

Environmental Product Declaration

In accordance with ISO 14025:2006 and EN 15804:2012+A2:2019/AC:2021 for:

Aluminium window system: EK69TH

from

CAPPELLO GROUP S.p.A



Programme:	The International EPD System, www.environdec.com
Programme operator:	EPD International AB
Type of EPD:	EPD of a single product from a manufacturer
EPD registration number:	EPD-IES-0032418:001
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<i>An EPD may be updated or depublished if conditions change. To find the latest version of the EPD and to confirm its validity, see www.environdec.com</i>	



GENERAL INFORMATION

Programme Information	
Programme:	The International EPD® System
Address:	EPD International AB Box 210 60 SE-100 31 Stockholm Sweden
Website:	www.environdec.com
E-mail:	support@environdec.com

Product Category Rules (PCR)
CEN standard EN 15804 serves as the Core Product Category Rules (PCR)
Product Category Rules (PCR): <i>PCR 2019-14 Construction products (v2.0.1), valid until 2030-04-07</i>
PCR review was conducted by: <i>The Technical Committee of the International EPD System. See www.environdec.com for a list of members. Review Chair: Rob Rouwette (chair), Noa Meron (co chair). The review panel may be contacted via the Secretariat www.environdec.com/contact.</i>
c-PCR-007 Windows and doors (EN 17213) (c-PCR to PCR 2019:14) - Version 2.0.0.

Third-party Verification
Independent third-party verification of the declaration and data, according to ISO 14025:2006, via:
☒ Individual EPD verification without a pre-verified LCA/EPD tool
Bureau Veritas Italia S.p.A., Viale Monza, 347, 20126 Milano (MI) Accredited by: ACCREDIA - Accreditation certification N. 00031VV
Procedure for follow-up of data during EPD validity involves third party verifier:
☐ Yes ☒ No

The EPD owner has the sole ownership, liability, and responsibility for the EPD.

EPDs within the same product category but published in different EPD programmes, may not be comparable. For two EPDs to be comparable, they shall be based on the same PCR (including the same first-digit version number) or be based on fully aligned PCRs or versions of PCRs; cover products with identical functions, technical performances and use (e.g. identical declared/functional units); have identical scope in terms of included life-cycle stages (unless the excluded life-cycle stage is demonstrated to be insignificant); apply identical impact assessment methods (including the same version of characterisation factors); and be valid at the time of comparison. For further information about comparability, see EN 15804 and ISO 14025.

INFORMATION ABOUT EPD OWNER

Owner of the EPD: Cappellogroup S.p.A.

Address: Zona Industriale IV Fase, viale 3, n° 5 Ragusa, RG 97100

Contact: Ing. Emanuele Schembari; emanuele.schembari@cappellogroup.it

LCA practitioner: MDB Advisors, Contact: info@mdb-advisors.com

Description of the organisation:

CAPPELLO GROUP S.p.A. is an Italian family-owned company founded in 1965 in Giarratana, Sicily. The company has progressively developed from its original mechanical activities into a diversified industrial group active in aluminium systems, surface treatments and renewable-energy solutions.

The production site considered in this study is located at Zona Industriale IV Fase, Viale 3, n° 5, 97100 Ragusa (RG), Italy. The site is used for the manufacture of aluminium window and door systems marketed under the EKLIP brand, including thermal-break casement systems, sliding and lift-and-slide systems, and related aluminium glazed systems.

CAPPELLO GROUP also carries out industrial powder coating and hot-dip galvanising activities and operates in the field of green energy through photovoltaic and building-integrated photovoltaic solutions.



PRODUCT INFORMATION

Product name:

Aluminium window system: EK69TH

Product identification:

EK69TH is a thermally insulated aluminium casement window system from CAPPELLO GROUP S.p.A., marketed under the trademark EKLIP. It is intended for use in construction where thermal insulation, mechanical strength, durability, acoustic insulation, watertightness and airtightness are required.

The basic material used in this product is aluminum alloy, while other materials include Polyamide thermal break material, EPDM/TPE sealing strips, insulated glass panels, accessories, and powder coatings.

The composition of materials and the mass per declared unit (1 m² of installed window) are derived from a representative product specimen of standard dimensions of 1230 × 1480 mm, single-sash configuration, with total specimen mass 68,15 kg. The reference flow per declared unit is therefore 37,38 kg/m².

UN CPC code:

4212 Doors, windows and their frames and thresholds for doors, of iron, steel or aluminium

Product description:

Description of EK69TH: aluminium casement system with thermal break for window and door applications. It accommodates inward-/outward-opening, tilt-and-turn, awning, pivoting and curved casement configurations. The system has a thermal transmittance $U_w \geq 0,94 \text{ W/m}^2\text{K}$, air permeability Class 4, watertightness Class E1200 and wind-resistance Class C3/B4.

