



# Environmental Product Declaration in accordance with ISO 14025 and EN 15804 Mirror / Ultra Mirror



Detailed version

Programme operator	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 83026 Rosenheim			
Life Cycle Assessment	ift Rosenheim GmbH Theodor-Gietl-Straße 7-9 83026 Rosenheim			
Holder of the declaration	Guardian Europe S.à.r.l. 19, rue du Puits Romain L-8070 Bertrange			
Declaration code	EPD-GM-GB-19.1			
Designation of declared product	Silver coating for flat glass			
Scope	Silver coating for flat glass to be used in interior applications for buildings.			
Basis	This EPD was prepared on the basis of EN ISO 14025:2011 and EN 15804:2012. In addition to that, the "Guidance on Preparing Type III Environmental Product Declarations" applies. This Declaration is based on the PCR Document "Flachglas im Bauwesen" (Glass in Building) PCR-FG-1.1 : 2013. The EPD is created as addition to the EPD Float glass, Laminated Safety and Coated Glass (EPD-GFEV-19.0).			
validity	This verified Environmental Product Declaration applies solely to the specified products and is valid for a period of 5 years from the date of issue. The declaration holder assumes full liability for the underlying data, certificates and verifications.			
	Publication date: 25. June 2015	Latest revision: 21. August 2019	Next revision: 25. June 2020	
LCA Basis	The LCA was prepared in accordance with EN ISO 14040 and EN ISO 14044. The base data include both data collected at various companies and generic data from the "GaBi 6" database. LCA calculations were based on the "cradle to gate" life cycle.			
Notes on publication	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.			
				
Prof. Ulrich Sieberath Director of Institute		Patrick Wortner, MBA and Eng., Dipl.-Ing. (FH) Independent, external Verifier		

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<b>Additional holder of declaration</b>	<ul style="list-style-type: none"> <li>• Guardian Oroshaza / Hungary</li> <li>• Guardian Dudelange / Luxembourg</li> <li>• Guardian Llodio / Spain</li> </ul>
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## 1 Product definition

### Product definition

This EPD applies to the product group Glass and is valid for:

Silver coating for flat glass. The LCA was prepared using the declared unit:

#### 1 m<sup>2</sup> glass coating

The LCA for the declared unit only includes the surface coating. The environmental effects of the glass can be found in the EPD Float glass, Laminated Safety and Coated Glass (EPD-GFEV-19.0) and is not included in this EPD.

The declared unit relates to the product stage of 1 m<sup>2</sup> silver-coating for flat glass.

### Product description:

#### Silver coating for flat glass

Silver coated flat glass is the result of silver and paint or copper sulphate deposition on high quality float glass. This deposition is done on a silver coating process line. After deposition of the silver layer, the paint layer is applied and cured by IR lights in order to protect the mirror from corrosion and mechanical damages

The product is used in the widest range of indoor applications i.e. bathrooms, furniture and solar mirrors. Silver-coated flat glass is applied on large sheets of glass and cut to size for cost effective fabrication.

The EPD is created as addition to the EPD Float glass, Laminated Safety and Coated Glass (EPD-GFEV-19.0). It can be used as an extension to following products:

- "Flat glass" (FG) refers to both uncoated and coated float glass. Float glass is a clear, flat soda lime silicate glass with parallel, fire-polished surfaces, in some cases bearing metal-oxide-based coatings to modify the radiation (thermal insulation and/or solar control) properties of the glass.

Product standards:

- Mirrors from silver-coated float glass for internal use: EN 1036

For detailed product descriptions and performance specifications please refer to the manufacturer specifications at [www.guardianglass.com](http://www.guardianglass.com) or product descriptions for the respective product.

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**Application**

Silver-coated flat glass for applications in buildings

- UltraMirror I is only used as interior applications in buildings.
- Mirror is used as interior applications in buildings as well as for specific solar mirror applications.

**Additional information**

For information and content of the EPD Float glass, Laminated Safety and Coated Glass (EPD-GFEV-19.0) visit [www.ift-service.de](http://www.ift-service.de)

## 2 Materials used

### 2.1 Primary products

**Primary products**

The main components of float glass, which consists of the naturally occurring raw materials sand (silicon carbonate, 59%), soda (sodium carbonate, 18%), dolomite (15%), lime (calcium carbonate, 4%), nepheline (3%), and sulphate (1%). The mass of the coating in relation to float glass with 4mm is estimated 1%.

