

ENVIRONMENTAL PRODUCT DECLARATION

as per ISO 14025 and EN 15804

Owner of the Declaration	Fachverband Schloss- und Beschlagindustrie e.V.
Publisher	Institut Bauen und Umwelt (IBU)
Programme Holder	Institut Bauen und Umwelt (IBU)
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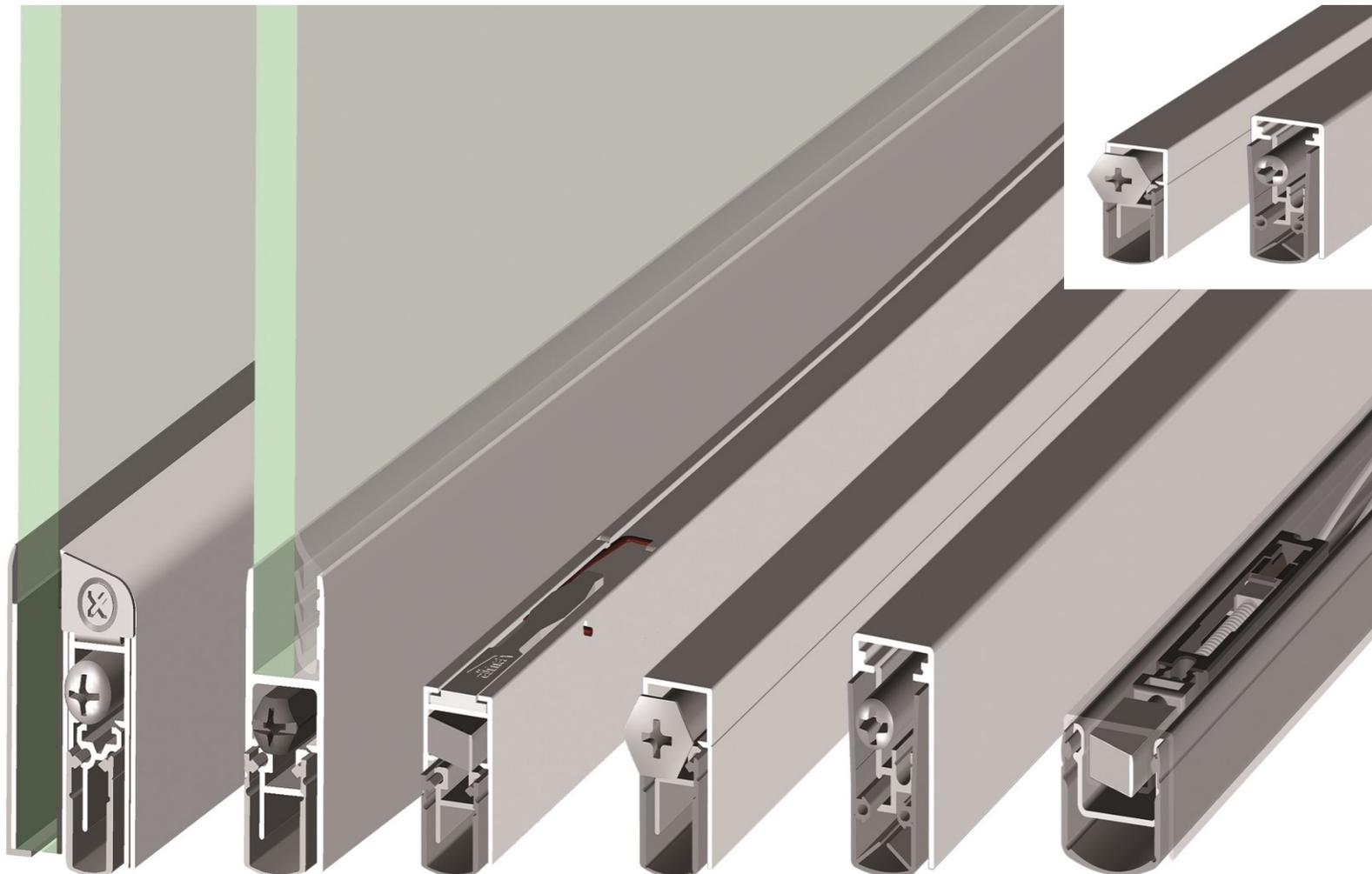
Automatic Door Gaskets

Fachverband Schloss- und Beschlagindustrie e.V.

www.bau-umwelt.com



Institut Bauen
und Umwelt e.V.



