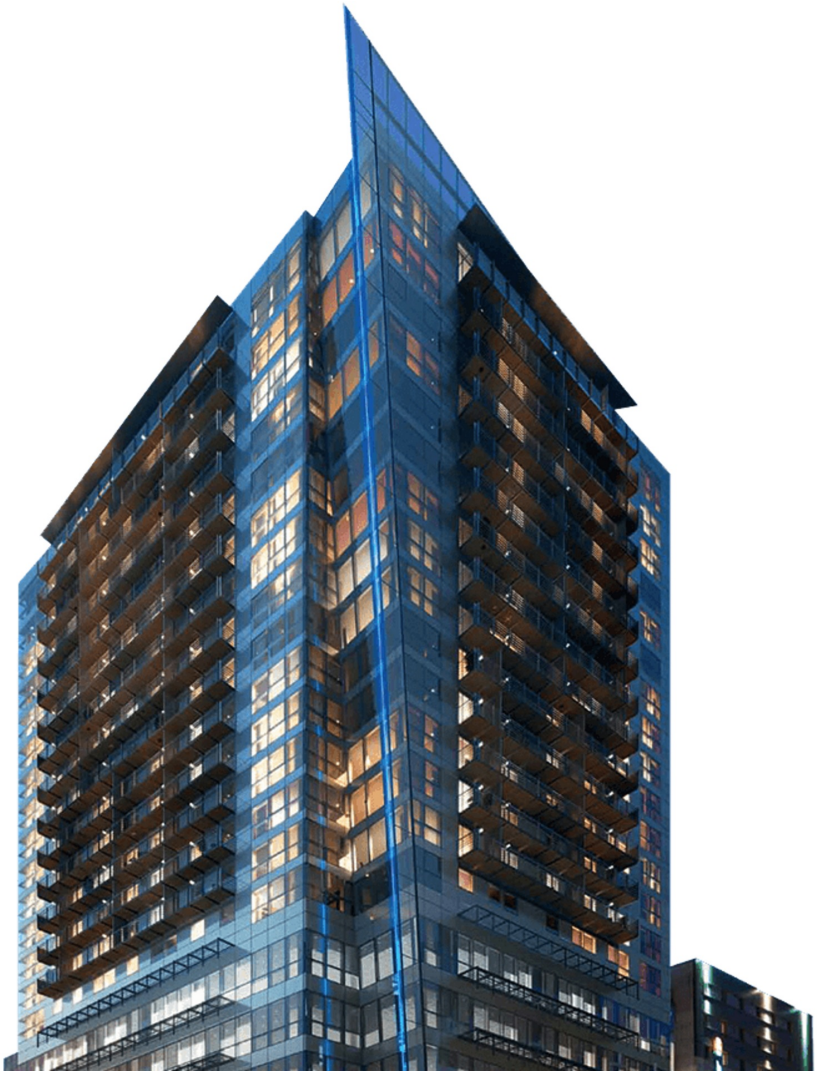
ENVIRONMENTAL PRODUCT DECLARATION

In accordance with ISO 14025 and EN15804+A2

Insulated glass unit 1m2 double glazed



Owner of the declaration:
CareyGlass

Product:
Insulated glass unit 1m2 double glazed

Declared unit:
1 m2

This declaration is based on Product Category Rules:
EN 15804:2012+A2:2019, EPD Ireland PCR Part A, Version 2.1, 2022
I.S. EN 17074; 2019 Glass in building - Environmental product declaration - Product category rules for flat glass products.

Program operator:
EPD Ireland - Irish Green Building Council

Declaration number:
EPDIE-24-190

Issue date:
03.03.2025

Valid to:
02.03.2030

General information

Product

Insulated glass unit 1m2 double glazed

Owner of the declaration:

CareyGlass
Contact person: Vicki Carey
Phone: 067 50700
e-mail: vcarey@careyglass.com

Program operator:

EPD Ireland - Irish Green Building Council
19 Mountjoy Square, Dublin D01 E8P5
Phone: +353 (01) 6815862
web: https://www.igbc.ie/epd-home/

Manufacturer:

CareyGlass

Declaration number:

EPDIE-24-190

Place of production:

CareyGlass
Limerick Road
E45XV81 Nenagh, Co. Tipperary, Ireland

This declaration is based on Product Category Rules:

EN 15804:2012+A2:2019, EPD Ireland PCR Part A, Version 2.1, 2022
I.S. EN 17074; 2019 Glass in building - Environmental product declaration - Product category rules for flat glass products.