For the process of Silver coating primary products as in 7.2 described are used.

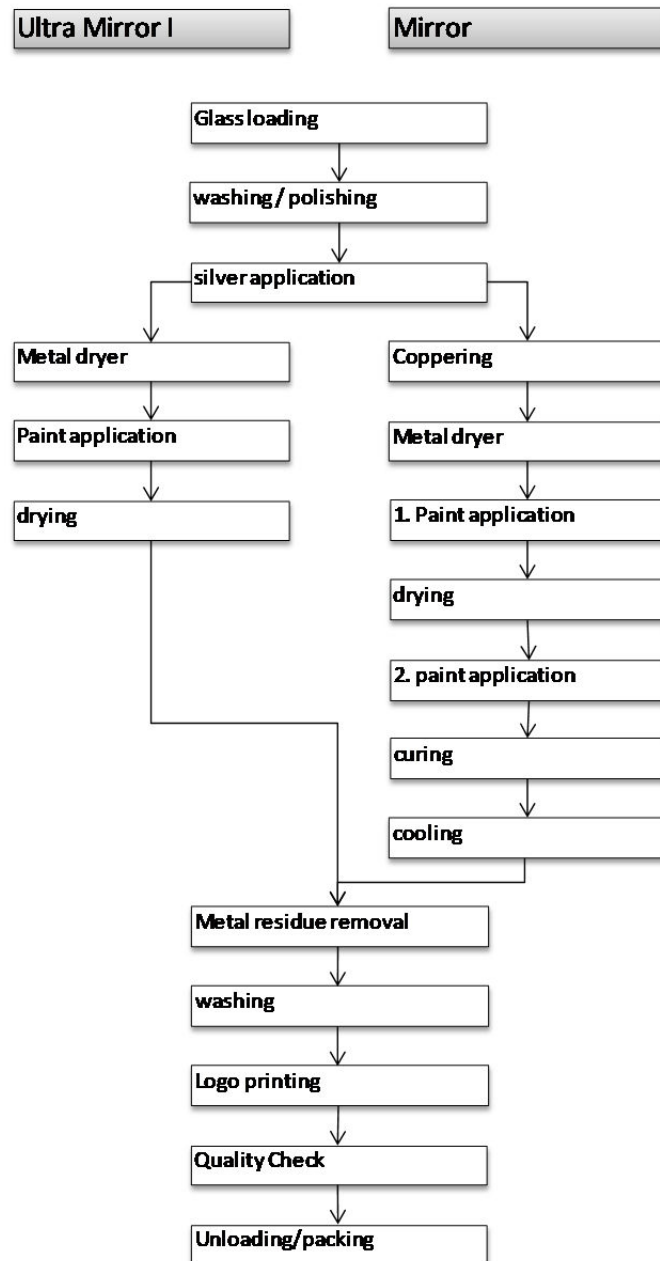
### 2.2 Declarable substances

**Declarable substances**

In accordance with the REACH candidate list, no substances of very high concern are contained. (Mirror: Declaration from November 2009 / Ultra Mirror: Declaration from July 2014).

### 3 Product stage

#### Product manufacture Wet coating process



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## 4 Construction stage

**Processing recommendations, installation** The mirror or UltraMirror I can be cut, grinded, polished or drilled. We recommend immediate cleansing after machining. Processing and installation guidelines must be applied

## 5 Use stages

**Emissions to the environment** No emissions to indoor air, water and soil known.

**B1 - B7** The use stage is not considered in this declaration.

## 6 End-of-life stage (not declared)

**Possible end-of-life stages** Mirror / Ultra Mirror is not specifically designed for reuse, although reuse is by all means possible.

The End-of-life stage of Mirror / Ultra Mirror can only be considered in combination with Flat glass. The End-of-life stage was not part of the LCA.  
All production waste generated during manufacture is internally recycled.

## 7 Life Cycle Assessment (LCA)

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

As the basis for this, an LCA was prepared for silver coating of flat glass. The LCA was developed in accordance with EN 15804 and the requirements set out by the international standards EN ISO 14040, 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.

