0.51	-40.40
GWP-f	kg CO_2 eq.	111.31	1.51	0.54	ND	0.28	47.80	0	0	0	0	0.00	0.12	5.01	0.52	-40.20
GWP-b	kg CO_2 eq.	-3.24	-2.07E-03	4.09	ND	2.64E-03	6.34E-02	0	0	0	0	0.00	-1.63E-04	2.22E-02	-1.54E-02	-0.13
GWP-l	kg CO_2 eq.	7.24E-02	8.37E-03	9.28E-05	ND	1.74E-05	5.10E-02	0	0	0	0	0.00	6.60E-04	5.29E-04	9.58E-04	-7.29E-03
ODP	kg CFC -11 eq.	1.09E-08	9.00E-14	6.01E-12	ND	3.00E-13	1.06E-08	0	0	0	0	0.00	7.09E-15	3.61E-11	1.22E-12	-1.62E-10
AP	mol H^+ eq.	0.67	1.92E-03	1.61E-03	ND	8.77E-04	0.52	0	0	0	0	0.00	1.38E-04	6.11E-03	3.68E-03	-0.17
EP-fw	kg P eq.	1.97E-04	4.48E-06	1.22E-06	ND	2.18E-06	8.71E-05	0	0	0	0	0.00	3.53E-07	7.21E-06	8.80E-07	-4.34E-05
EP-m	kg N eq.	0.13	7.02E-04	4.09E-04	ND	1.42E-04	9.13E-02	0	0	0	0	0.00	4.82E-05	1.43E-03	9.41E-04	-4.64E-02
EP-t	mol N eq.	1.49	8.17E-03	5.74E-03	ND	1.53E-03	1.08	0	0	0	0	0.00	5.65E-04	1.62E-02	1.03E-02	-0.52
POCP	kg NMVOC eq.	0.43	1.70E-03	1.09E-03	ND	6.70E-04	0.26	0	0	0	0	0.00	1.21E-04	3.86E-03	2.86E-03	-0.11
ADPF*[2]	MJ	1,561.12	20.10	7.70	ND	13.00	824.00	0	0	0	0	0.00	1.58	44.90	6.80	-510.00
ADPE*[2]	kg Sb eq.	6.57E-05	1.26E-07	1.15E-07	ND	4.30E-08	4.91E-05	0	0	0	0	0.00	9.89E-09	6.74E-07	5.32E-08	-4.81E-06
WDP*[2]	m^3 world eq. deprived	6.05	1.34E-02	0.52	ND	5.38	6.03	0	0	0	0	0.00	1.06E-03	0.82	5.68E-02	-1.15
Use of resources																
PERE	MJ	245,04	1,14	41,15	ND	0,21	62,60	0	0	0	0	0,00	8,99E-02	24,70	1,02	-87,60
PERM	MJ	37,15	0,00	-37,15	ND	0,00	0,00	0	0	0	0	0,00	0,00	0,00	0,00	0,00
PERT	MJ	282,19	0,00	4,00	ND	0,21	62,60	0	0	0	0	0,00	8,99E-02	24,70	1,02	-87,60
PENRE	MJ	1.544,98	20,10	8,49	ND	13	824,00	0	0	0	0	0,00	1,58	67,80	8,02	-511,00
PENRM	MJ	24,95	0,00	-0,79	ND	0,00	0,00	0	0	0	0	0,00	0,00	-22,95	-1,21	0,00
PENRT	MJ	1.569,93	20,10	7,70	ND	13	824,00	0	0	0	0	0,00	1,58	44,90	6,81	-511,00
SM	kg	1,28	0,00	0,00	ND	0,00	1,28	0	0	0	0	0,00	0,00	0,00	0,00	0,00
RSF	MJ	2,25E-12	0,00	0,00	ND	0,00	2,25E-12	0	0	0	0	0,00	0,00	0,00	0,00	0,00
NRSF	MJ	2,64E-11	0,00	0,00	ND	0,00	2,64E-11	0	0	0	0	0,00	0,00	0,00	0,00	0,00
FW	m^3	0,28	1,29E-03	1,39E-02	ND	0,13	0,19	0	0	0	0	0,00	1,02E-04	2,96E-02	1,72E-03	-0,08
Waste categories																
HWD	kg	4.26E-03	9.63E-11	6.87E-10	ND	1.87E-10	4.26E-03	0	0	0	0	0.00	7.59E-12	3.90E-09	3.50E-10	-5.95E-08
NHWD	kg	36.37	2.88E-03	4.58E-02	ND	0.04	33.70	0	0	0	0	0.00	2.27E-04	8.79E-02	34.80	-2.62
RWD	kg	3.65E-02	2.48E-05	1.10E-03	ND	5.77E-05	1.76E-02	0	0	0	0	0.00	1.95E-06	7.09E-03	7.58E-05	-1.48E-02
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0	0	0	0	0.00	0.00	0.00	0.00	0.00
MFR	kg	10.42	0.00	0.00	ND	0.00	33.90	0	0	0	0	0.00	0.00	34.10	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0	0	0	0	0.00	0.00	0.00	0.00	0.00
EEE	MJ	1.14	0.00	5.22	ND	0.00	2.00	0	0	0	0	0.00	0.00	4.31	0.00	0.00
EET	MJ	2.65	0.00	12.20	ND	0.00	4.60	0	0	0	0	0.00	0.00	9.89	0.00	0.00

