ENVIRONMENTAL PRODUCT DECLARATION

as per *ISO 14025* and *EN 15804+A2*

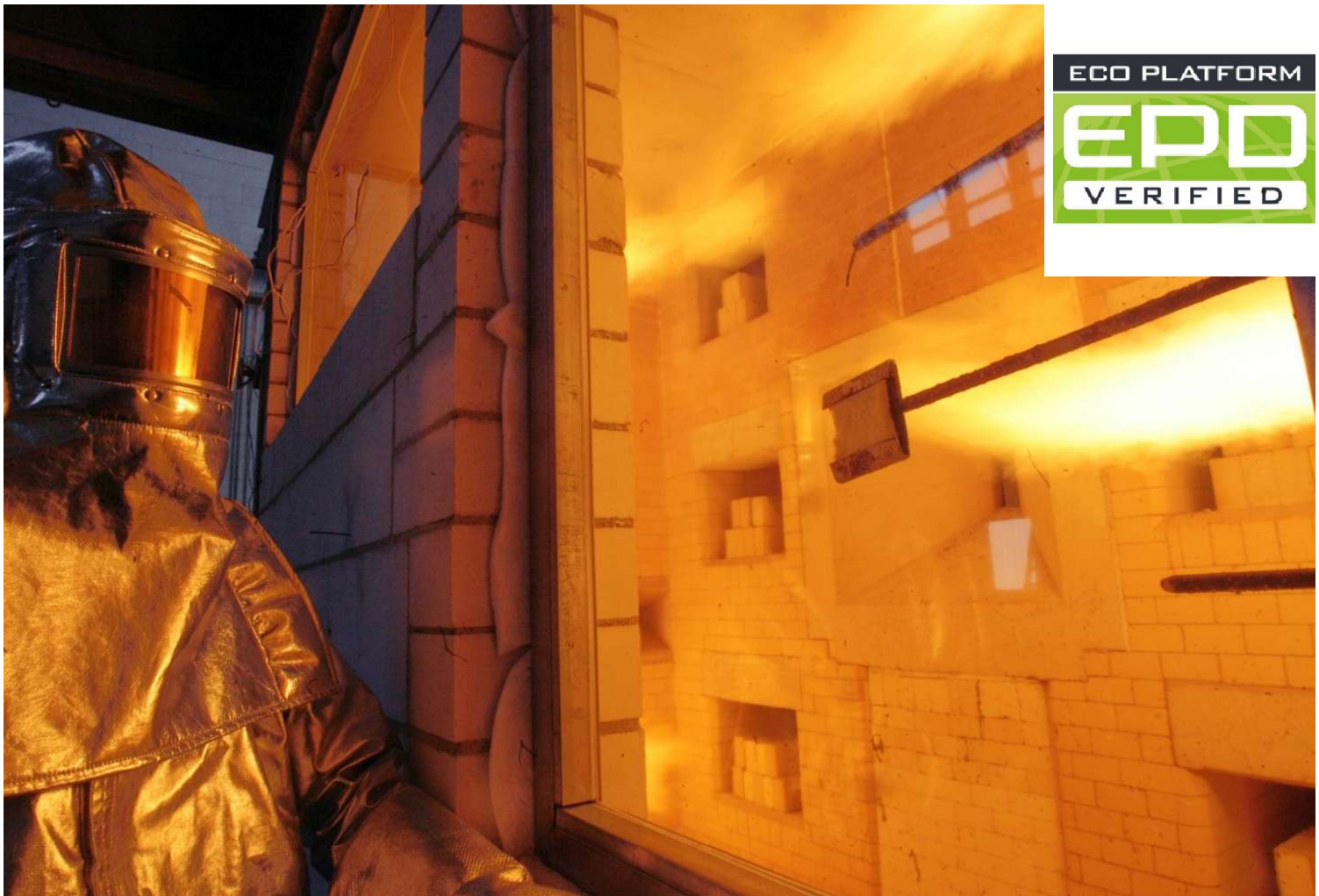
Owner of the Declaration	SCHOTT Technical Glass Solutions GmbH
Publisher	Institut Bauen und Umwelt e.V. (IBU)
Programme holder	Institut Bauen und Umwelt e.V. (IBU)
Declaration number	EPD-SCH-20230336-IBA1-EN
Issue date	19.08.2024
Valid to	18.08.2029

