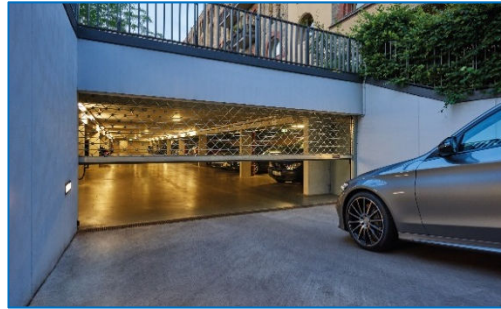
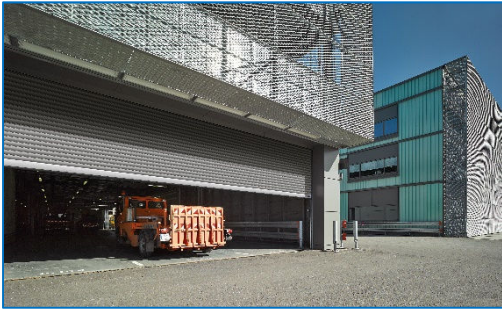


Environmental Product Declaration



Declaration Code: EPD-RR-GB-0.4.2



Hörmann KG Dissen

Rolling shutters and rolling grilles

Rolling shutters and rolling grilles in steel or aluminium



Basis:

DIN EN ISO 14025
EN15804

Company EPD
Environmental
Product Declaration

Publication date:
31.10.2022

Next revision:
31.10.2027






www.ift-rosenheim.de/
published EPDs

Environmental Product Declaration



Declaration Code: EPD-RR-GB-0.4.2

Programme operator	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 D-83026 Rosenheim		
Practitioner of the LCA	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 D-83026 Rosenheim		
Declaration holder	Hörmann KG Dissen Industriestraße 1 D-49201 Dissen am Teutoburger Wald www.hoermann.de		
Declaration code	EPD-RR-GB-0.4.2		
Designation of declared product	Rolling shutters and rolling grilles in steel or aluminium		
Scope	Hörmann rolling shutters and rolling grilles for external and internal use for building openings and vehicle entrances in industrial and commercial applications		
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 "PCR Part A" PCR-A-0.3:2018 and "Doors" PCR-TT-2.3:2018		
Validity	Publication date: 31.10.2022	Last revision: 31.10.2022	Next revision: 31.10.2027
	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 include both the data collected at the Hörmann KG Dissen production site 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 "rolling shutters and rolling grilles" and applies to:

**1 m² of rolling shutter or rolling grille
made by Hörmann KG Dissen**

The average unit is declared as follows:

Directly used material flows are determined using average sizes (4m x 4m) and assigned to the declared unit. All other inputs and outputs in the production were scaled to the declared unit in their entirety since no direct assignment to the average size is possible. The reference period is the year 2021.

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

- SB Rolling shutters
- TGT Rolling shutters
- DD Rolling shutters
- SB Rolling grilles
- TGT Rolling grilles
- DD Rolling grilles
- SR ShopRoller

Product description

Door leaf: Door sections made of roller-shaped and PU foamed aluminium or steel profiles, up to 12,000 mm width and 9,000 mm height, depth 23 mm - 28 mm. Different versions of window and ventilation elements are available.

Surface protection: Profiles bright-rolled, stucco-textured or galvanised without protective paint, optional external and internal RAL coating to choose, aluminium rolling griller curtains also anodised on request.

Door frame/hardware type: Laterally closed side guide construction made of galvanised steel or mill-finished aluminium

Door locking devices: Various locking options are available for both manually and power-operated doors

Counterbalance: Tension spring assembly with conical washers

Safety equipment:

- Finger trap protection
- Side trap guard
- Spring safety device for manual operation

Safety catch for doors with direct drive operator, chain drive operator or tubular operators

Seals:

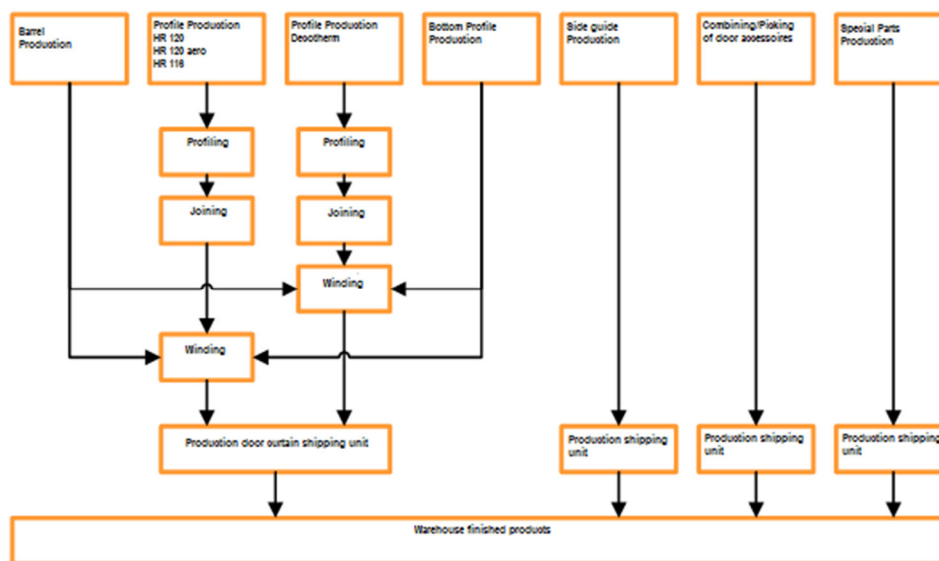
- Depending on version, all-round on 3 or 4 sides

Drive operators: with and without drive operator

For a detailed product description refer to the manufacturer specifications at <http://www.hoermann.de> or the product descriptions of the respective offer/quotation.

