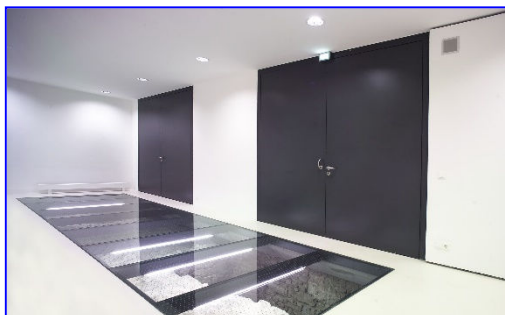


Environmental Product Declaration (EPD)



Declaration code EPD-FTÜ-GB-0.7.2



HÖRMANN

**TORTEC
Brandschutz
GmbH**

Doors

Fire and/or smoke protection doors made of steel and stainless steel

(STS/STU - commercial doors)



Basis:

DIN EN ISO 14025
EN15804

Company EPD
Environmental
Product Declaration

Publication date:
11.04.2023

Next revision:
11.04.2028



[www.ift-rosenheim.de/
published EPDs](http://www.ift-rosenheim.de/published-EPDs)

Environmental Product Declaration (EPD)



Declaration code EPD-FTÜ-GB-0.7.2

Programme operator	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 83026 Rosenheim, Germany		
Practitioner of the LCA	LCEE GmbH Birkenweg 24 64295 Darmstadt		
Declaration holder	TORTEC Brandschutztor GmbH Imling 10 4902 Wolfsegg, Austria www.tortec.at and www.hoermann.de		
Declaration code	EPD-FTÜ-GB-0.7.2		
Designation of declared product	Fire and/or smoke protection doors made of steel and stainless steel (STS/STU - commercial doors)		
Scope	Fire and smoke protection doors for object and industrial construction		
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" (General guideline for preparation of 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 and "Doors" PCR-TT-3.0:2023.		
Validity	Publication date: 11.04.2023	Last revision: 11.04.2023	Next revision: 11.04.2028
	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 data are based on both the data compiled from the production site of TORTEC Brandschutztor GmbH and the generic data derived from the "GaBi 10" database. LCA calculations were carried out for the included "cradle to gate – with options" including all upstream chains (e.g. raw material extraction, etc.).		
Notes	The ift-Guidance Sheet "Conditions and Guidance for the Use of ift Test Documents" applies. 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

Christoph Seehauser
Independent verifier

1 General Product Information

Product definition

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

1 m² Fire and/or smoke protection door made by TORTEC Brandschutztor GmbH

The functional unit is obtained by summing up:

Assessed product	Declared unit	Surface area of reference product	Surface weight
Fire and/or smoke protection door EI ₂ 30	1 m ²	2.68 m ²	47.60 kg/m ²
Fire and/or smoke protection door EI ₂ 30 with glass	1 m ²	2.68 m ²	49.57 kg/m ²
Fire and/or smoke protection door EI ₂ 90	1 m ²	2.68 m ²	73.72 kg/m ²

Table 1 Product groups

The average unit is declared as follows:

Directly used material flows are determined using the standard size (1.23 m x 2.18 m) according to EN 17213 and assigned to the declared unit. All other inputs and outputs in the manufacture were scaled to the declared unit as a whole, since no direct assignment to the standard size is possible. The reference period is the year 2021.

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

- Fire and/or smoke protection doors
 - STS/STU - commercial doors

For models without fire protection class (multi-purpose) or EI₂60, the calculated environmental effects of the fire protection door EI₂30 apply.

Product description

Door leaf:

- fully bonded and flush compound connection
- insulation corresponding to the protection class

Frame:

- Profile construction

Material/Surface:

- galvanized steel sheet optionally powder coated, or stainless steel

Type of operation:

- manually
- optionally per drive

Optional:

- glazing panel

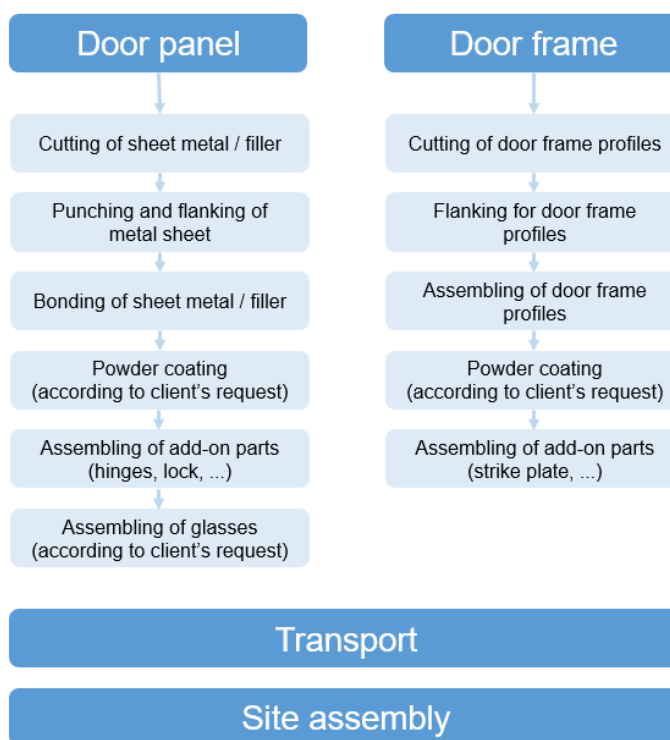
Protection classes:

- Multit-purpose
- EI₂30, EI₂60, EI₂90
- S200
- RC 2, RC 3

Specific data for drive units can be found in the manufacturer-specific EPDs. These components were not accounted for in the EPD. For doors with drive units, the impact indicators from the EPDs for drive units must be added up to the corresponding impact indicators from this EPD.

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

Product manufacture



Application

Closure for room and structural openings in industrial, commercial and private interior and exterior areas.

Test evidence / reports

The following verifications are held:

- Resistance to fire as per EN 1634-1
- Smoke leakage as per EN 1634-3
- Resistance to repeated opening and closing as per EN 1191
- Classification of burglar resistance as per EN 1627
- VOC emission of construction products as per ift certification scheme QM 359:2018-01

For information on further and updated verifications (incl. other national approvals) refer to www.tortec.at and www.hoermann.de.

Management systems

The following management systems are held:

- Quality management system as per DIN EN ISO 9001:2015
- Energy management system as per DIN EN ISO 50001:2018
- Environmental management system as per DIN EN ISO 14001:2015
- Management system for safety and health at work as per DIN ISO 45001:2018

Additional information

For additional verifications 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 06.10.2022).

All relevant safety data sheets can be obtained from company TORTEC Brandschutztor GmbH.

3 Construction process stage

Processing recommendations, installation

Observe the instructions for assembly/installation, operation, maintenance and disassembly, provided by the manufacturer. For this, see www.tortec.at and www.hoermann.de

4 Use stage

Emissions to the environment

No emissions to indoor air, water and soil are known. No VOC emissions are generated.

Reference service life (RSL)

The RSL information was provided by the manufacturer. The RSL must be established under specified reference conditions of use and relate to the declared technical and functional performance of the product within the building. It must be determined according to all specific rules given in European product standards or, if none are available, according to a c-PCR. It must also take into account ISO 15686-1, -2, -7 and -8. If there is guidance on deriving RSLs from European Product Standards or a c-PCR, then such guidance must take precedence.