PYRAN® PLATINUM

SCHOTT Technical Glass Solutions GmbH

Institut Bauen und Umwelt e.V.

www.ibu-epd.com | https://epd-online.com



ECO PLATFORM EPD VERIFIED

1. General Information

SCHOTT Technical Glass Solutions GmbH

Programme holder

IBU – Institut Bauen und Umwelt e.V.
Hegelplatz 1
10117 Berlin
Germany

Declaration number

EPD-SCH-20230336-IBA1-EN

This declaration is based on the product category rules:

Plate glass for construction and interlayers, 01.08.2021
(PCR checked and approved by the SVR)

Issue date

19.08.2024

Valid to

18.08.2029

Dipl.-Ing. Hans Peters
(Chairman of Institut Bauen und Umwelt e.V.)

Florian Pronold
(Managing Director Institut Bauen und Umwelt e.V.)

PYRAN® PLATINUM

Owner of the declaration

SCHOTT Technical Glass Solutions GmbH
Otto-Schott-Strasse 13
07745 Jena
Germany

Declared product / declared unit

The declared unit is 1m² in 5 mm thickness with a weight of 12,7 kg.

Scope:

The declaration refers to 1 m² glass ceramic of PYRAN® Platinum of SCHOTT Technical Glass Solutions GmbH. It is a specific product of two production sites. The production sites are located in Jena and Mainz, Germany.
The data used for the calculation of the life cycle assessment orginate from SCHOTT Technical Glass Solutions GmbH of the fiscal year 2020.
The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

The EPD was created according to the specifications of EN 15804+A2. In the following, the standard will be simplified as *EN 15804*.

Verification

The standard EN 15804 serves as the core PCR
Independent verification of the declaration and data according to ISO 14025:2011
☐ internally ☒ externally

Christina Bocher,
(Independent verifier)

2. Product

2.1 Product description/Product definition

PYRAN® Platinum fire-protection-rated glazing material is made from a transparent glass-ceramic with a thickness of 3/16' (5 mm).
It is intended for use in non-impact, non-safety-rated locations such as transoms and windows with fire-rating requirements of up to 90 minutes. For
the placing on the market of the product in the European Union/European Free Trade Association (EU/EFTA) (with the exception of Switzerland) Regulation (EU) No. 305/2011 (CPR) applies. The product needs a declaration of performance taking into consideration *EN 1748-2:2004*.

For the application and use the respective national provisions apply.

2.2 Application

PYRAN® Platinum fire-protection-rated glazing material is made from a transparent glass-ceramic. It is intended for use in non-impact, non-safety-rated locations such as transoms and windows with fire-rating requirements. Offering fire protection for up to 90 minutes in windows and 180 minutes in doors, the glass-ceramic also remains clear under intense thermal loads, giving a building's occupants essential vision and time to exit a building in an emergency.
UL-certified, the glass-ceramic is also available in filmed and laminated versions for added impact resistance.

2.3 Technical Data

Constructional data

Name	Value	Unit
Heat transfer coefficient acc. to DIN EN 673	5.7	W/(m^{2}K)
Total energy transmittance acc. to DIN EN 410	82	%
Light transmission level acc. to DIN EN 410	87	%
Airborne sound reduction acc. to DIN EN 20140-3 (optional)	31	dB

Performance data of the product according to the harmonised standards, based on provisions for harmonization.

2.4 Delivery status

PYRAN® Platinum has the thickness of 5 mm. The max. dimensions are 51x99 (1295 mm x 2514 mm).

2.5 Base materials/Ancillary materials

Base materials

Name	Value	Unit
SiO2	65,8	%
Al2O3	22,0	%
Li2O	4,0	%
Rest (other oxides)	8,2	%

PYRAN® Platinum meets environmental requirement and is produced without the hazardous heavy metals antimony or arsenic.