1 General Information

Fachverband Schloss- und Beschlag- industrie e.V.

Programme Holder

IBU - Institut Bauen und Umwelt e.V.
Panoramastrasse 1
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Declaration Number

EPD-FVS-20130194-IBG1-EN

This declaration is based on the product category regulations:

PCR Locks and Builders Hardware, 07-2012
(PCR-tested and approved by the independent testing com-
mittee)

Issue Date

23/09/2013

Valid to

22/09/2018



Prof. Dr.-Ing. Hans-Wolf Reinhardt
(President of Institut Bauen und Umwelt e.V.)



Prof. Dr.-Ing. Hans-Wolf Reinhardt
(Chairman of SVA)

Automatic Door Gaskets

Owner of the Declaration

Fachverband Schloss- und Beschlagindustrie e.V.
Offerstrasse 12
42551 Velbert

Declared Product/Declared Unit

A door gasket with an average weight of 0.441 kg

Scope of Validity:

This sample environmental declaration is based on an average automatic door gasket with a weight of 0.441 kg. A weighted average according to the quantity sold was calculated from three individual representative product samples.

The values determined to calculate the LCA originate from a member company selected by the Fachverband Schloss- und Beschlagindustrie e.V. The average product is representative for the product group according to the Fachverband Schloss- und Beschlagindustrie. The production and installation location is Germany.

The owner of the declaration is liable for the fundamental information and verification; any liability by the IDU in relation to manufacturers' information, LCA data and verification is excluded.

Verification

CEN standard EN 15804 serves as the core PCR

Independent verification of the declaration and data according to ISO 14025

internal external



Prof. Dr. Bii
(Independent tester appointed by SVA)

2 Product

2.1 Product Description

Automatic door gaskets mainly consist of metal. The housing is generally made of aluminium. Some types also have an anodised surface. The LCA refers to the product without anodised surface treatment. Just the trigger and the sealing section are visible after installation. Product weights between 0.415 kg and 0.554 kg are normal. The automatic door gasket is taken up by a floor-facing groove in the door leaf or in recesses in metal or plastic sections. With doors made completely of glass the gasket is clipped on to the glass door leaf.

The trigger and the inner components are mostly plastic. The springs normally consist of spring steel.

A weighted average according to the quantity sold was calculated from three individual representative product samples.

2.2 Application

The gasket types described here are generally used in buildings as floor seals. Depending on the version, automatic door gaskets can be provided for

use in fire and smoke protection doors and/or sound protection or house doors.

2.3 Technical Data

Not relevant.

2.4 Placing on the market/Application rules

No standards exist for placing automatic door gasket on the market. In order to comply with quality requirements the door gaskets are installed in accordance with the General Building Authority Test Certificate.

2.5 Delivery status

The automatic door gaskets examined here are supplied in the necessary lengths to fit the door widths. Standard lengths are defined according to DIN 18101. Door gaskets are supplied with standard door hardware.

2.6 Base materials/Ancillary materials

The declared automatic door gasket consists of aluminium (73.8%), silicone and plastics (16.6%), various steels (9.2%) and zinc (0.4%). Minimal

amounts of plant oil-based coolants are used in cutting to size, punching and boring holes. These have no negative effect during further processing and are therefore not removed.

The aluminium sections, if fitted, are anodised externally by a partner supplier. All auxiliary materials used comply with the specifications from quality, environmental and work safety management systems.

2.7 Manufacture

The manufacturing process consists of three stages:

- Prefabrication (cutting to size and punching)
- Prefitting of assemblies
- Installation + feeding in of sealing section

2.8 Environment and health during manufacturing

No hazardous environmental effects occur during manufacture.

Air: The compressed air (pneumatic cylinder) required for processing is produced in enclosed plants and cleaned with filter systems.

Water/Ground: No contamination of water or the ground is caused since no water is used in the manufacturing process.

Cleaning agents: are not used in the manufacturing process.

Noise: regular sound measurements result in a designated and marked noise zone for the cutting and punching area only. Employees use ear protection and are monitored by the company doctor.

2.9 Product processing/Installation

The gasket manufacturer delivers the door gaskets directly to the door manufacturer. There is normally no interim storage, as deliveries are order-related. The gaskets are selected according to door requirements during planning. The gaskets are fitted by screwing the fixing components to the door leaf.

The door element is then installed in the property by the installation company. The gasket lift height is then adjusted after installation.

