

ENVIRONMENTAL PRODUCT DECLARATION

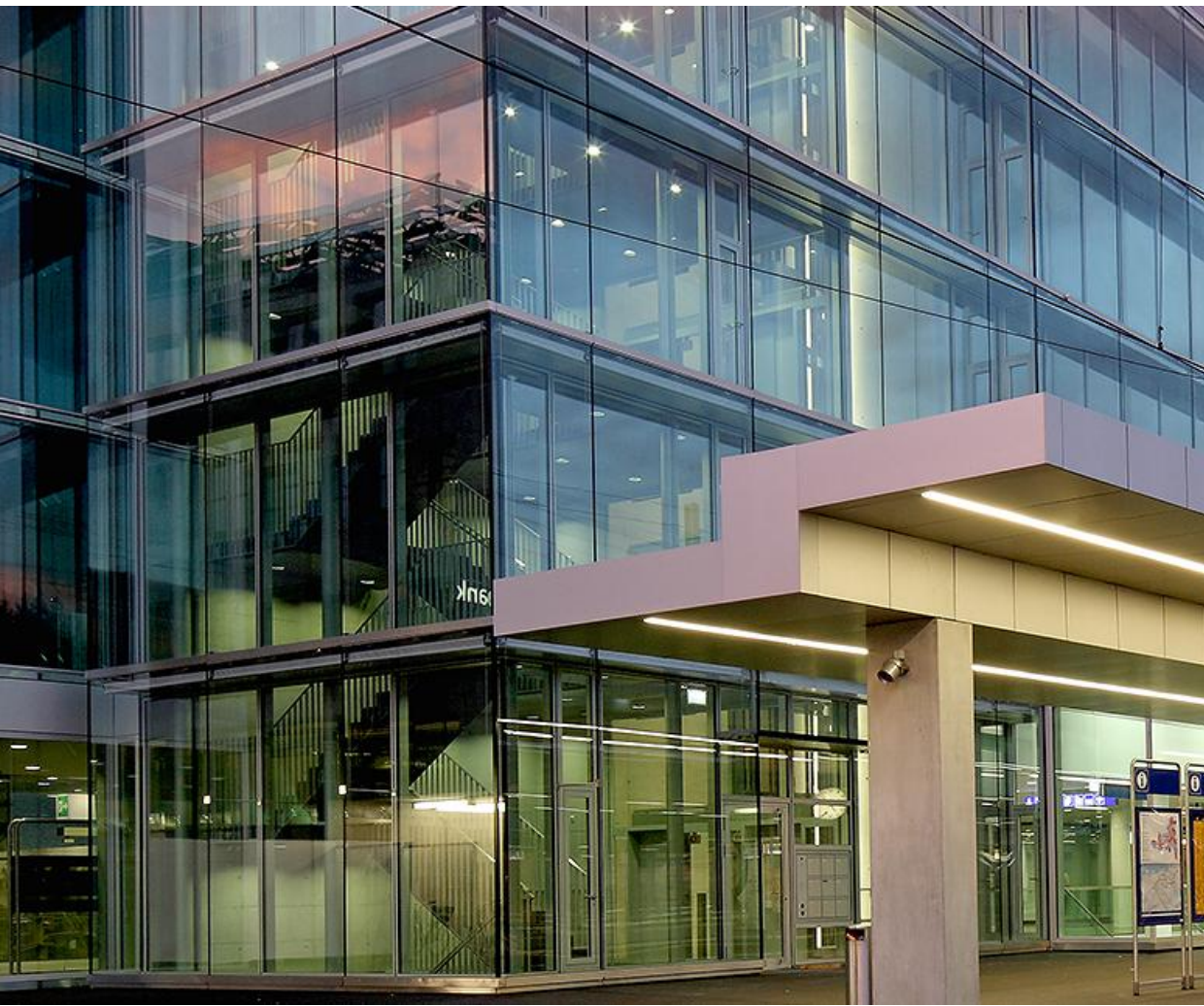
according to ISO 14025 and EN 15804

Declaration owner	Hydro Building Systems Germany GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-K.WIC_011.05.07.2018.12.46.01
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Valid until	19.11.2023

K/WIC_011; 2: WICTEC 50 WICTEC 50

Hydro Building Systems Germany GmbH

www.ibu-epd.com / <https://epd-online.com>



WICONA[®]
TECHNIK FÜR IDEEN

1. Product general information

Hydro Building Systems Germany GmbH

Programme holder

IBU - Institut Bauen und Umwelt e.V.
Panoramastr. 1
10178 Berlin
Deutschland

Declaration number

EPD-K.WIC_011.05.07.2018.12.46.01-EN

This declaration is based on the product category rules:

Windows and doors, 11.2015
(PCR tested and approved by the independent committee of experts)

Date of issue

20-11-18

Valid until

19.11.23

Prof. Dr.-Ing. Horst J. Bossenmayer
(President of the Institut Bauen und Umwelt e.V.)