This product/article/at least one partial article contains substances listed in the candidate list (date:2022/11/22) exceeding 0.1 percentage by mass:
no
This product/article/at least one partial article contains other CMR substances in categories 1A or 1B which are not on the candidate list, exceeding 0.1 percentage by mass:
no

Biocide products were added to this construction product or it has been treated with biocide products (this then concerns a treated product as defined by the (EU) Ordinance on Biocide Products No. 528/2012):
no

2.6 Manufacture

2.7 Environment and health during manufacturing

SCHOTT Technical Glass Solutions GmbH is certified according to *ISO 9001*, *ISO 14001* and *ISO 50001*. All types of SCHOTT fire-resistant glass is CE-certified and classified in accordance with *EN 13501-2*. PYRAN® Platinum is classified and labelled by Underwriters Laboratories, Inc.® and Underwriters Laboratories of Canada. Fire windows are tested according to NFPA 257 or UL 9, while fire doors are tested according to NFPA 252, UL 10B or UL 10C. For fire windows installed in areas subject to human impact, PYRAN® Platinum F and PYRAN® Platinum L meet *CPSC 16 CFR 1201* impact requirements. All fire windows and doors are installed according to *NFPA 80*.

2.8 Product processing/Installation

Installation of the construction site is carried out by experienced fitters specially trained in the processing of fire resistant glazing systems.

2.9 Packaging

Polyethylene (PE) Packaging foil
Wooden crates
The packaging materials are thermally recycled.

2.10 Condition of use

Condition for long-term service life is regular cleaning and maintenance of the product.

2.11 Environment and health during use

No emissions are produced during the service life, so no adverse health effects are to be expected. There are no hazards for ground, air and water.

2.12 Reference service life

A product service life of 50 years is given for PYRAN® Platinum *BNB 2017*. The specified service life is independent of the manufactures warranty.
The practical service life may be longer. Conditions for this long-term service life here are regular maintenance for the product.

2.13 Extraordinary effects

Fire

Fire protection
Specification of the building material class according to *EN 13501–1*.

Name	Value
Building material class	A1
Burning droplets	
Smoke gas development	

Water
There are no known negative impacts to the enviroment from exposure to fooding. No substances are released.

Mechanical destruction
No hazardous substances are released in the event of unforeseen mechanical destruction.

2.14 Re-use phase
After the service life the glass can be given to the disposer for recycling.

2.15 Disposal
The operator has the option of returning the glass to a disposal company for recycling with a credit note. For this purpose, the glass must be separated by type.
The waste code according to the European waste list is: 17 02 02: glass.

2.16 Further information
Further information and documentation on the product can be found on the Internet and at the following address:www.schott.com/en-ca/markets/architecture/fire-and-safety

3. LCA: Calculation rules

3.1 Declared Unit
The declared unit is 1 m² in 5 mm thick with a total weight of 12.7 kg.
The results are linear scalable to other product thicknesses as valid approximations. For this purpose the scaling factor (0.17) must be multiplied by the specific thickness.

For example:
94.6 kg CO_2 eqv. x 0.17 x 15mm > 241 kg CO_2 eqv.

Declared unit and mass reference

Name	Value	Unit
Declared unit	1	m^2
Grammage	12.7	kg/m^2
Scaling factor (m²/mm)	0.20	m²/mm
conversion factor (m²/kg)	0.079	-
Layer thickness	0.05	m

3.2 System boundary
Type of EPD: "Cradle to gate" - with options: A5.

In the EPD, the following life cycle stages are taken into account:
- Product stage (A1-A3): Raw material supply, packaging production, transport of raw materials, production
- Construction stage (A5): Packaging disposal
- Disposal stage (C-Module): C1 manual removal (not relevant for LCA); C2 Transport to disposal (50 km by truck); C3 no expenditure; C4 inert material landfill
- Potential benefits and burdens outside the system boundaries (D): Energy credit from thermal recovery from A5.

Installation into the building is not considered in this EPD.

For the environmental impact, the use of green electricity was calculated taking into account the residual electricity mix for there maining electricity. The proportion of the electricity demand covered by green electricity in the total electricity demand is 100%.

3.3 Estimates and assumptions
A landfill disposal after use is assumed for the product. The incineration of production residues (A3) and packaging waste (A5) generates electricity and thermal energy, which is credited in module D (R1 value >0,6).

3.4 Cut-off criteria
All data from the data collection, i.e. all raw materials, thermal energy and electricity consumption is taken into account. No measurements of the emissions are done on site. The specific emissions associated with the provision of thermal and electrical energy are taken into account in the upstream energy supply chains. It can be assumed that further emissions that occur during production are marginal and neglectable. For all input materials and relevant outputs the specific transport distances are considered.
The manufacture of the machinery, equipment and other infrastructure required for the production of the product on site is not taken into account in the life cycle assessment. No air pollutants were neglected that have a harmful effect on the environment.