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

Product manufacture



Scope

Hörmann rolling shutters and rolling grilles for external and internal use as space-saving shutters for building openings and vehicle entrances in industrial and commercial applications.

The door curtains are side-guided which allows optimal use in almost every installation situation.

The rolling shutters and rolling grilles meet the following building physics performance characteristics set out in EN 13241-1 (Products without fire resistance or smoke control characteristics):

- Resistance to wind load as per EN 12424
- Watertightness as per EN 12425
- Air permeability as per EN 12426
- Sound insulation as per EN 717-1
- Thermal insulation as per EN 13241-1/Annex B and EN 12428

All performance characteristics were tested by ift Rosenheim and certified.

Verifications

The following verifications are held:

- Product quality as per DIN EN 13241-1



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

Management systems The following management systems are in place:

- Quality management system to DIN EN ISO 9001
- Environmental management system to DIN EN ISO 14001
- Energy management system to DIN EN ISO 50001

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 18 August 2017).

All relevant safety data sheets are available from Hörmann KG Dissen.

3 Construction process stage

Processing recommendations, installation Observe the instructions for mounting/installation, operation, maintenance and disassembly, provided by the manufacturer. Refer to www.hoermann.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, the rolling shutters and rolling grilles made by Hörmann KG Dissen have an optional service life of 50 years.

The service life is dependent on the characteristics of the product and in-use conditions. The 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 may have a negative effect on the reference 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 Rolling shutters and rolling grilles 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 plastic parts are recycled. Residual fractions are sent to landfill or 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 the basis for this, Life Cycle Assessments (LCAs) were prepared for rolling shutters and rolling grilles. 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 Dissen am Teutoburger Wald 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 five 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 "GaBi" sustainability software tool 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 the rolling shutters and rolling grilles.

No additional data from 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 were not recorded by the company but are covered by the life cycle assessment in the assumed transport mix. The database is the research project "EPDs für transparente Bauelemente" (EPDs for transparent building components).

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.



Product group: “rolling shutters and rolling grilles

Life cycle stages The Annex shows the entire life cycle of rolling shutters and rolling grilles. Product stage "A1 – A3", transport to construction site "A4", use stage "B2, B3, B6 and B7", end-of-life stage "C1 – C4" and the benefits and loads beyond the system boundaries "D" were taken into consideration.

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 allocations of co-products were as follows. Allocations (i.e. the allocation of the environmental impacts of a process to several products) may have resulted for the background data sets used in the GaBi database, which are then included in the associated individual documentation.

- Allocation based on physical properties (e.g. mass, volume) when the difference in overall revenue from the co-products is low; (<25 %).

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 Hörmann KG Dissen was not considered. Secondary material is not used.

Inputs The LCA includes the production-relevant inputs per 1 m² of rolling shutter or rolling grille given below:

Energy

The natural gas input material is based on the data set “Erdgas Mix Deutschland” (Germany, natural gas mix), gas (lift trucks) is based on “Flüssiggas (LGP) Deutschland” (LGP) Germany liquid gas). Electricity is based on the “Hörmann Dissen” electricity mix (see Table below).

Electricity disclosure of energy supplier	Shares in %
Wind energy	40
Solar energy	15
Hydro power	45

Table 1: Hörmann 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 percent.

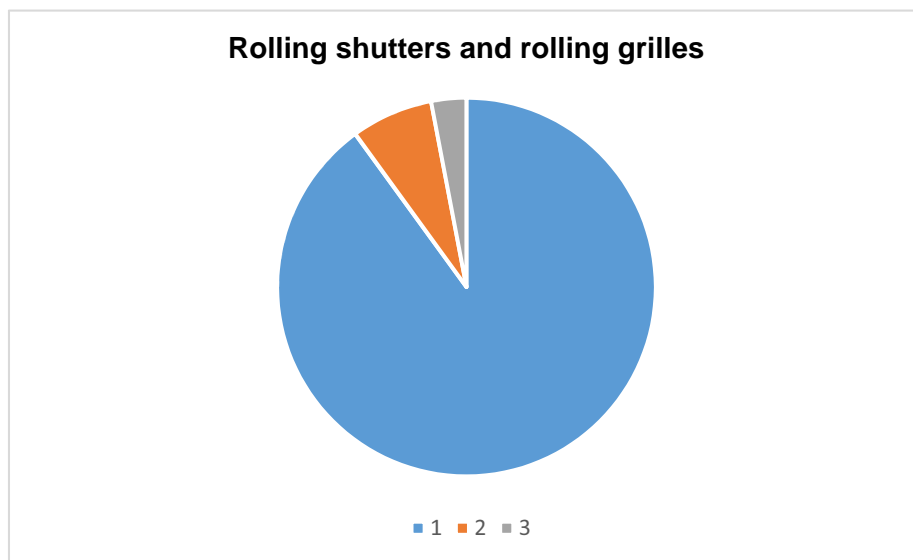


Figure 1: Percentage of individual materials per declared unit

No.	Material	Mass in %
1	Metals	90
2	Plastics	7
3	Other	3

Table 2: Percentage of individual materials per declared unit

Ancillary materials and consumables

< 1 g of ancillary materials and consumables are used.