### 7.1 Definition of goal and scope

**Goal** The goal of the LCA is to demonstrate the environmental impacts of FG and TSG with a mirror application. As set out by EN 15804 the environmental impacts covered by the Environmental Product Declaration for the product stage on a cradle to gate approach. The LCA is calculated for an EPD as addition to the EPD Float glass, Laminated Safety and Coated Glass (EPD-GFEV-19.0).

**Data quality and data availability, also geographical and time-related system boundaries** The production-specific data for silver coating of flat glass originate from data collected at the production plant. The average values determined are based on the volumes produced by the plants.

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The base data for the coating consist of data collected in 2013 for the geographical area of Europe and is corresponding to current production. The quantity data for the raw materials, energy and ancillary materials used are annual averages. Data were additionally collected by the **ift** Rosenheim in 2014 in order to verify representativeness. Therefore data was collected from production sites in Dudelange (LUX), Llodio (ESP) und Oroshaza (HUN).

The life cycle of the coating was modelled using the sustainability software tool "GaBi 6" for the development of Life Cycle Assessments. All relevant background datasets for the production of Mirror / Ultra Mirror are taken from the database of the software tool "GaBi 6".

The databases were last updated in 2015. Data before this date also originate from this database and are not more than 4 years old. No other generic data were used for the calculation.

To cover all European Union members, for all life cycle phases were used preferably generic data records for Europe (e.g. "power mix EU-27"). If no European records were existed, German or global records were used.

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

#### **Scope and system boundaries**

The system boundaries refer to all process steps for the manufacturing plants, from the extraction of the raw materials to the dispatch of the product, ready for shipment, from the production gate.

Due to the wide range of possible applications and designs, the use stage and the End-of-life stage are not included in the calculation.

#### **Cut-off criteria**

All operating data collected, i.e. all raw materials used by composition, the electrical energy consumed, internal consumption of ancillary materials, all production waste which can be directly attributed to the product, and all available emissions data from the plants, were included in the LCA.

Building sections/parts of facilities that are not relevant to the manufacture of the product were excluded.

The average weighted transport distances of the primary products/pre-products to the various manufacturing plants were not taken into account.

It can be assumed that the total of negligible processes per life cycle stage does not exceed 5 percent. The life cycle calculation also includes material and energy flows that account for less than 1 percent.

## **7.2 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.

The models of the unit processes used for the LCA have been documented in a transparent manner.

#### **Life cycle stages**

Product stage A1, A3.

#### **Benefits**

No benefits are taken into account.

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**Allocation procedures** In the product stage of Mirror / Ultra Mirror no Co-product occurs.

**Allocation of co-products**

**Allocations for reuse, recovery and recycling** There is no allocation for reuse, recovery and recycling declared

**Allocations based on life cycle boundaries** It is not possible to quantify that a certain amount of secondary material is used in the product stage. Since the End-of-life stage is not taken into account, a credit in D can't be awarded.

**Inputs**

The LCA includes the following production-relevant inputs:

**Energy**

The electricity mix is based on "European electricity mix".  
Gas is based on "EU-27: Thermal Energy from natural gas".

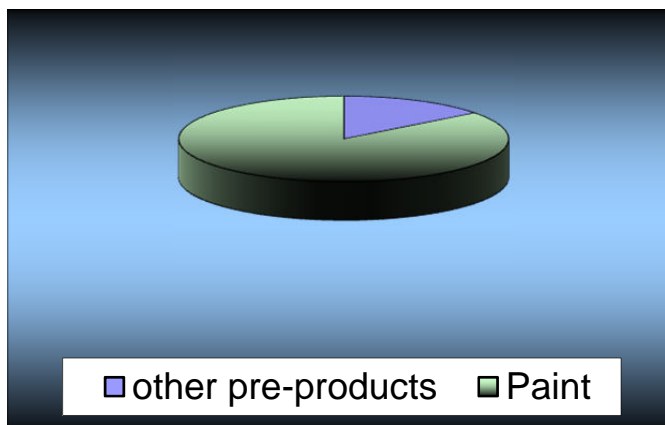
**Water**

For water the following European mix is used:  
"EU-27: Tap water; water purification treatment; production mix, at plant; from surface water (en)".