Key:
GWP-t – global warming potential - total **GWP-f** – global warming potential fossil fuels **GWP-b** – global warming potential - biogenic **GWP-l** – global warming potential - land use and land use change **ODP** – ozone depletion potential **AP** - acidification potential **EP-fw** - eutrophication potential - aquatic freshwater **EP-m** - eutrophication potential - aquatic marine **EP-t** - feutrophication potential - terrestrial **POCP** - photochemical ozone formation potential **ADPF*[2]** - abiotic depletion potential – fossil resources **ADPE*[2]** - abiotic depletion potential – minerals&metals **WDP*[2]** – Water (user) deprivation potential **PERE** - Use of renewable primary energy **PERM** - use of renewable primary energy resources **PERT** - total use of renewable primary energy resources **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources **PENRT** - total use of non-renewable primary energy resources **SM** - use of secondary material **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of fresh water **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for re-use **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy

	Results per 1 m² of multi-functional door															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	7.05E-06	1.10E-08	1.10E-08	ND	5.45E-09	4.69E-06	0	0	0	0	0.00	8.25E-10	4.85E-08	4.53E-08	-1.29E-06
IRP*[1]	kBq U235 eq.	4.54	3.63E-03	0.18	ND	0.01	2.67	0	0	0	0	0.00	2.86E-04	1.20	8.42E-03	-2.05
ETP-fw*[2]	CTUe	1,894.49	13.90	3.34	ND	8.85	1700.00	0	0	0	0	0.00	1.10	19.60	3.81	-386.00
HTP-c*[2]	CTUh	1.25E-07	2.81E-10	1.13E-10	ND	1.75E-10	5.78E-08	0	0	0	0	0.00	2.21E-11	5.83E-10	5.81E-10	-2.00E-08
HTP-nc*[2]	CTUh	3.59E-06	1.48E-08	4.2E-09	ND	7.88E-09	1.81E-06	0	0	0	0	0.00	1.16E-09	2.20E-08	6.44E-08	-5.29E-07
SQP*[2]	Dimensionless	802.97	6.90	2.73	ND	0.14	118.00	0	0	0	0	0.00	0.54	16.10	1.41	-63.10

Key:
PM – particulate matter emissions potential **IRP*[1]** – ionising radiation potential – human health **ETP-fw*[2]** - Ecotoxicity potential – freshwater **HTP-c*[2]** - Human toxicity potential – cancer effects **HTP-nc*[2]** - Human toxicity potential – non-cancer effects **SQP*[2]** – soil quality potential

Disclaimers

*1 This impact category deals mainly with the eventual impact of low-dose ionising 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 ionising radiation from the soil, from radon and from some building 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 experience with the indicator