Statement of liability:

The owner of the declaration shall be liable for the underlying information and evidence. The EPD Program operator shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

Type of EPD

Specific product EPD

Issue date:

03.03.2025

Declared unit:

1 m2 Insulated glass unit 1m2 double glazed

Valid to:

02.03.2030

Scope of the EPD:

A1,A2,A3,A4,A5,C1,C2,C3,C4,D

Year of study:

Functional unit:

1 m2 insulated glass unit double glazed with spacers and seal

Comparability:

Environmental Product Declarations from different programmes may not be directly comparable if not compliant with EN 15804:2012+A2:2019. Comparability is further dependent on the specific product category rules, system boundaries and allocations, and background data sources. See clause 5.3 of EN 15804:2012+A2:2019

LCA consultant or person responsible for LCA:
EcoReview, Peter Seymour

Verification:

Independent verification of the declaration and data, according to ISO14025:2010

Approved:

SIGNATURE OF PROGRAMME OPERATOR

Third party verifier:
Marcel Gómez Ferrer, Marcel Gómez Consultoria Ambiental

Pat Barry, CEO - Irish Green Building Council

Product

Product description:

The insulated glass unit comprises one sheet of clear flat glass, one sheet of coated flat glass, filled with argon gas in the void. The unit is sealed with primary and secondary seals, and the glass sheets are separated and held in place by a spacer. The insulated glass unit is used as external and internal glazing in commercial and public sector buildings.

Product specification:

The insulated glass unit is manufactured to the following technical standards:
• Thermally toughened soda lime silicate safety glass according to EN 12150-1:2015+A1:2019 (for toughening individual glass panes).
• Insulating glass unit according to EN 1279-1 (for assembly of final product).

Technical data:

the glass sheets are 6mm thick, and have a density of of 2,500 kg/m3. The void separating the two glass sheets is 20mm thick and is filled with argon gas. The U-value of the insulated glass unit is 1.1 W/m2.K.

Market/Geographical Area:

Europe and North America

Reference service life, product

Warranty period is 6 years.

Reference service life, building or construction works

LCA: Calculation rules

Declared unit:

1 m2 Insulated glass unit 1m2 double glazed

kg per Declared unit 30.43

Cut-off criteria:

All relevant inputs and outputs - like emissions, energy and materials - have been taken into account in this LCA, and in accordance with EN15804+A2:2019. The study covers at least 95% of the materials and energy per module and at least 99% of the total use of materials and energy of each unit process. Long term emissions have been excluded from the study.

Allocation:

The measurement of environmental impacts in this EPD uses the LCIA methodologies recommended for PEF 3.1. In this EPD, the waste processes are allocated in the relevant module. In the case of the use of secondary materials or energy recovered from secondary fuels, the system boundary between the system under study and the previous system (providing the secondary materials) is set where outputs of the previous system, e.g. materials, products, building elements or energy, reach the end-of-waste state. The modularity and the polluter payer principles have been followed.

Data quality:

Time representativeness: The production year used in this LCA is 2023. The Ecoinvent version 3.9.1 database was used to represent energies, and wastes arising. This version of Ecoinvent was issued in March 2023. The main raw materials' production data is from 2023 production. Time representativeness is thus assumed to be 'Very Good'.

Geographical representativeness: Data is from the area under study (Europe), where all the raw materials come from western Europe. The geographical representativeness is thus assumed to be 'Very Good'.