2.10 Packaging

The gaskets are normally supplied in disposable packaging made of recyclable cardboard and PE film. There is no elaborate gasket packaging because deliveries are made directly to the processor (door manufacturer). The packaging mainly serves as protection during transport.

2.11 Condition of use

The materials result from the raw materials described in Chapter 2.1. The automatic gaskets are maintenance-free and are not subject to wear under normal use.

2.12 Environment and health during manufacturing

Material-specific reactions or reciprocal reactions with the environment/health are not expected.

2.13 Reference service life

The products are designed for permanent use. Permanent function tests with 200,000 cycles have been demonstrated without damage.

2.14 Extraordinary effects

Fire

The aluminium sections and metal components are regarded as being not combustible and allocated to building material class A1 in accordance with DIN EN 13501-1 on account of their reaction to fire. The gasket sections are manufactured from self-extinguishing silicone. The entire gasket is classified as Class E in accordance with DIN EN 13501-1.

Water

Not relevant.

Mechanical destruction

Automatic gaskets are not part of any externally acting destruction but can only be destroyed in conjunction with the door component.

2.15 Re-use phase

The materials used are high-quality raw materials which can be recycled at the end of the use phase. No environmental contamination occurs when the gaskets are dismantled. Further use at the end of service life is not recommended.

2.16 Disposal

The gasket is to be disposed of separately if a door is dismantled. The materials can be completely recycled. Recycling is performed using waste code 170407 for mixed materials in accordance with the European Waste Index (AVV).

2.17 Further information

Mechanical door gaskets are manufactured in various different versions depending on the type of door to be sealed. With wooden and plastic doors they are inserted into a milled groove in the bottom edge. With metal doors they are fitted flush into the door profile and with glass doors they are glued to the outside of the door leaf.

This EPD describes mean values for the three different door gasket types.

3 LCA: Calculation rules

3.1 Declared unit

The declaration relates to an average automatic door gasket. A weighted average from three representative automatic door gaskets has been calculated. The total weight of the declared average door gasket is 0.441 kg.

Specification of the declared unit

Designation	Value	Unit
Conversion factor to 1 kg	2.267	-
Declared unit	0.441	Piece/Product

3.2 System boundary

EPD type: Cradle to gate - with options.

The calculated LCA addresses the life cycle stage of product manufacture as well as a recycling scenario. Product manufacture includes modules A1 (raw materials provision), A2 (transport) and A3 (manufacture). The recycling scenario includes modules C2 (transport for disposal/recycling), C3 (waste recycling) and C4 (disposal). Credits from re-use, recovery and recycling potential are shown in module D in accordance with DIN EN 15804.

3.3 Estimates and assumptions

The declared average automatic door gasket was calculated on the basis of production data from a member company of the Fachverband Schloss- und Beschlagindustrie e.V. To calculate the values, a manufacturer of automatic door gaskets was selected by the Fachverband Schloss- und Beschlagindustrie e.V. as being representative for further Fachverband Schloss- und Beschlagindustrie e.V. companies. The three door gaskets on which the calculation in this declaration is based were also deliberately chosen so that they best represent each product group. The manufacturing processes and raw materials are comparable due to the normative specifications and requirements.

The actual transport distances were used for the transport of the raw materials to the factory. A transport distance of 200 km was estimated for recycling.

3.4 Cut-off criteria

All production data collected was taken into account in the balance. Processes which contribute less than 1% by weight to the final result and in all impact categories have been ignored.

It can be assumed that the ignored processes would have contributed less than 5% respectively to the impact categories included.

Machines, plant and infrastructure needed for manufacture have been ignored. Transport for packaging has been ignored.

3.5 Background data

The GaBi 6 software system for integrated balancing developed by PE INTERNATIONAL was used to model the life cycle for the manufacture of automatic door gaskets.

The consistent data records in the GaBi 6 database are documented in the GaBi 6 online documentation. The basic data in the GaBi database were used for energy, transport and auxiliary materials. The LCA was produced for the reference area of Germany. This means that in addition to the production processes within these framework conditions, the preliminary stages relevant for Germany such as electricity of energy source provision were used.

Electricity from hydro-electric power was used exclusively for the manufacture of the automatic door gaskets. The data record for electricity from hydro-electric power for Germany with the reference year 2009 was used.

3.6 Data quality

All background data relevant for the LCA was taken from the GaBi 6 database. The last revision of the background data used for the LCA was less than four years ago.