3.5 Background data
In order to model the life cycle of the declared product the software system developed by Sphera for LCA is used *LCA FE and MLC*. All background data is valid for the years 2018 to 2021.
The data required for the upstream chain is taken from the MLC database.

3.6 Data quality
The data quality for the modelling can be considered as good. Corresponding data sets are available in the MLC database for all materials.
All data are reproducible and traceable. The data sets used are representative in terms of the geographical, temporal and technological coverage.

3.7 Period under review
The data collection for the product is carried out by SCHOTT Technical Glass Solutions GmbH at the sites Jena and Mainz (Germany) for the production year 2020. The production of the raw PYRAN product takes place in Jena, the ceramisation process is conducted in Mainz.

3.8 Geographic Representativeness
Land or region, in which the declared product system is manufactured, used or handled at the end of the product´s lifespan: North America

3.9 Allocation
No allocations are done in the present study.

3.10 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to *EN 15804* and the building context, respectively the product-specific characteristics of performance, are taken into account.
The background database is the MLC CUP2022.2 (formerly GaBi).

4. LCA: Scenarios and additional technical information

Characteristic product properties of biogenic carbon

Information on describing the biogenic carbon content at factory gate

Name	Value	Unit
Biogenic carbon content in product	-	kg C
Biogenic carbon content in accompanying packaging	1.34	kg C

Note: 1 kg of biogenic carbon is equivalent to 44/12 kg of CO_2.

The scenarios for module A5 and module C4 are described in detail below.

Installation into the building (A5)

Name	Value	Unit
Packaging waste: wood	2,98	kg
Packaging waste: paper	0,33	kg

End of life (C1-C4)

Name	Value	Unit
Landfilling	12.7	kg

The packaging, mainly wooden crates, is thermally treated. The resulting potential credit in the form of generated electricity and thermal energy is taken into account in module D.

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5. LCA: Results

In the following, the results of the indicators of impact assessment, resource use, waste and other output flows for the declared product PYRAN PLATINUM ® are presented. The results are based on an area of 1 m², the typical thickness of 5 mm with a weight of 12.7 kg/m². The results can be scaled linearly to the thickness.

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

Product stage			Construction process stage		Use stage							End of life stage				Benefits and loads beyond the system boundaries
Raw material supply	Transport	Manufacturing	Transport from the gate to the site	Assembly	Use	Maintenance	Repair	Replacement	Refurbishment	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	MND	X	MND	MND	MNR	MNR	MNR	MND	MND	X	X	X	X	X

RESULTS OF THE LCA - ENVIRONMENTAL IMPACT according to EN 15804+A2: 1m² PYRAN PLATINUM; 12.7 kg/m2; thickness: 5 mm

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
GWP-total	kg CO_2 eq	2.54E+01	4.99E+00	0	3.76E-02	0	1.87E-01	-2.06E+00
GWP-fossil	kg CO_2 eq	3.02E+01	1.11E-01	0	3.73E-02	0	1.87E-01	-2.04E+00
GWP-biogenic	kg CO_2 eq	-4.81E+00	4.88E+00	0	1.68E-04	0	-3.29E-05	-1.5E-02
GWP-luluc	kg CO_2 eq	7.28E-03	2.06E-05	0	1.44E-04	0	3.44E-04	-3.56E-04
ODP	kg CFC11 eq	7.61E-11	8.36E-13	0	7.67E-15	0	4.43E-13	-2.14E-11
AP	mol H^+ eq	7.08E-02	1.11E-03	0	3.52E-05	0	1.32E-03	-2.01E-03
EP-freshwater	kg P eq	9.29E-05	2.01E-07	0	7.47E-08	0	3.17E-07	-4.37E-06
EP-marine	kg N eq	2.06E-02	3.18E-04	0	1.17E-05	0	3.38E-04	-7.31E-04
EP-terrestrial	mol N eq	2.39E-01	5.29E-03	0	1.39E-04	0	3.72E-03	-7.8E-03
POCP	kg NMVOC eq	5.43E-02	8.31E-04	0	3.15E-05	0	1.03E-03	-1.9E-03
ADPE	kg Sb eq	1.81E-05	2.05E-08	0	3.75E-09	0	1.92E-08	-5.06E-07
ADPF	MJ	4.62E+02	1.38E+00	0	4.96E-01	0	2.44E+00	-2.96E+01
WDP	m^3 world eq deprived	1.06E+00	6.06E-01	0	1.61E-04	0	2.04E-02	-2.53E-02