Hans Peters
(Managing director IBU)

SERIE NOT FOUND!

Owner of the declaration

Hydro Building Systems Germany GmbH
Einsteinstrasse 61
89077 Ulm
Deutschland

Declared product/declared unit

Facade of the series SERIE NOT FOUND!, with the dimensions
(width x height) 2295 mm x 1955 mm.

Scope of application:

This declaration is a company EPD and refers to the aluminium construction product described, which is manufactured using the profile system described in a given dimension and with standard glazing. The product declared is specified by the profile series, product name, product properties and view as shown in this EPD document. This EPD is based on software created by Hydro Building Systems Germany GmbH and provided to the creator via WICTOP. The data entry is performed by the creator responsible for the specifications described in this EPD and the manufacture of the facade. The production location of the declared facade is the location of the creator.

The owner of the declaration is liable for the underlying information and proof, liability of IBU with regard to manufacturer information, LCA data and proof is excluded.

Verification

The CEN standard /EN 15804/ serves as the core PCR
Verification of the EPD by an independent third party according to
/ISO 14025/

internal

external

Matthias Schulz
(Independent auditor appointed by the SVA)

2. Product

2.1. Product description/product definition

Profile technology:

The WICTEC aluminium façade system is part of the building shell, made as a frame generally consisting of interconnected horizontal and vertical components anchored to the supporting elements of the structure. Built-in and/or recesses to be opened fulfil all the required functions of an inner or outer wall, but they do not contribute to the load bearing capacity or stability of the construction.

The façade is designed in building depths of 50 mm to 260 mm and in elevation widths of 50 mm and 60 mm and is characterised by the specification of the elevation width behind the WICTEC series name.

Profile connection is made by means of a notched bar with overlapping impact joints or with connectors for larger filling weights.

Heat protection:

Thermal insulation profiles for increased thermal insulation requirements enable U_f values up to 0.74 W/(m²K)

Infill thickness:

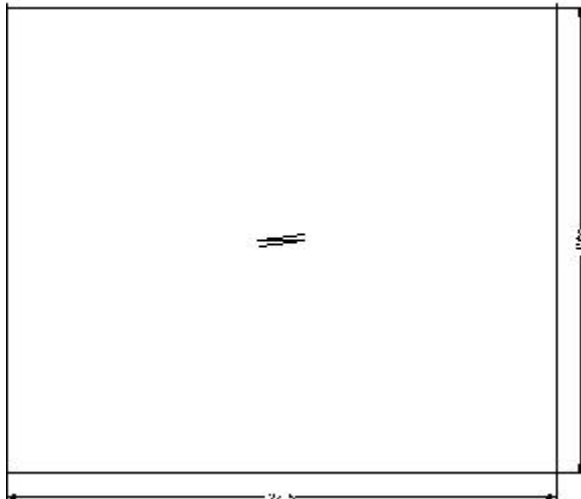
Infill thickness up to 63 mm

Burglar prevention:

Burglar prevention according to /DIN EN 1627/ up to RC3

Bullet resistance:

Bullet resistance according to /DIN EN 1522/ to FB4.



Product: WICTEC 50
Opening type: npd
Area: 0.00 m²
Transparent area: npd m²
Surface treatment: anodized

For marketing in the EU/EFTA, /Regulation (EU) No. 305/2011/. The product requires performance specifications taking into account the harmonised product standard /DIN EN 13830/, curtain walling and the CE marking.

For use, the respective national regulations apply.

2.2. Application

The façade series WICTEC is a curtain wall, covering the building, designed as an element façade or as a mullion and transom façade.

The windows integrated in the façade serve to illuminate and ventilate the building.

Based on the standard WICTEC 50 and WICTEC 60 series, these types of systems can be used to implement types such as 50P, 50E and 50A as well as WICTEC 50HI façades for the improvement of thermal insulation, WICTEC 50EL/60EL element façades and all glass and industrial façades.