Product packaging

The amounts used for product packaging are as follows:

No.	Material	Mass in kg per product group (PG)	
		Rolling shutters	Rolling grilles
1	Wood	1.83	2.35
2	Cardboard / paper	0.04	0.05

Table 3: Weight in kg of packaging per declared unit

Biogenic carbon content

The biogenic carbon content quantifies the amount of biogenic carbon in a construction product leaving the factory gate.

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	Mass Packaging in kg per m ²		Content C in kg consumed per m ²	
		Rolling shutters	Rolling grilles	Rolling shutters	Rolling grilles
1	Wood	1.83	2.35	0.82	1.05
2	Cardboard / paper	0.04	0.05	0.01	0.02

Table 4: Biogenic carbon content of packaging at gate

Outputs

The LCA includes the production-relevant outputs per 1 m² of rolling shutter or rolling grille given below:

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

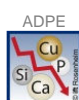
The impact assessment covers both inputs and outputs. The impact categories applied are named below:

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.



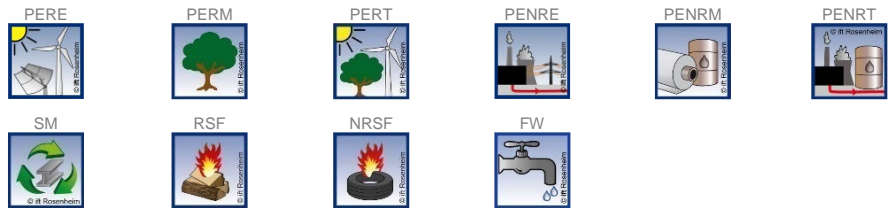


Use of resources

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;
- on-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.



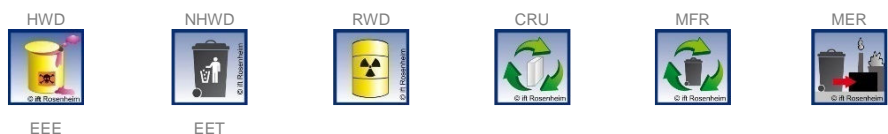
Waste

The waste generated during the production of 1 m² of rolling shutter or rolling grille 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
- eco-toxicity (fresh water)
- subcategory human toxicity - carcinogenic effect
- human toxicity - non-carcinogenic effect
- land use related impacts / soil quality