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 an EPD "cradle to factory gate with options", with modules C1-C4 and module D (A1-A3 + C + D and one or more additional modules from

A4 to B7), the specification of a reference service life (RSL) is only possible if the reference service life conditions are specified. The service life of the Fire and/or smoke protection doors made of steel and stainless steel of company TORTEC Brandschutztor GmbH is optionally specified with 50 years according to the BBSR table.

The service life is dependent on the characteristics of the product and in-use conditions. The conditions and characteristics 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 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

Fire and/or smoke protection doors made of steel and stainless steel are sent to central collection points. There the products are usually shredded and sorted into their 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.

In this EPD, the modules of after-use are presented according to the market situation.

Metals, glass, plaster as well as plastics are recycled to certain parts. Residual fractions are sent to landfill or, in part, thermally recycled.

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.

As a basis for this, life cycle assessments were prepared for Fire and/or smoke protection doors made of steel and stainless steel. These 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

Aim

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 2021 fiscal year. They were collected by the manufacturer on-site at the plant located in Wolfsegg 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 5 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" 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 Fire and/or smoke protection doors made of steel and stainless steel. 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 used were taken into consideration as a function of 100% of the mass of the products.

The following assumption was made for the means of transport:

- Truck, more than 32 t gross weight / 24.7 t payload, Euro 6, freight, 85 % capacity utilization

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

Aim

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 complete life cycle Fire and/or smoke protection doors made of steel and stainless steel is shown in the annex. The product stage "A1 – A3", construction process stage "A4 – A5", use stage "B1 – B4 and B6 – 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

No allocations occur during production.

Allocations for re-use, recycling and recovery

If the products are reused/recycled and recovered during the product stage (rejects), the elements are shredded, if necessary and then sorted into their 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

The 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).

Secondary material designated as inputs to Fire and/or smoke protection doors made of steel and stainless steel is calculated as input without loads. No benefits are assigned to Module D, but consumption to Modules C3 and C4 (worst case consideration).

The system boundary set for the recycled material refers to collection.

Secondary material

The use of secondary material by TORTEC Brandschutztor GmbH was considered in Module A3. Secondary material is used.

Inputs

The following manufacturing-related inputs were included in the LCA per 1 m² Fire and/or smoke protection door:

Energy

For the input material gas, "Thermal energy from natural gas EU-28" was assumed. For electricity from hydropower and photovoltaics, "Electricity from hydropower AT" or "Electricity from photovoltaics AT" are assumed.

Water

The water consumed by the individual process steps for the manufacture amounts to a total of 3.27E-05 l per m² of the element.

The consumption of fresh water specified in Section 6.3 originates (among others) from the process chain of the pre-products.

Raw material/Pre-products

The chart below shows the share of raw materials/pre-products in percent.

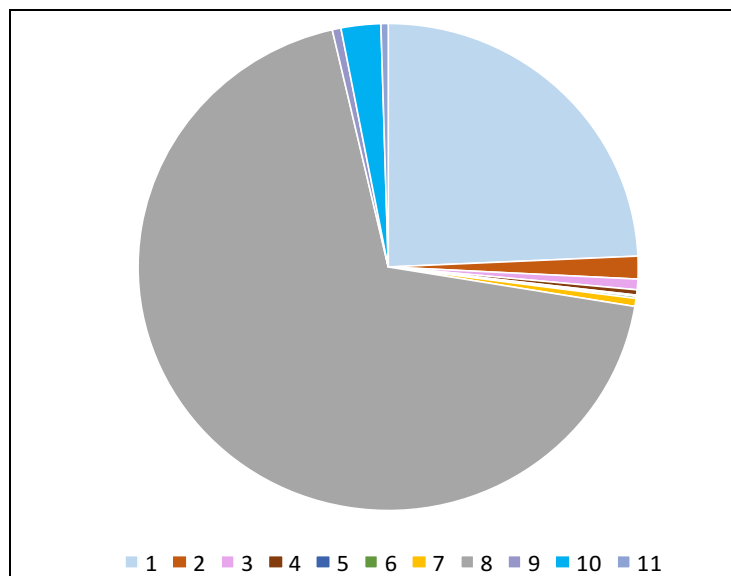


Illustration 1 Percentage of individual materials per declared unit (EI₂₃₀)

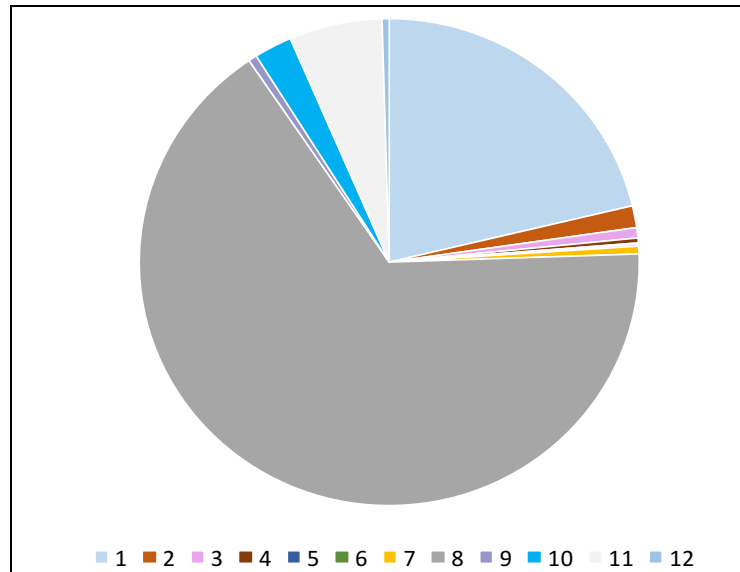


Illustration 2 Percentage of individual materials per declared unit (EI₂₃₀ with glass)

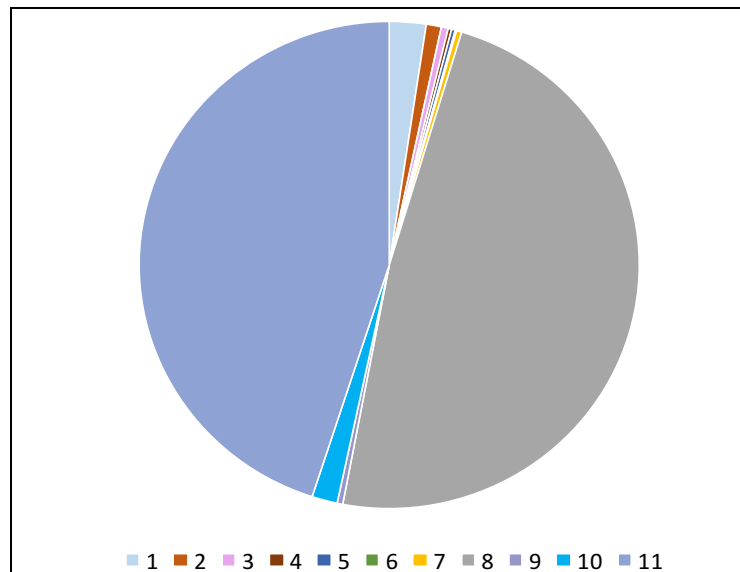


Illustration 3 Percentage of individual materials per declared unit (EI₂₉₀)

N°	Material	Mass in %		
		EI ₂₃₀	EI ₂₃₀ with glass	EI ₂₉₀
1	Mineral wool	24.28	21.28	2.38
2	Plaster	1.51	1.45	0.97
3	Coating	0.71	0.68	0.46
4	Glue	0.34	0.33	0.22
5	Laminate	0.09	0.09	0.23
6	Plastics	0.14	0.13	0.09
7	Gasket	0.53	0.51	0.34
8	Steel	68.81	66.06	48.29
9	Hardware	0.56	0.54	0.36
10	Aluminium	2.56	2.46	1.65
11	Glass	-	6.02	-
12	Vermiculite	0.47	0.45	45.01

Table 2 Percentage of individual materials per declared unit

Ancillary materials and consumables

1.67 g of ancillary materials and consumables are used.