2.3. Technical data

Structural data

Bezeichnung	Wert	Einheit
Heat transfer coefficient U _{cw} of the curtain walling according to /DIN EN 12631/	0.00	W/(m ² K)
Heat transfer coefficient panel according to /DIN EN 6946/	*)	W/(m ² K)
Sound insulation measures against outside noise /DIN EN ISO 10140/	*)	dB
Driving rain proof according to /DIN EN 12154/	npd	Class
Air permeability according to /DIN EN 12152/	npd	Pa
Direct airborne sound insulation R _w (C, C _{tr}) EN ISO 717-1	npd	dB
Fire resistance class for fire protection façades	npd	Class

according to /DIN EN 1634-3/ Brandschutzfassaden		
Resistance to dead weight (L/500, max 3 mm)	npd	-
Total energy transmittance g according to /DIN EN 13363-1/ and /DIN EN 13363-2/	npd	%
Light transmittance degree r _v according to /DIN EN 13363-1/ and /DIN EN 13363-2/	npd	%
Radiation properties according to /DIN EN 410/ Total energy transmittance g according to /DIN EN 13363-1/ and /DIN EN 13363-2/	npd	%
Radiation properties according to /DIN EN 410/ Light transmission TI according to /DIN EN 13363-1/ and /DIN EN 13363-2/	npd	%

*) omitted, as not a mandated property according to product regulation /DIN EN 14351/.

Product according to /CPR with hEN/:

Performance values of the product according to the performance specifications with regard to its essential characteristics in accordance with /DIN EN 13830/.

2.4. Delivery condition

All information about the present series of façades are order specific and listed in chapter 2.1.

A representation of the balanced façade element, as shown in Chapter 2.1 Product description, delivered as a pre-assembled façade element or in parts to the installation site.

Number: 1 Stück

Width: 2295 mm

Height: 1955 mm

2.5. Raw materials/auxiliary materials

The aluminium window considered consists of the following materials:

Designation	Value	Unit
EPDM	2.66	kg
Aluminium	22.10	kg
Edelstahl Schraube	0.40	kg
Glass, Float	252.40	kg
Eloxierung	0.00	kg
ABS	1.29	kg
Total Weight	278.85	kg

The product/article/at least a partial product contains substances from the candidate list (15.01.2018) above 0.1 by mass-%: no.

The product/at least one partial product contains further CMR substances of category 1A or 1B above 0.1 % by mass in at least one partial product which are not included in the candidate list: no

Biocidal products have been added to this construction product or it was treated with biocidal products (this is a treated product within the Biocidal Products Ordinance (EU) no. 528/2012): no

2.6. Manufacturing

Before the actual processing, the surface treatment of the aluminium profiles is carried out by anodizing or powder coating.

The extruded and thermally separated aluminium profiles are processed by sawing, milling, drilling and punching on corresponding semi or fully automatic machines. Scrap from processing (profile sections, chips) is collected sorted and recycled as secondary materials.

The permanently elastic seals are matched to the respective receiving area in the aluminium profile and are removed automatically or by hand.

The attachments are matched to the WICTEC product series. They are positively and/or frictionally connected to the profile system.

The glazing, panels or other fillings such as WICONA windows and doors are used and secured depending on the overall construction (weight, dimensions, etc.) during installation on the construction site.

2.7. Environment and health during production

Measures that go beyond national regulations for environmental protection and occupational safety are not required during the entire manufacturing process.

2.8. Product processing / installation

The bases for the processing and installation of the WICTEC product series are the currently applicable processing guidelines of Hydro Building Systems Germany GmbH and the notes detailed here. There are also recommendations for suitable aids contained therein.

In addition, the relevant regulations, standards and guidelines for planning, execution and installation of façades must be observed.

Particular attention is drawn to the /Guide to the installation of curtain walling/, Planning and execution of the installation for new construction and renovation from RAL Gütegemeinschaft Fenster und Haustüren e.V.

2.9. Packaging

Façade elements are stacked on transport racks, which are reused in the circulation process.

A proper securing of the façade elements is achieved by tie rods and straps. Elastic intermediate bearings between the individual elements prevent damage to the paintwork.

Generally, the façade elements are unpacked.

When transporting on an open loading surface, the transport unit can be wrapped with PE film to protect it from dirt and moisture.

PE foil, PE foam moulded parts, cardboard and spruce wood are used as packaging materials.