	Results per 1 m² of security door															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 eq.	265.76	2.17	10.40	ND	0.29	171.00	0	0	0	0	0.00	0.15	5.41	0.67	-63.70
GWP-f	kg CO_2 eq.	271.47	2.16	0.77	ND	0.28	169.00	0	0	0	0	0.00	0.15	5.38	0.68	-63.40
GWP-b	kg CO_2 eq.	-5.69	-2.97E-03	9.62	ND	2.64E-03	1.04	0	0	0	0	0.00	-2.03E-04	2.75E-02	-2.03E-02	-0.20
GWP-l	kg CO_2 eq.	0.20	1.20E-02	1.13E-04	ND	1.74E-05	0.16	0	0	0	0	0.00	8.21E-04	6.54E-04	1.26E-03	-0.01
ODP	kg CFC -11 eq.	1.20E-07	1.29E-13	6.84E-12	ND	3.00E-13	1.19E-07	0	0	0	0	0.00	8.82E-15	4.48E-11	1.61E-12	-2.51E-10
AP	mol H^+ eq.	1.44	2.75E-03	2.70E-03	ND	8.77E-04	1.21	0	0	0	0	0.00	1.71E-04	7.35E-03	4.85E-03	-0.29
EP-fw	kg P eq.	7.14E-04	6.42E-06	1.41E-06	ND	2.18E-06	5.10E-04	0	0	0	0	0.00	4.40E-07	8.95E-06	1.16E-06	-6.63E-05
EP-m	kg N eq.	0.28	1.01E-03	7.17E-04	ND	1.42E-04	0.22	0	0	0	0	0.00	6.00E-05	1.71E-03	1.24E-03	-0.08
EP-t	mol N eq.	3.20	1.17E-02	1.09E-02	ND	1.53E-03	2.55	0	0	0	0	0.00	7.04E-04	1.90E-02	1.36E-02	-0.89
POCP	kg NMVOC eq.	0.93	2.44E-03	1.89E-03	ND	6.70E-04	0.62	0	0	0	0	0.00	1.50E-04	4.60E-03	3.77E-03	-0.18
ADPF*[2]	MJ	4,241.44	28.70	9.05	ND	13.00	2,990.00	0	0	0	0	0.00	1.97	55.70	8.96	-822.00
ADPE*[2]	kg Sb eq.	1.12E-04	1.80E-07	1.36E-07	ND	4.30E-08	8.61E-05	0	0	0	0	0.00	1.23E-08	8.36E-07	7.01E-08	-7.47E-06
WDP*[2]	m^3 world eq. deprived	29.21	1.92E-02	1.12	ND	5.38	28.90	0	0	0	0	0.00	1.32E-03	0.93	7.48E-02	-2.02
Use of resources																
PERE	MJ	1.024,93	1,63	91,75	ND	0,21	653,00	0	0	0	0	0,00	0,11	30,70	1,35	-136,00
PERM	MJ	87,36	0,00	-87,36	ND	0,00	0,00	0	0	0	0	0,00	0,00	0,00	0,00	0,00
PERT	MJ	1.112,29	1,63	4,39	ND	0,21	653,00	0	0	0	0	0,00	0,11	30,70	1,35	-136,00
PENRE	MJ	4.225,57	28,80	10,92	ND	13,00	2.990,00	0	0	0	0	0,00	1,97	76,62	10,07	-823,00
PENRM	MJ	23,88	0,00	-1,86	ND	0,00	0,00	0	0	0	0	0,00	0,00	-20,92	-1,10	0,00
PENRT	MJ	4.249,45	28,80	9,06	ND	13,00	2.990,00	0	0	0	0	0,00	1,97	55,70	8,97	-823,00
SM	kg	2,51	0,00	0,00	ND	0,00	2,51	0	0	0	0	0,00	0,00	0,00	0,00	0,00
RSF	MJ	5,80E-20	0,00	0,00	ND	0,00	5,80E-20	0	0	0	0	0,00	0,00	0,00	0,00	0,00
NRSF	MJ	6,82E-19	0,00	0,00	ND	0,00	6,82E-19	0	0	0	0	0,00	0,00	0,00	0,00	0,00
FW	m^3	1,25	1,85E-03	2,79E-02	ND	0,13	1,08	0	0	0	0	0,00	1,26E-04	3,48E-02	2,27E-03	-0,13
Waste categories																
HWD	kg	3.37E-06	1.38E-10	8.32E-10	ND	1.87E-10	2.92E-06	0	0	0	0	0.00	9.45E-12	4.83E-09	4.61E-10	-1.01E-07
NHWD	kg	70.01	4.13E-03	0.10	ND	0.04	66.10	0	0	0	0	0.00	2.83E-04	9.13E-02	45.90	-4.63
RWD	kg	0.32	3.55E-05	1.14E-03	ND	5.77E-05	0.28	0	0	0	0	0.00	2.43E-06	8.82E-03	9.99E-05	-0.02
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0	0	0	0	0.00	0.00	0.00	0.00	0.00
MFR	kg	25.11	0.00	0.00	ND	0.00	62.00	0	0	0	0	0.00	0.00	51.30	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0	0	0	0	0.00	0.00	0.00	0.00	0.00
EEE	MJ	2.67	0.00	12.30	ND	0.00	1.48	0	0	0	0	0.00	0.00	3.93	0.00	0.00
EET	MJ	6.22	0.00	28.80	ND	0.00	3.39	0	0	0	0	0.00	0.00	9.02	0.00	0.00

Key:
GWP-t – global warming potential - total **GWP-f** – global warming potential fossil fuels **GWP-b** – global warming potential - biogenic **GWP-l** – global warming potential - land use and land use change **ODP** – ozone depletion potential **AP** - acidification potential **EP-fw** - eutrophication potential - aquatic freshwater **EP-m** - eutrophication potential - aquatic marine **EP-t** - feutrophication potential - terrestrial **POCP** - photochemical ozone formation potential **ADPF*[2]** - abiotic depletion potential – fossil resources **ADPE*[2]** - abiotic depletion potential – minerals&metals **WDP*[2]** – Water (user) deprivation potential **PERE** - Use of renewable primary energy **PERM** - use of renewable primary energy resources **PERT** - total use of renewable primary energy resources **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources **PENRT** - total use of non-renewable primary energy resources **SM** - use of secondary material **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of fresh water **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for re-use **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy

Results per 1 m² of security door																
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	1.46E-05	1.58E-08	1.69E-08	ND	5.45E-09	1.08E-05	0	0	0	0	0.00	1.03E-09	5.90E-08	5.97E-08	-2.06E-06
IRP*[1]	kBq U235 eq.	49.14	5.20E-03	0.19	ND	0.01	45.20	0	0	0	0	0.00	3.56E-04	1.49	1.11E-02	-3.22
ETP-fw*[2]	CTUe	4,119.43	20.00	3.89	ND	8.85	3790.00	0	0	0	0	0.00	1.37	24.40	5.02	-674.00
HTP-c*[2]	CTUh	1.85E-07	4.02E-10	1.51E-10	ND	1.75E-10	9.12E-08	0	0	0	0	0.00	2.75E-11	7.17E-10	7.66E-10	-2.77E-08
HTP-nc*[2]	CTUh	5.03E-06	2.12E-08	5.71E-09	ND	7.88E-09	2.50E-06	0	0	0	0	0.00	1.44E-09	2.69E-08	8.49E-08	-8.09E-07
SQP*[2]	dimensionless.	2,160.09	9.89	3.15	ND	0.14	597.00	0	0	0	0	0.00	0.68	20.00	1.86	-97.50

Key:
PM – particulate matter emissions potential **IRP*[1]** – ionising radiation potential – human health **ETP-fw*[2]** - Ecotoxicity potential – freshwater **HTP-c*[2]** - Human toxicity potential – cancer effects **HTP-nc*[2]** - Human toxicity potential – non-cancer effects **SQP*[2]** – soil quality potential

Disclaimers

*1 This impact category deals mainly with the eventual impact of low-dose ionising 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 ionising radiation from the soil, from radon and from some building 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 experience with the indicator

	Results per 1 m² of smoke control/fire resistant assembly															
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Core indicators																
GWP-t	kg CO_2 eq.	191.41	2.43	9.06	ND	0.29	108.00	0	0	0	0	0.00	0.16	5.22	0.91	-65.40
GWP-f	kg CO_2 eq.	97.42	2.42	0.72	ND	0.28	7.83	0	0	0	0	0.00	0.16	5.19	0.94	-65.20
GWP-b	kg CO_2 eq.	-6.45	-3.32E-03	8.34	ND	2.64E-03	2.64E-03	0	0	0	0	0.00	-2.24E-04	3.03E-02	-2.77E-02	-0.20
GWP-l	kg CO_2 eq.	3.43E-02	1.34E-02	1.08E-04	ND	1.74E-05	3.07E-03	0	0	0	0	0.00	9.04E-04	7.16E-04	1.73E-03	-1.07E-02
ODP	kg CFC -11 eq.	6.31E-08	1.44E-13	6.64E-12	ND	3.00E-13	6.25E-08	0	0	0	0	0.00	9.72E-15	4.92E-11	2.20E-12	-2.32E-10
AP	mol H^+ eq.	0.53	3.08E-03	2.45E-03	ND	8.77E-04	0.33	0	0	0	0	0.00	1.89E-04	7.88E-03	6.64E-03	-0.32
EP-fw	kg P eq.	1.86E-04	7.18E-06	1.36E-06	ND	2.18E-06	7.93E-06	0	0	0	0	0.00	4.84E-07	9.82E-06	1.59E-06	-6.23E-05
EP-m	kg N eq.	5.52E-02	1.13E-03	6.46E-04	ND	1.42E-04	4.52E-03	0	0	0	0	0.00	6.61E-05	1.81E-03	1.70E-03	-8.83E-02
EP-t	mol N eq.	0.61	1.31E-02	9.72E-03	ND	1.53E-03	4.92E-02	0	0	0	0	0.00	7.75E-04	1.99E-02	1.87E-02	-1.00
POCP	kg NMVOC eq.	0.30	2.73E-03	1.71E-03	ND	6.70E-04	3.49E-02	0	0	0	0	0.00	1.65E-04	4.89E-03	5.16E-03	-0.19
ADPF*[2]	MJ	2,474.80	32.20	8.74	ND	13.00	1390.00	0	0	0	0	0.00	2.17	61.10	12.30	-864.00
ADPE*[2]	kg Sb eq.	1.41E-04	2.01E-07	1.31E-07	ND	4.30E-08	1.18E-04	0	0	0	0	0.00	1.36E-08	9.17E-07	9.60E-08	-7.11E-06
WDP*[2]	m³ world eq. deprived	0.83	2.15E-02	0.98	ND	5.38	0.31	0	0	0	0	0.00	1.45E-03	0.95	0.10	-2.38
Use of resources																
PERE	MJ	603,57	1,83	80,05	ND	0,21	282,00	0	0	0	0	0,00	0,12	33,80	1,84	-129,00
PERM	MJ	75,75	0,00	-75,75	ND	0,00	0,00	0	0	0	0	0,00	0,00	0,00	0,00	0,00
PERT	MJ	679,32	1,83	4,30	ND	0,21	282,00	0	0	0	0	0,00	0,12	33,80	1,84	-129,00
PENRE	MJ	2.712,85	32,20	10,35	ND	13,00	1.640,00	0	0	0	0	0,00	2,17	77,59	13,17	-865,00
PENRM	MJ	18,96	0,00	-1,61	ND	0,00	0,00	0	0	0	0	0,00	0,00	-16,49	-0,87	0,00
PENRT	MJ	2.731,81	32,20	80,05	ND	13,00	1.640,00	0	0	0	0	0,00	2,17	61,10	12,30	-865,00
SM	kg	4,17	0,00	0,00	ND	0,00	4,17	0	0	0	0	0,00	0,00	0,00	0,00	0,00
RSF	MJ	2,34E-29	0,00	0,00	ND	0,00	0,00	0	0	0	0	0,00	0,00	0,00	0,00	0,00
NRSF	MJ	3,55E-28	0,00	0,00	ND	0,00	0,00	0	0	0	0	0,00	0,00	0,00	0,00	0,00
FW	m³	0,17	2,07E-03	2,46E-02	ND	0,13	2,63E-02	0	0	0	0	0,00	1,39E-04	3,65E-02	3,11E-03	-0,13
Waste categories																
HWD	kg	4.19E-06	1.54E-10	7.99E-10	ND	1.87E-10	3.75E-06	0	0	0	0	0.00	1.04E-11	5.3E-09	6.31E-10	-1.10E-07
NHWD	kg	6.66	4.62E-03	8.83E-02	ND	0.04	2.55	0	0	0	0	0.00	3.11E-04	8.49E-02	62.80	-5.42
RWD	kg	0.12	3.97E-05	1.13E-03	ND	5.77E-05	8.37E-02	0	0	0	0	0.00	2.68E-06	9.71E-03	1.37E-04	-2.35E-02
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0	0	0	0	0.00	0.00	0.00	0.00	0.00
MFR	kg	20.18	0.00	0.00	ND	0.00	69.40	0	0	0	0	0.00	0.00	48.10	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0	0	0	0	0.00	0.00	0.00	0.00	0.00
EEE	MJ	2.71	0.00	10.60	ND	0.00	1.47	0	0	0	0	0.00	0.00	3.10	0.00	0.00
EET	MJ	6.29	0.00	24.90	ND	0.00	3.36	0	0	0	0	0.00	0.00	7.11	0.00	0.00