Product packaging

The amounts used for product packaging are as follows:

N°	Material	Mass in kg		
		EI ₂₃₀	EI ₂₃₀ with glass	EI ₂₉₀
1	LDPE films and protective covers	0.37		
2	Packaging made of wood	4.89		
3	Cardboard	0.15		
4	Polystyrene	0.10		
5	PU foamed material	0.24		

Table 3 Weight in kg of packaging per declared unit

Biogenic carbon content

Only the biogenic carbon content of the associated packaging is reported, as the total mass of biogenic carbon-containing materials is less than 5% of the total mass of the product and associated packaging. According to EN 16449, the following amounts of biogenic carbon are generated for packaging:

N°	Part	Content in kg C		
		EI ₂₃₀	EI ₂₃₀ with glass	EI ₂₉₀
1	In the corresponding packaging	2.24		

Table 4 Biogenic carbon content of the packaging at the factory gate

Outputs

The following manufacturing-related outputs were included in the LCA per 1 m² Fire and/or smoke protection doors made of steel and stainless steel:

Waste

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

Waste water

No waste water is produced during the manufacturing process.

6.3 Impact assessment

Aim

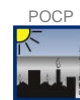
The impact assessment covers both inputs and outputs. The impact categories applied are stated below:

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 freshwater;
- Eutrophication salt water;
- Eutrophication land;
- Photochemical ozone creation;
- Water use.

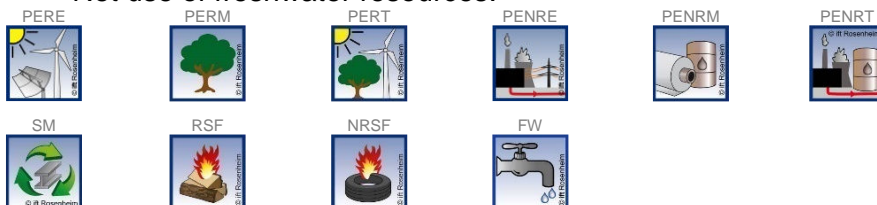


Resource management

The models for impact assessment were applied as described in DIN EN 15804-A2.

The following resource use indicators are presented in the EPD:

- Renewable primary energy as energy source;
- Renewable primary energy for material use;
- Total use of renewable primary energy;
- Non-renewable primary energy as energy source;
- 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 freshwater resources.



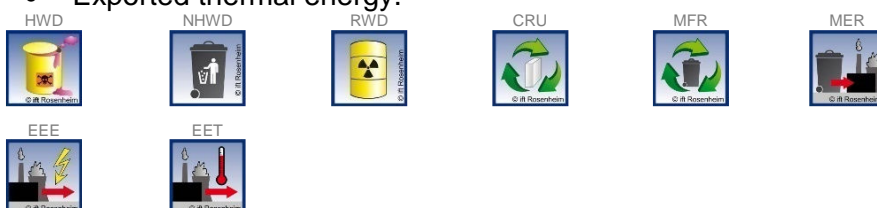
Waste

The waste generated during the production of 1 m² of Fire and/or smoke protection doors made of steel and stainless steel 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 following waste categories and indicators for output closures are presented in the EPD:

- Disposed hazardous waste;
- Disposed non-hazardous waste;
- Radioactive waste disposed;
- Components for re-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:

- Fine dust missions,
- Ionizing radiation, human health,
- Ecotoxicity (freshwater),
- Human toxicity, carcinogenic effects,
- Human toxicity, non-carcinogenic effects,
- Impacts associated with land use/soil quality.

Product Manager



IRP



ETP-fw



HTP-c




HTP-nc



SQP



 Results per 1 m² Fire and/or smoke protection door EI₂₃₀																
	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.	101.83	0.52	11.2	ND	0.28	0.92	0.00	ND	0.00	0.00	0.00	0.43	2.24	4.4E-02	-58.61
GWP-f	kg CO ₂ -eq.	109.51	0.52	2.2	ND	0.28	0.91	0.00	ND	0.00	0.00	0.00	0.433	2.22	4.50E-02	-58.49
GWP-b	kg CO ₂ -eq.	-7.71	-7.21E-04	8.97	ND	2.64E-03	6.36E-03	0.00	ND	0.00	0.00	0.00	-5.97E-04	2.00E-02	-1.33E-03	-0.11
GWP-l	kg CO ₂ -eq.	0.03	2.93E-03	2.08E-05	ND	1.74E-05	1.84E-04	0.00	ND	0.00	0.00	0.00	2.41E-03	4.71E-04	8.34E-05	-9.26E-03
ODP	kg CFC-11-eq.	2.19E-09	3.15E-14	8.18E-13	ND	3.00E-13	6.43E-12	0.00	ND	0.00	0.00	0.00	2.59E-14	3.25E-11	1.07E-13	-4.27E-11
AP	mol H ⁺ -eq.	0.34	5.14E-04	1.81E-03	ND	8.77E-04	1.59E-03	0.00	ND	0.00	0.00	0.00	3.80E-04	4.86E-03	3.20E-04	-0.18
EP-fw	kg P-eq.	1.67E-04	1.57E-06	1.97E-07	ND	2.18E-06	1.72E-06	0.00	ND	0.00	0.00	0.00	1.29E-06	6.51E-06	7.68E-08	-3.05E-05
EP-m	kg N-eq.	6.07E-02	1.63E-04	6.26E-04	ND	1.426E-04	4.30E-04	0.00	ND	0.00	0.00	0.00	1.09E-04	1.09E-03	8.19E-05	-3.20E-02
EP-t	mol N-eq.	0.88	1.95E-03	8.89E-03	ND	1.52E-03	4.57E-03	0.00	ND	0.00	0.00	0.00	1.35E-03	1.14E-02	9.00E-04	-0.47
POCP	kg NMVOC-eq.	0.19	4.50E-04	1.68E-03	ND	6.70E-04	1.45E-03	0.00	ND	0.00	0.00	0.00	3.20E-04	2.90E-03	2.48E-04	-0.10
ADPF*2	MJ	1199.80	7.02	2.22	ND	13.00	23.10	0.00	ND	0.00	0.00	0.00	5.78	40.22	0.59	-651.13
ADPE*2	kg Sb equivalent	4.31E-04	4.39E-08	2.01E-08	ND	4.30E-08	2.01E-07	0.00	ND	0.00	0.00	0.00	3.62E-08	6.07E-07	4.66E-09	-2.51E-04
WDP*2	m ³ world-eq. deprived	27.33	4.71E-03	1.13	ND	5.38	4.49E-02	0.00	ND	0.00	0.00	0.00	3.88E-03	2.12E-02	4.93E-03	-13.94
Resource management																
PERE	MJ	250.01	0.40	80.97	ND	0.21	3.16	0.00	ND	0.00	0.00	0.00	0.33	22.99	0.12	-76.95
PERM	MJ	81.31	0.00	-80.46	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	-0.64	-0.03	0.00
PERT	MJ	331.32	0.40	0.51	ND	0.21	3.16	0.00	ND	0.00	0.00	0.00	0.33	22.35	8.91E-02	-76.95
PENRE	MJ	1202.72	7.04	16.68	ND	13.03	23.10	0.00	ND	0.00	0.00	0.00	5.79	56.16	1.43	-651.43
PENRM	MJ	31.24	0.00	-14.45	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	-15.94	-0.84	0.00
PENRT	MJ	1233.96	7.04	2.23	ND	13.03	23.10	0.00	ND	0.00	0.00	0.00	5.79	40.22	0.59	651.43
SM	kg	12.33	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m ³	0.77	4.51E-04	2.66E-02	ND	0.12	3.41E-03	0.00	ND	0.00	0.00	0.00	3.72E-04	2.1E-02	1.50E-04	-0.41
Categories of waste																
HWD	kg	2.54E-04	3.37E-11	2.21E-10	ND	1.87E-10	1.73E-09	0.00	ND	0.00	0.00	0.00	2.77E11	3.48E-09	3.05E-11	-7.57E-08
NHWD	kg	9.29	1.00E-03	7.9E02	ND	3.69E-02	8.53E-03	0.00	ND	0.00	0.00	0.00	8.30E-04	3.03E-02	3.03	-5.19
RWD	kg	1.67E-03	8.67E-06	1.26E-04	ND	5.77E-05	4.33E-04	0.00	ND	0.00	0.00	0.00	7.14E-06	6.41E-03	6.49E-06	-1.25E-02
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	7.21	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	42.80	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	17.10	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	MJ	0.00	0.00	30.90	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	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