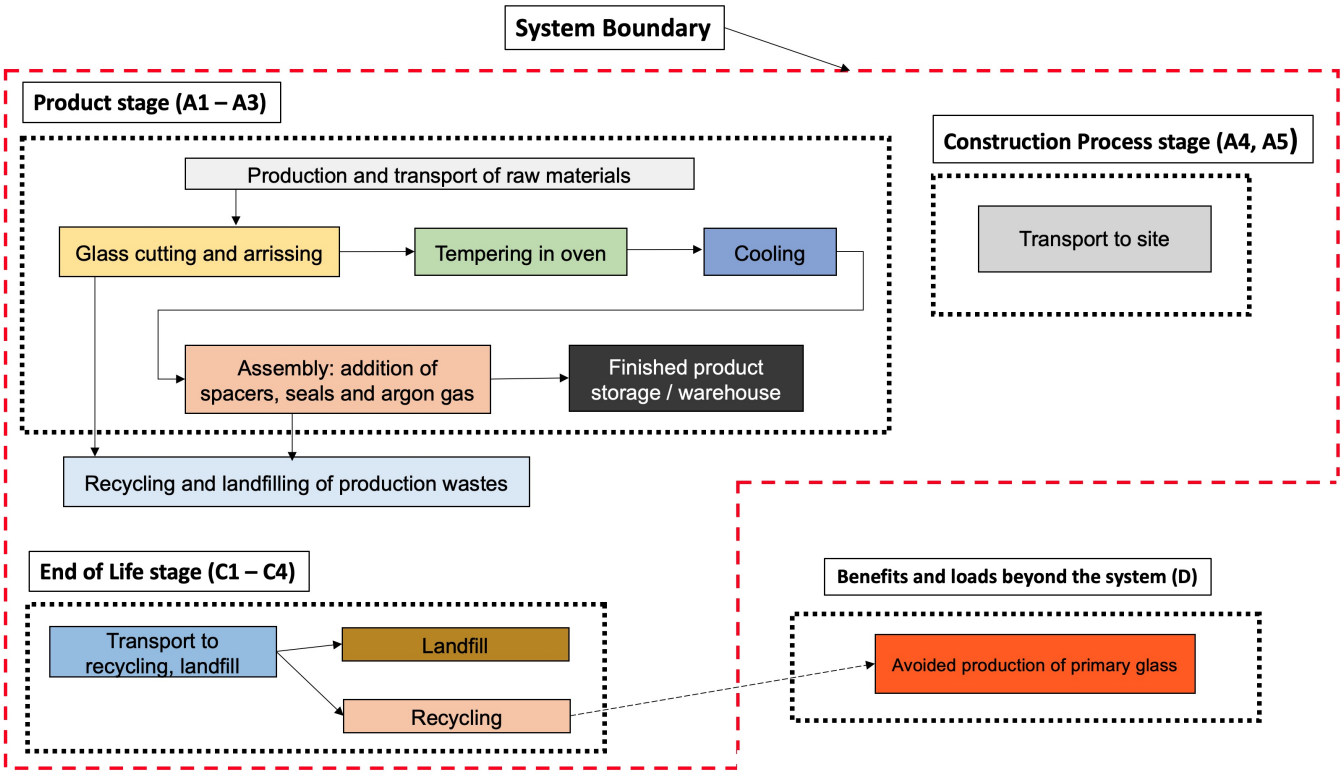
Technical representativeness: Data is from the processes and products under study. The same state of technology that is used by Carey Glass is that defined in the goal and scope. The processes at Carey Glass use electricity and diesel. The electricity record is for electricity generated by a mix of renewables and fossil fuel resources, plus own solar PV system. For the glass, there are two sources of EPD data:
(1) Coated glass data is from a manufacturer-specific glass EPD of a production-weighted average of six coated glass products, from production locations in Europe. The market of applicability of these EPD is Europe. The primary data on this glass raw material is for the 2021 calendar year.
(2) Clear Glass is from a manufacturer-specific and product-specific glass EPD for clear glass. The market of applicability of this EPD is Europe. The primary data on this glass raw material is for the 2021 calendar year.
The technical representativeness is thus assumed to be 'Good'.

Scope and type of EPD (X = Module declared; ND = Module not declared)

Product stage			Construction installation stage		Use stage							End of life stage				Beyond the system boundaries
Raw materials	Transport	Manufacturing	Transport	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	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X

System boundary:

This LCA covers the Product (A1, A2 and A3), Transport to site (A4), Construction Process (A5), End of Life (C1 to C4) and Benefits/loads beyond the system boundary (D) Stages, as indicated above. This is termed: "Cradle to gate with options, modules C1 to C4, and module D". A schematic of these stages is presented in the flow diagram below.