Key:
GWP-t – global warming potential - total **GWP-f** – global warming potential fossil fuels **GWP-b** – global warming potential - biogenic **GWP-l** – global warming potential - land use and land use change **ODP** – ozone depletion potential **AP** - acidification potential **EP-fw** - eutrophication potential - aquatic freshwater **EP-m** - eutrophication potential - aquatic marine **EP-t** - feutrophication potential - terrestrial **POCP** - photochemical ozone formation potential **ADPF*[2]** - abiotic depletion potential – fossil resources **ADPE*[2]** - abiotic depletion potential – minerals&metals **WDP*[2]** – Water (user) deprivation potential **PERE** - Use of renewable primary energy **PERM** - use of renewable primary energy resources **PERT** - total use of renewable primary energy resources **PENRE** - use of non-renewable primary energy **PENRM** - use of non-renewable primary energy resources **PENRT** - total use of non-renewable primary energy resources **SM** - use of secondary material **RSF** - use of renewable secondary fuels **NRSF** - use of non-renewable secondary fuels **FW** - net use of fresh water **HWD** - hazardous waste disposed **NHWD** - non-hazardous waste disposed **RWD** - radioactive waste disposed **CRU** - components for re-use **MFR** - materials for recycling **MER** - materials for energy recovery **EEE** - exported electrical energy **EET** - exported thermal energy

Results per 1 m² of smoke control/fire resistant assemblies																
	Unit	**A1-A3**	**A4**	**A5**	**B1**	**B2**	**B3**	**B4**	**B5**	**B6**	**B7**	**C1**	**C2**	**C3**	**C4**	**D**
Additional environmental impact indicators																
PM	Disease incidence	3.62E-06	1.77E-08	1.55E-08	ND	5.45E-09	2.38E-07	0	0	0	0	0.00	1.13E-09	6.38E-08	8.17E-08	-2.18E-06
IRP*[1]	kBq U235 eq.	3.50	5.82E-03	0.19	ND	0.01	0.20	0	0	0	0	0.00	3.92E-04	1.64	1.52E-02	-3.39
ETP-fw*[2]	CTUe	294.58	22.30	3.76	ND	8.85	21.40	0	0	0	0	0.00	1.50	26.70	6.87	-776.00
HTP-c*[2]	CTUh	9.98E-08	4.5E-10	1.43E-10	ND	1.75E-10	1.65E-08	0	0	0	0	0.00	3.03E-11	7.82E-10	1.05E-09	-2.50E-08
HTP-nc*[2]	CTUh	3.60E-06	2.37E-08	5.36E-09	ND	7.88E-09	1.24E-06	0	0	0	0	0.00	1.59E-09	2.91E-08	1.16E-07	-7.95E-07
SQP*[2]	dimensionless.	1418.26	11.10	3.06	ND	0.14	68.10	0	0	0	0	0.00	0.75	22.00	2.55	-92.70

Key:
PM – particulate matter emissions potential **IRP*[1]** – ionising radiation potential – human health **ETP-fw*[2]** - Ecotoxicity potential – freshwater **HTP-c*[2]** - Human toxicity potential – cancer effects **HTP-nc*[2]** - Human toxicity potential – non-cancer effects **SQP*[2]** – soil quality potential

Disclaimers

*1 This impact category deals mainly with the eventual impact of low-dose ionising 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 ionising radiation from the soil, from radon and from some building 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 experience with the indicator.