Results per 1 m² of rolling shutter

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.	70.02	2.00	ND	ND	6.89E-02	9.07	ND	ND	0.00	0.00	0.00	4.98E-02	3.78	2,27E-02	-36.80
GWP-f	kg CO ₂ eq.	72.61	2.01	ND	ND	6.85E-02	9.07	ND	ND	0.00	0.00	0.00	5,00E-02	3.77	2,34E-02	-36.70
GWP-b	kg CO ₂ eq.	-2.62	-1.96E-02	ND	ND	3.45E-04	-7.27E-03	ND	ND	0.00	0.00	0.00	-4.90E-04	9.30E-03	-6.92E-04	-2.57E-02
GWP-l	kg CO ₂ eq.	2.01E-02	1.35E-02	ND	ND	3.67E-06	9.14E-03	ND	ND	0.00	0.00	0.00	3.38E-04	2.48E-04	4.31E-05	-8.85E-03
ODP	kg CFC -11 eq.	2.40E-08	1.97E-13	ND	ND	6.38E-14	7.17E-08	ND	ND	0.00	0.00	0.00	4.92E-15	1.54E-11	5.49E-14	-1.53E-08
AP	mol H ⁺ eq.	0.22	2.89E-03	ND	ND	2.15E-04	6.94E-02	ND	ND	0.00	0.00	0.00	6.53E-05	2.57E-03	1.66E-04	-0.11
EP-fw	kg P eq.	6.22E-05	7.17E-06	ND	ND	1.86E-07	1.00E-05	ND	ND	0.00	0.00	0.00	1.79E-07	3.09E-06	3.96E-08	-2.74E-05
EP-m	kg N eq.	4.26E-02	1.06E-03	ND	ND	3.30E-05	6.18E-03	ND	ND	0.00	0.00	0.00	2.29E-05	5.93E-04	4.23E-05	-2.15E-02
EP-t	mol N eq.	0.46	1.24E-02	ND	ND	3.68E-04	6.51E-02	ND	ND	0.00	0.00	0.00	2.69E-04	6.81E-03	4.65E-04	-0.23
POCP	kg NMVOC eq.	0.14	2.53E-03	ND	ND	1.64E-04	2.07E-02	ND	ND	0.00	0.00	0.00	5.64E-05	1.62E-03	1.29E-04	-6.97E-02
ADPF*2	MJ	869.26	26.40	ND	ND	3.22	107.00	ND	ND	0.00	0.00	0.00	6.58E-01	19.50	0.31	-414.00
ADPE*2	kg Sb eq.	1.14E-03	2.02E-07	ND	ND	1.05E-08	1.75E-03	ND	ND	0.00	0.00	0.00	5.05E-09	2.89E-07	2.39E-09	-4.20E-04
WDP*2	m ³ world eq. deprived	2.24	2.24E-02	ND	ND	1.45E-03	2.43	ND	ND	0.00	0.00	0.00	5.59E-04	0.49	2.55E-03	-1.05
Use of resources																
PERE	MJ	182.57	1.83	ND	ND	4.62E-02	25.90	ND	ND	0.00	0.00	0.00	4.56E-02	10.50	4.59E-02	-77.70
PERM	MJ	29.89	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	212.46	1.83	ND	ND	4.62E-02	25.90	ND	ND	0.00	0.00	0.00	4.56E-02	10.50	4.59E-02	-77.70
PENRE	MJ	834.32	26.50	ND	ND	3.22	107.00	ND	ND	0.00	0.00	0.00	0.66	56.31	2.25	-416.00
PENRM	MJ	38.74	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	-36.81	-1.94	0.00
PENRT	MJ	873.06	26.50	ND	ND	3.22	107.00	ND	ND	0.00	0.00	0.00	0.66	19.50	0.31	-416.00
SM	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	4.16E-30	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	6.32E-29	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m ³	0.29	2.11E-03	ND	ND	5.65E-05	8.43E-02	ND	ND	0.00	0.00	0.00	5.26E-05	1.60E-02	7.76E-05	-0.15
Waste categories																
HWD	kg	2.60E-06	1.40E-10	ND	ND	4.36E-11	7.47E-08	ND	ND	0.00	0.00	0.00	3.49E-12	1.68E-09	1.57E-11	-1.24E-06
NHWD	kg	6.71	4.31E-03	ND	ND	3.50E-04	1.58	ND	ND	0.00	0.00	0.00	1.08E-04	0.26	1.57	-3.46
RWD	kg	2.85E-02	4.91E-05	ND	ND	1.32E-05	3.62E-03	ND	ND	0.00	0.00	0.00	1.23E-06	2.99E-03	3.41E-06	-1.60E-02
Output material flows																
CRU	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	18.20	0.00	0.00
MER	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.57	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	4.99	0.00	0.00
EET	MJ	1.34	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	8.94	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

Results per 1 m² of rolling shutter

Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Additional environmental impact indicators																
PM	Disease incidence	2.81E-06	1.86E-08	ND	ND	1.27E-09	6.47E-07	ND	ND	0.00	0.00	0.00	4.43E-10	2.27E-08	2.04E-09	-1.26E-06
IRP*1	kBq U235 eq.	5.55	7.42E-03	ND	ND	2.16E-03	0.61	ND	ND	0.00	0.00	0.00	1.85E-04	0.51	3.79E-04	-3.16
ETP-fw*2	CTUe	293.15	18.70	ND	ND	2.15	62.00	ND	ND	0.00	0.00	0.00	4.66E-01	8.80	0.17	-127.00
HTP-c*2	CTUh	1.35E-07	3.85E-10	ND	ND	4.15E-11	6.50E-09	ND	ND	0.00	0.00	0.00	9.61E-12	2.73E-10	2.62E-11	-3.23E-08
HTP-nc*2	CTUh	9.21E-07	2.12E-08	ND	ND	1.76E-09	2.34E-07	ND	ND	0.00	0.00	0.00	5.26E-10	1.26E-08	2.90E-09	-4.24E-07
SQP*2	dimensionless	520.26	11.20	ND	ND	3.09E-02	30.60	ND	ND	0.00	0.00	0.00	0.28	6.91	6.36E-02	-33.70

Key:

PM – particulate matter emissions potential **IRP*1** – ionising 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 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 rolling grille