Additional technical information:

The electricity used for 2023 production is a mix of electricity from (a) the grid comprising: on-shore wind (75.6%), natural gas (22.2%) and coal (0.1%), and (b) own solar PV (2.1%). The overall CO2 intensity of this electricity is 0.185 kg CO2/kWh.

LCA: Scenarios and additional technical information

The following information describe the scenarios in the different modules of the EPD.

A4. Transport to customer
The A4 scenario used in this EPD is based on the glass unit being manufactured in Nenagh, Ireland and transported to a customer in London, UK. The road transport distance is 569km, and the sea transport distance is 108km.

A5. Installation
Installation losses are considered to be effectively zero. This is because all efforts are made on site to install the glass units with the greatest of care, and losses are considered to be highly unusual events.

B. Use Stage
The use stage is not covered in this EPD.

C. End of Life Stage
In the end of life stage it is assumed that 70% of the insulated glass unit is recycled and 30% is landfilled.

C1. De-construction demolition
In the deconstruction/demolition stage C1 it is assumed that the no significant energy or materials are used, and the impacts in C1 are assumed to be zero.

C2. Transport
Transport of waste materials from site to recycling processing or landfilling is assumed to be 50km.

C3. Waste processing
Waste processing is the treatment of 70% of the waste glass at a glass recycling plant.

C4. Disposal
It is assumed that disposal of 30% of the insulated glass unit is landfilled.

D. Reuse, Recovery, Recycling potential
Beyond the system, after the waste glass has been processed in the recycling facility and has passed beyond the end-of-waste stage, it is assumed that the recycled glass (70% of the mass of the glass in the declared unit) replaces the production of primary glass.

Biogenic Carbon
These is no Biogenic Carbon in the product.

Database used: Ecoinvent v 3.9.1

LCA tool used: Ecochain Helix v 4.3.1

LCA: Results

The LCA results are presented below for the declared unit defined on page 2 of the EPD document.

Environmental impact											
Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	GWP-total	kg CO_2 -eq	5.05E+01	3.96E+00	5.76E+00	3.59E+00	0.00E+00	0.00E+00	2.77E-01	7.17E-01	0.00E+00	-2.04E+01
	GWP-fossil	kg CO_2 -eq	5.04E+01	3.96E+00	6.09E+00	3.59E+00	0.00E+00	0.00E+00	2.77E-01	3.87E-01	0.00E+00	-2.04E+01
	GWP-biogenic	kg CO_2 -eq	0.00E+00	0.00E+00	-3.30E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.30E-01	0.00E+00	0.00E+00
	GWP-luluc	kg CO_2 -eq	1.55E-02	2.12E-03	4.62E-03	1.85E-03	0.00E+00	0.00E+00	1.37E-04	5.08E-04	0.00E+00	-5.91E-03
	ODP	kg CFC11 -eq	1.37E-07	8.08E-08	1.25E-07	7.55E-08	0.00E+00	0.00E+00	6.03E-09	4.07E-09	0.00E+00	-4.56E-07
	AP	mol H+ -eq	9.83E-02	3.13E-02	2.12E-02	1.87E-02	0.00E+00	0.00E+00	6.06E-04	1.31E-03	0.00E+00	-2.05E-01
	EP-FreshWater	kg P -eq	7.86E-05	2.85E-05	8.10E-05	2.74E-05	0.00E+00	0.00E+00	2.25E-06	6.66E-06	0.00E+00	-3.35E-04
	EP-Marine	kg N -eq	3.00E-02	7.87E-03	5.44E-03	4.69E-03	0.00E+00	0.00E+00	1.49E-04	5.18E-04	0.00E+00	-3.30E-02
	EP-Terrestial	mol N -eq	3.44E-01	8.60E-02	5.58E-02	5.08E-02	0.00E+00	0.00E+00	1.55E-03	4.78E-03	0.00E+00	-4.03E-01
	POCP	kg NMVOC -eq	7.73E-02	2.91E-02	2.26E-02	1.97E-02	0.00E+00	0.00E+00	9.40E-04	1.59E-03	0.00E+00	-1.11E-01
	ADP-minerals&metals[1]	kg Sb-eq	1.37E-05	1.10E-05	1.15E-04	1.08E-05	0.00E+00	0.00E+00	9.06E-07	9.98E-07	0.00E+00	-1.18E-04
	ADP-fossil[1]	MJ	6.52E+02	5.47E+01	8.87E+01	5.02E+01	0.00E+00	0.00E+00	3.94E+00	3.50E+00	0.00E+00	-2.17E+02
	WDP[1]	m^3	5.43E+00	2.06E-01	8.07E-01	1.98E-01	0.00E+00	0.00E+00	1.63E-02	1.56E-01	0.00E+00	-4.64E+00