The corresponding member company made current primary data from production in 2011 available. This production data was checked for plausibility. According to the manufacturer's data, the representativeness of the declared product is excellent.

The database contained corresponding data records for all upstream products. The data quality can be regarded as being excellent.

3.7 Period under review

The data basis for this LCA is current data from a member company of the Fachverband Schloss- und Beschlagindustrie e.V. from 2011.

3.8 Allocation

No allocations were made as the automatic door gaskets are manufactured on independent production lines. All factory data relates exclusively to the declared products.

Metal waste such as chads and chips which accrue when processing the automatic door gasket are collected in the factory and re-processed. All metal waste produced is returned to the respective raw materials.

3.9 Comparability

Comparison or evaluation of EPD data is really only possible if all data records to be compared were produced in accordance with DIN EN 15804 and the building context and the product-specific technical features are taken into account.

4 LCA: Scenarios and additional technical information

The following technical information forms the basis of 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 recycling (C2)

Transport distance	200 km
Capacity utilisation (including empty runs)	85%

End of life (C1-C4)

Collected separately	100%
Collected as mixed construction waste	0%
Re-use	0%
Recycling	75%
Energy recovery	15%
Landfilling	10%

5 LCA: Results

DESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; MND = MODULE NOT DECLARED)

Product Stage			Construction Process Stage		Use Stage							End of Life Stage				Benefits and Loads Beyond the System boundary
Raw material supply	Transport	Manufacture	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	Deconstruction / Demolition	Transport	Waste processing	Disposal	Re-use, recovery or re-cycling potential
A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
X	X	X	MND	MND	MND	MND	MND	MND	MND	MND	MND	MND	X	X	MND	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: Automatic Door Gasket: [0.441 kg/product]

Parameter	Unit	Manufacture			Disposal			Credit
		A1-A3	C2	C3	C4	D		
GWP	[kg CO ₂ -Eq.]	4.4E+00	4.4E-03	1.8E-01	2.5E-03	-2.7E+00		
ODP	[kg CFC11-Eq.]	4.0E-07	9.2E-14	4.9E-11	4.7E-13	-2.7E-07		
AP	[kg SO ₂ -Eq.]	2.1E-02	1.9E-05	2.4E-04	3.8E-06	-1.4E-02		
EP	[kg PO ₄ ³⁻ -Eq.]	1.1E-03	4.7E-06	4.2E-05	5.8E-07	-5.9E-04		
POCP	[kg Ethen Eq.]	1.4E-03	-6.6E-06	2.0E-05	9.8E-07	-7.7E-04		
ADPE	[kgSb Eq.]	2.5E-05	2.0E-10	2.3E-07	2.2E-10	-6.8E-06		
ADPF	[MJ]	5.8E+01	6.0E-02	4.7E-01	8.2E-03	-2.4E+01		
Key	GWP = Global Warming Potential; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential of land and water; EP = Eutrophication potential; POCP Formation potential for tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources							

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: Automatic Door Gasket: [0.441 kg/product]