For additional info: Visit our company website, www.cappellogroup.it

Visual representation of the product:



Name and location of production site: Zona Industriale IV Fase, Viale 3, n° 5, 97100 Ragusa (RG), Italy

CONTENT DECLARATION

Product content	Mass, kg (for 1m ²)	Post-consumer recycled material, mass-% of product	Biogenic material, mass-% of product	Biogenic material, kg C/product or declared unit
Aluminium	10,09	53,7%	-	-
Polyamide	1,21	0%	-	-
EPDM / TPE seals	1,66	0%	-	-
Glass	21,72	0%	-	-
Accessories	1,21	0%	-	-
Paint (polyester powder coat)	1,50	0%	-	-
TOTAL	37,3834			

Packaging materials	Mass, kg (for 1m ²)	Mass-%(versus the product)	Biogenic material, kg C/product or declared unit
Polyurethane	0,1318	0,35%	-
Polypropelene	0,0202	0,05%	-
LDPE Film	0,1950	0,52%	-
LDPE Shrink film	0,0159	0,04%	-
Wood	0,2747	0,73%	0,137
TOTAL	0,6376	1,71%	0,137

1 kg biogenic carbon in the product/packaging is equivalent to the uptake of 44/12 kg of CO₂.

Note: The windows DO NOT contain substances of very high concern (SVHC) included in the ECHA Candidate List in concentration exceeding 0,1% (weight-%).

LCA INFORMATION

Declared unit: 1 m²

Conversion factor to mass: 37,38kg per 1 m² (one representative specimen of 1230 × 1480 mm, single-sash configuration)

Reference service life: No reference service life is declared in this study.

Time representativeness: January 2024 - December 2024

Database and LCA software used

- LCA Software: SimaPro software version 10.3.0.1
- Database: Ecoinvent (version 3.11)
- Impact categories were calculated using the method EN 15804+A2/EF 3.1
- Infrastructure and long-term emissions are excluded.

Description of system boundaries: Cradle-to-gate (A1-A3), with modules A4, A5, C1-C4, and D

The considered modules are:

Product stage

A1: Extraction of raw materials, fuel production, generation of electricity

A2: Transport of raw materials to the production plant

A3: Manufacturing processes

Construction process stage

A4: Transport of the product to the customer or directly to the site of use

A5: Installation of the product

End of life stage

C1: Process of deconstruction and/or demolition of the product.

C2: Transport of the demolished product to treatment plants

C3: Waste processing

C4: Disposal

D: Net environmental benefits deriving from matter/energy flows leaving the system under study

The scope of the work is therefore that of a "Cradle to gate with modules A4–A5, modules C1–C4 and module D (A1–A3 + C + D and A4–A5)".

Modules B1–B7 are not declared. The study is not intended to quantify the influence of the window system on the operational energy performance of a specific building.

Geographical scope:

The geographical scope of the study for A1-A3 includes upstream suppliers of raw materials and components, supplier transport to CAPPELLO GROUP S.p.A., and manufacturing at the Ragusa production site. From module A4 to module D the geographical scope is Italy.

Description of system boundaries

For the definition of the boundaries of the system, reference is made to the standards contained in the reference technical specifications, provided for within the EPD system. In particular, PCR 2019:14 version 2.0.1, valid up to 2030-04-07, in accordance with EN 15804, introduces a modular approach whereby the life cycle of a product is divided into General Modules, each of which is composed of different life cycle phases.

Declared Modules

Product Stage (A1-A3) The product stage encompasses all processes concerning the manufacture of the EKLIP aluminium window and door systems that involve the provision of raw materials, transport of materials to the place of manufacturing, manufacture itself, and auxiliary inputs.

A1 - Raw materials supply

This process category concerns the manufacturing of aluminium extrusions and sheets, polyamide thermal break bars, EPDM/TPE gaskets, insulating glass panels, accessories, and powder coating inputs. All packaging materials for the end product belong to the process category.

Per-series reference flows are computed from one representative product specimen per series and normalised to the declared unit of 1 m² of installed window/door system. LCA modelling uses ecoinvent 3.11 datasets compliant with EN 15804.

A2 - Transport to manufacturing site

Various raw materials and components are delivered from various suppliers to the CAPPELLO GROUP S.p.A. manufacturing plant in Ragusa, Italy. The distance for each material, its supplier, and the particular transport route is computed.

Road transports are modelled through EURO 5 freight lorry datasets, maritime transport through standard marine shipping datasets.

A3 - Manufacturing Process

The manufacturing process consists of aluminium processing, cutting, assembly, glazing integration, hardware installation, and powder coating.

Manufacturing electricity is supplied partly from the Italian medium-voltage grid (modelled with the AIB 2024 Italian residual mix) and partly from the on-site photovoltaic system. In 2024, 56,6% of the electricity consumed at the site was self-consumed from the on-site photovoltaic system.