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 of tropospheric ozone photochemical oxidants; ADPE = Abiotic depletion potential for non-fossil resources; ADPF = Abiotic depletion potential for fossil resources; WDP = Water (user) deprivation potential)

RESULTS OF THE LCA - INDICATORS TO DESCRIBE RESOURCE USE according to EN 15804+A2: 1m² PYRAN PLATINUM; 12.7 kg/m2; thickness: 5 mm

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
PERE	MJ	6.15E+02	4.61E+01	0	3.27E-02	0	3.68E-01	-9.94E+00
PERM	MJ	4.57E+01	-4.57E+01	0	0	0	0	0
PERT	MJ	6.61E+02	3.91E-01	0	3.27E-02	0	3.68E-01	-9.94E+00
PENRE	MJ	4.62E+02	1.38E+00	0	4.97E-01	0	2.45E+00	-2.96E+01
PENRM	MJ	0	0	0	0	0	0	0
PENRT	MJ	4.62E+02	1.38E+00	0	4.97E-01	0	2.45E+00	-2.96E+01
SM	kg	0	0	0	0	0	0	0
RSF	MJ	0	0	0	0	0	0	0
NRSF	MJ	0	0	0	0	0	0	0
FW	m^3	3.52E-02	1.43E-02	0	2.53E-05	0	6.2E-04	-4.09E-03

PERE = Use of renewable primary energy excluding renewable primary energy resources used as raw materials; PERM = Use of renewable primary energy resources used as raw materials; PERT = Total use of renewable primary energy resources; PENRE = Use of non-renewable primary energy excluding non-renewable primary energy resources used as raw materials; PENRM = Use of non-renewable primary energy resources used as raw materials; 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 – WASTE CATEGORIES AND OUTPUT FLOWS according to EN 15804+A2: 1m² PYRAN PLATINUM; 12.7 kg/m2; thickness: 5 mm

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
HWD	kg	1.59E-07	1.48E-10	0	2.17E-12	0	1.26E-10	-5.16E-09
NHWD	kg	6.62E+00	4.94E-02	0	8.08E-05	0	1.25E+01	-1.73E-02
RWD	kg	4.43E-03	4.32E-05	0	6.24E-07	0	2.68E-05	-1.1E-03
CRU	kg	0	0	0	0	0	0	0
MFR	kg	0	0	0	0	0	0	0

MER	kg	0	0	0	0	0	0	0
EEE	MJ	0	6.97E+00	0	0	0	0	0
EET	MJ	0	1.64E+01	0	0	0	0	0

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 OF THE LCA – additional impact categories according to EN 15804+A2-optional: 1m² PYRAN PLATINUM; 12.7 kg/m2; thickness: 5 mm

Parameter	Unit	A1-A3	A5	C1	C2	C3	C4	D
PM	Disease incidence	1.37E-06	6E-09	0	2.28E-10	0	1.63E-08	-1.47E-08
IR	kBq U235 eq	4.64E-01	4.28E-03	0	6.35E-05	0	2.92E-03	-1.09E-01
ETP-fw	CTUe	3.82E+02	5.66E-01	0	3.8E-01	0	1.37E+00	-4.97E+00
HTP-c	CTUh	1.86E-07	3.93E-11	0	7.62E-12	0	2.09E-10	-3.14E-10
HTP-nc	CTUh	1.98E-05	1.51E-09	0	3.83E-10	0	2.31E-08	-1.42E-08
SQP	SQP	7.61E+02	4.35E-01	0	1.49E-01	0	5.31E-01	-6.74E+00

PM = Potential incidence of disease due to PM emissions; IR = Potential Human exposure efficiency relative to U235; ETP-fw = Potential comparative Toxic Unit for ecosystems; HTP-c = Potential comparative Toxic Unit for humans (cancerogenic); HTP-nc = Potential comparative Toxic Unit for humans (not cancerogenic); SQP = Potential soil quality index

Disclaimer 1 – for the indicator “Potential Human exposure efficiency relative to U235”. This impact category deals mainly with the eventual impact of low-dose ionizing radiation on human health of the nuclear fuel cycle. It does not consider effects due to possible nuclear accidents, occupational exposure or radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, radon and from some construction materials is also not measured by this indicator.