ift ROSENHEIM																
Results per 1 m ² Fire and/or smoke protection door EI ₂₃₀																
Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Additional environmental impact indicators																
PM	Disease incidence	4.45E-06	3.06E-09	8.41E-09	ND	5.45E-09	1.45E-08	0.00	ND	0.00	0.00	0.00	2.41E-09	4.03E-08	3.94E-09	-1.85E-06
IRP*¹	kBq U235-eq.	3.70	1.27E-03	2.04E-02	ND	9.35E-03	5.10E-02	0.00	ND	0.00	0.00	0.00	1.05E-03	1.08	7.07E-04	-2.61
ETP-fw*²	CTUe	462.12	4.87	0.97	ND	8.85	10.80	0.00	ND	0.00	0.00	0.00	4.01	17.60	0.33	-197.24
HTP-c*²	CTUh	1.30E-07	9.83E-11	6.99E-11	ND	1.75E-10	4.29E-10	0.00	ND	0.00	0.00	0.00	8.09E-11	5.06E-10	5.06E-11	-7.14E-08
HTP-nc*²	CTUh	4.87E-06	5.08E-09	2.43E-09	ND	7.88E-09	1.58E-08	0.00	ND	0.00	0.00	0.00	4.17E-09	1.85E-08	5.60E-09	-2.61E-06
SQP*²	dimensionless	1,185	2.41	0.65	ND	0.14	2.27	0.00	ND	0.00	0.00	0.00	1.99	14.56	0.128	-69.48

Key:
PM – particulate matter emissions potential **IRP*¹** – ionizing radiation potential – human health **ETP-fw*²** - Eco-toxicity 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 ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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



Results per 1 m² Fire and/or smoke protection door EI₂₃₀ with glass

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.	116.24	0.54	11.20	ND	0.28	0.92	0.00	ND	0.00	0.00	0.00	0.45	2.32	4.99E-02	-53.27
GWP-f	kg CO ₂ -eq.	123.89	0.54	2.20	ND	0.28	0.91	0.00	ND	0.00	0.00	0.00	0.45	2.30	5.13E-02	-53.16
GWP-b	kg CO ₂ -eq.	-7.69	-7.52E-04	8.97	ND	2.64E-03	6.36E-03	0.00	ND	0.00	0.00	0.00	-6.18E-04	2.07E-02	-1.51E-03	-0.11
GWP-l	kg CO ₂ -eq.	0.039	3.03E-03	2.08E-05	ND	1.74E-05	1.84E-04	0.00	ND	0.00	0.00	0.00	2.50E-03	4.88E-04	9.47E-05	-9.40E-03
ODP	kg CFC-11-eq.	2.19E-09	3.27E-14	8.18E-13	ND	3.00E-13	6.43E-12	0.00	ND	0.00	0.00	0.00	2.68E-14	3.37E-11	1.22E-13	-4.09E-11
AP	mol H ⁺ -eq.	0.41	5.33E-04	1.81E-03	ND	8.77E-04	1.59E-03	0.00	ND	0.00	0.00	0.00	3.94E-04	5.03E-03	3.63E-04	-0.17
EP-fw	kg P-eq.	1.76E-04	1.63E-06	1.97E-07	ND	2.18E-06	1.72E-06	0.00	ND	0.00	0.00	0.00	1.34E-06	6.74E-06	8.72E-08	-2.79E-05
EP-m	kg N-eq.	7.70E-02	1.69E-04	6.26E-04	ND	1.426E-04	4.30E-04	0.00	ND	0.00	0.00	0.00	1.13E-04	1.13E-03	9.30E-05	-3.06E-02
EP-t	mol N-eq.	1.04	2.02E-03	8.89E-03	ND	1.52E-03	4.57E-03	0.00	ND	0.00	0.00	0.00	1.40E-03	1.18E-02	1.02E-03	-0.44
POCP	kg NMVOC-eq.	0.24	4.66E-04	1.68E-03	ND	6.70E-04	1.45E-03	0.00	ND	0.00	0.00	0.00	3.31E-04	3.05E-03	2.82E-04	-9.91E-02
ADPF*2	MJ	1429.89	7.28	2.22	ND	13.00	23.10	0.00	ND	0.00	0.00	0.00	5.98	41.63	0.67	-596.00
ADPE*2	kg Sb equivalent	5.53E-04	4.56E-08	2.01E-08	ND	4.30E-08	2.01E-07	0.00	ND	0.00	0.00	0.00	3.74E-08	6.25E-07	5.29E-09	-2.21E-04
WDP*2	m ³ world-eq. deprived	33.31	4.88E-03	1.13	ND	5.38	4.49E-02	0.00	ND	0.00	0.00	0.00	4.02E-03	0.51	5.60E-03	-12.40
Resource management																
PERE	MJ	257.16	0.41	80.97	ND	0.21	3.16	0.00	ND	0.00	0.00	0.00	0.34	23.78	0.17	-74.13
PERM	MJ	81.31	0.00	-80.46	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	-0.64	-0.03	0.00
PERT	MJ	338.47	0.41	0.51	ND	0.21	3.16	0.00	ND	0.00	0.00	0.00	0.34	23.14	0.14	-74.13
PENRE	MJ	1432.87	7.30	16.68	ND	13.03	23.10	0.00	ND	0.00	0.00	0.00	6.00	39.41	0.94	-596.00
PENRM	MJ	31.24	0.00	-14.45	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	-15.94	-0.84	0.00
PENRT	MJ	1464.11	7.30	2.23	ND	13.03	23.10	0.00	ND	0.00	0.00	0.00	6.00	23.47	0.10	-596.00
SM	kg	11.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m ³	0.94	4.06E-04	2.66E-02	ND	0.12	3.41E-03	0.00	ND	0.00	0.00	0.00	3.85E-04	0.021	1.70E-04	-0.37
Categories of waste																
HWD	kg	2.54E-04	3.17E-11	2.21E-10	ND	1.87E-10	1.73E-09	0.00	ND	0.00	0.00	0.00	2.87E-12	3.60E-09	3.46E-11	-6.89E-08
NHWD	kg	10.20	1.04E-03	7.9E02	ND	3.69E-02	8.53E-03	0.00	ND	0.00	0.00	0.00	8.59E-04	3.10E-02	3.44	-4.86
RWD	kg	0.25	8.99E-06	1.26E-04	ND	5.77E-05	4.33E-04	0.00	ND	0.00	0.00	0.00	7.39E-06	6.64E-03	7.37E-06	-1.24E-02
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	7.21	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	38.4	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	17.10	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	MJ	0.00	0.00	30.90	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	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 - eutrophication 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