For further information: The consumption of fresh water specified in Section 7.3 originates (among others) from the upstream processes of the primary products/pre-products.

**Raw material/primary products/pre-products:**

The chart below shows the percentage of raw materials/pre-products used.



**Figure 1: raw materials Mirror / Ultra Mirror**

No.	Material	Masse in %
1	Other pre-products	14.8
2	Paint	85.2

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#### Ancillary materials and consumables:

0.223 kg ancillary materials and consumables are required for 1 m<sup>2</sup> of Mirror / Ultra Mirror. Share in % is given below:

No.	Material	Mass in %
5	Sulphuric Acid	35.3
1	Xylene	20.7
6	Sodium Hydroxide solution (caustic soda)	14.8
8	Ammonium-hydroxide	9.9
9	others	19.3

#### Outputs

The LCA includes the production-relevant outputs for silver coating per 1 m<sup>2</sup> of Mirror / Ultra Mirror are given below:

#### Waste

Secondary raw materials were included in the benefits.  
See Section 7.3 - Impact assessment

#### Waste water

0.022 m<sup>3</sup> waste water is produced for the manufacture of 1 m<sup>2</sup> of Mirror / Ultra Mirror

### 7.3 Impact assessment

#### Goal

Impact assessment covers inputs and outputs. The impact categories applied are set out below:

#### Impact categories

The characterisation factors of the ELCD (European Reference Life Cycle Database) were used. The characterisation factors for the consumption of abiotic resources were taken from CML (Institute of Environmental Sciences, Faculty of Science, Leiden University, Netherlands).

- Abiotic depletion - fossil resources (ADP - fossil fuels.)
- Abiotic depletion - non-fossil resources (ADP - elements);
- Acidification of soil and water;
- Ozone depletion;
- Global warming;
- Eutrophication;
- Photochemical ozone creation.



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**Wastes**

The waste generated during the production of 1 m<sup>2</sup> of Mirror / Ultra Mirror is evaluated and shown separately for each of the three main fractions, namely 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 primary products/pre-products. Radioactive waste results from the generation of electricity. The wastes presented are generated throughout the entire product life cycle.

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<b>Results per m<sup>2</sup> silver coating for flat glass</b>		
<b>Environmental impacts</b>	<b>Unit</b>	<b>A1, A3</b>
Global warming potential (GWP 100)	kg CO <sub>2</sub> equiv.	2.03
Ozone depletion potential (ODP)	kg R11-equiv.	1.25E-08
Acidification potential of soil and water (AP)	kg SO <sub>2</sub> equiv.	0.01
Eutrophication potential (EP)	kg PO <sub>4</sub> <sup>3-</sup> equiv.	8.65E-04
Photochemical ozone creation potential (POCP)	kg C <sub>2</sub> H <sub>4</sub> equiv.	7.73E-04
Abiotic depletion potential - non-fossil resources (ADP - elements)	kg Sb- equiv.	1.53E-04
Abiotic depletion potential - fossil resources (ADP – fossil fuels)	MJ and Hz.	28.17
<b>Use of resources</b>	<b>Unit</b>	
Use of renewable primary energy - excluding renewable primary energy resources used as raw materials	MJ	5.14
Use of renewable primary energy resources used as raw materials (material use)	MJ	0.00
Total use of renewable primary energy resources (primary energy and renewable primary energy resources used as raw materials) (energy + material use)	MJ	5.14
Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials.	MJ	36.14
Use of non-renewable primary energy resources used as raw materials (material use)	MJ	0.00
Total use of non-renewable primary energy resources (primary energy and non-renewable primary energy resources used as raw materials) (energy + material use)	MJ	36.14
Use of secondary materials	kg	0.00
Use of renewable secondary fuels	MJ	0.00
Use of non-renewable secondary fuels	MJ	0.00
Use of net fresh water	m <sup>3</sup>	0.05

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Waste categories	Unit	A1, A3
Hazardous waste disposed	kg	1.17E-05
Non-hazardous waste disposed (municipal waste)	kg	0.10
Radioactive waste	kg	3.14E-03
Output material flows	Unit	A1, A3
Components for re-use	kg	-
Materials for recycling	kg	-
Materials for energy recovery	kg	-
Exported energy	MJ	-

## 7.4 Interpretation, LCA presentation and critical verification

### Interpretation

All relevant and necessary items as per EN ISO 14040 and EN ISO 14044 were included in the LCA. It can therefore be assumed that the LCA is suitable, without restriction, for use in the Environmental Product Declaration for Mirror / Ultra Mirror.