Packaging materials, which consist of plastic film, strapping, protective profiles, and wood, form part of the system boundaries,

Construction process stage (A4-A5)

A4 - Transportation to the construction site

Transport of the finished EK69TH systems from the CAPPELLO GROUP S.p.A. production site in Ragusa to the customer or building site is modelled as road freight with EURO 5 articulated lorries (16-32 ton capacity, Diesel). A conservative weighted-average road distance of 264 km is adopted, derived

from the 2024 sales/delivery records and corresponding to the farthest client destination identified in the year.

Table A4 - Transport to the building site (EN 15804+A2 Table 10)

Scenario information	Unit (per declared unit, 1 m ²)
Fuel type and consumption of vehicle, vehicle type	Ecoinvent dataset: Transport, freight, lorry, 16-32 metric ton, diesel, EURO 5 {RER}.
Distance	264 km (road distance, conservative)
Capacity utilisation (including empty returns)	load factor 5,79 ton (including empty returns)
Bulk density of transported products	300 kg/m ³
Volume capacity utilisation factor	1

A5 - Installation

Installation involves the mounting of the system within the building opening and the disposal of the packaging waste created during the process. There is no energy demand for the installation process, while the demand for tools is assumed insignificant. Ancillary products such as sealants, foams, and fixings are excluded and considered at the building level.

Packaging waste (plastic and wooden products) is included within the system and managed following European standards of waste management (recycling, incineration, and landfills).

Table A5 - Installation of the product in the building (EN 15804+A2 Table 11)

Scenario information	Unit (per declared unit, 1 m ²)
Ancillary materials for installation (specified by material)	0 kg
Water use	0 m ³ (no water required for installation)
Other resource use	0 kg
Quantitative description of energy type (regional mix) and consumption during the installation process	0 kWh - installation requires only common hand tools and low-impact electric tools (screwdrivers, drills); associated energy consumption considered negligible and excluded.
Waste materials on the building site before waste processing, generated by the product's installation (specified by type)	Polyurethane PU corner profiles: 0,1318 kg; PP strapping: 0,0202 kg; LDPE film (pallet shrink): 0,1950 kg; LDPE shrink film: 0,0159 kg; Wood wedges: 0,2747 kg.
Output materials (specified by type) as result of waste processing at the building site (collection for recycling, energy recovery, disposal — specified by route). The respective percentages are taken from EUROSTAT.	Plastic fractions: • Recycling 92,2%, • energy recovery 4,7%, • landfill 3,1%. Wood: • recycling 82,05%, • energy recovery 17,95%, • landfill 0%.
Direct emissions to ambient air, soil and water	0 kg

End-of-life stage (C1-C4)

At end-of-life, the EKLIP system is expected to be dismantled following standard construction industry practices and taken to waste treatment facilities. The materials are sorted into recyclable, recoverable and waste fractions.

C1: Module C1 includes the deconstruction and dismantling of the installed EKLIP aluminium window and door systems from the building at the end of their service life. The products are assumed to be manually or mechanically dismantled using standard demolition practices for façade and window systems.

In accordance with the PCR guidance, the energy consumption for dismantling is assumed to be 1,1 kWh per tonne of dismantled product.

C2: Transportation to waste treatment facilities (80-130 km depending on location)

Within the end-of-life waste scenarios for stage C2, this module accounts for the road transport of products to their designated end-of-life destination, namely the waste treatment facility. This applies to all fractions directed to recycling, energy recovery, or final disposal in landfill.

C3: This module includes the waste processing operations required to prepare the dismantled materials for recycling, recovery or final disposal.

C4: This module includes the final disposal of material fractions that are not recovered or recycled during the end-of-life stage. The non-recovered fractions are assumed to be transported to landfill facilities and treated according to representative European disposal practices.

Table C - End-of-life (EN 15804+A2 Table 15)

Processes / parameter	Value (per declared unit, 1 m ²) - by type of material		
Collection process specified by type kg collected separately	37,3834 kg/m ²		
Recovery system specified by type - kg for re-use	0 kg/m ² (no re-use scenario credited)		
Recovery system specified by type	Material fraction	Recycling / treatment	Landfill
	Non-glass parts	95%	5%
	Glass	30%	70%
Assumptions for scenario development - dismantling energy (C1)	1,1 kWh per tonne dismantled product (per PCR 2019:14 v2.0.1 and EN 17213 default).		
Assumptions for scenario development - transport to treatment (C2)	80 km for fractions destined for recycling / recovery; 130 km for fractions destined for landfill (PCR 2019:14 v2.0.1 default).		
Assumptions for scenario development - geographic / temporal	Representative European end-of-life scenario for windows and doors per EN 17213 and PCR 2019:14 v2.0.1.		