2.10. State of use

Façades of the WICTEC product range are installed in a thermally separated design as a building closing component and are exposed to weather conditions.

Maintenance or care of the profile surface is not required.

During the service life there are no changes in the material composition.

2.11. Environment & health during use

The mullion and transom profiles are determined on the basis of the structural diagrams for wind and glass loads.

The façade is securely anchored to the building.

According to research report /Emissions from building elements/ ift Rosenheim, there is no danger to the environment.

Under normal conditions of use and regular maintenance, there is no danger to the health of the user and to the soil, air and water.

2.12. Reference service life

According to the /Sustainable Building Assessment System/ aluminium façades comply with Code 335.811 with a service life of more than 50 years.

This corresponds to the reference lifetime.

2.13. Extraordinary influences

Fire

If this product has properties, these are listed under chapter 2.3 Technical data.

A classification of the individual components according to /DIN EN 13501-1/ resulted in:

Fire protection

Designation	Value
Building material class	E
Burning dripping	d0
Smoke development	s1

Water

Due to the unforeseen effects of water, no substances are released.

It is unlikely that there will be any impact on the environment.

Mechanical destruction

Mechanical destruction can cause sharp edges at the break points.

Negative impacts on the environment are not to be expected in case of unforeseen mechanical destruction.

2.14. End of life phase

The theoretical service life of the façade profiles exceeds the service life of, for example, the glazing or the permanently elastic seals.

The aluminium profiles are 100% recyclable. Primary and secondary aluminium have identical product quality. Scrap from demolition, conversion or refurbishment can easily be separated and recycled (via the recycling industry). The process waste produced in the production and further processing of the profile is completely recorded in the factory and processed into new input material in a recycling process in the re-melting plant. Press studs can be made with reused extruded profiles as the starting material.

2.15. Disposal

Aluminium

Due to its high value, aluminium scrap is not disposed of as a raw material but is recycled in an established cycle for reuse or recycling.

Façade elements made of aluminium are disassembled into their individual parts on the construction site, shredded in the recycling plant and cleaned from foreign parts. Recycling companies separate metals and non-metallic materials with specially developed processes, so that aluminium is sorted and separated from fractions such as stainless steel, iron, other non-ferrous metals, plastics and other materials.

Today, separation processes guarantee that aluminium scrap, once processed, can be re-melted in aluminium foundries to Al-Mg-Si-0.5 press studs and pressed into profiles in press factories.

/EAK/ 170402 Aluminium

Metals

Low and high alloy steels and other non-ferrous metals are separated from the aluminium fraction by separation during recycling and are recycled separately.

/EAK/ 170403 lead

/EAK/ 170404 zinc

/EAK/ 170405 iron and steel

/EAK/ 170406 tin

/EAK/ 170407 mixed metals

Flat glass

Production scrap of flat glass during the production is directly taken for local recycling. When dismantling or renovating the façade, the glazing is removed from the frame on location at the construction site and taken separately to the glass industry return system/collection circuit. Architectural glass is collected, separated from foreign substances, granulated and reused or deposited in raw materials.

/EAK/ 170202 Glass

Plastics/permanent elastic sealants

Can be recycled materially or thermally.

/EAK/ 170203

Insulation materials

Insulating materials made of panels or attachments are not soiled and can be recycled. Soiled insulation materials are deposited on a construction material landfill. With reference to details on the current take back and recycling recommendations reference is made to the insulation industry.

/EAK/ 170604

2.16. Further information

On the WICONA homepage you will find more information about the products.

www.wicona.de

3. LCA: Calculation rules

3.1. Declared unit

The declared unit is a facade SERIE NOT FOUND! in specific dimensions 2295 mm x 1955 mm with a frame proportion of -nan(ind) %

Declared unit

Designation	Value	Unit
Declared unit facade 2295 mm x 1955 mm	1	Piece
Conversion factor to 1kg	1/278.85	-
Conversion factor to 1 m ²	0.41	-

3.2. System limit

This EPD is an EPD of the cradle-to-gate type - with options.

The stage of production (module A1-A3 raw material supply, transport to the factory and production), the stage of construction of the structure (module A4 transport to the construction site), parts of the end of life cycle (modules C3 and C4 waste treatment and disposal) are taken into account. In addition, the credits and charges are considered outside the system limits (module D).

3.3. Estimates and assumptions

For the transport of the raw materials to the factory (module A2) a distance of 500 km is assumed.