**The environmental impacts shown are suitable for the certification of buildings.**

### Report

The LCA report was prepared in accordance with the requirements of EN ISO 14040, EN ISO 14044, EN 15804 and ISO 14025.

The results of the study are not designed to be used for comparative statements intended for publication.

The results and conclusions reported to the target group are complete, correct, without bias and transparent.

The report is not addressed to third parties due to confidential information contained in the report.

### Critical verification

The LCA was critically verified by the independent and external verifier Patrick Wortner, MBA and Eng., Dipl.-Ing. (FH).

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## 8 General information regarding the EPD

### Comparability

This EPD was prepared in accordance with EN 15804 and is therefore only comparable to those EPDs that also comply with EN 15804.  
Any comparison must be based on reference to the building context and the fact that the same boundary conditions were considered in the various life cycle stages.  
For a comparison of EPDs for construction products the rules as per EN 15804 (Clause 5.3) apply.

### Communication

The communications format of this EPD meets the requirements of EN 15942:2011 and is therefore the basis for B2B communication. Only the nomenclature has been changed according to EN 15804.

### Verification

Verification of the Environmental Product Declaration is documented in accordance with the **ift** Guideline "Guidance on Preparing Type III Environmental Product Declarations" in accordance with the requirements set out in ISO 14025.

The European standard EN 15804 serves as the core PCR <sup>a</sup> .
Independent verification of the declaration according to EN ISO 14025:2010 <input type="checkbox"/> internal <input checked="" type="checkbox"/> external
Independent third party verifier Patrick Wortner
<sup>a</sup> Product category rules <sup>b</sup> Voluntary for the exchange of information within trade, obligatory for the exchange of information between trade and consumer (see ISO 14025:2010, 9.4)

### Revisions of this document

No.	Date	Status note	Creator	Verifier
1	25.06.2015	First internal verification and approval	F. Stich	F. Stöhr
2	21.07.2016	Adaption based on EPD-GFEV-19.0 and external verification	F. Stich	P. Wortner
3	21.08.2019	Review	V. Zwick	P. Wortner
4				
5				

**Bibliography:**

- [1] Ökologische Bilanzierung von Baustoffen und Gebäuden – Wege zu einer ganzheitlichen Bilanzierung.  
Hrsg.: Eyerer, P.; Reinhardt, H.-W.  
Birkhäuser Verlag, Basel, 2000
- [2] Leitfaden Nachhaltiges Bauen.  
Hrsg.: Bundesministerium für Verkehr, Bau- und Wohnungswesen  
Berlin, 2013
- [3] GaBi 6: Software und Datenbank zur Ganzheitlichen Bilanzierung.  
Hrsg.: IKP Universität Stuttgart und PE Europe GmbH  
Leinfelden-Echterdingen, 1992 – 2014
- [4] „Ökobilanzen (LCA)“.  
Klöpffer, W.; Grahl, B.  
Wiley-VCH-Verlag, Weinheim, 2009
- [5] EN 15804:2012+A1:2013  
Nachhaltigkeit von Bauwerken – Umweltdeklarationen für Produkte – Regeln für Produktkategorien.  
Beuth Verlag GmbH, Berlin
- [6] EN 15942:2011  
Nachhaltigkeit von Bauwerken – Umweltproduktdeklarationen – Kommunikationsformate zwischen Unternehmen  
Beuth Verlag GmbH, Berlin
- [7] ISO 21930:2007-10  
Hochbau – Nachhaltiges Bauen – Umweltproduktdeklarationen von Bauprodukten  
Beuth Verlag GmbH, Berlin
- [8] Leitfaden zur Planung und Ausführung der Montage von Fenstern und Haustüren.  
Hrsg.: RAL-Gütegemeinschaft Fenster und Haustüren e.V.  
Frankfurt, 2010
- [9] EN ISO 14025:2011-10  
Umweltkennzeichnungen und -deklarationen Typ III Umweltdeklarationen – Grundsätze und Verfahren.  
Beuth Verlag GmbH, Berlin
- [10] EN ISO 16000-9:2006-08  
Innenraumluftverunreinigungen – Teil 9: Bestimmung der Emissionen von flüchtigen organischen Verbindungen aus Bauprodukten und Einrichtungsgegenständen – Emissionsprüfkammer-Verfahren.  
Beuth Verlag GmbH, Berlin
- [11] EN ISO 16000-11:2006-06  
Innenraumluftverunreinigungen – Teil 11: Bestimmung der Emissionen von flüchtigen organischen Verbindungen aus Bauprodukten und Einrichtungsgegenständen – Probenahme, Lagerung der Proben und Vorbereitung der Prüfstücke.  
Beuth Verlag GmbH, Berlin
- [12] DIN ISO 16000-6:2004-12  
Innenraumluftverunreinigungen – Teil 6: Bestimmung von VOC in der Innenraumluft und in Prüfkammern, Probenahme auf TENAX TA®, thermische Desorption und Gaschromatografie mit MS/FID.  
Beuth Verlag GmbH, Berlin
- [13] DIN EN ISO 14040:2009-11  
Umweltmanagement – Ökobilanz – Grundsätze und Rahmenbedingungen.