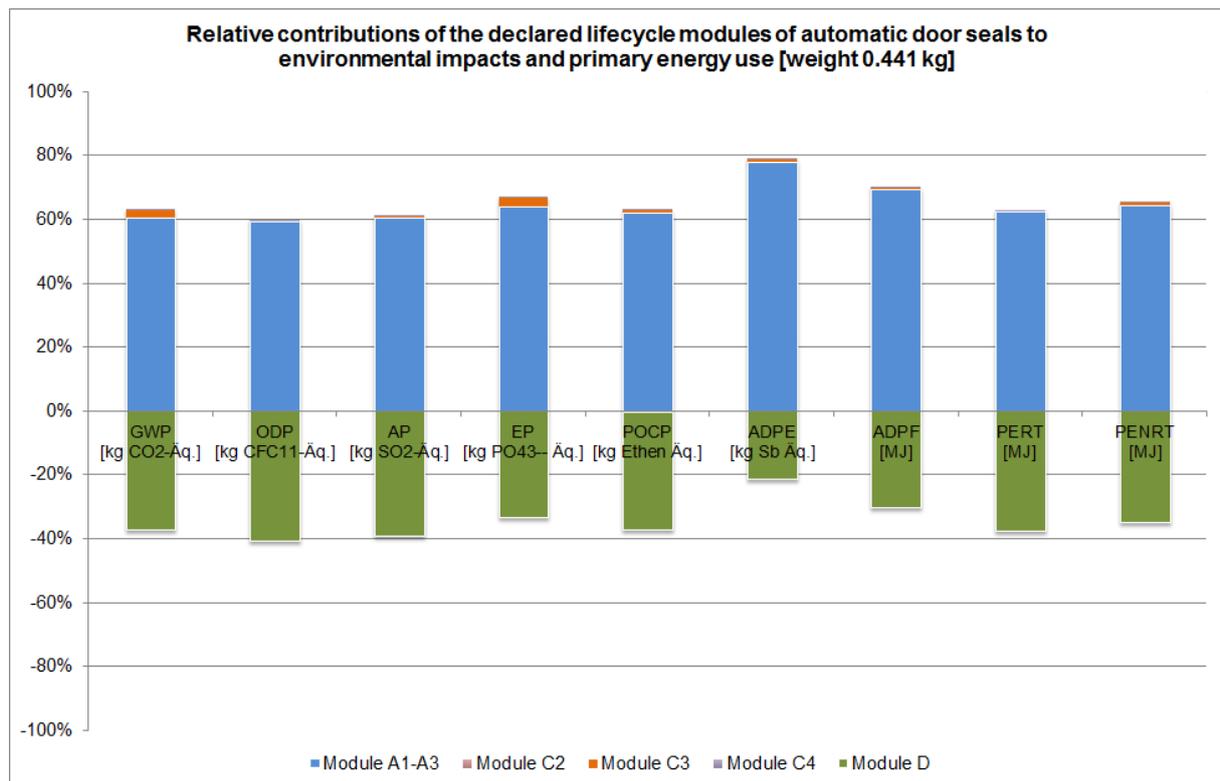
Parameter	Unit	Manufacture			Disposal			Credit
		A1-A3	C2	C3	C4	D		
PERE	[MJ]	1.9E+01	3.6E-03	3.1E-02	6.4E-04	-1.1E+01		
PERM	[MJ]	0.0E+00	-	-	-	-		
PERT	[MJ]	1.9E+01	3.6E-03	3.1E-02	6.4E-04	-1.1E+01		
PENRE	[MJ]	6.4E+01	6.9E-02	5.2E-01	8.6E-03	-3.5E+01		
PENRM	[MJ]	2.9E-03	-	-	-	-		
PENRT	[MJ]	6.4E+01	6.0E-02	5.2E-01	8.6E-03	-3.5E+01		
SM	[kg]	0.0E+00	-	-	-	-		
RSF	[MJ]	2.5E-04	4.5E-07	5.7E-04	1.5E-05	1.6E-06		
NRSF	[MJ]	2.4E-03	4.7E-06	6.0E-03	3.6E-05	1.7E-05		
FW	[m ³]	*	*	*	*	*		
Key	PERE = Renewable primary energy as energy source; PERM = Renewable primary energy resources as material utilisation; PERT = Total use of renewable primary energy resources; PENRE = Non-renewable primary energy as energy source; PENRM = Non-renewable primary energy as material utilisation; 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 = Use of net fresh water							

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT: Automatic Door Gasket: [0.441 kg/product]

Parameter	Unit	Manufacture			Disposal			Credit
		A1-A3	C2	C3	C4	D		
HWD	[kg]	-*	-*	-*	-*	-*		
NHWD	[kg]	-*	-*	-*	-*	-*		
RWD	[kg]	5.4E-03	8.6E-08	2.0E-05	1.5E-07	-3.4E-03		
CRU	[kg]	-	-	-	-	0.0E+00		
MFR	[kg]	-	-	-	-	3.3E-01		
MER	[kg]	-	-	-	-	2.8E-02		
EE [elec.]	[MJ]	-	-	-	-	7.3E-02		
EE [ther.]	[MJ]	-	-	-	-	1.8E-01		
Key	HWD = Hazardous waste disposal; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed; CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EE = Exported thermal energy							

* The indicators cannot be identified (SVA resolution dated 07/01/2013).

6 LCA: Interpretation



The largest contribution to **Global Warming Potential (GWP, 100 years)** comes from preliminary product provision (98%) - mainly from the manufacture of continuous aluminium casting and the silicone gaskets. 2% of global warming gas emissions are caused by the manufacturing process itself. These are mainly attributable to the use of polyethylene. A total of 61% of all GWP emissions are credited; the dominant contribution comes from recycling the aluminium (93%).