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.	100.02	2.85	ND	ND	6.89E-02	9.07	ND	ND	0.00	0.00	0.00	7.13E-02	5.39	3.26E-02	-52.60
GWP-f	kg CO ₂ eq.	103.48	2.85	ND	ND	6.85E-02	9.07	ND	ND	0.00	0.00	0.00	7.16E-02	5.37	3.35E-02	-52.60
GWP-b	kg CO ₂ eq.	-3.33	-2.79E-02	ND	ND	3.45E-04	-7.27E-03	ND	ND	0.00	0.00	0.00	-7.01E-04	1.33E-02	-9.93E-04	-3.66E-02
GWP-l	kg CO ₂ eq.	2.86E-02	1.92E-02	ND	ND	3.67E-06	9.14E-03	ND	ND	0.00	0.00	0.00	4.83E-04	3.54E-04	6.18E-05	-1.27E-02
ODP	kg CFC -11 eq.	3.45E-08	2.80E-13	ND	ND	6.38E-14	7.17E-08	ND	ND	0.00	0.00	0.00	7.04E-15	2.20E-11	7.87E-14	-2.20E-08
AP	mol H ⁺ eq.	0.32	4.11E-03	ND	ND	2.15E-04	6.94E-02	ND	ND	0.00	0.00	0.00	9.34E-05	3.68E-03	2.37E-04	-0.16
EP-fw	kg P eq.	8.85E-05	1.02E-05	ND	ND	1.86E-07	1.00E-05	ND	ND	0.00	0.00	0.00	2.56E-07	4.42E-06	5.68E-08	-3.91E-05
EP-m	kg N eq.	6.07E-02	1.51E-03	ND	ND	3.30E-05	6.18E-03	ND	ND	0.00	0.00	0.00	3.28E-05	8.48E-04	6.07E-05	-3.08E-02
EP-t	mol N eq.	0.65	1.76E-02	ND	ND	3.68E-04	6.51E-02	ND	ND	0.00	0.00	0.00	3.86E-04	9.74E-03	6.67E-04	-0.33
POCP	kg NMVOC eq.	0.20	3.59E-03	ND	ND	1.64E-04	2.07E-02	ND	ND	0.00	0.00	0.00	8.08E-05	2.31E-03	1.85E-04	-9.98E-02
ADPF*2	MJ	1,240.00	37.50	ND	ND	3.22	107.00	ND	ND	0.00	0.00	0.00	0.94	27.80	0.44	-593.00
ADPE*2	kg Sb eq.	1.63E-03	2.88E-07	ND	ND	1.05E-08	1.75E-03	ND	ND	0.00	0.00	0.00	7.23E-09	4.13E-07	3.43E-09	-6.12E-04
WDP*2	m ³ world eq. deprived	3.20	3.19E-02	ND	ND	1.45E-03	2.43	ND	ND	0.00	0.00	0.00	8.01E-04	0.70	3.66E-03	-1.52
Use of resources																
PERE	MJ	256.30	2.60	ND	ND	4.62E-02	25.90	ND	ND	0.00	0.00	0.00	6.53E-02	15.00	6.59E-02	-111.00
PERM	MJ	38.48	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PERT	MJ	294.78	2.60	ND	ND	4.62E-02	25.90	ND	ND	0.00	0.00	0.00	6.53E-02	15.00	6.59E-02	-111.00
PENRE	MJ	1,195.96	37.60	ND	ND	3.22	107.00	ND	ND	0.00	0.00	0.00	0.95	80.67	3.22	-595.00
PENRM	MJ	55.55	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	-52.77	-2.78	0.00
PENRT	MJ	1,251.51	37.60	ND	ND	3.22	107.00	ND	ND	0.00	0.00	0.00	0.95	27.90	0.44	-595.00
SM	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RSF	MJ	5.88E-30	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NRSF	MJ	8.93E-29	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FW	m ³	0.42	3.00E-03	ND	ND	5.65E-05	8.43E-02	ND	ND	0.00	0.00	0.00	7.53E-05	2.28E-02	1.11E-04	-0.21
Waste categories																
HWD	kg	3.49E-06	1.99E-10	ND	ND	4.36E-11	7.47E-08	ND	ND	0.00	0.00	0.00	5.00E-12	2.41E-09	2.26E-11	-1.96E-06
NHWD	kg	9.60	6.13E-03	ND	ND	3.50E-04	1.58	ND	ND	0.00	0.00	0.00	1.54E-04	0.37	2.25	-4.96
RWD	kg	4.06E-02	6.98E-05	ND	ND	1.32E-05	3.62E-03	ND	ND	0.00	0.00	0.00	1.75E-06	4.28E-03	4.89E-06	-2.29E-02
Output material flows																
CRU	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MFR	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	26.10	0.00	0.00
MER	kg	0.00	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EEE	MJ	0.73	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	7.12	0.00	0.00
EET	MJ	1.71	0.00	ND	ND	0.00	0.00	ND	ND	0.00	0.00	0.00	0.00	12.70	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



Results per 1 m² of rolling shutter

Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
Additional environmental impact indicators																
PM	Disease incidence	3.95E-06	2.65E-08	ND	ND	1.27E-09	6.47E-07	ND	ND	0.00	0.00	0.00	6.34E-10	3.24E-08	2.92E-09	-1.81E-06
IRP*1	kBq U235 eq.	7.94	1.05E-02	ND	ND	2.16E-03	0.61	ND	ND	0.00	0.00	0.00	2.65E-04	0.72	5.43E-04	-4.52
ETP-fw*2	CTUe	420.03	26.50	ND	ND	2.15	62.00	ND	ND	0.00	0.00	0.00	0.67	12.60	0.25	-181.00
HTP-c*2	CTUh	1.76E-07	5.47E-10	ND	ND	4.15E-11	6.50E-09	ND	ND	0.00	0.00	0.00	1.38E-11	3.90E-10	3.75E-11	-4.62E-08
HTP-nc*2	CTUh	1.32E-06	3.01E-08	ND	ND	1.76E-09	2.34E-07	ND	ND	0.00	0.00	0.00	7.54E-10	1.80E-08	4.15E-09	-6.07E-07
SQP*2	dimensionless	678.46	15.90	ND	ND	3.09E-02	30.60	ND	ND	0.00	0.00	0.00	0.40	9.89	9.13E-02	-48.30

Key:

PM – particulate matter emissions potential **IRP*1** – ionising 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 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

Calculation of the scenarios was based on a service life of 50 years. Furthermore, the scenarios of the research project "EPDs für transparente Bauelemente" (EPDs for transparent building components) were used(1).