6.4 Interpretation, LCA presentation and critical review

Evaluation

The environmental impacts of

- multi-functional doors
- security doors
- smoke control and fire resistant assemblies

differ considerably from each other. The differences are due mainly to the amount of pre-products and raw materials used. This was to be expected, mainly due to the use of varying amounts of steel glass and the varying types of glass used.

The environmental impacts during the manufacture of the products result mainly from the use of steel and glass and their upstream chains. The environmental impacts during the use stage are mainly due to the one-time replacement of glass components.

As regards the recycling of the multi-purpose doors, for multi-functional doors, security doors as well as smoke control and fire resistant assemblies, an average between 2% and 7% of the environmental impacts of steel can be assigned as benefits to scenario D. The benefits for glass range between an average of 1% and 7%.

The charts below show the distribution of the main environmental impacts.

The values obtained from the LCA calculation are suitable for the certification of buildings.

Charts

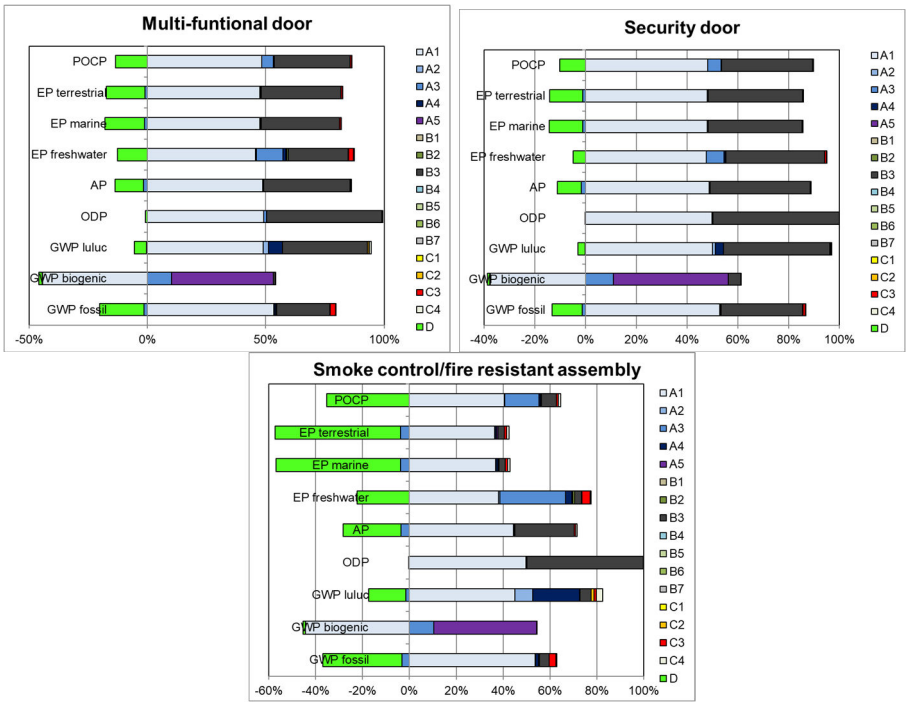


Figure 3: Percentage of the modules in selected environmental impact categories

Report

The LCA report underlying this EPD was developed according to the requirements of DIN EN ISO 14040 and DIN EN ISO 14044 as well as DIN EN 15804 and DIN EN ISO 14025. It is not adressed to third parties for reasons of confidentiality. It is deposited with the ift Rosenheim. The results and conclusions reported to the target group are complete, correct, without bias and transparent. The results of the study are not designed to be used for comparative statements intended for publication.

Critical review

The critical review of the LCA and of the report took place in the course of verification of the EPD and was carried out by Patrick Wortner, MBA and Eng., Dipl.-Ing, an external verifier.

7 General information regarding the EPD

Comparability

This EPD was prepared in accordance with DIN EN 15804 and is therefore only comparable to those EPDs that also comply with the requirements set out in DIN EN 15804.
Any comparison must refer to the building context and the same boundary conditions of the various life cycle stages.
For comparing EPDs of construction products, the rules set out in DIN EN 15804 (Clause 5.3) apply.

Identification of the product groups and the resulting variations are documented in the underlying report.