ift ROSENHEIM																
Results per 1 m ² Fire and/or smoke protection door EI ₂₃₀ with glass																
Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Additional environmental impact indicators																
PM	Disease incidence	5.08E-06	3.17E-09	8.41E-09	ND	5.45E-09	1.45E-08	0.00	ND	0.00	0.00	0.00	2.49E-09	4.17E-08	4.48E-09	-1.71E-06
IRP*¹	kBq U235-eq.	3.91	1.31E-03	2.04E-02	ND	9.35E-03	5.10E-02	0.00	ND	0.00	0.00	0.00	1.08E-03	1.12	8.03E-04	-2.54
ETP-fw*²	CTUe	566.33	5.05	0.97	ND	8.85	10.80	0.00	ND	0.00	0.00	0.00	4.15	18.22	0.37	-196.00
HTP-c*²	CTUh	1.38E-07	1.02E-10	6.99E-11	ND	1.75E-10	4.29E-10	0.00	ND	0.00	0.00	0.00	8.37E-11	5.24E-10	5.75E-11	-6.63E-08
HTP-nc*²	CTUh	4.89E-06	5.27E-09	2.43E-09	ND	7.88E-09	1.58E-08	0.00	ND	0.00	0.00	0.00	4.31E-09	1.91E-08	6.36E-09	-2.37E-06
SQP*²	dimensionless	1188.93	2.50	0.65	ND	0.14	2.27	0.00	ND	0.00	0.00	0.00	2.06	15.05	0.14	-64.50

Key:
PM – particulate matter emissions potential **IRP*¹** – ionizing radiation potential – human health **ETP-fw*²** - Eco-toxicity 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 ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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



Results per 1 m² Fire and/or smoke protection door EI₂₉₀

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.	91.56	0.79	11.20	ND	0.28	0.92	0.00	ND	0.00	0.00	0.00	0.67	3.47	6.29E-02	-49.75
GWP-f	kg CO ₂ -eq.	99.42	0.79	2.20	ND	0.28	0.91	0.00	ND	0.00	0.00	0.00	0.67	3.44	6.47E-02	-43.68
GWP-b	kg CO ₂ -eq.	-7.88	-1.08E-03	8.97	ND	2.64E-03	6.36E-03	0.00	ND	0.00	0.00	0.00	-9.25E-04	3.10E-02	-1.91-03	-0.06
GWP-l	kg CO ₂ -eq.	0.035	4.36E-03	2.08E-05	ND	1.74E-05	1.84E-04	0.00	ND	0.00	0.00	0.00	3.74E-03	7.30E-04	1.19E-04	-9.20E-03
ODP	kg CFC-11-eq.	2.18E-09	4.69E-14	8.18E-13	ND	3.00E-13	6.43E-12	0.00	ND	0.00	0.00	0.00	4.01E-14	5.04E-11	1.54E-13	-2.61E-11
AP	mol H ⁺ -eq.	0.29	7.66E-04	1.81E-03	ND	8.77E-04	1.59E-03	0.00	ND	0.00	0.00	0.00	5.89E-04	7.53E-03	4.58E-04	-0.13
EP-fw	kg P-eq.	1.60E-04	2.34E-06	1.97E-07	ND	2.18E-06	1.72E-06	0.00	ND	0.00	0.00	0.00	2.00E-06	1.00E-05	1.10E-07	-2.30E-05
EP-m	kg N-eq.	5.59E-02	2.43E-04	6.26E-04	ND	1.426E-04	4.30E-04	0.00	ND	0.00	0.00	0.00	1.69E-04	1.69E-03	1.28E-04	-2.64E-02
EP-t	mol N-eq.	0.62	2.91E-03	8.89E-03	ND	1.52E-03	4.57E-03	0.00	ND	0.00	0.00	0.00	2.10E-03	1.77E-02	1.16E-03	-0.30
POCP	kg NMVOC-eq.	0.18	6.70E-04	1.68E-03	ND	6.70E-04	1.45E-03	0.00	ND	0.00	0.00	0.00	4.96E-04	4.57E-03	3.56E-04	-8.80E-02
ADPF*2	MJ	1118.17	10.46	2.22	ND	13.00	23.10	0.00	ND	0.00	0.00	0.00	8.95	62.28	0.84	-544.02
ADPE*2	kg Sb equivalent	4.86E-04	6.55E-08	2.01E-08	ND	4.30E-08	2.01E-07	0.00	ND	0.00	0.00	0.00	5.6E-08	9.40E-07	6.67E-09	-2.46E-04
WDP*2	m ³ world-eq. deprived	28.28	7.02E-03	1.13	ND	5.38	4.49E-02	0.00	ND	0.00	0.00	0.00	6.01E-03	0.77	7.06E-03	-12.76
Resource management																
PERE	MJ	236.65	0.59	81.15	ND	0.21	3.16	0.00	ND	0.00	0.00	0.00	0.51	37.25	0.27	-63.42
PERM	MJ	83.41	0.00	-80.64	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	-2.63	-0.14	0.00
PERT	MJ	320.06	0.59	0.51	ND	0.21	3.16	0.00	ND	0.00	0.00	0.00	0.51	34.62	0.13	-63.42
PENRE	MJ	1121.00	10.48	16.68	ND	13.03	23.10	0.00	ND	0.00	0.00	0.00	8.98	60.07	1.04	-544.02
PENRM	MJ	31.24	0.00	-14.45	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	-15.94	-0.84	0.00
PENRT	MJ	1152.24	10.48	2.23	ND	13.03	23.10	0.00	ND	0.00	0.00	0.00	8.98	44.13	0.20	-544.02
SM	kg	11.30	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m ³	0.82	6.71E-04	2.66E-02	ND	0.12	3.41E-03	0.00	ND	0.00	0.00	0.00	5.76E-04	0.032	2.14E-04	-0.37
Categories of waste																
HWD	kg	5.71E-04	5.02E-11	2.21E-10	ND	1.87E-10	1.73E-09	0.00	ND	0.00	0.00	0.00	4.30E11	5.39E-09	4.36E-11	-6.37E-08
NHWD	kg	7.10	1.50E-03	7.9E02	ND	3.69E-02	8.53E-03	0.00	ND	0.00	0.00	0.00	1.29E-03	4.70E-02	4.33	-3.76
RWD	kg	0.011	1.29E-05	1.26E-04	ND	5.77E-05	4.33E-04	0.00	ND	0.00	0.00	0.00	1.11E-05	9.94E-03	9.29E-06	-9.60E-03
Output material flows																
CRU	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	6.50	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	62.40	0.00	0.00
MER	kg	0.00	0.00	0.00	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	17.10	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EET	MJ	0.00	0.00	30.90	ND	0.00	0.00	0.00	ND	0.00	0.00	0.00	0.00	0.00	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 - eutrophication 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