Beuth Verlag GmbH, Berlin

- [14] DIN EN ISO 14044:2006-10  
Umweltmanagement – Ökobilanz – Anforderungen und Anleitungen.  
Beuth Verlag GmbH, Berlin
- [15] prEN 14351-2:2009-05  
Fenster und Türen – Produktnorm, Leistungseigenschaften – Teil 2:  
Innentüren ohne Feuerschutz- und/oder Rauchdichtheitseigenschaften.  
Beuth Verlag GmbH, Berlin
- [16] prEN 16034:2010-01  
Fenster, Türen und Tore – Produktnorm, Leistungseigenschaften –  
Feuer- und/oder Rauchschutzeigenschaften.  
Beuth Verlag GmbH, Berlin
- [17] DIN EN 12457-1:2003-01  
Charakterisierung von Abfällen – Auslaugung;  
Übereinstimmungsuntersuchung für die Auslaugung von körnigen Abfällen  
und Schlämmen – Teil 1: Einstufiges Schüttelverfahren mit einem  
Flüssigkeits-/Feststoffverhältnis von 2 l/kg und einer Korngröße unter  
4 mm (ohne oder mit Korngrößenreduzierung).  
Beuth Verlag GmbH, Berlin
- [18] DIN EN 12457-2:2003-01  
Charakterisierung von Abfällen – Auslaugung;  
Übereinstimmungsuntersuchung für die Auslaugung von körnigen Abfällen  
und Schlämmen – Teil 2: Einstufiges Schüttelverfahren mit einem  
Flüssigkeits-/Feststoffverhältnis von 10 l/kg und einer Korngröße unter  
4 mm (ohne oder mit Korngrößenreduzierung).  
Beuth Verlag GmbH, Berlin
- [19] DIN EN 12457-3:2003-01  
Charakterisierung von Abfällen – Auslaugung;  
Übereinstimmungsuntersuchung für die Auslaugung von körnigen Abfällen  
und Schlämmen – Teil 3: Zweistufiges Schüttelverfahren mit einem  
Flüssigkeits/Feststoffverhältnis von 2 l/kg und 8 l/kg für Materialien mit  
hohem Feststoffgehalt und einer Korngröße unter 4 mm (ohne oder mit  
Korngrößenreduzierung).  
Beuth Verlag GmbH, Berlin
- [20] DIN EN 12457-4:2003-01  
Charakterisierung von Abfällen – Auslaugung;  
Übereinstimmungsuntersuchung für die Auslaugung von körnigen Abfällen  
und Schlämmen – Teil 4: Einstufiges Schüttelverfahren mit einem  
Flüssigkeits-/Feststoffverhältnis von 10 l/kg für Materialien mit einer  
Korngröße unter 10 mm (ohne oder mit Korngrößenreduzierung).  
Beuth Verlag GmbH, Berlin
- [21] DIN EN 13501-1:2010-01  
Klassifizierung von Bauprodukten und Bauarten zu ihrem Brandverhalten –  
Teil 1: Klassifizierung mit den Ergebnissen aus den Prüfungen zum  
Brandverhalten von Bauprodukten.  
Beuth Verlag GmbH, Berlin
- [22] DIN EN 14351-1:2010-08  
Fenster und Türen – Produktnorm, Leistungseigenschaften – Teil 1:  
Fenster und Außentüren ohne Eigenschaften bezüglich Feuerschutz  
und/oder Rauchdichtheit.  
Beuth Verlag GmbH, Berlin
- [23] DIN 4102-1:1998-05  
Brandverhalten von Baustoffen und Bauteilen – Teil 1: Baustoffe; Begriffe,