Communication

The communications format of this EPD meets the requirements of EN 15942:2012 and is therefore the basis for B2B communication. Only the nomenclature has been changed according to DIN EN 15804.

Verification

Verification of the Environmental Product Declaration is documented in accordance with the ift "Richtlinie zur Erstellung von Typ III Umweltproduktdeklarationen" (Guidance on preparing Type III Environmental Product Declarations) in accordance with the requirements set out in DIN EN ISO 14025.

The Declaration is based on the PCR documents“PCR Part A” PCR-A-0.3:2018, “Doors” PCR TT-2.3:2018 as well as EN 17213 “PCR for windows and doors”.

The European standard EN 15804 serves as the core PCR [a)]
Independent verification of the Declaration and statement according to EN ISO 14025:2010 ☐ internal ☒ external
Independent third party verifier: [b)] Patrick Wortner
[a)] Product category rules [b)] Optional for business-to-business communication Mandatory for business-to-consumer communication (see EN ISO 14025:2010, 9.4)

Revisions of this document

No.	Date	Note:	Practitioner of the LCA	Verifier
1	23.05.2022	External verification	Hilz	Wortner

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9 Annex

Description of life cycle scenarios forHoSta Multi-purpose door system **Multi-purpose door system**

Product stage			Con-struction phase		Use stage							End-of-life stage				Benefits and loads from beyond the system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	Manufacture	Transport	Construction/installation process	Use	Maintenance	Repair	Replacement	Modification/refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Re-use Recovery Recycling potential
✓	✓	✓	✓	✓	—	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Calculation of the scenarios was based on a building service life of 50 years (in accordance with RSL of Section 4 Use stage).

The scenarios were based on information provided by the manufacturer. The scenarios were furthermore based on the research project "EPDs for transparent building components" [1])

Note: The standard scenarios selected are presented in bold type. They were also used for calculating the indicators in the summary table.

- ✓ Included in the LCA
- — Not included in the LCA

A4 Transport to the construction site

No.	Scenario	Description
A4	Large-scale project	40 t truck (Euro 0-6 mix), diesel, 27 t payload, 100% capacity used, approx. 150 km to construction site and empty return trip

A4 Transport to the construction site	Transport weight [kg/m²] Density [kg/m³]
Multi-functional door	72.37
Security door	103.69
Smoke control/ fire resistant assembly	116.00

Since only one scenario is used, the results are shown in the relevant summary table.

A5 Construction/Installation

No.	Scenario	Description
A5	Small lifting trolley / lifting platform	Small lifting platform/lifting trolley is required for the installation of the products. (1 kWh/m²)

In case of deviating consumption the installation / assembly of the products forms part of the site management and is covered at the building level.

Energy consumption during installation is based on 1 kWh/m² product. Ancillary material, consumables, use of water, use of other resources, material losses, direct emissions as well as waste during installation are negligible.

It is assumed that the packaging material in the module construction / installation is sent to waste handling. Waste is only recycled thermally or disposed of in line with the conservative approach. Films/foils / protective covers, wood and cardboard in waste incineration plants.
Benefits from A5 are specified in Module D. Benefits from waste incineration plant: electricity replaces electricity mix (EU 28); thermal energy replaces thermal energy from natural gas (EU 28).
Transport to the recycling plants is not taken into account.
Since only one scenario is used, the results are shown in the relevant summary table.

B1 Use
Refer to Section 4 Use stage - Emissions to the environment. Emissions cannot be quantified.

B2 Inspection, maintenance, cleaning
Since only one scenario is used, the results are shown in the relevant summary table.

B2.1 Cleaning

No.	Scenario	Description
B2.1	Rarely manual	Manually using water, annually

Ancillary materials, consumables, use of energy, material losses and waste as well as transport distances during cleaning are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B2.2 Maintenance

No.	Scenario	Description
B2.2	Normal use	Annual functional check, visual inspection, greasing/lubrication and, if necessary, repair according to manufacturer 0.25 kg lubricant per 50 yr (1)

Ancillary materials, consumables, use of energy and water, material losses and waste as well as transport distances during maintenance are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B3 Repair

No.	Scenario	Description
B3	Normal use and heavy use	According to manufacturer: One replacement*: hardware and seals/gaskets

*Assumptions for evaluation of possible environmental impacts; statements made do not constitute any guaranty or warranty of performance.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from Hodapp GmbH und Co. KG .

A 50-year service is stated for multi-functional doors, security doors as well as smoke control and fire resistant assemblies made by Hodapp GmbH und Co. KG . Scenario B3 presents the LCA of the components of building elements with a service life of less than the relevant period of 50 years.

Is is assumed that the replaced components in the module “Repair” are recycled. Metals in melt (material recycling), plastics in waste incineration plants. Benefits from B3 are specified in Module D. Benefits from waste incineration: electricity replaces electricity mix (EU 28); thermal energy replaces thermal energy from natural gas (EU 28).