ift ROSENHEIM																
Results per 1 m ² Fire and/or smoke protection door EI ₂₉₀																
Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Additional environmental impact indicators																
PM	Disease incidence	4.02E-06	4.55E-09	8.41E-09	ND	5.45E-09	1.45E-08	0.00	ND	0.00	0.00	0.00	3.73E-09	6.24E-08	5.64E-09	-1.46E-06
IRP*1	kBq U235-eq.	3.04	1.89E-03	2.04E-02	ND	9.35E-03	5.10E-02	0.00	ND	0.00	0.00	0.00	1.62E-03	1.68	1.01E-03	-2.13
ETP-fw*2	CTUe	335.06	7.26	0.97	ND	8.85	10.80	0.00	ND	0.00	0.00	0.00	6.22	27.26	0.47	-119.42
HTP-c*2	CTUh	2.46E-07	1.46E-10	6.99E-11	ND	1.75E-10	4.29E-10	0.00	ND	0.00	0.00	0.00	1.25E-10	7.84E-10	7.24E-11	-1.35E-07
HTP-nc*2	CTUh	1.93E-06	7.57E-09	2.43E-09	ND	7.88E-09	1.58E-08	0.00	ND	0.00	0.00	0.00	6.46E-09	2.86E-08	8.02E-09	-9.72E-07
SQP*2	dimensionless	1125.22	3.60	0.65	ND	0.14	2.27	0.00	ND	0.00	0.00	0.00	3.08	22.54	0.18	-35.31

Key:
PM – particulate matter emissions potential **IRP*1** – ionizing radiation potential – human health **ETP-fw*2** - Eco-toxicity 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 ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

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

6.4 Interpretation, LCA presentation and critical review

Evaluation

The environmental impacts of

- Fire and/or smoke protection door EI₂30
- Fire and/or smoke protection door EI₂30 with glass
- Fire and/or smoke protection door EI₂90

differ to varying degrees in different environmental impact categories. The differences lie primarily in the masses of the pre-products and raw materials used. Furthermore, different pre-products and raw materials are used in some cases for the various doors.

In the area of production, the environmental impact fire and/or smoke protection doors EI₂30, EI₂30 with glass and EI₂90 mainly results from the use of steel (including coating powder) or its pre-chains. Further environmental impacts result from the use of mineral wool and aluminum as well as from the packaging used. The manufacturing process, transport and the source materials laminate or plaster play a subordinate role in terms of the level of environmental impact.

Compared to the predecessor EPD "EPD-FTÜ-0.7.1" from five years ago, the LCA results have decreased in all environmental categories. Reasons for this are the use of other/more appropriate GaBi data sets, changes in background data in GaBi, and increased secondary material use in pre-products.

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

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

Diagrams

The diagrams below show the B modules with reference to the specified RSL.

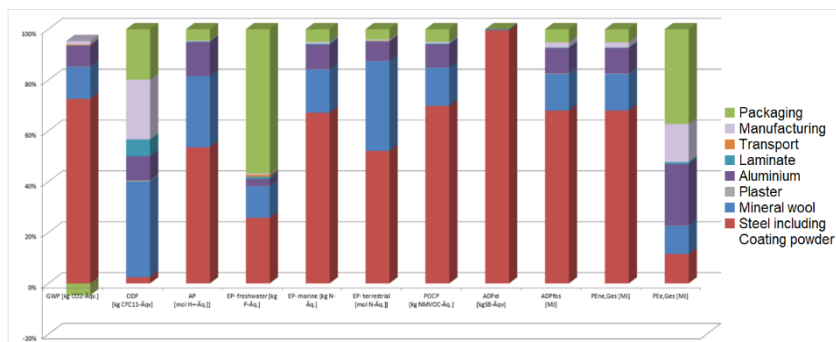


Illustration 4 Percentages of selected components, manufacturing and transport at the production stage based on selected environmental impact categories (Fire and/or smoke protection door EI230)

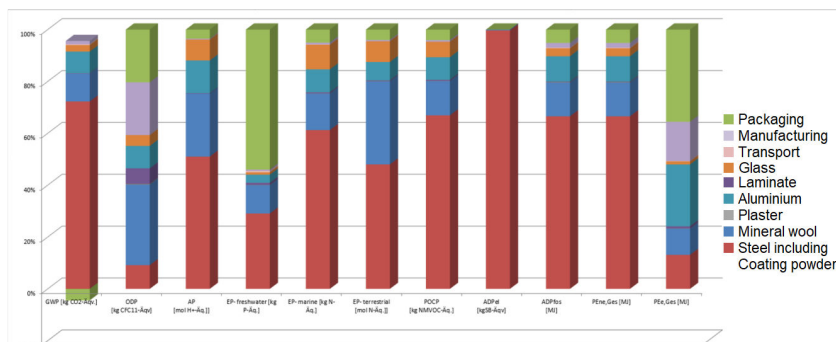


Illustration 5 Percentages of selected components, manufacturing and transport at the production stage based on selected environmental impact categories (Fire and/or smoke protection door EI230 with glass)

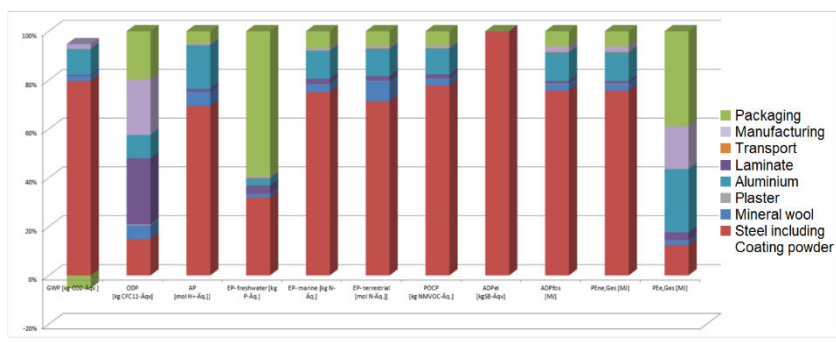


Illustration 6 Percentages of selected components, manufacturing and transport at the production stage based on selected environmental impact categories (Fire and/or smoke protection door EI290)

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 deposited with 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 life cycle assessment was carried out by the independent ift auditor Christoph Seehauser, M.Sc.



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.

The detailed individual results of the products were summarised on the basis of conservative assumptions and differ from the average results. The products covered by this EPD are similar in their material composition. Major differences result from the fire protection class, which is why this serves as the basis for product grouping.

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.

This declaration is based on PCR documents documents "PCR Part A" PCR-A-0.3:2018 and "Doors" PCR TT-3.0:2023.