The packaging materials are not considered in this study due to their minor influence on the results.

For the disposal of metals, material recycling (module D) is modelled (e.g. aluminium profiles). If necessary, a collection rate of 96% is taken into account. For the remainder, landfill is accepted (module C4).

Plastic parts are thermally recycled (module C4), whereby energy is gained. Credits from the substitution or saved expenses for electricity and steam are allocated to module D.

For glass, a sink is modelled. It can be assumed that recycling takes place. However, this is not included in the LCA, as no data are available.

3.4. Truncation rules

All materials that are included in the parts list from WICTOP are taken into account in the calculation of the life cycle assessment. Packaging is neglected due to different options and the minimal effect on the results.

3.5. Background data

All background data are taken from the databases of /GaBi ts software/. The consistent records contained in the GaBi ts database are documented in the online /GaBi documentation/.

For some precursors existing EPDs are used, if available, which were created in accordance with the current standard /EN 15804/.

3.6. Data quality

The last revision of the GaBi ts background data was performed in 2018.

The quality and representativeness of data from WICTOP can be considered high.

3.7. The period under consideration

This declaration was created on 20.11.2018.

3.8. Allocation

The life cycle assessment takes into account the recycling potential of the metal parts used. Of the metal scrap produced in the system from the production and end of life of the metal parts, the required amount of secondary aluminium for the production is first returned or saturated ("closed loop"), followed by the awarding of a credit for the remaining net scrap quantity.

Environmental impacts of combustion of plastic parts in the EoL scenario are attributed to module (C4); resulting credits for thermal and electrical energy are declared in module D. The credits are based on European average data for the environmental burden of the production of electrical energy and thermal energy from natural gas.

3.9. Comparability

In principle, a comparison or evaluation of EPD data is only possible if all records to be compared were compiled in accordance with /EN 15804/ and the building context or product specific specifications are taken into account.

4. LCA: Scenarios and other technical information

The following technical information is the basis for the declared modules or can be used for the development of specific scenarios in the context of a building assessment, if modules are not declared (MND).

Transport to construction site (A4)

Designation	Value	Unit
Liters of fuel		
Train (Diesel)	0.01158	l / 100 km
Plane (kerosine)	0.42164	l / 100 km
40 tons truck (Diesel)	0.00165	l / 100 km
7,5 tons truck (Diesel)	0.00591	l / 100 km
22 tons truck (Diesel)	0.00231	l / 100 km
Ship (heavy heating oil)	0.00040	l / 100 km
Transport distance		
Train	0.00	km
Plane	0.00	km
40 tons truck	0.00	km
7,5 tons truck	0.00	km
22 tons truck	0.00	km
Ship	0.00	km
Utilisation (including empty runs)		
Train	51	%
Plane	61	%
40 tons truck	55	%
7,5 tons truck	4	%
22 tons truck	66	%
Ship	48	%
Volume utilisation factor	1	-

Referenc useful life

Designation	Value	Unit
Referenc service life	50	a

Ende des Lebenswegs (C1-C4)

Designation	Value	Unit
Separately collected waste type	278.85	kg
Collected as mixed construction waste	0.00	kg
For reuse	0.00	kg
For recycling (D)	274.01	kg
For energy recovery (C3)	3.95	kg
For landfilling (C4)	0.88	kg
For thermal utilisation (C4)	0.00	kg

5. LCA: Results

In the following, the results of the indicators of the impact assessment, resource use as well as waste and other output flows related to 1 piece facade SERIE NOT FOUND! in specific dimension 2295 mm x 1955 mm are shown.

For the conversion to the unit declared see chapter 3.1

LCA results are based on the characterisation method CML

SPECIFICATION OF THE SYSTEM LIMITS (X = INCLUDED IN LIFE CYCLE ASSESSMENT, MND = MODULE NOT DECLARED)

PRODUCT STAGE			CONSTRUCTION PROCESS STAGE		USE STAGE								END OF LIFE STAGE				BENEFITS AND LOADS BEYOND THE SYSTEM BOUNDARYS
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement ⁽¹⁾	Refurbishment ⁽¹⁾	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential	
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D	
X	X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	X	

RESULTS OF THE LIFE CYCLE ASSESSMENT ENVIRONMENTAL IMPACT:

SERIE NOT FOUND! 2295 mm x 1955 mm

Parameter	Parameter	Unit	A1-A3	A4	C3	C4	D
GWP	Global warming potential	[kg CO ₂ -Eq.]	439.72	0.00	9.63	1.41E-02	-101.97
ODP	Depleting the stratospheric ozone layer	[kg CFC ₁₁ -Eq.]	6.92E-06	0.00	1.57E-13	3.18E-15	-5.30E-06
AP	Acidification potential of soil and water	[kg SO ₂ -Eq.]	2.83	0.00	3.05E-03	8.33E-05	-3.98E-01
EP	Eutrophication	[kg (PO ₄) ³ -Eq.]	2.72E-01	0.00	4.71E-04	1.15E-05	-2.34E-02
POCP	Forming potential for tropospheric ozone	[kg Ethen-Eq.]	-2.39E-01	0.00	1.34E-04	6.48E-06	-2.29E-02
ADPE	Potential for the abiotic degradation of non-fossil resources	[kg Sb-Eq.]	8.97E-04	0.00	1.51E-07	5.39E-09	-7.15E-05
ADPF	Potential for the abiotic degradation of fossil fuels	[MJ]	5331.87	0.00	1.73	1.82E-01	-1084.80

RESULTS OF THE LIFE CYCLE ASSESSMENT RESOURCE ACCOUNT:

SERIE NOT FOUND! 2295 mm x 1955 mm

Parameter	Parameter	Unit	A1-A3	A4	C3	C4	D
PERE	Renewable primary energy as an energy source	[MJ]	778.74	0.00	2.96E-01	2.34E-02	-458.85
PERM	Renewable primary energy to the material use	[MJ]	0.00	0.00	0.00	0.00	0.00
PERT	Total renewable primary energy	[MJ]	778.74	0.00	2.96E-01	2.34E-02	-458.85
PENRE	Non-renewable primary energy as an energy source	[MJ]	5858.09	0.00	166.65	1.89E-01	-1439.26
PENRM	Non-renewable primary energy to the material use	[MJ]	164.65	0.00	-164.65	0.00	0.00
PENRT	Total non-renewable primary energy	[MJ]	6022.88	0.00	2.00	1.89E-01	-1439.26
SM	Use of secondary materials	[kg]	72.05	0.00	0.00	0.00	0.00
RSF	Renewable secondary fuels	[MJ]	0.00	0.00	0.00	0.00	0.00
NRSF	Non-renewable secondary fuels	[MJ]	0.00	0.00	0.00	0.00	0.00
FW	Use of freshwater resources	[m³]	1.71	0.00	2.22E-02	3.60E-05	-9.26E-01

RESULTS OF LIFE CYCLE ASSESSMENT OUTPUT RIVERS AND WASTE CATEGORIES:

SERIE NOT FOUND! 2295 mm x 1955 mm

Parameter	Parameter	Unit	A1-A3	A4	C3	C4	D
HWD	Hazardous waste for landfill	[kg]	4.05E-05	0.00	4.65E-09	3.25E-09	-1.15E-07
NHWD	Discarded non-hazardous waste	[kg]	51.03	0.00	2.59E-01	8.86E-01	-23.31
RWD	Discarded radioactive waste	[kg]	2.85E-01	0.00	1.11E-04	2.74E-06	-1.46E-01
CRU	Components for reuse	[kg]	0.00	0.00	0.00	0.00	0.00
MFR	Materials for recycling	[kg]	0.00	0.00	0.00	0.00	274.01
MER	Materials for the energy recovery	[kg]	0.00	0.00	0.00	0.00	0.00
EEE	Exported electrical energy	[MJ]	0.00	0.00	18.60	0.00	0.00
EET	Exported thermal energy	[MJ]	0.00	0.00	33.59	0.00	0.00

6. LCA: Interpretation

The LCA results in the production phase (modules A1-A3) are dominated by the materials used. The two main drivers are the material fractions of aluminium and glass. Other materials such as plastics or other metal components are less relevant in terms of mass as well as life cycle assessment. Transport (module A2) plays a significantly subordinate role compared to the materials used.

In Module C3, the costs of thermal utilisation of the plastics used are to be considered as a low

contribution. The recycling of aluminium is shown in Module D and includes both the costs of the remelting process and the credits for the expenses saved (substitution of primary aluminium). The credits are higher than the charges, which leads to negative LCA results in module D. The recycled aluminium, as well as the other metal parts used in the product, can be re-used in the next product system.