GWP-total = Global Warming Potential total; GWP-fossil = Global Warming Potential fossil fuels; GWP-biogenic = Global Warming Potential biogenic; GWP-luluc = Global Warming Potential land use and land use change; ODP = Depletion potential of the stratospheric ozone layer; AP = Acidification potential, Accumulated Exceedance; EP-freshwater = Eutrophication potential, fraction of nutrients reaching freshwater end compartment: EP-marine = Eutrophication potential, fraction of nutrients reaching marine end compartment; EP-terrestrial = Eutrophication potential, Accumulated Exceedance; POCP = Formation potential of tropospheric ozone; ADP-minerals&metals = Abiotic depletion potential for non-fossil resources; ADP-fossil = Abiotic depletion for fossil resources potential; WDP = Water (user) deprivation potential, deprivation-weighted water consumption

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator

Remarks to environmental impacts

Additional environmental impact indicators

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PM	Disease incidence	8.70E-07	2.57E-07	2.56E-07	2.49E-07	0.00E+00	0.00E+00	2.06E-08	2.65E-08	0.00E+00	-2.14E-06
	IRP[2]	kgBq U235 -eq	6.83E-01	2.46E-02	2.58E-02	2.39E-02	0.00E+00	0.00E+00	1.99E-03	9.54E-03	0.00E+00	-2.50E-01
	ETP-fw[1]	CTUe	3.32E+02	2.70E+01	3.11E+01	2.48E+01	0.00E+00	0.00E+00	1.95E+00	3.76E+00	0.00E+00	-1.80E+02
	HTP-c[1]	CTUh	6.45E-09	1.77E-09	5.72E-09	1.62E-09	0.00E+00	0.00E+00	1.26E-10	5.40E-10	0.00E+00	-4.33E-09
	HTP-nc[1]	CTUh	2.65E-07	3.45E-08	1.35E-07	3.36E-08	0.00E+00	0.00E+00	2.79E-09	3.61E-09	0.00E+00	-1.11E-07
	SQP[1]	dimensionless	2.79E+01	2.78E+01	2.86E+01	2.78E+01	0.00E+00	0.00E+00	2.38E+00	2.97E+00	7.21E+00	-6.75E+01

PM = Particulate Matter emissions; IRP = Ionizing radiation – human health; ETP-fw = Eco toxicity – freshwater; HTP-c = Human toxicity – cancer effects; HTP-nc = Human toxicity – non cancer effects; SQP = Potential Soil Quality Index (dimensionless)

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

1. The results of this environmental impact indicator shall be used with care as the uncertainties on these results are high or as there is limited experienced with the indicator
2. 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 nor due to radioactive waste disposal in underground facilities. Potential ionizing radiation from the soil, from radon and from some construction materials is also not measured by this indicator.

Resource use												
Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	PERE	MJ	3.18E+02	7.67E-01	8.53E+01	7.44E-01	0.00E+00	0.00E+00	6.19E-02	2.37E-01	0.00E+00	-1.14E+01
	PERM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PERT	MJ	3.18E+02	7.67E-01	8.53E+01	7.44E-01	0.00E+00	0.00E+00	6.19E-02	2.37E-01	0.00E+00	-1.14E+01
	PENRE	MJ	3.56E+02	5.81E+01	9.72E+01	5.34E+01	0.00E+00	0.00E+00	4.18E+00	3.72E+00	0.00E+00	-2.35E+02
	PENRM	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	PENRT	MJ	3.56E+02	5.81E+01	9.72E+01	5.34E+01	0.00E+00	0.00E+00	4.18E+00	3.72E+00	0.00E+00	-2.35E+02
	SM	kg	1.83E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	RSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	NRSF	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	FW	m^3	1.32E-01	6.68E-03	2.08E-02	6.42E-03	0.00E+00	0.00E+00	5.28E-04	4.38E-03	0.00E+00	-1.25E-01