The European standard EN 15804 serves as the core PCR ^{a)}
Independent verification of the Declaration and statement according to EN ISO 14025:2010 <input checked="" type="checkbox"/> internal <input type="checkbox"/> external
Independent third party verifier: ^{b)} Christoph Seehauser
^{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

N°	Date	Note	Person in charge	Testing personnel
1	06.04.2023	Internal test	Pscherer	Seehauser

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9 Annex

Description of life cycle scenarios for Fire and/or smoke protection doors made of steel and stainless steel

Product stage			Con- struction process stage		Use stage*							End-of-life stage				Benefits and loads beyond system boundaries
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Raw material supply	Transport	production	Transport	Construction/installation process	Use	maintenance	Repair	replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction/demolition	Transport	Waste processing	Disposal	Reuse Recovery Recycling potential
✓	✓	✓	✓	✓	✓	✓	✓	✓	—	✓	✓	✓	✓	✓	✓	✓

* For declared B-modules, the calculation of the results is performed taking into account the specified RSL related to one year

Table 5 Overview of applied life cycle stages

The scenarios were calculated taking into account the defined RSL (see Point 4 Use stage).

The scenarios were furthermore based on the research project “EPDs for transparent building components” (1) and on EN 17213 (2).

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



Product group Doors

Additional environmental impact indicators							
PM	Disease incidence	3.06E-09	1.12E-08	3.17E-09	1.16E-08	4.55E-09	1.67E-08
IRP	kBq U235-eq.	1.27E-03	4.65E-03	1.31E-03	4.83E-03	1.89E-03	6.94E-03
ETPfw	CTUe	4.87	17.87	5.05	18.53	7.26	26.63
HTPc	CTUh	9.83E-11	3.60E-10	1.02E-10	3.74E-10	1.46E-10	5.37E-10
HTPnc	CTUh	5.08E-09	1.86E-08	5.27E-09	1.93E-08	7.57E-09	2.78E-08
SQP	dimensionless	2.41	8.86	2.5	9.18	3.60	13.20

A5 Construction/Installation

No.	Scenario	Description
A5	Manual	According to the manufacturer, the products are installed without additional lifting and auxiliary devices

In case of deviating consumption during installation/assembly of the products which forms part of the site management, they are covered at the building level.

Ancillary materials, consumables, use of energy and water, other resource use, material losses, direct emissions as well as waste during construction / installation are negligible.

It is assumed that the packaging material in the Module construction / installation is sent to waste handling. Waste is 100% thermally recycled. Benefits from A5 are specified in module D. Benefits from waste incineration: 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.

Since this is a single scenario, the results are shown in the relevant summary table.

B1 Use

Refer to Section 4 Use stage - Emissions to the environment.

The following additional information is not part of the LCA, life cycle inventory or data from information modules.

For fire and/or smoke protection doors made of steel and stainless steel, there is proof of VOC emissions from building products according to the "ift Certification Scheme for VOC Emissions from Building Products (QM 359)". Results can be viewed at <https://www.tortec.at/downloads> or upon request.

B2 Inspection, maintenance, cleaning

Since this is a single scenario, the results are shown in the relevant summary table.

B2.1 Cleaning

No.	Scenario	Description
B2.1	Rarely, manual	Manual using suitable cleaning agents (water); annual; (2.5 l per m ² and year; 125 l/50 years) (1).

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

Since this is a single scenario, the results are shown in the relevant summary table.



Product group Doors

B2.2 Maintenance		
No.	Scenario	Description
B2.2	Normal use	Annual functional check, visual inspection, lubrication/greasing and, if necessary, repair according to manufacturer. 0.25 kg lubricants per 50 years (1).
<p>Ancillary materials, consumables, use of energy and water, waste, material losses and transport distances during maintenance are negligible.</p> <p>Since this is a single scenario, the results are shown in the relevant summary table.</p>		
B3 Repair		
No.	Scenario	Description
B3	Normal use and heavy use	According to the manufacturer: One-time replacement*of hardware and seals/gaskets.
<p>* Assumptions for evaluation of possible environmental impacts; statements made do not constitute any guaranty or warranty of performance.</p> <p>For updated information refer to the relevant instructions for assembly/installation, operation and maintenance issued by company TORTEC Brandschutztor GmbH</p> <p>The service life of the Fire and/or smoke protection doors made of steel and stainless steel of company TORTEC Brandschutztor GmbH is optionally specified with 50 years. For scenario B3, the respective components of the building elements whose useful life is less than the specified RSL are accounted for. The results were based on one year, taking into account the RSL.</p> <p>It is assumed that the replaced components in the repair module will be sent for recycling. Metals into the melt (material recycling), plastics to incineration plants, mineral/inert materials to landfill. Benefits from B3 are specified in module D. Benefits from waste incineration: Benefits from waste incineration: electricity replaces electricity mix (EU 28); thermal energy replaces thermal energy from natural gas (EU 28).</p> <p>Transport to the recycling plants is not taken into account.</p> <p>Ancillary materials, consumables, use of energy and water, waste, material losses and transport distances during repair are negligible.</p> <p>Since this is a single scenario, the results are shown in the relevant summary table.</p>		



Product group Doors

B4 Exchange/replacement		
No.	Scenario	Description
B4.1	No replacement	According to manufacturer, a replacement is not planned.
B4.2	Normal use and heavy use	one-time replacement after 50 years (RSL)*

* 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 reference service life and the 50-year building service life. The results were based on one year, taking into account the RSL.

For updated information refer to the relevant instructions for assembly/installation, operation and maintenance issued by company TORTEC Brandschutztor GmbH

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

Fire door		EI ₂ 30		EI ₂ 30 with glass		EI ₂ 90	
B4 Exchange / Replacement	Unit	B4.1	B4.2	B4.1	B4.2	B4.1	B4.2
Core indicators							
GWP-t	kg CO ₂ equivalent	0.00	101.83	0.00	116.24	0.00	91.56
GWP-f	kg CO ₂ equivalent	0.00	109.51	0.00	123.89	0.00	99.42
GWP-b	kg CO ₂ equivalent	0.00	-7.71	0.00	-7.69	0.00	-7.88
GWP-l	kg CO ₂ equivalent	0.00	0.03	0.00	0.039	0.00	0.035
ODP	kg CFC-11-eq.	0.00	2.19E-09	0.00	2.19E-09	0.00	2.18E-09
AP	mol H ⁺ -eq.	0.00	0.34	0.00	0.41	0.00	0.29
EP-fw	kg P-eq.	0.00	1.67E-04	0.00	1.76E-04	0.00	1.60E-04
EP-m	kg N-eq.	0.00	6.07E-02	0.00	7.70E-02	0.00	5.59E-02
EP-t	mol N-eq.	0.00	0.88	0.00	1.04	0.00	0.62
POCP	kg NMVOC-eq.	0.00	0.19	0.00	0.24	0.00	0.18
ADPF	MJ	0.00	1199.8	0.00	1429.89	0.00	1118.17
ADPE	kg Sb equivalent	0.00	4.31E-04	0.00	5.53E-04	0.00	4.86E-04
WDP	m ³ world-eq. deprived	0.00	27.33	0.00	33.31	0.00	28.28
Resource management							
PERE	MJ	0.00	250.68	0.00	257.83	0.00	239.42
PERM	MJ	0.00	80.64	0.00	80.64	0.00	80.64
PERT	MJ	0.00	331.32	0.00	338.47	0.00	320.06
PENRE	MJ	0.00	1200.39	0.00	1430.54	0.00	1118.67
PENRM	MJ	0.00	33.57	0.00	33.57	0.00	33.57
PENRT	MJ	0.00	1233.96	0.00	1464.11	0.00	1152.24
SM	kg	0.00	12.33	0.00	11	0.00	11.3
RSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00	0.00	0.00	0.00
FW	m ³	0.00	0.77	0.00	0.94	0.00	0.82
Categories of waste							
HWD	kg	0.00	2.54E-04	0.00	2.54E-04	0.00	5.71E-04
NHWD	kg	0.00	9.29	0.00	9.36	0.00	7.1
RWD	kg	0.00	1.67E-03	0.00	0.25	0.00	0.011