The standard scenarios selected are presented in bold type.

The environmental impacts of the

- rolling shutters
- rolling grilles

sometimes differ considerably. The differences are mainly due to the amount of the pre-products and raw materials used. This was to be expected in particular for steel used. The general use of less raw materials and pre-products for rolling grilles results also in the lowest environmental impacts.

The environmental impacts during the manufacture of both rolling shutters and rolling grilles result mainly from the use of steel and aluminium and their upstream chains. PU-foam, plastics as well as the door operator and the relevant upstream chains also play a major role. In addition, the environmental impacts from the replacement of the drive operator during the 50-year use stage play a major role.

For scenario C4 only marginal consumptions arising from the physical pre-treatment and management of the disposal site are expected. Allocation to individual products is almost impossible for site disposal. During the recycling of rolling shutters, an average of about 15% of the environmental impacts of steel, about 10% of the environmental impacts of aluminium and about 5% of the environmental impacts of the door operator, arising during the life cycle, can be assigned as benefits to scenario D. For roller grilles an average of about 16% applies to steel, about 11% to aluminium and about 6% to door operators.

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

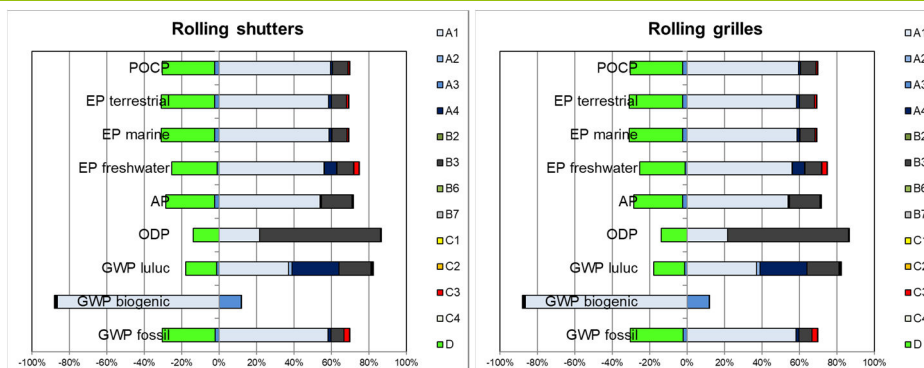


Figure 2: Percentage of the modules in selected environmental impact categories

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 addressed 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.

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 and "Doors" PCR-TT-2.3:2018



Product group: "rolling shutters and rolling grilles"

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 type="checkbox"/> internal <input checked="" type="checkbox"/> 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	31.10.2022	External Verification	Hilz	Wortner
3				

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10 Annex

Description of life cycle scenarios for rolling shutters and rolling grilles

Product stage			Con-struction stage		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 service building 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



Product group: "rolling shutters and rolling grilles"

A4 Transport to the construction site				
No.	Scenario	Description		
A4	Direct shipment to construction site/branch	40 t truck, 80 percent capacity used, approx. 580 km to domestic construction site and return trip with 10 percent load		
A4 Transport to the construction site		Transport weight [kg/m²]		
Rolling shutters		22.73		
Rolling grilles		32.31		
Since only one scenario is used, the results are shown in the relevant summary table.				
A5 Construction/Installation – not included, informative module				
No.	Scenario	Description		
A5	Disposal of packaging	Packaging is disposed according to the on-site waste management		
Environmental impacts occur in the selected scenario, resulting from the use of packaging material.				
The amounts used for product packaging calculated in A1-A3, are as follows:				
Material		Mass in kg		
Wood	1.83	2.35		
Cardboard / paper	0.04	0.05		
Drive operators and control systems	0.74	0.95		
B1 Use				
Refer to Section 4 Use stage - Emissions to the environment. Emissions cannot be quantified.				
B2 Inspection, maintenance, cleaning				
B2.1 Cleaning				
No.	Scenario	Description		
B2.1.1	Rarely manual	Manually using suitable detergents, annually (2.5 l per cleaning = 125 l / 50 yr)		
B2.1.2	Frequently manual	Manually using suitable detergents, every three months (2.5 l per cleaning = 500 l / 50 yr)		
Ancillary materials, consumables, use of energy, material losses and waste as well as transport distances during cleaning are negligible.				
B2.1 Cleaning		Unit	B2.1.1	B2.1.2
Core indicators				
GWP-t		kg CO ₂ eq.	1.13E-02	4.51E-02
GWP-f		kg CO ₂ eq.	1.00E-02	4.00E-02
GWP-b		kg CO ₂ eq.	1.26E-03	5.06E-03
GWP-l		kg CO ₂ eq.	2.75E-06	1.10E-05
ODP		kg CFC -11 eq.	4.46E-14	1.78E-13
AP		mol H ⁺ eq.	1.79E-05	7.16E-05
EP-fw		kg P eq.	1.44E-06	5.75E-06
EP-m		kg N eq.	1.04E-05	4.16E-05