7. Proof

The proof of combustion gas toxicity and leaching behaviour are not declared because the harmonised product standards do not require proof of these. The dominant material fractions of the declared product are coated aluminium and glass. Neither of the

materials are flammable and both are inert to environmental influences such as rain.

8. Bibliographic references

/Institut Bauen und Umwelt e.V./, Berlin (ed.):
Creation of environmental product declarations (EPDs)

/General programme guide/
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www.ibu-epd.com

/PCR Part A/
Institut Bauen und Umwelt e.V., Königswinter (ed.)
Product Category Rules PCR for construction products Part A
Calculation rules for the life cycle assessment and requirements for the background report 2013-04
www.bau-umwelt.de

/PCR Part B/
Institut Bauen und Umwelt eV, Königswinter (ed.)
Product category rules PCR for construction products Part B
Guidance texts for building related products and services of the curtain walling component group
www.bau-umwelt.de

/Regulation (EU) No. 305/2011/
also EU Construction Products Regulation (EU CPR) of the European Parliament and of the Council of 9 March 2011 establishing harmonised conditions for the marketing of construction products. It replaces Directive 89/106/EEC.

/Sustainable Building Assessment System/
Service lives of components for life cycle analysis according to the Sustainable Building Assessment System
Revision: 22.02.2017.
www.nachhaltigesbauen.de

/GaBi ts Software/
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/DIN EN 10140-1/
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/DIN EN 12154/
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/DIN EN 12631/
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/DIN EN 13363-2/
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/Emissions from building elements/

Examination of the emissions of windows and exterior doors to evaluate the behaviour of building elements in terms of hygiene, environmental protection and health, Final report 2010, ift Rosenheim

/Guide to the installation of curtain walling/

Planning and execution of the assembly for new construction and renovation, issue August 2017, RAL-Gütegemeinschaft Fenster, Fassaden und Haustüren e.V.

/REACH/

Candidate list from 15.01.2018

/CPR with hEN/

Construction Products Regulations with harmonised European standard
Please refer to: /Regulation (EU) No. 305/2011/

/EAK/

European waste catalogue

/DIN EN 410/

Glass in building - Determination of photometric and radiation physical parameters of glazing;
German version DIN EN 410:2011-04.

/DIN EN 673/

Glass in building - Determination of thermal transmittance (U-value) - Method of calculation;
German version DIN EN 673:2011-04.

/DIN EN 717/

Acoustics - Assessment of sound insulation in buildings and building components - Part 1: Airborne sound insulation (ISO 717-1: 2013);
German version DIN EN ISO 717-1: 2013-06.

/DIN EN 1522/

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German version DIN EN 1522:1999-02.

/DIN EN 1627/

Draft - doors, windows, curtain walling, grilles and shutters - Burglar prevention - Requirements and classification;
German version DIN EN 1627:2011-09.

/DIN EN 6946/

Components - Thermal resistance and thermal transmittance coefficient calculation method (ISO 6946: 2007);
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/DIN 4102-13/

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German version DIN EN ISO 10077-1: 2018-01.

/DIN EN 10077-2/

Thermal performance of windows, doors and shutters - Calculation of thermal transmittance coefficient - Part 2: Numerical method for frames (ISO 10077-2: 2017);
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/DIN EN ISO 14025/

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Sustainability of buildings - Environmental product declarations - Basic rules for the product category construction products;
German version DIN EN 15804: 2014-07.

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**Publisher**

Institut Bauen und Umwelt
e.V.
Panoramastr.1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail info@bau-umwelt.com
Web www.bau-umwelt.com

**Programme holder**

Institut Bauen und Umwelt
e.V.
Panoramastr.1
10178 Berlin
Germany

Tel +49 (0)30 3087748- 0
Fax +49 (0)30 3087748- 29
Mail Info@bau-umwelt.com
Web www.bau-umwelt.com



thinkstep

**Creator of the life cycle
assessment**

thinkstep AG
Hauptstraße 111-113
70771
Leinfelden-Echterdingen
Germany

Tel +49 (0)711 341817-0
Fax +49 (0)711 341817-25
Mail info@thinkstep.com
Web www.thinkstep.com

**Declaration owner**

Hydro Building Systems
Germany GmbH
Einsteinstraße 61
89077 Ulm
Germany

Tel +49 (0)731 3984-0
Fax +49 (0)731 3984 241
Mail info@wicona.de
Web www.wicona.de