Product group Doors

Output material flows							
CRU	kg	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	7.21	0.00	7.21	0.00	6.50
MER	kg	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00	0.00	0.00	0.00
EET	MJ	0.00	0.00	0.00	0.00	0.00	0.00
Additional environmental impact indicators							
PM	Disease incidence	0.00	4.45E-06	0.00	5.08E-06	0.00	4.02E-06
IRP	kBq U235-eq.	0.00	3.70	0.00	3.91	0.00	3.04
ETPfw	CTUe	0.00	462.12	0.00	566.33	0.00	335.06
HTPc	CTUh	0.00	1.30E-07	0.00	1.38E-07	0.00	2.46E-07
HTPnc	CTUh	0.00	4.87E-06	0.00	4.89E-06	0.00	1.93E-06
SQP	dimensionless	0.00	1.185	0.00	1188.93	0.00	1125.22

B6 Operational energy use

No.	Scenario	Description
B6.1	manual	No energy consumed when used
B6.2	power-operated normal use	Optionally with drive: 0.0003 kWh per cycle, 500 cycles per day, 270 days per year, 43.1 kWh per year; EU-28 electricity mix.

There is no energy used during normal use. The products are opened by manual control. There is no transport consumption for energy use in buildings. Ancillary materials, consumables and water, waste materials and other scenarios are negligible. In the following table, the results were based on one year, taking into account the RSL.

B6 Operational energy use	Unit	Fire door	
		El ₂ 30, El ₂ 30 with glass and El ₂ 90	
		B6.1	B6.2
Core indicators			
GWP-t	kg CO ₂ equivalent	0.00	15.55
GWP-f	kg CO ₂ equivalent	0.00	15.41
GWP-b	kg CO ₂ equivalent	0.00	0.14
GWP-l	kg CO ₂ equivalent	0.00	3.27E-03
ODP	kg CFC-11-eq.	0.00	2.25E-10
AP	mol H ⁺ -eq.	0.00	3.37E-03
EP-fw	kg P-eq.	0.00	4.51E-05
EP-m	kg N-eq.	0.00	7.58E-03
EP-t	mol N-eq.	0.00	7.95E-02
POCP	kg NMVOC-eq.	0.00	2.04E-02
ADPF	MJ	0.00	278.97
ADPE	kg Sb equivalent	0.00	4.21E-06
WDP	m ³ world-eq. deprived	0.00	3.46
Resource management			
PERE	MJ	0.00	155.07
PERM	MJ	0.00	0.00
PERT	MJ	0.00	155.07
PENRE	MJ	0.00	279.04
PENRM	MJ	0.00	0.00
PENRT	MJ	0.00	279.04
SM	kg	0.00	0.00
RSF	MJ	0.00	0.00
NRSF	MJ	0.00	0.00
FW	m ³	0.00	0.14



Product group Doors

Categories of waste			
HWD	kg	0.00	2.41E-08
NHWD	kg	0.00	0.21
RWD	kg	0.00	4.44E-02
Output material flows			
CRU	kg	0.00	0.00
MFR	kg	0.00	0.00
MER	kg	0.00	0.00
EEE	MJ	0.00	0.00
EET	MJ	0.00	0.00
Additional environmental impact indicators			
PM	Disease incidence	0.00	2.79E-07
IRP	kBq U235-eq.	0.00	7.53
ETPfw	CTUe	0.00	122.11
HTPc	CTUh	0.00	3.51E-09
HTPnc	CTUh	0.00	1.28E-07
SQP	dimensionless	0.00	101.00

B7 Operational water use

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

There is no transport consumption for water use in buildings. Ancillary materials, consumables, waste materials and other scenarios are negligible.

C1 Deconstruction

No.	Scenario	Description
C1	Deconstruction	<p>According to EN 17213 Dismanteling of fire and/or smoke protection sliding door</p> <ul style="list-style-type: none"> 95% non-glass content 30% glass

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

Since this is a single scenario, the results are shown in the relevant summary table.

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

C2 Transport

No.	Scenario	Description
C2	Transport	Transport to collection point with 7.5 t truck (Euro 6 Mix), 80% capacity used, approx. 50 km to collection point and empty return trip.

Since this is a single scenario, the results are shown in the relevant summary table.

C3 Waste management

No.	Scenario	Description
C3	Current market situation	<p>Share for recirculation of materials: According to EN 17213</p> <ul style="list-style-type: none"> • Metals and glass 100% recycled, • Plastics 100% incineration plant, • Plaster 4.7% recycled, remainder to landfill (3), • Vermiculite 100% recycled, • Mineral wool 100% recycled, • Laminate 100% incineration plant.

Electricity consumption of recycling plant: 0.5 MJ/kg.

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 Disposal	Unit	EI ₂₃₀	EI ₂₃₀ with glass	EI ₉₀
Collection process, collected separately	kg	45.2	46.8	70.03
Collection process, collected as mixed construction waste	kg	2.38	2.79	3.68
Recovery system, for re-use	kg	0	0	0
Recovery system, for recycling	kg	40.67	37.08	60.91
Recovery system, for energy recovery	kg	0.76	0.71	0.82
Disposal	kg	3.03	3.44	4.33

The 100% scenarios differ from the current average recovery shown here (in background report C3.4). The evaluation of each scenario is described in the background report.

Since this is a single scenario, the results are shown in the summary table.

C4 Disposal		
No.	Scenario	Description
C4	Disposal	The non-recordable amounts and losses within the re-use/recycling chain (C1 and C3) are modelled as “disposed” (DE).
<p>The 100% scenarios differ from the current average recovery shown here (in background report C4.4). The evaluation of each scenario is described in the background report.</p> <p>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.</p> <p>Since this is a single scenario, the results are shown in the summary table.</p>		
D Benefits and loads from beyond the system boundaries		
No.	Scenario	Description
D	Recycling potential	<p>Share for recirculation of materials:</p> <ul style="list-style-type: none"> • Benefits as a result of 100% recycling of recyclable primary materials • Benefits as a result of 100% thermal recycling of plastic and wood components • Benefits as a result of recycling of plaster components (4.7%) • Benefits as a result of thermal recycling of packaging materials (from module A5) <p>Benefits from incineration plant are mapped via DE records.</p>
<p>The values in Module D result from recycling of the packaging material in Module A5 and from deconstruction at the end of service life.</p> <p>The 100% scenarios differ from the current average recovery shown here (in background report D4). The evaluation of each scenario is described in the background report.</p> <p>Since this is a single scenario, the results are shown in the summary table.</p>		

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Notes

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