Product group: "rolling shutters and rolling grilles"

EP-t	mol N eq.	5.48E-05	2.19E-04
POCP	kg NMVOC eq.	1.45E-05	5.82E-05
ADPF	MJ	0.14	0.57
ADPE	kg Sb eq.	1.20E-09	4.78E-09
WDP	m ³ world eq. deprived	5.38	21.50
Use of resources			
PERE	MJ	2.53E-02	0.10
PERM	MJ	0.00	0.00
PERT	MJ	2.53E-02	0.10
PENRE	MJ	0.14	0.57
PENRM	MJ	0.00	0.00
PENRT	MJ	0.14	0.57
SM	kg	0.00	0.00
RSF	MJ	0.00	0.00
NRSF	MJ	0.00	0.00
FW	m ³	0.13	0.50
Waste categories			
HWD	kg	1.30E-11	5.22E-11
NHWD	kg	3.55E-02	0.14
RWD	kg	4.81E-06	1.92E-05
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	3.54E-10	1.41E-09
IRP	kBq U235 eq.	7.12E-04	2.85E-03
ETPfw	CTUe	0.23	0.94
HTPc	CTUh	9.00E-12	3.60E-11
HTPnc	CTUh	8.24E-10	3.30E-09
SQP	dimensionless	1.90E-02	7.59E-02

B2.2 Maintenance

No.	Scenario	Description
B2.2.1	Normal use	Annual functional check, visual inspection, greasing/lubrication and, if necessary, repair (62.5 g lubricant, 50 yr)
B2.2.2	Heavy use	Half-yearly functional check, visual inspection, greasing/lubrication and, if necessary, repair (62.5 g lubricant, 50 yr)

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

B2.2 Maintenance	Unit	B2.2.1	B2.2.2
Core indicators			
GWP-t	kg CO ₂ eq.	6.89E-02	0.14
GWP-f	kg CO ₂ eq.	6.85E-02	0.14
GWP-b	kg CO ₂ eq.	3.45E-04	6.90E-04
GWP-l	kg CO ₂ eq.	3.67E-06	7.35E-06
ODP	kg CFC -11 eq.	6.38E-14	1.28E-13
AP	mol H ⁺ eq.	2.15E-04	4.30E-04
EP-fw	kg P eq	1.86E-07	3.72E-07

Product group: "rolling shutters and rolling grilles"

EP-m	kg N eq.	3.30E-05	6.60E-05
EP-t	mol N eq.	3.68E-04	7.35E-04
POCP	kg NMVOC eq.	1.64E-04	3.28E-04
ADPF	MJ	3.22	6.45
ADPE	kg Sb eq.	1.05E-08	2.09E-08
WDP	m ³ world eq. deprived	1.45E-03	2.91E-03
Use of resources			
PERE	MJ	4.62E-02	9.25E-02
PERM	MJ	0.00	0.00
PERT	MJ	4.62E-02	9.25E-02
PENRE	MJ	3.22	6.45
PENRM	MJ	0.00	0.00
PENRT	MJ	3.22	6.45
SM	kg	0.00	0.00
RSF	MJ	0.00	0.00
NRSF	MJ	0.00	0.00
FW	m ³	5.65E-05	1.13E-04
Waste categories			
HWD	kg	4.36E-11	8.70E-11
NHWD	kg	3.50E-04	7.00E-04
RWD	kg	1.32E-05	2.65E-05
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	1.27E-09	2.55E-09
IRP	kBq U235 eq.	2.16E-03	4.32E-03
ETPfw	CTUe	2.15	4.31
HTPc	CTUh	4.15E-11	8.30E-11
HTPnc	CTUh	1.76E-09	3.53E-09
SQP	dimensionless	3.09E-02	6.20E-02

B3 Repair

No.	Scenario	Description
B3	Normal use and heavy use	Three replacements*; drive operators and one replacement*: seals, depending on number of door operations

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

For updated information refer to the relevant "Anleitung für Montage, Betrieb und Wartung" (manufacturer instructions for assembly/installation, operation and servicing/maintenance.).

A 50-service life has been specified for rolling shutters and rolling grilles made by Hörmann KG Dissen. Scenario B3 presents the LCA of the components of building elements with a service life of less than the relevant period of 50 years.

It is assumed that the replaced components in the module Repair are recycled. Metals in melt (material recycling), plastics in waste incineration plants, timber disposed to site/landfill. 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 because they are irrelevant.

B4 Exchange / Replacement

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

For updated information refer to the relevant manufacturer instructions for assembly/installation, operation and servicing/maintenance.

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 Hörmann KG Dissen.