Transport to the recycling plants is not taken into account.
Ancillary materials, consumables, use of energy and water, waste, material losses and transport distances during repair are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B4 Exchange / Replacement

No.	Scenario	Description
B4	No replacement	No replacement over a 50 year period*

*Assumptions for evaluation of possible environmental impacts; statements made do not constitute any guaranty or warranty of performance.

The statements made in this EPD are only informative to allow evaluation at the building level.

It is assumed that no replacement will be necessary during the 50 year service life according to the BBSR Table and the assumed 50-year building service life.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from Hodapp GmbH und Co. KG .

Ancillary materials, consumables, use of energy and water, material losses, waste as well as transport distances during installation are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B5 Improvement / Modernisation
According to the manufacturer, the elements are not included in the improvement / modernisation activities for buildings.

For updated information refer to the respective instructions for assembly/installation, operation and maintenance from Hodapp GmbH und Co. KG .

Ancillary materials, consumables, use of energy and water, material losses, waste as well as transport distances during replacement are negligible.

Since only one scenario is used, the results are shown in the relevant summary table.

B6 Operational energy use

There is no energy used during normal use. The products are opened by manual operation.

B7 Operational water use
No water consumption when used as intended. Water consumption for cleaning is specified in Module B2.1.

C1 Deconstruction

No.	Scenario	Description
C1	Deconstruction	As per EN 17213: Deconstruction of glass-free materials 95%; Deconstruction of glass 30% Further deconstruction rates are possible, give adequate reasons.

No relevant inputs or outputs apply to the scenario selected. The energy consumed for deconstruction is negligible. Any arising consumption is marginal.

Since only one scenario is used, the results are shown in the summary table.

In case of deviating consumption the removal of the products forms part of the site management and is covered at the building level.

C2 Transport

No.	Scenario	Description
C2	Transport	Transport to collection point using 40 t truck (Euro 0-6 mix), diesel, 27 t payload, 80% capacity used, 50 km

Since only one scenario is used, the results are shown in the relevant summary table.

C3 Waste management		
No.	**Scenario**	**Description**
C3.1	**Disposal**	**Based on EN 17213 :** • **100% metals in melt** • **100% glass in melt** • **100% inert (insulating) material sent to landfill** • **100 % plastics - thermal recycling**

Electricity consumption of incineration plant: 0.5 MJ/kg.

As the products are placed on the European market, the disposal scenario is based on average European data sets.

The below table presents the disposal processes and their percentage by mass/weight. The calculation is based on the above mentioned shares in percent related to the declared unit of the product system.

C3.1 Disposal	Unit	Multi-functional door	Security door	Smoke control/ fire resistant assembly
Collection process, collected separately	kg	47.61	59.27	65.26
Collection process, collected as mixed construction waste	kg	22.40	38.86	45.92
Recovery system, for re-use	kg	0.00	0.00	0.00
Recovery system, for recycling	kg	34.12	51.27	48.06
Recovery system, for energy recovery	kg	1.12	1.02	0.80
Disposal	kg	34.77	45.84	62.32

The 100% scenarios differ from current average recycling (C3.1). The evaluation of the individual scenarios is presented in the underlying report.

Since only one scenario is used, the results are shown in the relevant summary table.

C4 Disposal		
No.	**Scenario**	**Description**
C4.1	**Standard scenario**	**The non-recordable amounts and losses within the re-use/recycling chain (C1 and C3) are modelled as "disposed" (EU-28).**

The consumption in scenario C4 results from physical pre-treatment, waste recycling and management of the disposal site. The benefits obtained here from the substitution of primary material production are allocated to Module D, e.g. electricity and heat from waste incineration.

The 100% scenarios differ from the standard scenario (C4.1). The evaluation of the individual scenarios is presented in the underlying report.

Since only one scenario is used, the results are shown in the relevant summary table.

D Benefits and loads from beyond the system boundaries

No.	Scenario	Description
D1	**Recycling potential (current market situation)**	**Steel scrap from C3 excluding the scrap used in A3 replaces 60% of steel; Glass recyclate from C3 excluding the glass shards used in A3 replace 60% of glass; Plastic recyclate from C3 excluding the plastics used in A3 replaces 60% of plastics; Benefits from waste incineration: electricity replaces electricity mix (EU-28); thermal energy replaces thermal energy from European natural gas (EU-28).**

The values in Module D result from recycling of the packaging material in Module A5 and from deconstruction at the end of service life.

The 100% scenarios differ from current average recycling (D1). The evaluation of the individual scenarios is presented in the underlying report.

Since only one scenario is used, the results are shown in the relevant summary table.

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Notes
This EPD is mainly based on the work and findings of the Institut für Fenstertechnik e.V., Rosenheim (ift Rosenheim) and specifically on the ift-Richtlinie NA-01/3 Allgemeiner Leitfaden zur Erstellung von Typ III Umweltproduktdeklarationen. (Guideline NA.01/3 - Guidance on preparing Type III Environmental Product Declarations)

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