Module D - Reuse/recovery/recycling potential

Module D quantifies the net benefits and loads beyond the system boundary from recyclable materials and energy carriers exiting the system at end-of-life. Flows included per declared unit (1 m²): For the EKLIP aluminium window and door systems, Module D mainly includes:

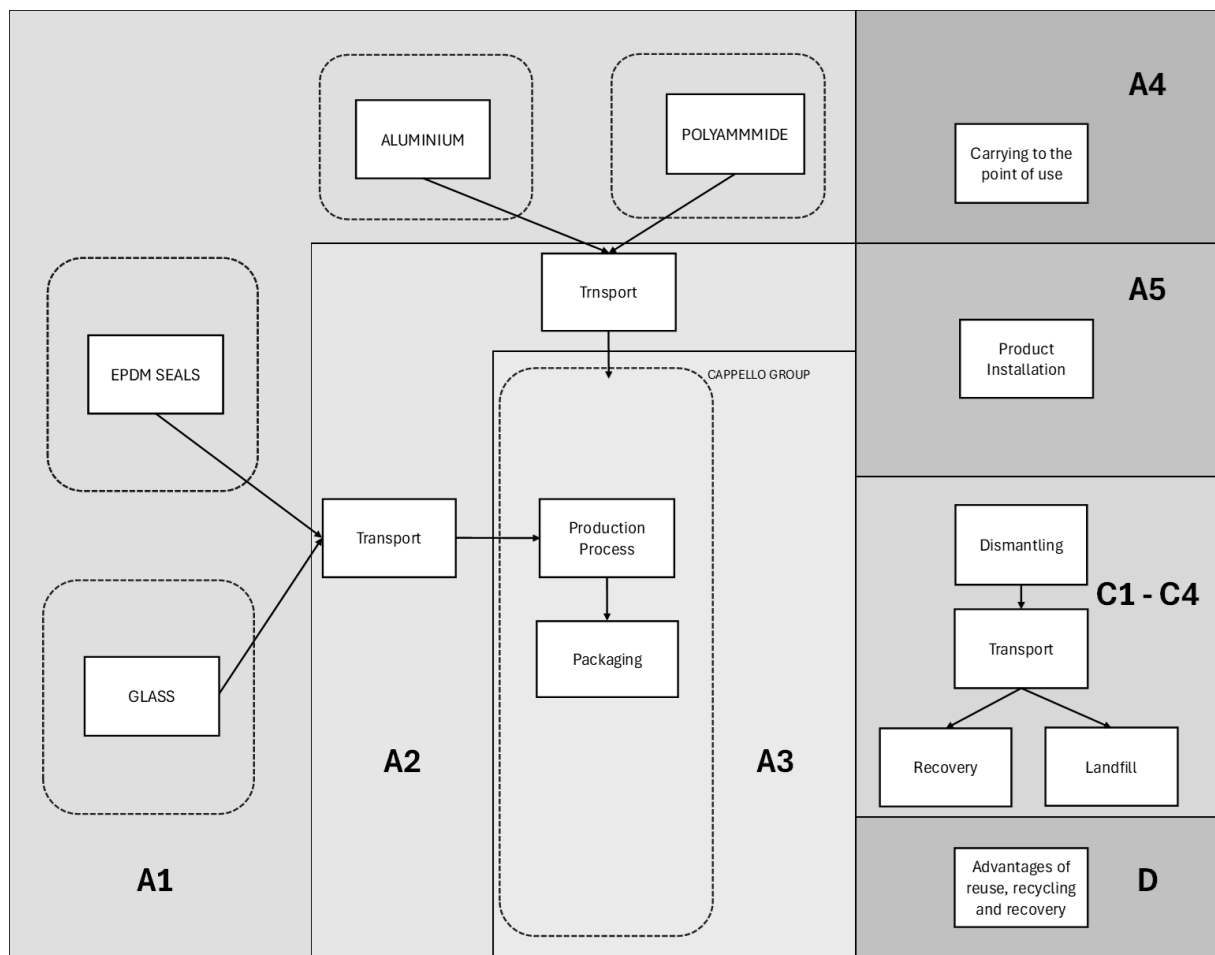
- recycling potential of aluminium profiles;
- recycling potential of recovered glass fractions;
- recycling of Plastic components

A conservative recycling efficiency of 90% is applied to all recovered material flows leaving the system at C3 (aluminium, glass and mixed plastics). Module D credits are computed per declared unit (kg/m²) and quality-ratio adjusted in accordance with EN 15804+A2 / PCR 2019:14 v2.0.1.

Module D is outside the product system (modules A-C). Biogenic carbon or inherent energy of the discarded product was reported once in the declared product life cycle and was not accounted for a second time in module D, to avoid double accounting.

Module D is reported separately because it represents potential environmental benefits and loads occurring beyond the defined life-cycle system boundary of the declared product.

Process flow diagram



Allocation:

Allocation was not performed whenever possible since inputs and outputs were directly assigned to the EKLIP product series. In cases when it was impossible to use the direct assignment method, physical allocation was used considering weight, geometry, and production time.

Cut-off rules:

The inventory process follows EN 15804:2012+A2:2019/AC:2021, PCR 2019:14 (Version 2.0.1), c-PCR-007 Windows and doors (Version 2.0.0) and EN 17213:2020+A1:2025. Input and output flows relevant to the assessment object and for which data are available have been considered within the system boundary. The inventory includes raw materials, packaging, supplier transport, manufacturing electricity, production waste, finished-product transport, installation-related flows, end-of-life treatment and Module D recovery/recycling potential. Site water consumption is formally excluded under the cut-off provisions.