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 materials; RSF = Use of renewable secondary fuels; NRSF = Use of non-renewable secondary fuels; FW = Net use of fresh water

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Waste

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	HWD	kg	5.08E-05	3.34E-04	1.50E-01	3.13E-04	0.00E+00	0.00E+00	2.50E-05	1.74E-05	0.00E+00	-9.09E-04
	NHWD	kg	6.31E-01	2.25E+00	2.20E+00	2.27E+00	0.00E+00	0.00E+00	1.96E-01	9.68E-01	8.50E+00	-1.42E+00
	RWD	kg	5.99E-03	1.57E-05	1.61E-05	1.54E-05	0.00E+00	0.00E+00	1.29E-06	7.36E-06	0.00E+00	-1.91E-04

HWD = Hazardous waste disposed; NHWD = Non-hazardous waste disposed; RWD = Radioactive waste disposed

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

End of life - Output flow

Indicator		Unit	A1	A2	A3	A4	A5	C1	C2	C3	C4	D
	CRU	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	MFR	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.10E+01	0.00E+00	0.00E+00
	MER	kg	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EEE	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	EET	MJ	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

CRU = Components for re-use; MFR = Materials for recycling; MER = Materials for energy recovery; EEE = Exported energy electrical; EET = Exported energy thermal

"Reading example: 9,0 E-03 = 9,0*10-3 = 0,009"
*INA Indicator Not Assessed

Biogenic Carbon Content

Indicator	Unit	At the factory gate
Biogenic carbon content in product	kg C	0.00E+00
Biogenic carbon content in accompanying packaging	kg C	0.00E+00

Note: 1 kg biogenic carbon is equivalent to 44/12 kg CO2

Additional requirements

Dangerous substances

None of the substances contained in the product are listed in the “Candidate List of Substances of Very High Concern for authorisation”, or they do not exceed the limit for registration with the European Chemicals Agency.

Mandatory additional information on release of dangerous substances to indoor air, soil and water.

Bibliography

[1] I.S. EN 15804:2012+A2:2019/AC :2021,: Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products', EN 15804:2012+A2:2019/AC :2021.
[2] I.S. EN 17074; 2019 Glass in building - Environmental product declaration - Product category rules for flat glass products.
[3] EcoChain, 2024, web: http://app.ecochain.com.
[4] Product Category Rules: Part A, Implementation and use of EN 15804:2012+A2:2019 and CEN TR 16970:2016 in Ireland for the development of Environmental Product Declarations; Version 2.0, issue date: 17.08.2021, published by the EPD Ireland Programme operator (Irish Green Building Council).
[5] https://eplca.jrc.ec.europa.eu/LCDN/developerEF.html.
[6] PEF methodology final draft.pdf (europa.eu).

EPD IRELAND	**Program operator and publisher** EPD Ireland - Irish Green Building Council 19 Mountjoy Square, Dublin D01 E8P5	Phone: e-mail: web:	+353 (01) 6815862 epd@igbc.ie https://www.igbc.ie/epd-home/
CareyGlass	**Owner of the declaration:** CareyGlass Limerick Road, E45XV81 Nenagh, Co. Tipperary, Ireland	Phone: e-mail: web:	067 50700 vcarey@careyglass.com www.careyglass.com
EcoReview	**Author of the Life Cycle Assessment** EcoReview Ireland , Kilkenny, Ireland	Phone: e-mail: web:	+353 87 258 9783 pseymour@ecoreview.ie ecoreview.ie
LCA.no	**Developer of PDF generator** LCA.no AS Dokka 6A, 1671 Kråkerøy, Norway	Phone: e-mail: web:	+47 916 50 916 post@lca.no www.lca.no
ECO PLATFORM EPD VERIFIED	ECO Platform ECO Portal	web: web:	www.eco-platform.org ECO Portal