100% of the **Ozone Depletion Potential (ODP)** comes from upstream chains. The manufacture of the aluminium extrusions (94%) and the silicone gaskets (4%) contribute especially to the total ODP. Halogenated organic emissions (R 114, dichlorotetrafluoroethane) are released by the use of nuclear power in the manufacturing processes of the preliminary products. These can in turn be attributed to the CFCs used for cooling in nuclear power stations. The credit is for 68%, 99% of which originates from recycling aluminium.

The **Acidification Potential (AP)** is dominated by 97% in the production stage by the provision of raw materials (module A1). The greatest effects therefore result from the manufacture of aluminium extrusions (84%). Above all sulphur dioxide (70%) and nitrogen oxide (26%) dominate the AP. A credit of 64% is offset mainly by recycling the aluminium.

the largest contribution to **eutrophication potential (EP)** comes from preliminary product provision (88%), mainly the aluminium extrusions (76%). The EP is dominated by nitrogen oxide emissions (83%) due to the energy provider implementation. A total of 52% of the total emissions are credited.

The **Abiotic Depletion Potential (ADP non-fossil)** is mainly caused by the manufacturing stage (module A1-A3). The upstream chains (A1) (99%) contribute mainly to the total ADP. The disposal stage (C2 and C3) have no significant influence. The credit is 27% in total.

The **Abiotic Depletion Potential (ADP fossil)** results mainly from the contribution of the upstream chains in module A1 (75%). The use of sheet aluminium (58%) and silicone gaskets (7%) makes a particularly large contribution to the ADPF. A credit of 43% is offset mainly by recycling the aluminium.

The **ozone smog potential (POCP)** is triggered by the provision of the pre-products. Modules A1 and A3 (3%) exhibit lower contamination levels than A1 (95%). Especially the MNVOC group, sulphur dioxide and nitrogen oxide contribute to POCP. The credit here is 58%.

The **entire primary energy requirement** is divided between 80% from non-renewable energy sources and 20% from renewable sources.

85% of the **entire renewable primary energy requirement (PERT)** results from the pre-product manufacture upstream chains (module A1). The influence of the manufacture of the aluminium extrusions is particularly apparent at 89% and the silicone gaskets at 9%. The credit (module D) totals 60%, of which the largest part is attributable to aluminium recycling.

With regard to the **entire non-renewable primary energy requirement (PENRT)** the pre-product manufacture upstream chains contribute 91% (largely from aluminium manufacture). The production of the door gasket itself contributes 9%. A total of 54% is credited which comes mainly from recycling the metallic pre-products.

7 Requisite evidence

According to the PCR, no verification is necessary.

8 References

Institut Bauen und Umwelt 2011

Published by Institut Bauen und Umwelt (IBU) Generation of Environmental Product Declarations (EPDS)

General principles

For the Institut Bauen und Umwelt e.V. (IBU)'s EPD range, 2011-09, www.bau-umwelt.de

PCR 2012, Part A

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PCR 2012, Part B

Instructions for building-related products and services, Part B: Requirements of the EPD for PCR Door locks and hardware, Institut Bauen und Umwelt e.V., www.bau-umwelt.de, July 2012, Version 1.0

AVV

European Waste Catalogue dated 10th December 2001 (Federal Legal Gazette p. 3379) last modified by Article 5 Paragraph 22 of the law dated 24th February 2012 (Federal Legal Gazette p. 212).

ISO 14025

ISO 14025:2007-10, Environmental labels and declarations - Type III Environmental declarations - Principles and procedures (ISO 14025:2006);

DIN EN 15804

DIN EN 15804:2012-04: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction

GaBi 6

GaBi 6 Software and database for Life Cycle Engineering, JKP (Institute for Polymer Testing and Polymer Science) University of Stuttgart and PE Europe AG, Leinfelden-Echterdingen, 2012

GaBi 6

GaBi 6 Documentation of GaBi 6 data records in the integrated balancing database. LBP, University of Stuttgart and PE International, 2011 <http://documentation.gabi-software.com/>,

DIN EN 18101

DIN EN 18101 1985-01: Doors; Doors for residential buildings; sizes of door leaves, position of hinges and lock, interdependence of dimensions.

DIN EN 13501-1

DIN EN -1:2010-01: Fire classification of construction products and building elements - Part 1: Classification using data from reaction to fire tests



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