Cut-off criteria are applied according to EN 15804+A2 and PCR criteria, ensuring that at least 99% of the mass and energy flows and at least 95% of the total environmental impact are taken into account.

Manufacturing electricity mix:

The electricity used in the production process (phase A1-A3) was modelled using the national Residual Mix provided by the AIB (Association of Issuing Bodies) for a share of 44% and by the photovoltaic system for 56%. The GWP-GHG of the electricity mix is equal to: 0,289 kg CO₂eq./kWh.

Data Quality

Parameter	Description
Data Collection	01/01/2024 - 31/12/2024
Sites used	Zona Industriale IV Fase, viale 3, n° 5 Ragusa, RG 97100, Italy
Geography	The production is carried out at the Cappello site located in Ragusa, RG, Italy. The products are primarily distributed within the Italian market, with additional distribution across European countries.
Technology	EKLIP aluminium window and door systems are manufactured at the Cappello Group plant in Ragusa through the following sequence of operations: cutting of aluminium 6060 extruded profiles to length, machining (drilling, milling, end-cutting), assembly of the polyamide PA66 thermal break between inner and outer profiles by knurling and rolling, application of EPDM/TPE gaskets, mounting of hardware and accessories, integration of the insulating glass unit (IGU), and finishing with polyester powder-coat. Electricity is supplied partly from the Italian grid (AIB 2024 residual mix) and partly from the on-site photovoltaic system (56,6% self-consumption in 2024).
Averaging	Averaging was only made for waste allocation
LCI/LCA database	Ecoinvent 3.11 - Allocation, cut-off, EN 15804
EPD used	EPD-IES-0021553: EPD International AB
Data Quality Scheme	EN 15804:2012+A2:2019, Annex E, Table E.2
Use of Fair data with more than 30% of core impact	No fair data detected. Very Good Data used.
Use of poor/ very poor relevant data	The datasets used to model the waste show limited geographical representativeness
Other informations	The end of life scenario for packaging waste has been modelled based on last available Eurostat data and for product Representative European end-of-life scenario for windows and doors per EN 17213 is used.

The data quality information presented in this EPD has been prepared and reported in accordance with the requirements set forth in UNI EN 15941:2024 and complies with the data quality criteria specified in EN 15804:2012+A2:2019.

Process	Source type	Source	Reference year	Data category	Share of primary data, of GWP-GHG results for A1-A3
Production of aluminium	EPD	EPD-IES-0021553	2024	Primary data	49%
Production of Glass	Database	Ecoinvent v3.11	2024	Primary data	20%
Production of Other raw materials	Database	Ecoinvent v3.11	<5 years old	Secondary data	0%
Production of packaging	Database	Ecoinvent v3.11	<5 years old	Secondary data	0%
Transport of materials to production site	Database	Ecoinvent v3.11	2024	Primary data	4%
Generation of electricity used in manufacturing of product	Database	AIB 2024; Ecoinvent v3.11	2024	Primary data	6%
Other processes	Databases	Ecoinvent v3.11	<5 years old	Secondary data	0%
Total share of primary data, of GWP-GHG results for A1-A3					79%

Description of system boundaries

The system boundary for this study follows the modular approach defined in PCR 2019:14 version 2.0.1, valid until 2030-04-07 and EN 15804:2012+A2:2019/AC:2021, whereby the life cycle of a product is divided into modules, each representing different life cycle phases. The scope of this EPD is "**Cradle to gate with modules A4–A5 , modules C1–C4 and module D (A1–A3 + C + D and A4–A5)**".

	Product stage			Distribution/ installation stage		Use stage							End-of-life stage				Beyond product life cycle
	Raw material supply	Transport	Manufacturing	Transport	Construction installation	Use	Maintenance	Repair	Replacement	Refurbishment	Operational energy use	Operational water use	De-construction demolition	Transport	Waste processing	Disposal	Reuse-Recovery-Recycling-potential
Module	A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	D
Modules declared	X	X	X	X	X	ND	ND	ND	ND	ND	ND	ND	X	X	X	X	X
Geography	EU	Italy	Italy	Italy	Italy								EU	EU	EU	EU	EU
Share of primary data*	79%			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – products	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-
Variation – sites	-			-	-	-	-	-	-	-	-	-	-	-	-	-	-

*The share of primary data is calculated based on GWP-GHG results. It is a simplified indicator for data quality that supports the use of more primary data, to increase the representativeness of and comparability between EPDs. Note that the indicator does not capture all relevant aspects of data quality and is not comparable across product categories.