B6 Operational energy use

No.	Scenario	Description
B6.1	Manually operated	No energy consumed when used
B6.2	Power-operated normal use	Per drive operator: 35 kWh/50a (incl. standby mode) (20 cycles per day)
B6.3	Power-operated Heavy use	Per drive operator: 88 kWh/50a (incl. standby mode) (50 cycles per day)

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

B6 Operational energy use	Unit	B6.1	B6.2	B6.3
Core indicators				
GWP-t	kg CO ₂ eq.	0.00	13.00	32.80
GWP-f	kg CO ₂ eq.	0.00	12.90	32.50
GWP-b	kg CO ₂ eq.	0.00	0.12	0.29
GWP-l	kg CO ₂ eq.	0.00	2.73E-03	6.86E-03
ODP	kg CFC -11 eq.	0.00	1.89E-10	4.75E-10
AP	mol H ⁺ eq.	0.00	2.83E-02	7.12E-02
EP-fw	kg P eq.	0.00	3.77E-05	9.47E-05
EP-m	kg N eq.	0.00	6.36E-03	1.60E-02
EP-t	mol N eq.	0.00	6.67E-02	0.17
POCP	kg NMVOC eq.	0.00	1.72E-02	4.32E-02
ADPF	MJ	0.00	234.00	589.00
ADPE	kg Sb eq.	0.00	3.52E-06	8.84E-06
WDP	m ³ world eq. deprived	0.00	2.94	7.39
Use of resources				
PERE	MJ	0.00	130.00	327.00
PERM	MJ	0.00	0.00	0.00
PERT	MJ	0.00	130.00	327.00
PENRE	MJ	0.00	234.00	589.00
PENRM	MJ	0.00	0.00	0.00



Product group: "rolling shutters and rolling grilles"

PENRT	MJ	0.00	234.00	589.00
SM	kg	0.00	0.00	0.00
RSF	MJ	0.00	0.00	0.00
NRSF	MJ	0.00	0.00	0.00
FW	m³	0.00	0.12	0.31
Waste categories				
HWD	kg	0.00	2.03E-08	5.10E-08
NHWD	kg	0.00	0.18	0.44
RWD	kg	0.00	3.74E-02	9.41E-02
Output material flows				
CRU	kg	0.00	0.00	0.00
MFR	kg	0.00	0.00	0.00
MER	kg	0.00	0.00	0.00
EEE	MJ	0.00	0.00	0.00
EET	MJ	0.00	0.00	0.00
Additional environmental impact indicators				
PM	Disease incidence	0.00	2.35E-07	5.91E-07
IRP	kBq U235 eq.	0.00	6.34	15.90
ETPfw	CTUe	0.00	103.00	258.00
HTPc	CTUh	0.00	2.95E-09	7.41E-09
HTPnc	CTUh	0.00	1.08E-07	2.71E-07
SQP	dimensionless	0.00	84.40	212.00

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 during water use in buildings. Ancillary materials, consumables, waste materials and other scenarios are negligible.

C1 Deconstruction

No.	Scenario	Description
C1	Deconstruction	<p>Rolling shutters and rolling grilles 95% deconstruction</p> <p>The energy consumed for deconstruction is negligible. Any arising consumption is marginal.</p>

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 relevant 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.



Product group: "rolling shutters and rolling grilles"

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	Current market situation	<p>Share for recirculation of materials:</p> <ul style="list-style-type: none"> • 98% steel in melt (UBA, 2017) • 95% aluminium in melt (GDA, 2018) • 97% remaining metals in melt (UBA, 2017) • 66% plastics, thermal recycling in waste incineration plant (Zukunft Bauen, 2017) • 45% plastics, material recycling (Zukunft Bauen, 2017) • 87% electrical components (based on 87% waste electrical equipment; UBA, 2018) • Remainder to landfill

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 shows 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	Rolling shutters	Rolling grilles
Collection process, collected separately	kg	19.84	28.41
Collection process, collected as mixed construction waste	kg	1.04	1.50
Recovery system, for re-use	kg	0.00	0.00
Recovery system, for recycling	kg	18.26	26.07
Recovery system, for energy recovery	kg	1.10	1.57
Disposal	kg	1.56	2.24

The 100% scenarios differ from current average recycling (C3.4). 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	Disposal	The non-recordable amounts and losses within the re-use/recycling chain (C1 and C3) are modelled as “disposed” (EU-28).
<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 only one scenario is used, the results are shown in the relevant summary table.</p>		
D Benefits and loads from beyond the system boundaries		
No.	Scenario	Description
D4	Recycling potential (current market situation)	Aluminium recyclate from C3 excluding the recyclate used in A3 replaces 60% of aluminium compound; Steel scrap from C3 excluding the scrap used in A3 replaces 60% of steel; Plastic recyclate from C3 excluding the plastics used in A3 replaces 60% of plastic granules; Benefits from waste incineration: electricity replaces electricity mix (EU-28); thermal energy replaces thermal energy from natural gas (EU-28).
<p>The values in module D result from deconstruction at the end of service life.</p> <p>The 100% scenarios differ from current average recycling (D.1). The evaluation of the individual scenarios is presented in the underlying report.</p> <p>Since only one scenario is used, the results are shown in the relevant summary table.</p>		

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Notes

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