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Anforderungen und Prüfungen.  
Beuth Verlag GmbH, Berlin

- [24] OENORM S 5200:2009-04-01  
Radioaktivität in Baumaterialien.  
Beuth Verlag GmbH, Berlin
- [25] DIN/CEN TS 14405:2004-09  
Charakterisierung von Abfällen – Auslaugungsverhalten –  
Perkulationsprüfung im Aufwärtsstrom (unter festgelegten Bedingungen).  
Beuth Verlag GmbH, Berlin
- [26] VDI 2243:2002-07  
Recyclingorientierte Produktentwicklung.  
Beuth Verlag GmbH, Berlin
- [27] Richtlinie 2009/2/EG der Kommission  
zur 31. Anpassung der Richtlinie 67/548/EWG des Rates zur Angleichung  
der Rechts- und Verwaltungsvorschriften für die Einstufung, Verpackung  
und Kennzeichnung gefährlicher Stoffe an den technischen Fortschritt  
(15. Januar 2009)
- [28] ift-Richtlinie NA-01/3  
Allgemeiner Leitfaden zur Erstellung von Typ III Umweltprodukt-  
deklarationen.  
ift Rosenheim, August 2014
- [29] Arbeitsschutzgesetz – ArbSchG  
Gesetz über die Durchführung von Maßnahmen des Arbeitsschutzes zur  
Verbesserung der Sicherheit und des Gesundheitsschutzes der  
Beschäftigten bei der Arbeit, 5. Februar 2009 (BGBl. I S. 160, 270)
- [30] Bundesimmissionsschutzgesetz – BImSchG  
Gesetz zum Schutz vor schädlichen Umwelteinwirkungen durch  
Luftverunreinigungen, Geräusche, Erschütterungen und ähnlichen  
Vorgängen, 26. September 2002 (BGBl. I S. 3830)
- [31] Chemikaliengesetz – ChemG  
Gesetz zum Schutz vor gefährlichen Stoffen  
Unterteilt sich in Chemikaliengesetz und eine Reihe von Verordnungen;  
hier relevant: Gesetz zum Schutz vor gefährlichen Stoffen, 2. Juli 2008  
(BGBl. I S.1146)
- [32] Chemikalien-Verbotsverordnung – ChemVerbotsV  
Verordnung über Verbote und Beschränkungen des Inverkehrbringens  
gefährlicher Stoffe, Zubereitungen und Erzeugnisse nach dem  
Chemikaliengesetz, 21. Juli 2008 (BGBl. I S. 1328)
- [33] Gefahrstoffverordnung – GefStoffV  
Verordnung zum Schutz vor Gefahrstoffen, 23. Dezember 2004  
(BGBl. I S. 3758)
- [34] „PCR Flachglas im Bauwesen. Product Category Rules nach ISO 14025  
und EN 15804“.  
ift Rosenheim, Januar 2013
- [35] Forschungsvorhaben „EPDs für transparente Bauelemente“.  
ift Rosenheim, 2011

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**A5 Construction/Installation – not considered, informative module**

No.	Scenario	Description
A5	Disposal packaging	Output substances following waste treatment on site.
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
Plastic		3,17E-03



## **Imprint**

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### **notes**

This EPD is mainly based on the work and findings of the Institut für Fenstertechnik e.V., Rosenheim (**ift** Rosenheim) and specifically on the **ift**-Guideline NA.01/1 – Guidance on the Preparation of Type III Environmental Product Declarations.

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### **Layout**

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