ENVIRONMENTAL PERFORMANCE

LCA results of the product - main environmental performance results

Mandatory impact category indicators according to EN 15804

Results per functional unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-total	kg CO ₂ eq.	1,07E+02	1,54E+00	3,27E-01	1,40E-02	4,02E+00	3,80E+00	2,09E-01	-2,05E+01
GWP-fossil	kg CO ₂ eq.	1,07E+02	1,54E+00	2,62E-01	1,40E-02	4,01E+00	3,66E+00	2,08E-01	-2,02E+01
GWP-biogenic	kg CO ₂ eq.	7,64E-03	3,34E-04	6,27E-02	2,46E-06	6,23E-04	1,37E-01	3,58E-04	-1,50E-01
GWP-luluc	kg CO ₂ eq.	5,11E-01	2,43E-05	1,76E-03	5,77E-07	1,44E-04	5,64E-03	5,93E-04	-2,14E-01
ODP	kg CFC 11 eq.	4,68E-06	3,49E-08	2,73E-09	2,13E-10	6,03E-08	1,74E-08	2,89E-09	-6,20E-07
AP	mol H ⁺ eq.	7,13E-01	3,97E-03	8,99E-04	1,29E-04	2,09E-02	5,89E-03	1,03E-03	-1,22E-01
EP-freshwater	kg P eq.	3,98E-02	7,92E-06	5,80E-05	1,17E-07	2,46E-05	9,44E-04	9,94E-06	-6,64E-03
EP-marine	kg N eq.	1,23E-01	1,52E-03	3,54E-04	6,10E-05	9,29E-03	2,25E-03	8,59E-04	-1,82E-02
EP-terrestrial	mol N eq.	1,18E+00	1,66E-02	3,11E-03	6,68E-04	1,02E-01	1,19E-02	4,80E-03	-1,90E-01
POCP	kg NMVOC eq.	3,85E-01	6,58E-03	1,11E-03	1,99E-04	4,07E-02	3,83E-03	1,50E-03	-9,54E-02
ADP-minerals&metals*	kg Sb eq.	1,80E-03	4,01E-08	1,30E-07	4,91E-10	1,05E-07	3,08E-07	1,55E-08	-2,69E-06
ADP-fossil*	MJ	1,59E+03	2,05E+01	2,73E+00	1,83E-01	5,18E+01	2,51E+01	2,56E+00	-4,36E+02
WDP*	m ³	5,82E+01	1,62E-02	5,01E-02	2,31E-04	5,80E-02	5,87E-01	-1,09E-01	-1,96E+01
Acronyms	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								

* Disclaimer: 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. The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks.

"The estimated impact results are only relative statements, which do not indicate the endpoints of the impact categories, exceeding threshold values, safety margins and/or risks."

"The results of the end-of-life stage (modules C1-C4) should be considered when using the results of the product stage (modules A1-A3)."

Additional mandatory and voluntary impact category indicators

Results per functional unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
GWP-GHG ¹	kg CO ₂ eq.	1,08E+02	1,54E+00	2,64E-01	1,40E-02	4,01E+00	3,71E+00	2,09E-01	-2,04E+01

Resource use indicators

Results per functional unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
PERE	MJ	2,80E+02	5,10E-02	4,11E+00	3,99E-04	9,62E-02	6,56E+00	1,04E-02	-6,46E+01
PERM	MJ	3,66E+00	0,00E+00	-3,66E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	2,83E+02	5,10E-02	4,49E-01	3,99E-04	9,62E-02	6,56E+00	1,04E-02	-6,46E+01
PENRE	MJ	1,59E+03	2,05E+01	1,39E+01	1,83E-01	5,18E+01	1,51E+02	2,56E+00	-4,36E+02
PENRM	MJ	1,37E+02	0,00E+00	-1,11E+01	0,00E+00	0,00E+00	-1,26E+02	0,00E+00	0,00E+00
PENRT	MJ	1,59E+03	2,05E+01	2,74E+00	1,83E-01	5,18E+01	2,51E+01	2,56E+00	-4,36E+02
SM	kg	7,63E+00	1,06E-05	3,93E-05	3,68E-07	3,03E-05	1,99E-04	1,41E-05	1,04E+01
RSF	MJ	4,40E-02	8,74E-07	2,24E-06	6,38E-08	1,62E-06	1,29E-05	1,23E-06	-3,53E-03
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
FW	m ³	1,80E+00	3,96E-04	1,29E-03	5,55E-06	1,39E-03	1,58E-02	-2,54E-03	-4,74E-01
Acronyms	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								

¹ This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

Waste indicators

Results per functional unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Hazardous waste disposed	kg	3,76E+00	7,79E-04	5,93E-03	1,92E-05	3,97E-03	7,47E-02	2,81E-03	-2,38E+00
Non-hazardous waste disposed	kg	1,00E+02	6,61E-02	4,50E-01	6,57E-04	1,58E-01	6,94E+00	2,02E+00	-1,46E+02
Radioactive waste disposed	kg	4,28E-03	1,23E-06	1,03E-05	8,54E-09	2,10E-06	1,75E-04	1,59E-07	-9,02E-04