Disclaimer 2 – for the indicators “abiotic depletion potential for non-fossil resources”, “abiotic depletion potential for fossil resources”, “water (user) deprivation potential, deprivation-weighted water consumption”, “potential comparative toxic unit for ecosystems”, “potential comparative toxic unit for humans – cancerogenic”, “Potential comparative toxic unit for humans - not cancerogenic”, “potential soil quality index”. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high as there is limited experience with the indicator.

This EPD was created using a software tool.

6. LCA: Interpretation

In relation to the entire life cycle of the product, the manufacturing phase A1-A3 is the most environmentally relevant phase, accounting for >95% of the environmental impacts. Transport processes (A2, C2) and packaging disposal (A5) are of marginal importance for the environmental impact. Disposal to inert landfill (C4) also has a low impact. Minor potential credits (D) in the form of electricity and thermal energy arise from the thermal treatment of the packaging. The use of "green electricity" significantly reduces the consumption of fossil energy sources.

Within the production stage (A1-A3): In the majority of the impact categories, the glass precursor is of high importance for the environmental impact, with shares >50%. Exceptions are ADPe, EP fresh water and GWP biotic, where other raw materials or processes are significant. In the case of ADPe, electricity generation from wind power plays a major role. For EP freshwater, wastewater treatment is the significant contributor. In the case of biotic GWP, the disposal of paper packaging is the predominant cause.

7. Requisite evidence

According to the PCR, no evidences are required.

8. References

IBU Part A
PCR - Part A: Calculation Rules for the Life Cycle Assessment and Requirements on the Project Report according to EN 15804+A2:2019, version 2.1, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 2021

IBU Part B
Requirements on the EPD for Plate glass for construction and interlayers, version 01.01.0001, Institut Bauen und Umwelt e.V., www.bau-umwelt.com, 08/2021

LCA FE und MLC
MLC dataset documentation for the software system LCA FE and databases; LBP (University of Stuttgart) and Sphera Solutions GmbH, Leinfelden-Echterdingen, 2023, Version CUP2022.2 (formerly GaBi)

EN 15804
EN 15804:2012+A2:2019: Sustainability of construction works - Environmental Product Declarations - Core rules for the product category of construction products

EN 1748-2:2004
Glass in building, Special basic products,Glass ceramics

ISO 14001
Environmental management systems

ISO 50001
Energy management

NFPA 257
Standard on Fire Test for Window and Glass Block Assemblies

UL 9
Standard for Fire Tests of Window Assemblies

NFPA 252
Standard Methods of Fire Tests of Door Assemblies

UL 10B
Standard Methods of
Fire Tests of Door Assemblies

UL 10C
Standard for Positive Pressure Fire Tests of Door Assemblies

EN ISO 14025
EN ISO 14025:2011-10 Environmental labels and declarations - Type III environmental declarations - Principles and procedures

EN ISO 14040
EN ISO 14040:2009-11 Environmental management - Life cycle assessment - Principles and framework

EN ISO 14044
EN ISO 14044:2006-10 Environmental management - Life cycle assessment - Requirements and guidelines

REGULATION (EU) No 305/2011
OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 9 March 2011

DIN EN 673: 2011
Glass in building - Determination of thermal transmittance (U value)

DIN EN 410:2011
Glass in building - Determination of luminous and solar characteristics of glazing

DIN EN 20140-3
Acoustics - Measurement of sound insulation in buildings and of building elements - Part 3: Laboratory measurements of airborne sound insulation of building elements

BNB
(german) BBSR table 'Nutzungsdauern von Bauteilen zur Lebenszyklusanalyse nach BNB', Assessment system for sustainable building, Federal Institute for Research on Building, Urban Affairs and Spatial Development, Division II Sustainable Building; Available online at https://www.nachhaltigesbauen.de/austausch/nutzungsdauern-von-bauteilen/ (02/2017)

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