Output flow indicators

Results per functional unit									
Indicator	Unit	A1-A3	A4	A5	C1	C2	C3	C4	D
Components for re-use	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
Material for recycling	kg	7,83E-01	4,61E-07	3,07E-01	4,89E-09	1,16E-06	1,20E+01	9,29E-07	3,72E+00
Materials for energy recovery	kg	2,14E-05	3,02E-09	6,04E-08	1,53E-10	1,17E-08	1,85E-07	1,31E-08	-5,43E-06
Exported energy, electricity	MJ	1,92E+00	8,16E-04	6,75E-03	3,27E-06	7,59E-04	1,18E-01	4,92E-04	-2,05E-01
Exported energy, thermal	MJ	2,05E+00	1,94E-03	4,44E-04	1,31E-06	5,44E-05	2,66E-03	6,87E-05	-4,80E-01

**Disclaimer: The results of modules A1-A3 should not be used without considering the results of module C*

Additional Information: Compliance with CAM (Criteri Ambientali Minimi)

This EPD is not sectorial. This Environmental Product Declaration (EPD) provides additional information on the alignment of EK69TH with the Criteri Ambientali Minimi (CAM) for construction products and EN 15804+A2.

1. Compliance with CAM Requirements

- Life Cycle Assessment (LCA) Approach: The product has undergone a Life Cycle Assessment (LCA) following ISO 14040, ISO 14044, and EN 15804:2012+A2:2019/AC:2021.
- EPD Compliance: This product has a third-party verified EPD compliant with ISO 14025 and UNI EN 15804, ensuring transparent environmental performance reporting.
- Use of Virgin Raw Materials: The representative material composition used in the environmental assessment includes recycled material content values derived from supplier documentation and production inventory data:
 - Aluminium: 85,4% total content of recycled of which 31,7% recovered byproduct material
 - Polyamide: 55% recycled content (Pre-consumer)
- Environmental Impact Reduction:
 - The production process uses electricity from the grid and from the on-site photovoltaic system, with 56,6% of consumption self-consumed from the on-site PV.
 - The product does not contain Substances of Very High Concern (SVHCs) above 0.1% by mass, in compliance with ECHA regulations.
 - The product in question do not contain Volatile Organic Compounds (VOC). Hence, this meets low VOC emissions criteria, minimizing indoor air pollution risks.
- End-of-Life and Circular Economy Considerations:
 - The product is designed for durability and long-term performance, reducing the need for frequent replacement.
 - The recycled content in raw materials contribute to the circularity profile of the EK systems and support resource efficiency and material recovery objectives within the life cycle assessment framework.

2. Contribution to Green Public Procurement (GPP)

The EK aluminium systems manufactured by Cappello Group support the objectives of Green Public Procurement (GPP) and sustainable construction by contributing to resource efficiency, circular economy principles, and transparent environmental reporting.

The declared products provide:

- Transparent and third-party verified environmental information developed according to EN 15804+A2 and ISO 14025.

- High recycled material content, including 85,4% recycled aluminium, contributing to reduced consumption of primary raw materials and supporting circular economy strategies.
- Durable aluminium systems designed for long service life and reduced maintenance requirements.
- End-of-life recycling potential for aluminium components, with benefits associated with material recovery declared in Module D.
- Traceable life cycle assessment data supporting sustainable procurement processes and environmental building certifications.
- Compliance with internationally recognized environmental assessment standards, making the products suitable for use in public and sustainable construction projects.

The EK systems contribute to improving the environmental performance of buildings through the use of recyclable materials, efficient manufacturing processes, and transparent environmental declarations consistent with CAM and GPP principles.

Additional LCA results EoL

In addition to the most probable scenario, results from the corresponding 100% scenarios are added in this section.

Representative European end-of-life scenario for windows and doors per EN 17213. Additional 100% scenarios for 100% recycled and 100% landfill are declared in the section below. Modules C1 and C2 do not change between the alternative 100% scenarios and the baseline scenario used in the EPD; only modules C3 and C4 are affected, and Module D is updated accordingly.

Mandatory impact category indicators according to EN 15804

Results per functional unit		100% Landfill			100% Recycled		
Indicator	Unit	C3	C4	D	C3	C4	D
GWP-total	kg CO ₂ eq.	0,00E+00	7,81E-01	0,00E+00	4,02E+00	0,00E+00	-3,30E+01
GWP-fossil	kg CO ₂ eq.	0,00E+00	7,78E-01	0,00E+00	3,87E+00	0,00E+00	-3,25E+01
GWP-biogenic	kg CO ₂ eq.	0,00E+00	1,50E-03	0,00E+00	1,45E-01	0,00E+00	-2,52E-01
GWP-luluc	kg CO ₂ eq.	0,00E+00	1,01E-03	0,00E+00	5,99E-03	0,00E+00	-2,28E-01
ODP	kg CFC 11 eq.	0,00E+00	8,05E-09	0,00E+00	1,87E-08	0,00E+00	-9,14E-07
AP	mol H ⁺ eq.	0,00E+00	2,62E-03	0,00E+00	6,32E-03	0,00E+00	-2,48E-01
EP-freshwater	kg P eq.	0,00E+00	3,18E-05	0,00E+00	1,01E-03	0,00E+00	-8,00E-03
EP-marine	kg N eq.	0,00E+00	9,37E-03	0,00E+00	2,40E-03	0,00E+00	-3,72E-02
EP-terrestrial	mol N eq.	0,00E+00	1,16E-02	0,00E+00	1,28E-02	0,00E+00	-4,21E-01
POCP	kg NMVOC eq.	0,00E+00	3,80E-03	0,00E+00	4,12E-03	0,00E+00	-1,57E-01
ADP-minerals&metals*	kg Sb eq.	0,00E+00	5,71E-08	0,00E+00	3,25E-07	0,00E+00	-6,25E-06
ADP-fossil*	MJ	0,00E+00	7,22E+00	0,00E+00	2,68E+01	0,00E+00	-5,81E+02

WDP*	m ³	0,00E+00	2,28E+00	0,00E+00	6,27E-01	0,00E+00	2,37E+01
GWP-GHG ²	kg CO ₂ eq.	0,00E+00	7,80E-01	0,00E+00	3,93E+00	0,00E+00	3,29E+01
PERE	MJ	0,00E+00	6,83E-02	0,00E+00	7,01E+00	0,00E+00	7,41E+01
PERM	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
PERT	MJ	0,00E+00	6,83E-02	0,00E+00	7,01E+00	0,00E+00	7,41E+01
PENRE	MJ	0,00E+00	7,23E+00	0,00E+00	1,53E+02	0,00E+00	5,81E+02
PENRM	MJ	0,00E+00	0,00E+00	0,00E+00	1,26E+02	0,00E+00	0,00E+00
PENRT	MJ	0,00E+00	7,23E+00	0,00E+00	2,68E+01	0,00E+00	5,81E+02
SM	kg	0,00E+00	2,10E-04	0,00E+00	2,11E-04	0,00E+00	2,58E+01
RSF	MJ	0,00E+00	1,74E-05	0,00E+00	1,36E-05	0,00E+00	-1,12E-02
NRSF	MJ	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
FW	m ³	0,00E+00	-5,31E-02	0,00E+00	1,68E-02	0,00E+00	-5,71E-01
Hazardous waste disposed	kg	0,00E+00	1,63E-02	0,00E+00	7,94E-02	0,00E+00	2,62E+00
Non-hazardous waste disposed	kg	0,00E+00	3,96E+01	0,00E+00	7,38E+00	0,00E+00	1,62E+02
Radioactive waste disposed	kg	0,00E+00	1,21E-06	0,00E+00	1,88E-04	0,00E+00	-1,06E-03
Components for re-use	kg	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00	0,00E+00
Material for recycling	kg	0,00E+00	1,68E-05	0,00E+00	1,26E+01	0,00E+00	3,91E+00
Materials for energy recovery	kg	0,00E+00	1,65E-07	0,00E+00	1,95E-07	0,00E+00	-1,61E-05
Exported energy, electricity	MJ	0,00E+00	9,23E-03	0,00E+00	1,26E-01	0,00E+00	-2,92E-01
Exported energy, thermal	MJ	0,00E+00	8,12E-04	0,00E+00	2,81E-03	0,00E+00	1,59E+00

ABBREVIATIONS

Abbreviation	Definition
General Abbreviations	
EN	European Norm (Standard)

² This indicator accounts for all greenhouse gases except biogenic carbon dioxide uptake and emissions and biogenic carbon stored in the product. As such, the indicator is identical to GWP-total except that the CF for biogenic CO₂ is set to zero.

EF	Environmental Footprint
GPI	General Programme Instructions
ISO	International Organization for Standardization
CEN	European Committee for Standardization
CPC	Central product classification
SVHC	Substances of Very High Concern
ND	Not Declared
kg	Kilogram
m ³	Cubic Meter
CO ₂ eq.	Carbon Dioxide Equivalents
PCR	Product Category Rules
AIB	Association of Issuing Bodies
GPP	Green Public Procurement
CAM	Criteri Ambientali Minimi (Italian Minimum Environmental Criteria)
EF	Environmental Footprint (method)
CPC	Central Product Classification (United Nations)
ND	Not Declared

REFERENCES

- Central Product Classification (CPC) Series M No.77. v.2.1. United Nations. New York. 2015.
- Database Ecoinvent v.3.11 (www.ecoinvent.org).
- General Programme Instructions of International EPD System. Version 5.0.1
- PCR 2019:14 Construction products version 2.0.1
- c-PCR-007 Windows and doors (EN 17213) (c-PCR to PCR 2019:14) - Version 2.0.0.
- EN 15804:2012+A2:2019/AC:2021
- EN 17213:2020+A1:2025
- LCA_STUDY_REPORT_EPD_CAPPELLO_REV01

VERSION HISTORY

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